

**Call: HORIZON-CL4-2021-RESILIENCE-01
(A DIGITISED, RESOURCE-EFFICIENT AND RESILIENT INDUSTRY 2021)**

Topic: HORIZON-CL4-2021-RESILIENCE-01-03

Type of Action: HORIZON-RIA

Proposal number: 101058522

Proposal acronym: FutuRaM

Type of Model Grant Agreement: HORIZON Action Grant Budget-Based

Table of contents

Section	Title	Action
1	General information	
2	Participants	
3	Budget	
4	Ethics and security	

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

1 - General information

Fields marked * are mandatory to fill.

Topic	HORIZON-CL4-2021-RESILIENCE-01-03	Type of Action	HORIZON-RIA
Call	HORIZON-CL4-2021-RESILIENCE-01	Type of Model Grant Agreement	HORIZON-AG

Acronym **FutuRaM**

Proposal title **Future Availability of Secondary Raw Materials**

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months **48**

Fixed keyword 1 **Waste management**

Secondary raw materials; Critical raw materials; WEEE; ELV; Batteries; UNFC; Mining waste; Slags & Ashes;

Free keywords **Construction & Demolition Waste; Circular economy; Climate neutral; CRM; SRM**

Abstract *

The Future Availability of Secondary Raw Materials (FutuRaM) project seeks to (1) develop knowledge on the availability and recoverability of secondary raw materials (SRMs) within the European Union (EU), with a special focus on critical raw materials (CRMs), to enable fact-based decision making for their exploitation in the EU and third countries, and (2) disseminate this information via a systematic and transparent Secondary Raw Materials Knowledge Base (SRM-KB).

The FutuRaM project will establish a methodology, reporting structure, and guidance to improve the raw materials knowledge base up to 2050, and facilitate the exploitation of SRMs with a particular focus on CRMs. The project will integrate SRM and CRM data to model their current stocks and flows, and consider economic, technological, geopolitical, regulatory, social and environmental factors to further develop, demonstrate and align SRM recovery projects with the United Nations Framework Classification for Resources (UNFC).

The project will address the following waste streams: Batteries; Waste Electrical and Electronic Equipment; End-of-Life Vehicles; Mining waste; Slags and Ashes; and Construction and Demolition Waste. FutuRaM will further develop and test the UNFC methodology through 18 case studies across the six FutuRaM waste streams.

FutuRaM research into the future availability of raw materials is relevant to the specific aspects of the work plan. It will contribute to a transition to climate-neutral, circular and digitised economy; develop an understanding of anthropogenic resources; develop the necessary criteria to establish a resource classification approach; combine new & existing data and present it in a UNFC format; develop a proposal for EU statistics for SRMs; and contribute to raising awareness of raw materials supply challenges in the EU and the possible solutions.

Remaining characters **122**

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under any EU programme, including the current call?

Yes No

Please give the proposal reference or contract number.

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

Declarations

Field(s) marked * are mandatory to fill.

- 1) We declare to have the explicit consent of all applicants on their participation and on the content of this proposal. *
- 2) We confirm that the information contained in this proposal is correct and complete and that none of the project activities have started before the proposal was submitted (unless explicitly authorised in the call conditions).
- 3) We declare:
- to be fully compliant with the eligibility criteria set out in the call
 - not to be subject to any exclusion grounds under the [EU Financial Regulation 2018/1046](#)
 - to have the financial and operational capacity to carry out the proposed project.
- 4) We acknowledge that all communication will be made through the Funding & Tenders Portal electronic exchange system and that access and use of this system is subject to the [Funding & Tenders Portal Terms and Conditions](#).
- 5) We have read, understood and accepted the [Funding & Tenders Portal Terms & Conditions](#) and [Privacy Statement](#) that set out the conditions of use of the Portal and the scope, purposes, retention periods, etc. for the processing of personal data of all data subjects whose data we communicate for the purpose of the application, evaluation, award and subsequent management of our grant, prizes and contracts (including financial transactions and audits).
- 6) We declare that the proposal complies with ethical principles (including the highest standards of research integrity as set out in the [ALLEA European Code of Conduct for Research Integrity](#), as well as applicable international and national law, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. [Appropriate procedures, policies and structures](#) are in place to foster responsible research practices, to prevent questionable research practices and research misconduct, and to handle allegations of breaches of the principles and standards in the Code of Conduct.
- 7) We declare that the proposal has an exclusive focus on civil applications (activities intended to be used in military application or aiming to serve military purposes cannot be funded). If the project involves dual-use items in the sense of [Regulation 428/2009](#), or other items for which authorisation is required, we confirm that we will comply with the applicable regulatory framework (e.g. obtain export/import licences before these items are used).
- 8) We confirm that the activities proposed do not
- aim at human cloning for reproductive purposes;
 - intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed), or
 - 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.
 - lead to the destruction of human embryos (for example, for obtaining stem cells)
- These activities are excluded from funding.
- 9) We confirm that for activities carried out outside the Union, the same activities would have been allowed in at least one EU Member State.

The coordinator is only responsible for the information relating to their own organisation. Each applicant remains responsible for the information declared for their organisation. If the proposal is retained for EU funding, they will all be required to sign a declaration of honour.

False statements or incorrect information may lead to administrative sanctions under the EU Financial Regulation.

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

2 - Participants

List of participating organisations

#	Participating Organisation Legal Name	Country	Action
1	WASTE OF ELECTRICAL AND ELECTRONICAL EQUIPMENT FORUM AISBL	BE	
2	REPIC LIMITED	UK	
3	Erion WEEE	IT	
4	ecosystem	FR	
5	TECHNISCHE UNIVERSITAT BERLIN	DE	
6	UNIVERSITY COLLEGE LONDON	UK	
7	CHALMERS TEKNISKA HOEGSKOLA AB	SE	
8	RECHARGE	BE	
9	BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES	FR	
10	GEOLOGIAN TUTKIMUSKESKUS	FI	
11	VLAAMSE INSTELLING VOOR TECHNOLOGISCH ONDERZOEK N.V.	BE	
12	GEOLOSKI ZAVOD SLOVENIJE	SI	
13	UNIVERSITEIT LEIDEN	NL	
14	UNITED NATIONS INSTITUTE FOR TRAINING AND RESEARCH	CH	
15	WEEECycling	FR	
16	LUDWIG-MAXIMILIANS-UNIVERSITAET MUENCHEN	DE	
17	SOCIEDADE PORTUGUESA DE INOVACAO CONSULTADORIA EMPRESARIAL E FOMENTO DA INOVACAO SA	PT	
18	SVERIGES GEOLOGISKA UNDERSOKNING	SE	
19	Duncan Kushnir	SE	
20	BOLIDEN MINERAL AB	SE	
21	UNIVERSITY OF BELGRADE - FACULTY OF MINING AND GEOLOGY	RS	

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

22	Mace	UK
23	LOVISAGRUVAN AB	SE
24	EIDGENOSSISCHE MATERIALPRUFUNGS- UND FORSCHUNGSASTALT	CH
25	Otanm?ki Mine Oy	FI
26	BUNDESANSTALT FUER GEOWISSENSCHAFTEN UND ROHSTOFFE	DE
27	Stiftung Gemeinsames R?cknahmesystem Batterien	DE
28	EUROPEAN METAL RECYCLING LIMITED	UK

Organisation data

PIC	Legal name
997394353	WASTE OF ELECTRICAL AND ELECTRONICAL EQUIPMENT FORUM AISBL
Short name: WEEE FORUM	
Address	
Street	BOULEVARD AUGUSTE REYERS 80
Town	BRUXELLES
Postcode	1030
Country	Belgium
Webpage	www.weee-forum.org
Specific Legal Statuses	
Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no
SME Data	
Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.	
SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name	<i>Name of the department/institute carrying out the work.</i>	<input checked="" type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	<i>Please enter street name and number.</i>	
Town	<i>Please enter the name of the town.</i>	
Postcode	<i>Area code.</i>	
Country	<i>Please select a country</i>	

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr _____

Gender Woman Man Non Binary

First name* James

Last name* HORNE

E-Mail* james.horne@weee-forum.org

Position in org. Project Manager

Department WASTE OF ELECTRICAL AND ELECTRONICAL EQUIPMENT FORUM AISBL

Same as organisation name

Same as proposing organisation's address

Street BOULEVARD AUGUSTE REYERS 80

Town BRUXELLES

Post code 1030

Country Belgium

Website <https://weee-forum.org/>

Phone +447711410805

Phone 2 +XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Magdalena	Charytanowicz	magdalena.charytanowicz@weee-forum.org	+32 2 7068703
Pascal	Leroy	pascal.leroy@weee-forum.org	+XXX XXXXXXXXX
Eniko	Hajosi	eniko.hajosi@weee-forum.org	+XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input checked="" type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Dataset	<i>The Urban Mine Platform (UMP), outcome of ProSUM project, it is a centralised database containing all readily available data on market inputs, stocks in use and hibernated, compositions and waste flows of electrical and electronic equipment (EEE), vehicles and batteries for all EU Member States plus Switzerland and Norway.</i> http://www.urbanmineplatform.eu/homepage
Publication	<i>ProSUM Final Report: Prospecting Secondary raw materials in the Urban mine and Mining wastes. The report outlines the results of the projects, the platforms created (above mentioned UMP and Minerals Knowledge Data Platform (MKDP)) and analyses the available data for WEEE, batteries, ELVs and mining waste. It also gives the recommendations for the future use of UMP (available also as a separate, more detailed report).</i> http://prosumproject.eu/sites/default/files/DIGITAL_Final_Report.pdf
Publication	<i>ORAMA Final report: Optimising quality of information in RAw MAterials data collection across Europe .The report presents a clear set of recommendations for data collection practices for primary and secondary raw materials. Among others, it recommends a single standard for reporting of resource data, the United Nations Framework Classification (UNFC), a framework for reporting mineral resource data developed by the UN. https://orama-h2020.eu/wp-content/uploads/ORAMA_WP6_DEL6.6_20191115_v.1.0.pdf</i>
Publication	<i>CEWASTE project final report: ?A contribution to future Raw Materials Recycling?. The report presents the voluntary certification scheme for the collection, transport and treatment facilities of key types of waste containing significant amounts of valuable materials and CRMs, such as WEEE and batteries. It singles out the types of equipment and components that contain high concentrations of CRMs.</i> https://cewaste.eu/wp-content/uploads/2021/04/CEWASTE-Final-Public-Raport.pdf
Publication	<i>WEEE Flows report: In-depth review of the WEEE Collection Rates and Targets in the EU-28, Norway, Switzerland, and Iceland. The study investigates the flows of e-waste in Europe. It highlights the factors that impede formal/official collection.</i> https://weee-forum.org/wp-content/uploads/2020/11/In-depth-review_WEEE-Collection-Targets-and-Rates_UNITAR_2020_Final.pdf

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM project	<i>The project delivered the first Urban Mine Knowledge Data Platform, a centralised database of all available data and information on arisings, stocks, flows and treatment of waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELVs), batteries and mining wastes for both primary and secondary raw materials.</i> http://www.prosumproject.eu/
ORAMA project	<i>ORAMA (Optimising quality of information in RAw MAterials data collection across Europe) took the results of ProSUM (and other projects such as Minerals4EU or MICA) to the next level, by identifying the best practices in collecting information on European raw materials and supporting further development of the Raw Materials Information System (RMIS).</i> https://orama-h2020.eu/
CEWASTE project	<i>CEWASTE developed a voluntary certification scheme for waste treatment. Specifically, the project created, validated and launched the scheme for collection, transport and treatment facilities of key types of waste containing significant amounts of valuable and critical raw materials such as waste electrical and electronic equipment (WEEE) and batteries.</i> https://cewaste.eu/

Administrative forms

<i>European Innovation Partnership on Raw Materials</i>	<i>The WEEE Forum is a member of the European Innovation Partnership on Raw Materials - Danilo Bonato of Erion (one of WEEE Forum's Linked 3rd parties) as member of the High-Level Steering Group and Pascal Leroy, WEEE Forum's Director General, as Sherpa.</i>
<i>European Raw Materials Alliance (ERMA) membership</i>	<i>The WEEE Forum is one of the partners in ERMA which seeks to increase EU resilience in the rare earths and magnets value chain, and will identify barriers, opportunities and investment cases. The WEEE Forum will contribute in the field of recycling and secondary raw materials.</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
936090353	REPIC LIMITED

Short name: REPIC LIMITED

Address

Street REPIC House, Waterfold Business Park
Town Bury
Postcode BL9 7BR
Country United Kingdom
Webpage www.repic.co.uk

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name	<i>Name of the department/institute carrying out the work.</i>	<input checked="" type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	<i>Please enter street name and number.</i>	
Town	<i>Please enter the name of the town.</i>	
Postcode	<i>Area code.</i>	
Country	<i>Please select a country</i>	

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Co-author of ProSUM Project Final Report.</i>
Publication	<i>Co-author of Industry White Paper Developing a Dynamic WEEE Flow Model for the UK</i>
Publication	<i>Co-author An independent study on Waste Electrical and Electronic Equipment (WEEE) flows in the UK</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM	<i>Project Co-ordinator on behalf of the WEEE Forum</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889809519	<i>Erion WEEE</i>

Short name: Erion WEEE

Address

Street	Via Messina, 38
Town	Milano
Postcode	20154
Country	Italy
Webpage	https://erionweee.it/

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	10/08/2021 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name PROJECTS AND INNOVATION not applicable

Same as proposing organisation's address

Street Via Lepetit, 40

Town Lainate (MI)

Postcode 20045

Country Italy

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Luca	Campadello	Man	Italy	luca.campadello@erion.it	Category A Top grad	Leading	0000-0002-7581-4880	Orcid ID
Mr	Filippo	Stringa	Man	Italy	filippo.stringa@erion.it	Category B Senior re	Team member	0000-0002-2041-8100	Orcid ID
Ms	Alessia	Accili	Woman	Italy	alessia.accili@erion.it	Category B Senior re	Team member	0000-0002-7258-551	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Magazine economiacircolare.com (2020) (https://economiacircolare.com)</i> The web magazine, produced by ERION together with CDCA, is a trade publication dedicated to the circular economy and boasts scientific partnerships with the main Italian research bodies active in innovation and research in the industrial and environmental fields.
Publication	<i>The Italian Atlas of Circular economy (2017) (https://economiacircolare.com/atlante)</i> Presented and realised together with CDCA (Centre for the Documentation of Environmental Conflicts) and in partnership with ASUD, Poliedra, Banca Etica and Fondazione Ecosistemi, the Italian Atlas of the Circular Economy is the first digital platform dedicated to Italian circular enterprises, surveying and narrating the experiences of the Circular Economy in Italy.
Service	<i>Erion for you digital platform (2020) (https://erionpervoi.it/it)</i> It is the website dedicated to environmental awareness and the importance of recycling waste associated with electronic products. A journey to make together with citizens through best practices, news from all over the world, useful information, curiosities, ideas to copy and much more
Publication	<i>?Using Internet of Things and Distributed Ledger Technology for Digital Circular Economy Enablement: The Case of Electronic Equipment? (2021) (https://www.mdpi.com/2071-1050/13/9/4982/htm)</i> . In this paper, the application of Internet of Things (IoT) and Distributed Ledger Technology (Blockchain) are discussed by presenting the case of professional Electrical and Electronic Equipment (EEE) in Italy.
Publication	<i>?Product clustering as a strategy for enhanced plastics recycling from WEEE? (2020) (https://www.sciencedirect.com/science/article/abs/pii/S0007850620301025)</i> <i>Using statistical data sets for a case study of selected common WEEE products categories, the clusters in which to sort the products and dismantled components are documented and can support enhanced polymer recycling in an industrial setting.</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
CEWASTE (2019 -2021) (H2020 ? G.A. 820859) https:/	<i>The aim of the CEWASTE project is to make the current models for recovering Critical Raw Materials (CRMs) from specific types of waste, e.g. WEEE, more sustainable, through the introduction of a voluntary certification scheme for the collection, transport and treatment of waste containing a significant amount of CRMs. ERION contributes to analyse the current obstacles associated to CRMs recycling and study possible solutions for improving the efficiency and duration of the certification scheme.</i>
PolyCE (2017-2021) (H2020 ? G.A. 730308) https://w	<i>The project PolyCE (Post-Consumer High-tech Recycled Polymers for a Circular Economy) aims to enable recycling of plastics from electronic waste for a more sustainable future. ERION leads the WEEE supply chain demonstrator for clustering the products, sorting and EoL treatment of plastic from WEEE. ERION contributes to the elaboration of technical requirements addressing the entire PCR plastics supply and value chain for the further development of WEEE and plastic recycling standards (CENELEC).</i>
NONTOX (2018-2022) (H2020 - G.A. 820895) http://no	<i>The project aims to increase the amount of recycled plastic by removing the hazardous substances that currently limit its re-use. ERION will collaborate in the mapping of the plastics supply chain, the European regulations governing it and the definition of innovative solutions to overcome possible obstacles, through environmental and economic assessments.</i>

Administrative forms

<i>BlockWEEE (2019) (EIT Climate KIC ?P.A. 190796)</i>	<p><i>The project BlockWEEE evaluates the benefits of introducing blockchain technology in professional EEE/WEEE management systems. ERION will control the achievement of project objectives and it will facilitate the communication among partners (the point of contact between industrial and research sectors). ERION will also provide inputs about stakeholders' needs, existing operational constraints, the economic feasibility of the proposed solutions and actual data to perform the BlockWEEE approach.</i></p>
<i>CRM Recovery (2016-2018) (LIFE)</i>	<p><i>ERION is responsible for the Italian trial, consisting of the implementation of innovative collection and recovery processes for improving the recovery of critical raw materials from WEEE.</i></p> <p><i>http://www.criticalrawmaterialrecovery.eu</i></p>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
<i>Logistics and waste treatment operators</i>	<p><i>The logistics and waste treatment operations managed by ERION are entrusted to INTERSEROH TSR ITALIA. Through this collaboration, ERION is able to ensure an excellent service for its Members in terms of quality, environmental protection and efficiency of the management process of the waste.</i></p>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
895993657	ecosystem

Short name: ecosystem

Address

Street 34/40 Rue Henri Regnault

Town COURBEVOIE

Postcode 92400

Country France

Webpage

Specific Legal Statuses

Legal person	yes
Public body	unknown
Non-profit	unknown
International organisation	unknown
Secondary or Higher education establishment	unknown
Research organisation	unknown

SME Data

Based on the below details from the Participant Registry the organisation is **unknown** (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input checked="" type="checkbox"/>
providing data on WEEE, testing case study	

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>ProSUM Final Report: Prospecting Secondary raw materials in the Urban mine and Mining wastes</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Sampling program	<i>ecosystem? sampling program regarding the composition of the collected flow (type of WEEE and there share in the collection)</i>
BME	<i>ecosystem? assessment program of materials and pollutants in the WEEE input flows</i>
EXTRADE	<i>(Extraction of rare earth elements contained in permanent magnets of electric and electronic waste) (ANR project)</i>
ProSUM	<i>Prospecting Secondary raw materials in the Urban mine and Mining wastes (H2020 project)</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999986678	TECHNISCHE UNIVERSITAT BERLIN
Short name: TUB	
Address	
Street	STRASSE DES 17 JUNI 135
Town	BERLIN
Postcode	10623
Country	Germany
Webpage	www.tu-berlin.de
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	25/05/2016 - no
SME self-assessment	25/05/2016 - no
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Institute of High-Frequency and Semiconductor System Technologies not applicable

Same as proposing organisation's address

Street STRASSE DES 17 JUNI 135

Town BERLIN

Postcode 10623

Country Germany

Department 2

Department name School of Process EngineeringChair of Circular Economy and Recy not applicable

Same as proposing organisation's address

Street STRASSE DES 17 JUNI 135

Town BERLIN

Postcode 10623

Country Germany

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Prof. _____

Gender Woman Man Non Binary

First name* **Vera Susanne**

Last name* **Rotter**

E-Mail* **vera.rotter@tu-berlin.de**

Position in org. Professor, head of chair, senior researcher

Department Chair of Circular Economy and Recycling Technology

Same as organisation name

Same as proposing organisation's address

Street STRASSE DES 17 JUNI 135

Town BERLIN

Post code 10623

Country Germany

Website <https://www.circulareconomy.tu-berlin.de/abfallwirtschaft/>

Phone +493031422619

Phone 2 +XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Nadine	Schreyer	nadine.schreyer@tu-berlin.de	+XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Prof	Vera Susanne	Rotter	Woman	Austria	Vera.rotter@tu-berlin.de	Category A Top grad	Leading	0000-0001-9300-7292	Orcid ID
Ms	Nathalie	Korf	Non-binary	Germany	nathalie.korf@tu-berlin.de	Category D First stag	Team member	0000-0002-0770-660X	Orcid ID
Ms	Marina	Proske	Woman	Germany	Marina.proske@tu-berlin.de	Category D First stag	Team member	0000-0003-0077-9125	Orcid ID
Mr	Eduard	Wagner	Man	Germany	Eduard.wagner@tu-berlin.de	Category D First stag	Team member	0000-0002-8166-5252	Orcid ID
Prof	Martin	Schneider-Ramelow	Man	Germany	Martin.schneider-ramelow@tu-berlin.de	Category A Top grad	Team member	12244272900	Scopus Author Identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Korf et al., 2019: Multi-element chemical analysis of printed circuit boards ? challenges and pitfalls; https://doi.org/10.1016/j.wasman.2019.04.061
Publication	Mahlitz et al., 2019: Characterizing the Urban Mine?Challenges of Simplified Chemical Analysis of Anthropogenic Mineral Residues; https://doi.org/10.3390/resources8030132
Publication	Mahlitz et al., 2020: Characterizing the Urban Mine?Simulation-Based Optimization of Sampling Approaches for Built-in Batteries in WEEE; https://doi.org/10.3390/recycling5030019
Dataset	Mahlitz et al., 2020: WEEE Batteries - Sampling data; https://doi.org/10.14279/depositonce-9338
Publication	Maisel, F. 2020; Preparing WEEE plastics for recycling ? How optimal particle sizes in pre-processing can improve the separation efficiency of high quality plastics; https://doi.org/10.1016/j.resconrec.2019.104619

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM	Prospecting Secondary raw materials in the Urban mine and Mining wastes http://www.prosumproject.eu/ a Horizon2020 project, which generated the First Urban Mine Knowledge Data Platform - http://www.urbanmineplatform.eu/homepage - a centralised database of all available data and information on arisings, stocks, flows and treatment of waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELV), batteries and mining wastes.
ORAMA	An Horizon2020 project, which focused on optimising data collection for primary and secondary raw materials in Member States. https://orama-h2020.eu/
ARGOS	A national project within the r? innovation program, funded by the German Federal Ministry of Education and Research, which focussed on reducing non-functional recycling of critical elements by developing a multi-sensor alloy detection system.
PolyCE	An Horizon2020 project, enabling recycling of plastics from waste of electrical and electronic equipment (WEEE) https://www.polyce-project.eu/
MoDeSt	A national project funded by the German Federal Ministry of Education and Research, focusing on modular design for smartphone. It covers the global value chain of smartphone from production to material recovery to promote among other material recycling.

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Lab for chemical physical waste characterization	The Chair of Circular Economy and Recycling Technology operates a laboratory for waste and SRM analysis including, disassembly, waste sorting, sampling and sample preparation and full chemical analysis, as well as mobile inline analytical device
Raw data data sets from the ProSUM project	Both groups have detailed raw data sets on Battery and WEEE composition from previous projects

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999975620	UNIVERSITY COLLEGE LONDON

Short name: UNIVERSITY COLLEGE LONDON

Address

Street	GOWER STREET
Town	LONDON
Postcode	WC1E 6BT
Country	United Kingdom
Webpage	http://www.ucl.ac.uk

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	30/05/2008 - no
SME self-assessment	unknown
SME validation	30/05/2008 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Civil, Environmental & Geomatic Engineering not applicable

Same as proposing organisation's address

Street GOWER STREET

Town LONDON

Postcode WC1E 6BT

Country United Kingdom

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Prof. _____

Gender Woman Man Non Binary

First name* Julia

Last name* Stegemann

E-Mail* j.stegemann@ucl.ac.uk

Position in org. Professor of Environmental Engineering

Department Civil, Environmental & Geomatic Engineering

Same as organisation name

Same as proposing organisation's address

Street GOWER STREET

Town LONDON

Post code WC1E 6BT

Country United Kingdom

Website <http://www.ucl.ac.uk>

Phone +44(0)2076797370

Phone 2 +44(0)7810880334

Other contact persons

First Name	Last Name	E-mail	Phone
Giles	Machell	g.machell@ucl.ac.uk	+XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Prof	Julia	Stegemann	Woman	Germany	j.stegemann@ucl.ac.uk	Category A Top grad	Leading	0000-0002-4491-8222	Orcid ID
Dr	Stijn	Van Ewijk	Man	Netherlands	s.vanewijk@alumni.ucl.ac.uk	Category C Recognis	Team member	0000-0002-8894-4692	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Van Ewijk, S., Stegemann, J. A., & Ekins, P. (2021). Limited climate benefits of global recycling of pulp and paper. Nature Sustainability. doi:10.1038/s41893-020-00624-z</i>
Publication	<i>Leng, L., Zhang, W., Li, H., Bogush, A. A., Stegemann, J. A., & Huang, H. (2021). The impact of the particle size of meat and bone meal (MBM) incineration ash on phosphate precipitation and phosphorus recovery. Journal of Environmental Chemical Engineering, 9 (3), 105247. doi:10.1016/j.jece.2021.105247</i>
Publication	<i>de Tudela, A. R. P., Rose, C. M., & Stegemann, J. A. (2019). Quantification of Material Stocks in Existing Buildings Using Secondary Data- A Case Study for Timber in a London Borough. Resources, Conservation & Recycling: X, 100027. doi:10.1016/j.rcrx.2019.100027</i>
Publication	<i>Stegemann, J. A. (2014). The potential role of energy-from-waste air pollution control residues in the industrial ecology of cement. Journal of Sustainable Cement-Based Materials, 1-17. doi:10.1080/21650373.2013.878673</i>
Publication	<i>Stegemann, J. A., & Zhou, Q. (2009). Screening tests for assessing treatability of inorganic industrial wastes by stabilisation/solidification with cement. Journal of Hazardous Materials, 161 (1), 300-306. doi:10.1016/j.jhazmat.2008.03.090</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Circular Economy Centre	<i>Led by J. Stegemann (UCL) in collaboration with 24 co-investigators from 6 other leading UK research organisations, the ICEC-MCM focuses on improving the way we use materials such as aggregate, cement, brick, plasterboard, stone and glass, particularly in infrastructure.</i>
Industrial Symbiosis in the Cement Industry	<i>Led by J. Stegemann (UCL), this collaboration with the China Building Materials Academy and South China University of Technology conducted a scientific study of the fate and behaviour of toxic metals from untreated wastes, through the cement kiln, to hydrated cement pastes and the environment. Advanced techniques for chemical analysis and materials characterisation, and geochemical modelling investigated changes to metal speciation.</i>
Past Human Activity in Structuring Landscape	<i>The Role of Past Human Activity in Structuring Modern Landscapes & Soils: J. Stegemann was a co-investigator on this grant to examine the long term environmental impacts of material flows and processes associated with Maya salt production on Ambergris Caye, Belize, a thousand years ago.</i> <i>This project ran from 2013-2016 and was funded by the Leverhulme Trust. (?200K)</i>
Metal Extraction from Bottom Ash	<i>This project funded by a commercial sponsor under confidentiality arrangements developed a process for extraction of precious metals from bottom ash from energy-from-waste facilities (?80K, 2012/13).</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
ICEC-MCM	<i>See above. This Centre brings together leading researchers on construction materials and the circular economy to provide a critical mass and forum for interaction to create positive change in materials resource efficiency in this sector.</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999980373	CHALMERS TEKNISKA HOEGSKOLA AB

Short name: CHALMERS TEKNISKA HOEGSKOLA AB

Address

Street -

Town GOETEBORG

Postcode 41296

Country Sweden

Webpage www.chalmers.se

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	19/08/2008 - no
SME self-assessment	unknown
SME validation	19/08/2008 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Technology management and economics not applicable

Same as proposing organisation's address

Street -

Town Gothenburg

Postcode 41296

Country Sweden

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* Maria

Last name* Ljunggren

E-Mail* maria.ljunggren@chalmers.se

Position in org. Associate professor

Department Environmental systems analysis

Same as organisation name

Same as proposing organisation's address

Street -

Town GOETEBORG

Post code 41296

Country Sweden

Website www.chalmers.se

Phone +46317721000

Phone 2 +XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Prof	Maria	Ljunggren	Woman	Sweden	maria.ljunggren@chalmers.se	Category B Senior researcher	Leading	https://orcid.org/0000-0001-6418-8557	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Nordelof, A., Messagie, M., Tillman, A-M, Ljunggren Soderman, M., Van Mierlo, J. (2014) Environmental Impacts of Hybrid, Plug-in hybrid and Battery Electric Vehicles What can we learn from Life Cycle Assessment, International Journal of Life Cycle Assessment, 19:11, pp 1866-1890.</i>
Publication	<i>Andersson, M., Ljunggren Soderman, M., Sanden, B. (2017) Are scarce metals in vehicles functionally recycled? Waste Management, 60:407-416.</i>
Publication	<i>Nordelof, A., Alatalo, M., Ljunggren Soderman, M. (2019) A scalable life cycle inventory of an automotive power electronics inverter unit Part I: design and composition, International Journal of Life Cycle Assessment, 24(1): 78-92.</i>
Publication	<i>Huisman, J., Leroy, P., Tertre, F., Ljunggren Soderman, M., Chancerel, P., Cassard, D., Lovik, A. N., Wager, P., Kushnir, D., Rotter, V.S., Mahlitz, P., Herreras, L., Emmerich, J., Hallberg, A., Habib, H., Wagner, M., Downes, S. (2017), Prospecting Secondary Raw Materials in the Urban Mine and mining wastes (ProSUM) - Final Report, ISBN: 978-92-808-9060-0 (print), 978-92-808-9061-7 (electronic), December 21, 2017, Brussels, Belgium.</i>
Publication	<i>Andersson, M., Ljunggren Soderman, M., Sanden, B. (2019) Challenges of recycling multiple scarce metals: the case of Swedish ELV and WEEE recycling, Resources Policy, 63:101403.</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM	<i>Prospecting Secondary raw materials in the Urban mine and Mining wastes (European Union's Horizon 2020 Grant agreement N° 641999)</i>
ORAMA	<i>Optimising data collection for Primary and Secondary Raw Materials European Union's Horizon 2020 Grant agreement Nr 641999)</i>
Commissioned datasets	<i>Datasets delivery on European stocks and flows of vehicles for the Raw Material Information System (RMIS), Commissioner: European Commission, DG Joint Research Centre, Institute Sustainable Resources, Land Resources Unit, Ispra, Italy, 2020-2021</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
948382969	RECHARGE

Short name: RECHARGE

Address

Street AVENUE DE TERVUEREN 168 3
Town BRUXELLES
Postcode 1150
Country Belgium
Webpage www.rechargebatteries.org

Specific Legal Statuses

Legal person yes
Public body no
Non-profit yes
International organisation no
Secondary or Higher education establishment no
Research organisation no

SME Data

Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.

SME self-declared status unknown
SME self-assessment unknown
SME validation unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Claude**

Last name* **Chason**

E-Mail* **cchanson@rechargebatteries.org**

Position in org. General Manager

Department RECHARGE

Same as organisation name

Same as proposing organisation's address

Street AVENUE DE TERVUEREN 168 3

Town BRUXELLES Post code 1150

Country Belgium

Website <https://rechargebatteries.org/>

Phone +32 2 777 05 60 Phone 2 +XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input checked="" type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Dataset	<i>Contribution to Batteries Stock and flows data of the Prosum project, based on RECHARGE dataset.</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ELIBAMA	<i>Lithium batteries manufacturing and recycling in EU</i>
ProSUM	<i>Raw materials urban mine</i>
Batteries 2030+	<i>Future batteries in EU</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999993662	BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES
Short name: BRGM	
Address	
Street	3 AV CLAUDE GUILLEMIN
Town	ORLEANS
Postcode	45060
Country	France
Webpage	www.brgm.fr
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	19/06/2008 - no
SME self-assessment	unknown
SME validation	19/06/2008 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Water, Environment, Process Development and Analysis Division not applicable

Same as proposing organisation's address

Street 3 AV CLAUDE GUILLEMIN

Town ORLEANS

Postcode 45060

Country France

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr _____

Gender Woman Man Non Binary

First name* Daniel

Last name* Monfort Climent

E-Mail* d.monfortcliment@brgm.fr

Position in org. Researcher

Department Water, Environment, Process Development and Analysis Division

Same as organisation name

Same as proposing organisation's address

Street 3 AV CLAUDE GUILLEMIN

Town ORLEANS

Post code 45060

Country France

Website www.brgm.fr

Phone 0033238643483

Phone 2 +XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Lydie	Jeux	l.jeux@brgm.fr	0033238644654
Marie	Gastine	m.gastine@brgm.fr	+XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Antoine	Beylot	Man	France	a.beylot@brgm.fr	Category C Recognis	Team member	0000-0002-3483-4770	Orcid ID
Mr	Daniel	Monfort	Man	Spain	d.monfortcliment@brgm.fr	Category C Recognis	Leading	0000-0003-2038-4139	Orcid ID
Dr	Stephanie	Muller	Woman	France	s.muller@brgm.fr	Category C Recognis	Team member	0000-0003-0547-9199	Orcid ID
Dr	Jacques	Villeneuve	Man	France	j.villeneuve@brgm.fr	Category B Senior re	Team member		
Dr	Antoine	Boubault	Man	France	a.boubault@brgm.fr	Category C Recognis	Team member	0000-0002-6713-6987	Orcid ID
Dr	Faustine	Laurent	Woman	France	f.laurent@brgm.fr	Category C Recognis	Team member		
Mr	Olivier	Frezot	Man	France	o.frezot@brgm.fr	Category B Senior re	Team member		
Dr	Francoise	Bodenan	Woman	France	f.bodenan@brgm.fr	Category B Senior re	Team member	0000-0001-6518-3336	Orcid ID
Dr	Guillaume	Bertrand	Man	France	g.bertrand@brgm.fr	Category B Senior re	Team member	0000-0001-5912-7223	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input checked="" type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input checked="" type="checkbox"/>
Public procurer of results	<input checked="" type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input checked="" type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<p><i>Main deliverable of SURFER project, financed by ADEME (French Environment and Energy Agency). This report contains and discuss Material Intensities or Bill of Materials for all energy sector facilities and plants, focusing on CRMs, concrete and metal content. This data would be used to evaluate French Energy Transition material footprint.</i></p> <p>A paper is under redaction.</p> <p>https://librairie.ademe.fr/energies-renouvelables-reseaux-et-stockage/4654-surfer.html</p>
Dataset	<p><i>Urban Mine Platform. The portal UMP presents the main achievements of ProSUM project, displaying results for batteries, vehicles and WEEE. http://www.urbanmineplatform.eu/</i></p> <p><i>BRGM is the webmaster of the website and hosts the database.</i></p>
Dataset	<p><i>The Physical accounts of raw material stock and flow information service (PANORAMA) project combines the best data sources from different parts of the value chain collected in previous work and combines them with gap filling and reconciliation approaches to build a comprehensive Supply Chain Database. This database on material flows and stocks forms the basis for a web-based information service system.</i></p> <p>https://panorama.brgm.fr/</p>
Dataset	<p><i>ProMine Mineral databases: new tools to assess primary and secondary mineral resources in Europe. Article presenting the results of ProMine project in terms of GIS database of primary and secondary resources. This dataset is presently available and consultable in EGDI.</i></p> <p>https://www.eurogeosurveys.org/wp-content/uploads/2015/08/312472_1_En_2_Chapter_OnlinePDF.pdf</p>
Publication	<p><i>Life cycle impact assessment methods for estimating the impacts of dissipative flows of metals: The dissipation of metals leads to potential environmental impacts, usually evaluated for product systems with life cycle assessment. Dissipative flows of metals become inaccessible for future users, going against the common goal of a more circular economy. Therefore, they should be addressed in life cycle impact assessment (LCIA) in the area of protection "Natural Resources."</i></p>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM	<i>Prospecting Secondary raw materials in the Urban mine and Mining waste: WP Leader, in charge of the development of the EU-Urban Mine Knowledge Data Platform.</i>
PANORAMA	<i>Project EIT Raw Materials, in progress. Physical accounts of raw material stock and flow information service: WP leader, in charge of the raw material stock and flow database and web-enabled information services.</i>
Minerals4EU and Mintell4EU	<i>Minerals4EU (FP7) European intelligence network on the supply of raw materials. WP leader in charge of the development of the EU Minerals Knowledge Data Platform. In Mintell4EU (ongoing) BRGM is WP co-leader of the improvement of Raw Materials Knowledge Data Platforms.</i>
SCRREEN and SCRREEN 2	<i>SCRREEN1: Solution for Critical Raw Materials: a European Expert Network. BRGM was WP Leader, in charge of the knowledge management and the development of the EU-Critical Raw Material Knowledge Data Platform (EU-CRMKDP). SCRREEN 2 (ongoing) continue to support the European CRM strategy and bring expert advice in support of decision-making at the EU level covering all the raw materials and their value chains screened in the CRMs 2020 assessment.</i>

Administrative forms

SURFER	<p><i>Financed by ADEME, French Environment and Energy Agency (2017-2021). Estimation of the material needs for energy transition for France and thus following different national and international energy transition scenarios. In this project, BRGM collected many public data sets about material composition in the energy sector such as PV panels, wind turbines, nuclear, batteries</i></p>
--------	--

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Plat?Inn	<p><i>Plat Inn: an experimental pilot facility for the treatment of mineral raw materials, waste and industrial by-products</i></p> <p><i>https://www.brgm.fr/en/laboratory-technological-platform/plat-inn-bridging-gap-between-laboratory-industrial-production</i></p>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999432614	GEOLOGIAN TUTKIMUSKESKUS

Short name: GEOLOGICALSURVEY OF FINLAND

Address

Street VUORIMIEHENTIE 5
Town ESPOO
Postcode 02151
Country Finland
Webpage www.gtk.fi

Specific Legal Statuses

Legal person yes
Public body yes
Non-profit yes
International organisation no
Secondary or Higher education establishment no
Research organisation yes

SME Data

Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.

SME self-declared status unknown
SME self-assessment unknown
SME validation unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Circular Economy Solution Unit not applicable

Same as proposing organisation's address

Street VUORIMIEHENTIE 5

Town ESPOO

Postcode 02151

Country Finland

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr _____

Gender Woman Man Non Binary

First name* Teemu

Last name* Karlsson

E-Mail* teemu.karlsson@gtk.fi

Position in org. Geologist

Department Circular Economy Solutions Unit

Same as organisation name

Same as proposing organisation's address

Street Neulaniementie 5

Town Kuopio

Post code 70211

Country Finland

Website www gtk fi

Phone +358505651370

Phone 2 +XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Teemu	Karlsson	Man	Finland	teemu.karlsson@gtk.fi	Category C Recognised	Leading	https://orcid.org/0000-001-9034-3880	Orcid ID
Mr	Janne	Hokka	Man	Finland	janne.hokka@gtk.fi	Category C Recognised	Team member	https://orcid.org/0000-0003-0562-9353	Orcid ID
Mrs	Anna	Tornivaara	Woman	Finland	anna.tornivaara@gtk.fi	Category C Recognised	Team member		
Mrs	Taina	Eloranta	Woman	Finland	taina.eloranta@gtk.fi	Category C Recognised	Team member		
Mrs	Svetlana	Sapon	Woman	Finland	svetlana.sapon@gtk.fi	Category C Recognised	Team member		
Mrs	Maija	Pennanen	Woman	Finland	maija.pennanen@gtk.fi	Category C Recognised	Team member		
Mrs	Sini	Hunter	Woman	Finland	sini.hunter@gtk.fi	Category C Recognised	Team member		
Mr	Tero	Korhonen	Man	Finland	tero.korhonen@gtk.fi	Category C Recognised	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Dataset	<p>https://hakku GTK.fi/en/locations/search?location_id=61</p> <p>https://hakku GTK.fi/en/locations/search?location_id=62</p> <p>GTK is collecting, managing, and sharing information on Finnish mineral deposits and mines with an in-house built information management system and user interface. Variety of spatial data products can be produced from the information management system as needed.</p>
Publication	<p>Torniavaara, A., R?is?nen, M.L., et al. (2018) Continued survey of the extractive waste facilities of closed and abandoned mines (KAJAK II). SY 12/2018. The KAJAK II project primarily focused on determining the current status and possible needs for further actions at the 30 mine locations as well as two additional locations that were identified at a later time.</p>
Service	<p>https://gtkdata GTK.fi/mdae/index.html</p> <p>GTK has solid experience in management of data flow from field capture to online services with variety of geoscientific data.</p>
Service	<p>https://www GTK.fi/en/services/data-sets-and-online-services-geo-fi/interface-services/</p> <p>http://portal.onegeology.org/OnegeologyGlobal/</p> <p>GTK provides wide range of interface services from which data can be harvested to worldwide geoscientific portals. Interface services are implemented in accordance with the international standards.</p>
Publication	<p>Luodes, H., Kauppila, P.M., Karlsson, T. et al. (2011) Classification of inert extractive waste Waste rock after quarrying. Ministry of Environment, Environmental Protection Department, SY21/2011.</p>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Morecovery	An EIT RawMaterials innovation project coordinated by GTK, offering a comprehensive metal and mineral recovery service, from laboratory to pilot scale that allows organisations in the raw materials extractive industry to assess whether it is worth recovering metals and minerals from their solid and liquid side streams. Duration 2019-2021 (on-going).
Mining and Metallurgy regions of EU MIREU	The MIREU project will bring together European mining and metallurgy regions to work together on improving conditions for the responsible development and secure supply of raw materials in the EU. The regions will share their experiences and knowledge to help tackle the fundamental challenges of establishing and maintaining an extractive industry. The main objective is to establish the Council of Mining and Metallurgy European Regions ?CoMMER.
ORAMA	The ORAMA project focused on optimising data collection for primary and secondary raw materials in Member States. A cornerstone to the EIP on Raw Materials is the development of the EU knowledge base on primary and secondary raw materials, commenced by a series of European-funded projects.
KAJAK II	Between 2011 and 2013, Finland surveyed the extractive waste facilities of closed and abandoned mines that may cause serious negative environmental impacts or have the potential of becoming in the medium or short term a serious threat to human health or the environment, in accordance with the EU's Extractive Waste Directive (2006/21/EC).

Administrative forms

ProMine	<p><i>Promine project was a EC project coordinated by GTK in the area of exploration and efficient use of mineral resources within Europe. The main objective of ProMine was to develop innovative concepts and processes for strategic mineral supply and for new high added value mineral-based products.</i></p>
---------	---

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Outokumpu mineral processing pilot plant and labor	<i>The main purpose of the pilot plant and its laboratories is to develop innovations for mineral grinding and beneficiation processes and to provide research services for different industries.</i>
GTK Research Laboratory	<i>GTK's research laboratory is part of Finland's national research infrastructure and it provides analysis and experts services in geology. The lab's main areas of focus are isotope geology and applied mineralogy.</i>
Circular Raw Materials Research Infrastructure	<i>In GTK, RAMI includes the laboratories of X-Ray computed tomography (XCT) and the recently ordered Field Emission gun electron probe microanalyzer (FEG-EPMA). These laboratories were established to conduct cutting edge research and innovation with the support of top-notch scientific experts.</i>
Morecovery pilot unit	<i>A pilot-scale industrial water treatment and element recovery system in a sea container. The pilot is modular and can be adjusted to different cases.</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999645238	VLAAMSE INSTELLING VOOR TECHNOLOGISCH ONDERZOEK N.V.
Short name: VITO	
Address	
Street	BOERETANG 200
Town	MOL
Postcode	2400
Country	Belgium
Webpage	www.vito.be
Specific Legal Statuses	
Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	01/01/2021 - no
SME self-assessment	31/12/2015 - no
SME validation	16/05/1991 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name ADVANCE & ART not applicable

Same as proposing organisation's address

Street BOERETANG 200

Town MOL

Postcode 2400

Country Belgium

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Andrea**

Last name* **Winterstetter**

E-Mail* **andrea.winterstetter@vito.be**

Position in org. Researcher

Department Sustainable Materials Management

Same as organisation name

Same as proposing organisation's address

Street BOERETANG 200

Town MOL

Post code 2400

Country Belgium

Website www.vito.be

Phone +3214335151

Phone 2 +XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Ms	Andrea	Winterstetter	Woman	Germany	andrea.winterstetter@vito.be	Category C Recognis	Leading	0000-0003-0888-2493	Orcid ID
Mr	Dirk	Nelen	Man	Belgium	dirk.nelen@vito.be	Category B Senior re	Team member	0000-0001-6000-9005	Orcid ID
Mr	Ive	Vanderreydt	Man	Belgium	ive.vanderreydt@vito.be	Category B Senior re	Team member	0000-0002-4364-9446	Orcid ID
Mrs	Evelien	Diels	Woman	Belgium	evelien.dils@vito.be	Category C Recognis	Team member	0000-0001-7257-0035	Orcid ID
Mr	Frantisek	Kukurugya	Man	Slovakia	fero.kukurugya@vito.be	Category C Recognis	Team member	0000-0003-1261-0976	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Winterstetter, A., Heuss-Assbichler, S., Stegemann, J., Ulrich, K. R. A. L., Wager, P., Osmani, M., & Rechberger, H. (2021). <i>The role of anthropogenic resource classification in supporting the transition to a circular economy</i> . <i>Journal of Cleaner Production</i> , 126753
Publication	A. Winterstetter, D. Laner, H. Rechberger, J. Fellner: "Integrating anthropogenic material stocks and flows into a modern resource classification framework: Challenges and potentials.? <i>Journal of Cleaner Production</i> , 133 (2016), pp. 1352-1362
Publication	Fellner J, Lederer J, Purgar A, Winterstetter A, Rechberger H, Winter F, Laner D (2015) Evaluation of resource recovery from waste incineration residues - The case of zinc; <i>Waste Management</i> , 35, 95 - 103.
Publication	Kukurugya, F., Nielsen, P. and Horckmans, L.(2020). Up-concentration of Chromium in Stainless Steel Slag and Ferrochromium Slags by Magnetic and Gravity separation. <i>Minerals</i> , 10 (10).
Publication	Kukurugya, F., Rahfeld, A., M?ckel, R., Nielsen, P., Horckmans, L., Spooren, J., Broos, K., 2018. Recovery of iron and lead from a secondary lead smelter matte by magnetic separation. <i>Minerals Engineering</i> 122, 17-25.

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ETC/WMGE	<i>The European Topic Centre on Waste and Materials in a Green Economy (ETC/WMGE) is a consortium of European organisations working in partnership with the European Environment Agency. The ETC/WMGE informs decision-makers and the public by presenting reliable and comparable data and information on waste management and prevention, green economy, material resource efficiency and the transition to a circular economy in Europe.</i>
MINEA	<i>To provide information on the future availability of primary materials, inventories of geogenic deposits (resources) and the economically extractable shares (reserves) have been developed. COST Action aims to actuate the reporting of material resources/reserves in the anthroposphere. The focus is on (1) construction and demolition waste, (2) waste regained from landfills and (3) solid residues from waste incineration.</i>
CHROMIC	<i>The CHROMIC project aims to develop new processes to recover chromium, vanadium, molybdenum and niobium from industrial waste, through smart combinations and new technological innovations. This will help reduce the CO2 emissions of metal production and reduce the environmental impact of its wastes.</i>
COLLECTORS	<i>COLLECTORS was a European-funded, Horizon 2020 project which aims to identify and highlight existing good practices of waste collection and sorting. It focused on three waste streams: paper and packaging, waste electrical and electronic equipment (WEEE), and construction and demolition waste (CDW).</i>
METGROW+	<i>METGROW+ will address and solve bottlenecks in the European raw materials supply by developing innovative metallurgical technologies for unlocking the use of potential domestic raw materials. The METGROW+ consortium has received an EIP RM Commitment status. The consortium is supported by internationally respected research institutes and universities.</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
-------------------------------------	--

Administrative forms

--	--

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999466370	GEOLOSKI ZAVOD SLOVENIJE

Short name: GeoZS

Address

Street DIMICEVA 14

Town LJUBLJANA

Postcode 1000

Country Slovenia

Webpage www.geo-zs.si

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name	Department for Mineral Resources and Geochemistry	<input type="checkbox"/> not applicable
<input checked="" type="checkbox"/> Same as proposing organisation's address		
Street	DIMICEVA 14	
Town	LJUBLJANA	
Postcode	1000	
Country	Slovenia	

Department 2

Department name	Geological Information Centre	<input type="checkbox"/> not applicable
<input checked="" type="checkbox"/> Same as proposing organisation's address		
Street	DIMICEVA 14	
Town	LJUBLJANA	
Postcode	1000	
Country	Slovenia	

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Gorazd**

Last name* **Zibret**

E-Mail* **gorazd.zibret@geo-zs.si**

Position in org. Senior researcher

Department Department for Mineral Resources and Geochemistry

Same as organisation name

Same as proposing organisation's address

Street DIMICEVA 14

Town LJUBLJANA Post code 1000

Country Slovenia

Website www.geo-zs.si

Phone +38612809737 Phone 2 +38631359104

Other contact persons

First Name	Last Name	E-mail	Phone
Barbara	Simic	barbara.simic@geo-zs.si	+38612809747

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Gorazd	Zibret	Man	Slovenia	gorazd.zibret@geo-zs.si	Category B Senior re	Leading	0000-0002-9957-1895	Orcid ID
Mrs	Jasna	Sinigoj	Woman	Slovenia	jasna.sinigoj@geo-zs.si	Category C Recognis	Team member		
Mrs	Spela	Kumelj	Woman	Slovenia	spela.kumelj@geo-zs.si	Category D First stag	Team member		
Dr	Spela	Bavec	Woman	Slovenia	spela.bavec@geo-zs.si	Category C Recognis	Team member	0000-0002-5134-0641	Orcid ID
Dr	Robert	sajn	Man	Slovenia	robert.sajn@geo-zs.si	Category A Top grad	Team member	0000-0003-0663-9414	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input checked="" type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Service	<i>EGDI - European Geological Data Infrastructure. EGDI is EuroGeoSurveys?European Geological Data Infrastructure. It provides access to Pan-European and national geological datasets and services from the Geological Survey Organizations of Europe.</i>
Service	<i>Geological Survey of Slovenia has a role of Public Mining Service and supports the ministry responsible for mining (Ministry of Infrastructure) in terms of sustainable mineral management and mineral policy. The Public Mining Service is authorized to monitor all mineral exploration works and maintain a Mining Register and Mining Cadastre on the national level, including a chronology of mining rights granting (Mining Registry Book web application and database).</i>
Dataset	<i>GeoZS prepared national mine waste registry for Slovenia, according to the EU mine waste directive. Sites were catalogued, investigated and characterised according to its environmental hazard.</i>
Publication	<i>Zibret G, Lemiere B, Mendez AM, Cormio C, Sinnet D, Cleal P, Szabo K, Carvalho T (2020) National mineral waste databases as an information source for assessing material recovery potential from mine waste, tailings and metallurgical waste. Minerals 10, 1-20. https://doi.org/10.3390/min10050446 (open access)</i>
Publication	<i>Blasenbauer D et al. (28 authors). Knowledge base to facilitate anthropogenic resource assessment. COST Action Mining the European Anthroposphere, 2020, https://doi.org/10.5281/zenodo.3739164 (open access)</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
PROSUM	<i>http://www.prosumproject.eu/ - The ProSUM project delivered the First Urban Mine Knowledge Data Platform, a centralised database of all available data and information on arisings, stocks, flows and treatment of waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELVs), batteries and mining wastes. Map view urban mine http://www.urbanmineplatform.eu/homepage Map view Mining Waste Extension http://minerals4eu.brgm-rec.fr/minerals4EU/</i>
MINEA	<i>GeoZS was part of the MINEA network (Mining the anthroposphere, https://www.mineanetwork.eu/), where mine waste was considered one of the key components. In this project we reviewed a selection of national mine waste registers in the EU countries in order to determine whether they contain suitable data for mine waste valorisation for its re-use. We also reviewed several hundred case studies where mine waste was re-used, concerning both, metal extraction and its use as a construction material.</i>
RESEERVE	<i>https://reseerve.eu/ - the aim of the RESEERVE project was the creation of the West Balkan Mineral Register for primary and secondary raw materials. The register enables the integration of the region into a pan-European minerals intelligence network and bring it closer to the common mineral market (duration 2018 ? 2021).</i>
Mintell4EU / Minerals4EU	<i>https://geoera.eu/projects/mintell4eu7/ - The overall aim of this proposal is to improve the European Knowledge Base on raw materials by updating the electronic Minerals Yearbook produced in the Minerals4EU project and to extend the spatial coverage and quality of data currently in the Minerals Inventory. The project increase the degree of harmonization, and interaction between existing data platforms, with the ambition of reaching a fully operational and reliable data knowledge system.</i>

Administrative forms

RIS-ALiCE	<p><i>The main goal of the RIS-ALiCE project (http://ris-alice.zag.si/) is to create a network of relevant stakeholders, in the area of currently unused and landfilled Al-rich wastes, including mine wastes, to be used for the production of innovative low CO₂ mineral binders. In the project we characterised and valorised a variety of Al-rich residues, and the results are placed in the open on-line registry (https://www.alice-registry.eu/).</i></p>
-----------	---

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
EGDI - European Geological Data Infrastructure	<i>EGDI is EuroGeoSurveys European Geological Data Infrastructure. It provides access to Pan-European and national geological datasets and services from the Geological Survey Organizations of Europe.</i>
Harvesting system for PRM and SRM	<i>Once per month collects PRM and SRM (mining waste) data from data providers from 28 EU countries into a single database.</i>
Mintell4EU minerals survey application	<i>Application for collecting statistical data relating to the mineral resources and reserves and production on country level. Data can be compliant with international systems of reporting (e.g. PERC, JORC, UNFC, etc.), or with country's national reporting code.</i>
RESEERVE database	<i>This database contains data about mine wastes from from ESEE area.</i>
Field surveying equipment & labs	<i>Georadar with array of antennas, equipment for seismic reflection measurements, borehole logging system, sampling system with shallow corers; samples preparation systems (washing, grinding and pulverising, drying, sieving up to 10 ?m etc.), optical and SEM (with EDS and EBSD), XRF, X</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999974553	UNIVERSITEIT LEIDEN
<hr/>	
Short name: ULEI	
Address	
Street	RAPENBURG 70
Town	LEIDEN
Postcode	2311 EZ
Country	Netherlands
Webpage	http://www.leidenuniv.nl
 Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes
 SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	27/01/2010 - no
SME self-assessment	unknown
SME validation	27/01/2010 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name	Institute of Environmental Science (CML)	<input type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	P.O. Box 9518	
Town	Leiden	
Postcode	2300 RA	
Country	Netherlands	

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* Jose

Last name* Mogollon

E-Mail* jmmogollonlee@gmail.com

Position in org. Assistant Professor

Department Institute of Environmental Science (CML)

Same as organisation name

Same as proposing organisation's address

Street P.O. Box 9518

Town Leiden

Post code 2300 RA

Country Netherlands

Website <https://www.universiteitleiden.nl/en/>

Phone +31715277166

Phone 2 +XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Jose	Mogollin	Man	United States	jmmogollonlee@gmail.com	Category B Senior re	Leading	0000-0002-7110-5470	Orcid ID
Dr	Tomer	Fishman	Man	Hungary	t.fishman@cml.leidenuniv.nl	Category B Senior re	Team member	0000-0003-4405-2382	Orcid ID
Dr	Ester	van der Voet	Woman	Netherlands	voet@cml.leidenuniv.nl	Category A Top grad	Team member	000-0003-0788-9570	Orcid ID
Prof	Arnold	Tukker	Man	Netherlands	tukker@cml.leidenuniv.nl	Category A Top grad	Team member	0000-0002-8229-2929	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Dataset	<i>EXIOBASE version 3.3: A hybrid environmentally extended multi-regional input output Table with 160 sectors and products and 40 regions</i>
Publication	<i>Donati et al., Modeling the circular economy in environmentally extended input-output tables: Methods, software and case study, Resour Conserv Recy 152:104508, 2020</i>
Publication	<i>Aguilar-Hernandez et al., The circularity gap of nations: A multiregional analysis of waste generation, recovery, and stock depletion in 2011, Resour Conserv Recy 151:104452, 2019</i>
Publication	<i>Fishman et al., A comprehensive set of global scenarios of housing, mobility, and material efficiency for material cycles and energy systems modelling, J Ind Ecol 25:305-320, 2021</i>
Publication	<i>Deetman et al., Modelling global material stocks and flows for residential and service sector buildings towards 2050, J Clean Prod 245:118658, 2018</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
PANORAMA	<i>The Physical AccouNts Of RAw MAterial stock and flow information service (PANORAMA) focuses on the development of an information system for critical material movement and accumulation throughout the global economy that can be easily updated on a yearly basis. For this purpose, it uses a multi-regional supply-use framework and detailed information on product compositions.</i>
SCRREEN	<i>This project seeks to establish an EU Expert Network that covers the whole value chain for present and future critical raw materials based on existing structures and initiatives, as well as international collaborations. Ultimately it collects and organize data generated in various critical raw material projects and create a knowledge portal for academics and policy makers.</i>
Getting the data right	<i>The goal of this project is to provide an up-to-date climate footprint generator, based on a consistent physical and monetary model of global production and consumption activities together with their climate impacts and a very fine detail level (< 1000 activities and product groups) and geographical specificity.</i>
Circ?uit	<i>The Circ?uit research projects focus on addressing circular economy from 5 perspectives: Business model, Supply chains, Users, Design, and Systems. The latest one is related to the potential environmental and socio-economic impacts of a transition to circular economy.</i>
RaMa-Scene	<i>This project focusses on developing a scenario building web-tool and knowledge package to enable multi-level decision making for the transition to the Circular Economy</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
ALICE HPC	<i>Academic Leiden Interdisciplinary Cluster Environment is the High Performance Computing facility of the Leiden University and Leiden University Medical Center. It is available to all researchers from both the university and the LUMC consisting of 604 TFlops, 816 cores (1632 threads)and 14.4 TB RA</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
997721825	UNITED NATIONS INSTITUTE FOR TRAINING AND RESEARCH
Short name: UNITAR	
Address	
Street	AVENUE DE LA PAIX 7
Town	GENEVA
Postcode	1202
Country	Switzerland
Webpage	www.unitar.org
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	yes
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	25/11/2008 - no
SME self-assessment	unknown
SME validation	25/11/2008 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Sustainable Cycles (SCYCLE) Programme not applicable

Same as proposing organisation's address

Street

Platz der Vereinten Nationen 1

Town

Bonn

Postcode

53113

Country

Germany

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Ruediger**

Last name* **Kuehr**

E-Mail* **ruediger.kuehr@unitar.org**

Position in org. Director, Sustainable Cycles Programme (SCYCLE)

Department Sustainable Cycles Programme (SCYCLE)

Same as organisation name

Same as proposing organisation's address

Street Platz der Vereinten Nationen 1

Town Bonn

Post code 53113

Country Germany

Website <https://unitar.org/>

Phone 0049-228-815-0213

Phone 2 0049-228-815-0299

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Ruediger	Kuehr	Man	Germany	ruediger.kuehr@unitar.org	Category A Top grad	Team member	https://www.researchgate.net/profile/Ruediger-Kuehr	Research Gate
Dr	Kees	Balde	Man	Netherlands	balde@vie.unu.edu	Category B Senior re	Leading	https://orcid.org/0000-002-9624-3941	Orcid ID
Dr	Otmar	Deubzer	Man	Germany	deubzer@vie.unu.edu	Category B Senior re	Team member	https://orcid.org/0000-003-1435-9762	Orcid ID
Ms	Michelle	Wagner	Woman	Germany	wagner@vie.unu.edu	Category D First stag	Team member	https://orcid.org/0000-002-2066-0028	Orcid ID
Ms	Vanessa	Forti	Woman	Italy	forti@vie.unu.edu	Category D First stag	Team member	https://orcid.org/0000-002-6210-7896	Orcid ID
Ms	Giulia	Iattoni	Woman	Italy	iattoni@vie.unu.edu	Category D First stag	Team member	https://orcid.org/0000-003-0427-0609	Orcid ID
Mr	Keshav	Parajuly	Man	Nepal	parajuly@vie.unu.edu	Category C Recognis	Team member	https://orcid.org/0000-003-1688-8668	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input checked="" type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>The Global E-waste Monitor (2013, 2017, 2020) provides the most comprehensive overview of the global e-waste data, challenges, explains how it fits into international efforts to reach the Sustainable Development Goals, and discusses how to create a sustainable society and circular economy. The report provides a national and regional analysis on e-waste quantities and legislative instruments, and makes projections until 2030.</i>
Publication	<i>E-waste statistics - Guidelines on classification, reporting and indicators. The guidelines provide a universally relevant e-waste measurement framework and a classification of e-waste and facilitate the implementation of harmonised concepts to measure the size of a country's e-waste market, its transboundary e-waste movement and the e-waste recycling performance within that country.</i>
Publication	<i>Greening ICT Supply Chains ? Survey on Conflict Minerals Due Diligence Initiatives This report provides an overview of the many initiatives that provide the ICT sector with guidance and assurance tools on how to conduct due diligence for conflict minerals entering their supply chains. It also serves as a needs assessment for a mineral supply chain due diligence standard that takes consideration of wider issues of sustainability, above and beyond the issues surrounding conflict minerals.</i>
Publication	<i>In-depth review of the WEEE Collection Rates and Targets in Europe. In-depth review report on the WEEE Collection Rates in the EU-28, Switzerland, Norway and Iceland,?which shows that the implementation mechanisms of WEEE legislation, such as the ?all actors? approach, a clearing house, and mandatory handover positively contribute to WEEE collection.</i>
Publication	<i>The Dutch WEEE Flows 2020: What happened between 2010 and 2018. The report quantifies the 2018 Dutch WEEE Flows in 2018 manner comparable to the Dutch WEEE Flows study of 2010. This report presents the EEE POM, WEEE Generated, the compliantly regulated WEEE Collection, and the WEEE Flows outside of the regulated WEEE management system in the Netherlands.</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ProSUM	<i>The ProSUM project delivered the First Urban Mine Knowledge Data Platform, a centralised database of all available data and information on arisings, stocks, flows and treatment of waste electrical and electronic equipment (WEEE), end-of-life vehicles (ELVs), batteries and mining wastes.</i>
Countering WEEE Illegal Trade (CWIT)	<i>Funded under the 7th framework programme of the European Commission, this project aims to provide a set of recommendations to support the European Commission, law enforcement authorities, and customs organisations, in countering the illegal trade of eWaste in and from Europe.</i>
SCRREEN	<i>The project will establish an EU Expert Network that covers the whole value chain for present and future critical raw materials. It will build on existing structures and initiatives, as well as international collaborations, and will aim at clustering related EU projects and initiatives. This network will be set up as a permanent forum for policy-makers, industry and society who are interested or are involved in raw materials. It will encourage permanent dialogue between stakeholders.</i>
FORAM	<i>The project developed an EU-based platform of international experts and stakeholders that will advance the idea of a World Forum on Raw Materials and enhance the international cooperation on raw material policies and investments. The global use of mineral resources has drastically increased and supply chains have become ever more complex.</i>

Administrative forms

ORAMA	<p><i>The ORAMA project focuses on Optimising data collection for primary and secondary raw materials in Member States. A cornerstone to the EIP on Raw Materials is the development of the EU knowledge base on primary and secondary raw materials, commenced by a series of European-funded projects. As the next iteration, ORAMA addresses specific challenges related to data availability, geographical coverage, accessibility, standardisation, harmonisation, interoperability, quality, and coverage.</i></p>
-------	--

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889405126	WEEECycling

Short name: WEEECycling

Address

Street	13 ROUTE DES IFS
Town	TOURVILLE LES IFS
Postcode	76400
Country	France
Webpage	www.weecycling.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	yes
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	08/09/2021 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr _____

Gender Woman Man Non Binary

First name* Serge

Last name* Kimbel

E-Mail* serge.kimbel@weeecycling.com

Position in org. General manager

Department WEEECycling

Same as organisation name

Same as proposing organisation's address

Street 13 ROUTE DES IFS

Town TOURVILLE LES IFS Post code 76400

Country France

Website www.weeecycling.com

Phone +33285290272 Phone 2 +XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Serge	KIMBEL	Man	France	Serge.kimbel@weeecycle.com	Category A Top grad	Leading		
Dr	Matthieu	MACAUD	Man	France	Matthieu.macaud@weeecycle.com	Category A Top grad	Team member		
Ms	Aurelia	Benney	Woman	France	Aurelia.benney@weeecycle.com	Category B Senior re	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
<i>Other achievement</i>	<i>Only refining company in Europe producing precious and strategic metals only from waste. Awarded by Plan Relance, Concours Mondial de l'Innovation. Carrying all steps of transformation of strategic metals on the same site in Normandy.</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Laboratory	<i>Many tools to analyse the different metals and waste</i>
Foundry	<i>Many furnaces to smelt and thermically treat the waste</i>
Chemical department	<i>Several chemical processes to separate the metals</i>
Electro Chemical department	<i>Electrolysis plant</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999978433	LUDWIG-MAXIMILIANS-UNIVERSITAET MUENCHEN

Short name: LMU MUENCHEN

Address

Street GESCHWISTER SCHOLL PLATZ 1
Town MUENCHEN
Postcode 80539
Country Germany
Webpage www.uni-muenchen.de

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	06/03/2014 - no
SME self-assessment	06/03/2014 - no
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name	Earth and Environmental Sciences	<input type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	Theresienstr. 41	
Town	Munich	
Postcode	80333	
Country	Germany	

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Prof. _____

Gender Woman Man Non Binary

First name* **Soraya**

Last name* **Heuss-Assbichler**

E-Mail* **heuss@lmu.de**

Position in org. Professor of Mineralogy

Department Earth and Environmental Sciences Mineralogy, Petrology and Geochemistry

Same as organisation name

Same as proposing organisation's address

Street Theresienstr. 41

Town Munich

Post code 80333

Country Germany

Website <https://www.en.mineralogie.geowissenschaften.uni-muenchen.de/inde>

Phone +43(0)8921804252

Phone 2 +43(0)15771729901

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Prof	Soraya	Heuss-Assbichler	Woman	Germany	heuss@lmu.de	Category A Top grad	Leading	https://orcid.org/0000-0003-0863-7586	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Suppes, Rudolf, and Soraya Heuss-Assbichler. "Resource potential of mine wastes: A conventional and sustainable perspective on a case study tailings mining project." <i>Journal of Cleaner Production</i> 297 (2021): 126446.
Publication	Suppes, Rudolf, and Soraya Heuss-Assbichler. "How to Identify Potentials and Barriers of Raw Materials Recovery from Tailings Part I: A UNFC-Compliant Screening Approach for Site Selection." <i>Resources</i> 10.3 (2021): 26.
Publication	Wintersteller, A., Heuss-Assbichler, S., Stegemann, J., Ulrich, K. R. A. L., W?ger, P., Osmani, M., & Rechberger, H. (2021). The role of anthropogenic resource classification in supporting the transition to a circular economy. <i>Journal of Cleaner Production</i> , 126753.
Publication	Heuss-Assbichler, S., Kral, U., L?vik, A., Mueller, S., Simoni, M., Stegemann, J., ... & Wintersteller, A. <i>Strategic Roadmap on Sustainable Management of Anthropogenic Resources</i> . 2020. https://zenodo.org/record/373926 , 9, X6WBG1Bo3b1.
Publication	Blasenbauer, D., ..., S. Heuss-A?bichler, ?U. Kral, M?J. Stegemann, A. Wintersteller, and G. Zibret (2020). Knowledge base to facilitate anthropogenic resource assessment (MINEA Deliverable). COST Action Mining the European Anthroposphere (MINEA). online: https://doi.org/10.5281/zenodo.3739164

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
COST Action Mining the European Anthroposphere	Leader of the working group Anthropogenic Resource Classification This project ran from 2016-2020. During this period two reports were developed ? as a base for assessment and classification of anthropogenic resources
UNECE ? UNFC	Expert group on Anthropogenic resources: since 2016, active member of ARWG in developing the specification for anthropogenic resource classification with UNFC.
Specific product oriented precipitation (SPOP)	Overall concept for the implementation of hydroxide-free precipitation of metals including CRMs dissolved in wastewater from various industries: Development of the concept and construction of a portable pilot plant, in cooperation with companies, including general consideration of recycling potential of industrial waste water. The projects were funded by Bavarian State Ministry of the Environment and Consumer Protection (BAFOISoFo-65214) 2014 - 2016 and (BAFOISoFo-71263) 2016 to 2021
Treatment of MSWI-Ashes	Development of the SPOP process for the recovery of non-ferrous metals from fly ash from refuse incineration for broad application in waste incineration plants in cooperation with MSWI Ingolstadt and companies. Funded by Central Innovation Programme for small and medium-sized enterprises (SMEs) (ZIM) (ZF4585201 CM8) 2018-2021
Longterm-behavior of Bottom Ash	Various EU funded projects on the long-term behaviour of bottom ashes and mobilisation of species, in particular metals and by Bavarian State Ministry of the Environment and Consumer Protection (2000 to 2012)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Department of Earth and Environment Sciences	The faculty has modern analytical and observational techniques to characterize (geo-)materials including raw material extraction, pollutant dispersion etc.), which include performing experimental settings (e.g., remote sensing, sample preparation lab, EMS, SEM, XRD, XRF, FTIR).

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999479368	SOCIEDADE PORTUGUESA DE INOVACAO CONSULTADORIA EMPRESARIAL E FOMENTO DA INOVACAO SA

Short name: SPI

Address

Street AV MARECHAL GOMES DA COSTA 1376 PORTO C

Town PORTO

Postcode 4150 356

Country Portugal

Webpage www.spi.pt

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	31/12/2012 - yes
SME self-assessment	31/12/2012 - yes
SME validation	17/06/2008 - yes

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Prof. _____

Gender Woman Man Non Binary

First name* **Augusto**

Last name* **Medina**

E-Mail* **augustomedina@spi.pt**

Position in org. President of the Board

Department **SOCIEDADE PORTUGUESA DE INOVACAO CONSULTADORIA EMPRESARIAL E FOMEN** Same as organisation name

Same as proposing organisation's address

Street **AV MARECHAL GOMES DA COSTA 1376 PORTO CONCELHO FOZ DO DOURO**

Town **PORTO**

Post code **4150 356**

Country **Portugal**

Website **www.spieurope.eu**

Phone **+351 22 607 64 00**

Phone 2 **+XXX XXXXXXXX**

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Main author: SPI (2021). D.6.4. SISCODE Business Model. SISCODE - Society in Innovation and Science through CODEsign (H2020 project).
Publication	Main author: SPI (2021). D.6.6. Exploitation strategy of competitive goods and services. VIDA-Value-added Innovation in food chAins (H2020 project).
Publication	Main author: SPI (2018). D.7.8. Final Exploitation Plan. BINGO - Bringing INnovation to onGOing water management? A better future under climate change (H2020 project)
Publication	Main author: SPI (2018). D.8.8 Market Analysis. SOlar Calcium-looping integRAtion for ThermoChemical Energy Storage (H2020 project).
Publication	SPI (2009). "Knowledge Based Economy", including 9 paperback books: "Concept, Base Support and Trends", "Social and Economic Development", "Central Administration", "Local Administration", "Companies", "Education Institutions", "Scientific and Technological Institutions," "Non-Profit Institutions and The Portuguese Reality". (published in Portuguese).

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ENRICH Centres	SPI is a key partner in the development and operation of ENRICH centres. ENRICH delivers innovation-related services (Co-working, Soft-landing, market intelligence, cooperative events, RDI consulting). In the period 2017-2020, SPI was a partner in the establishment and implementation of the following centers: ERICENA (China), CEBRABIC (Brazil) and NearUS (USA). Currently, in the period 2021-2024, SPI is part of the implementation of the three European Commission-funded projects of ENRICH Centres.
SPARCs	SPARCs demonstrates and validates technically and socio-economically viable and replicable, innovative solutions for rolling out smart, integrated positive energy systems for the transition to a citizen centred zero carbon & resource efficient economy. SPI is the task leader of WP that aims to develop a methodological approach supporting and informing the process of urban transformation and energy transition in cities. https://www.sparcs.info/
Urban GreenUP	Urban GreenUP aims at obtaining a tailored methodology (1) to support the co-development of Renaturing Urban Plans focused on climate change mitigation and adaptation and efficient water management, and (2) to assist in the implementation of NBS in an effective way. SPI's role in URBAN GreenUp is targeted towards designing and implementing a wide Exploitation and Market deployment strategy and working on Replication and City Clustering. https://www.urbangreenup.eu/
Saraswati 2.0	SARASWATI 2.0 aims to identify best available and affordable technologies for decentralized wastewater treatment with scope of resource/energy recovery and reuse in urban and rural areas. SPI is in charge of creation of project's exploitation plan to efficiently exploit tangible and intangible project outcomes. https://projectsaraswati2.com/
Project BINGO	BINGO aimed at providing practical knowledge and tools to end-users, water managers, decision and policy-makers affected by climate change to enable them to better cope with all climate projections, including droughts and floods. SPI was the leader of the WP- Dissemination, communication and exploitation. http://www.projectbingo.eu/

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Multimedia team	SPI has an in-house multimedia design team with expertise designing and developing materials appropriate and effective for communicating results and outcomes of EC projects to the widest range of relevant stakeholders.

Administrative forms

<i>Project administration office</i>	<i>SPI has an internal financial and administrative team for project management activities.</i>
<i>International offices</i>	<i>Offices in Portugal (Porto, Lisbon, Coimbra, Aveiro, Evora and Azores), China (Beijing and Macao), USA (Washington D.C.), and Spain (Santiago de Compostela).</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
995575991	SVERIGES GEOLOGISKA UNDERSOKNING
Short name: SGU	
Address	
Street	VILLAVAEGEN 18
Town	UPPSALA
Postcode	S-75128
Country	Sweden
Webpage	www.sgu.se
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	01/01/1900 - yes
SME self-assessment	unknown
SME validation	01/01/1900 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Mineral Resources not applicable

Same as proposing organisation's address

Street VILLAVAEGEN 18

Town UPPSALA

Postcode S-75128

Country Sweden

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Ronald**

Last name* **Arvidsson**

E-Mail* **ronald.arvidsson@sgu.se**

Position in org. Senior Geophysicist

Department Mineral Resources

Same as organisation name

Same as proposing organisation's address

Street VILLAVAEGEN 18

Town UPPSALA

Post code S-75128

Country Sweden

Website www.sgu.se

Phone +46-18-179013

Phone 2 +XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Anna	Ladenberger	anna.ladenberger@sgu.se	+XXX XXXXXXXXX
Roger	Hamberg	roger.hamberg@sgu.se	+XXX XXXXXXXXX
Ildiko	Antal-Lundin	ildiko.antal@sgu.se	+XXX XXXXXXXXX
Patrick	Casey	patrick.casey@sgu.se	+XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Ronald	Arvidsson	Man	Sweden	Ronald.arvidsson@sgu.se	Category B Senior re	Leading		
Dr	Anna	Ladenberger	Woman	Sweden	Anna.ladenberger@sgu.se	Category B Senior re	Team member	0000-0002-1488-5351	Orcid ID
Dr	Roger	Hamberg	Man	Sweden	Roger.hamberg@sgu.se	Category C Recognis	Team member		
Mrs	Ildiko	Antal-Lundin	Woman	Sweden	Ildiko.antal@sgu.se	Category B Senior re	Team member		
Mr	Patrick	Casey	Man	United States	Patrick.Casey@sgu.se	Category D First stag	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Katarzyna Guzik, Krzysztof Galos, Alicja Kot-Niewiadomska, Toni Eerola, Pasi Eilu, Jorge Carvalho, Francisco Javier Fernandez-Naranjo, Ronald Arvidsson, Nikolaos Arvanitidis and Agnes Raaness, 2021. A look at the potential benefits and constraints of development of CRMs production in the EU analysis of selected case studies. MDPI, DOI: 10.3390/resources10070067
Publication	Roger Hamberg, Glenn Bark, Christian Maurice, Lena Alakangas, 2016. Release of arsenic from cyanidation tailings. Minerals Engineering 93 (2016) 57?64
Publication	Martiya Sadeghi, Nikolaos Arvanitidis and Anna Ladenberger, 2020. Geochemistry of Rare Earth Elements in Bedrock and Till, Applied in the Context of Mineral Potential in Sweden. Minerals 2020, 10(4), 365; https://doi.org/10.3390/min10040365 .
Publication	Endl, Berger, Arvanitidis, Arvidsson and others, 2019. Good Practice Guidance for mineral resources in sustainable land-use planning. MINLAND Project Report D6.2: Final Manual for Good Practice Guidance November 2019 DOI: 10.13140/RG.2.2.21839.51368
Publication	Philippe Negrel, Anna Ladenberger, Clemens Reimann, Manfred Birke, Alecos Demetriades, Martiya Sadeghi, The GEMAS Project Team, 2019. GEMAS: Geochemical background and mineral potential of emerging tech-critical elements in Europe revealed from low-sampling density geochemical mapping. Applied Geochemistry in press. DOI: https://doi.org/10.1016/j.apgeochem.2019.104425

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
MinLand	Sustainable land use in extraction of primary raw materials including critical raw materials
X-Mine	Technological development of access to exploration for raw materials, including critical raw materials
SCRREEN	Expert advice to better understand the value chains of the raw materials screened in the CRMs assessment. Making this information freely available, through the SCRREEN knowledge database and the EC Raw Materials Information System
PROSUM	Access to secondary raw materials
Minerals4EU	Minerals4EU (FP7): Minerals Intelligence Network for Europe (2013-2015)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Database of geological resources and mining waste	Information about location and content of raw materials.
Information about location and content of raw mate	Containing more than 3 million m of drill core from deposits close to present day mining waste sites.

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889451589	Duncan Kushnir

Short name: Duncan

Address

Street ?sten Und?ns Gata 180, LGH 1004

Town Lund

Postcode 227 52

Country Sweden

Webpage

Specific Legal Statuses

Legal person	no
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	06/09/2021 - yes
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Duncan**

Last name* **Kushnir**

E-Mail* **dk@duncankushnir.com**

Position in org. Position in org. Sole proprietor

Department Duncan Kushnir

Same as organisation name

Same as proposing organisation's address

Street ?sten Und?ns Gata 180, LGH 1004

Town Lund

Post code 227 52

Country Sweden

Website duncankushnir.com

Phone +46735070549

Phone 2 +XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Duncan	Kushnir	Man	Sweden	dk@duncankushnir.com	Category B Senior re	Leading	0000-0002-2881-4132	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input checked="" type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Dataset	http://www.urbanmineplatform.eu/composition/ Calculation and provision of the material contents of the EU vehicle fleet for the PROSUM urban mine platform
Publication	Jaco Huisman, Pascal Leroy, Francois Tertre, Maria Ljunggren Soderman, Perrine Chancerel, Daniel Cassard, Amund N. Lovik, Patrick Wager, Duncan Kushnir, Vera Susanne Rotter, Paul Mahlitz, Lucia Herreras, Johanna Emmerich, Anders Hallberg, Hina Habib, Michelle Wagner, Sarah Downes. (2017) Prospecting Secondary Raw Materials in the Urban Mine and mining wastes (ProSUM) - Final Report, ISBN: 978-92-808-9060-0 (print), 978-92-808-9061-7 (electronic), December 21, 2017, Brussels, Belgium
Publication	Ljunggren Soderman, M.; Kushnir, D.; Sanden, B. (2013) Will metal scarcity limit the use of electric vehicles Systems Perspectives on Electromobility. Chalmers University of Technology, Goteborg Sweden. ISBN: 978-91-980973-9-9
Publication	Kushnir, Duncan; Sanden, Bjorn A. (2012) The time dimension and lithium availability for electric vehicles. Journal of Resources Policy.
Publication	Arvidsson R, Tillman A-M, Sanden B A, Janssen M, Nordelof A, Kushnir D, Molander S. (2018). Environmental Assessment of Emerging Technologies Recommendations for Prospective LCA. Journal of Industrial Ecology, In press.

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
PROSUM (EU HORIZON 2020)	ProSUM aimed to map the entire secondary urban mine (e.g. materials in society) in the EU, both now and in the future. My work in ProSUM was developing and implementing a full stock-flow model of all materials in all vehicles in the EU.
PROEME (EU HORIZON 2020)	PRO-EME is a large consortium project that aims to accelerate the uptake of electromobility in Europe by producing and disseminating state of the art fleet planning and policy tools to a wide variety of stakeholders. My work in PRO-EME consisted of producing a state-of the art carbon emission simulator for all vehicle models and energy grids in the European Union.
REALIZE	The work packages are targeted at practical needs at all levels of recycling activities. They encompass a range of scope from technology development and testing to long term innovation strategy based empirically on the changing materials in the vehicle stock and Swedish industry's specific capabilities.

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
998308869	BOLIDEN MINERAL AB

Short name: BOLIDEN MINERAL AB

Address

Street

.

Town

SKELLEFTEHAMN

Postcode

932 81

Country

Sweden

Webpage

www.boliden.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	25/01/2017 - no
SME self-assessment	unknown
SME validation	29/04/2010 - no

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Environmental Department, Boliden Mines not applicable

Same as proposing organisation's address

Street .

Town SKELLEFTEHAMN

Postcode 932 81

Country Sweden

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* Erik

Last name* Ronne

E-Mail* erik.ronne@boliden.com

Position in org. Research Program Manager

Department Environmental Department, Boliden Mines

Same as organisation name

Same as proposing organisation's address

Street .

Town SKELLEFTEHAMN

Post code 932 81

Country Sweden

Website Please enter website

Phone +XXX XXXXXXXXX

Phone 2 +XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Erik	Ronne	Man	Sweden	erik.ronne@boliden.com	Category A Top grad	Leading		
Mr	Andreas	Vallmark	Man	Sweden	andreas.vallmark@boliden.com	Category C Recognis	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999884343	UNIVERSITY OF BELGRADE - FACULTY OF MINING AND GEOLOGY
Short name: UNIVERSITY OF BELGRADE - FACULTY OF MINING AND GEOLOGY	
Address	
Street	Djusina 7
Town	BELGRADE
Postcode	11000
Country	Serbia
Webpage	www.rfg.bg.ac.rs
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	unknown
Secondary or Higher education establishment	yes
Research organisation	unknown
SME Data	
Based on the below details from the Participant Registry the organisation is no (small- and medium-sized enterprise) for the call.	
SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Mining Department not applicable

Same as proposing organisation's address

Street Djusina 7

Town BELGRADE

Postcode 11000

Country Serbia

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* Ivica

Last name* Ristovic

E-Mail* ivica.ristovic@rgf.bg.ac.rs

Position in org. Professor

Department Mining Department

Same as organisation name

Same as proposing organisation's address

Street Djudina 7

Town BELGRADE

Post code 11000

Country Serbia

Website <https://rgf.bg.ac.rs/index.php>

Phone +381613095976

Phone 2 +381113219119

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Ivica	Ristovic	Man	Serbia	ivica.ristovic@rgf.bg.ac.rs	Category A Top grad	Leading	https://www.scopus.com/authid/detail.uri?authorId=12144264100	Scopus
Dr	Tomislav	Subaranovic	Man	Serbia	tomislav.subaranovic@rgf.bg.ac.rs	Category B Senior re	Team member	https://www.scopus.com/authid/detail.uri?authorId=57208534156	Scopus

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Anna Pytlak, Anna Szafranek-Nakonieczna, Weronika Goraj, Izabela Sniezynsk, Aleksandra Krazala, Artur Banach, Ivica Ristovic, Miroslaw Slowakiewicz, Zofia Stepniewska: A survey of greenhouse gases production in central European lignites. Science of the Total Environment, 2021, 800, 149551</i>
Publication	<i>Milan Kragovic, Nenad Ristic, Jelena Gulicovski, Andrijana Nedeljkovic, Snezana Pasalic, Ivica Ristovic, Marija Stojmenovic: Application of lignite combustion waste slag generated in heating plants as a partial replacement for cement. Part II: Physical mechanical and physical chemical characterization of mortar and concrete. Minerals, 2021, 11(9), 925</i>
Publication	<i>Milan Kragovic, Marija Stojmenovic, Jelena Petrovic, Jorge Loredo, Snezana Pasalic, Andrijana Nedeljkovic, Ivica Ristovic. Influence of Alginate Encapsulation on Point of Zero Charge (pH pzc) and Thermodynamic Properties of the Natural and Fe(III)-Modified Zeolite. Procedia Manufacturing, 2019, 32, pp. 286-293</i>
Publication	<i>Sanja Krstic, Milan Kragovic, Maja Pagnacco, Vladimir Dodevski, Branka Kaluderovic, Milos Momcilovic, Ivica Ristovic, Marija Stojmenovic: Hydrothermal synthesized and alkaline activated carbons prepared from glucose and fructose detailed characterization and testing in heavy metals and methylene blue removal. Minerals, 2018, 8(6), 246</i>
Publication	<i>Gordana Milentijevic, Blagoje Nedeljkovic, Milena Lekic, Zoran Nikic, Ivica Ristovic, Jelena Djokic: Application of a Method for Intelligent Multi-Criteria Analysis of the Environmental Impact of Tailing Ponds in Northern Kosovo and Metohija. Energies, 2016, 9(11), 935</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
RIS-CuRE	<i>Exploration and raw materials resources assessment, EIT Raw Materials, http://ris-cure.zag.si/, 01/01/2019 ? 31/12/2021 .</i>
RESEERVE	<i>Mineral potential of the Eastern and South-Eastern Europe region, EIT Raw Materials, https://eitrawmaterials.eu/project/reseerve/, 1 April 2018 ? 30 June 2021.</i>
Improvement of Lignite Opencast Technology	<i>Improvement of Lignite Opencast Technology in Order to Increase Energy Efficiency and Occupational Safety (TR 33039) financed by the Ministry of Education and Science of the Republic of Serbia within the framework of Programme of research in the field of technological development for the period 2011-2019.</i>
Limestone Exploitation Project	<i>Impact assessment study of the Limestone Exploitation Project as a raw material for technical-building stone from the Rgotinski Krs deposit near Zajecar RGF, Belgrade 2015.</i>
Cadastre of abandoned mines	<i>Cadastre of abandoned mines on the territory of AP Vojvodina, http://www.vojvodina.gov.rs, RGF, 2014.</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Bi-partite root auger set, to 2 m depth	<i>By applying the bi-partite root auger almost undisturbed, uniform soil samples can be taken in layers of maximal 15 cm. The bi-partite root auger consists of a bottom part fitted with an exchangeable drilling-crown and a short unscrewable top part (handle) with a beating head.</i>
Piston sampler, set for sampling max. 5m	<i>Piston sampler, set for sampling to a depth of 5 m</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889341882	Mace

Short name: Mace Limited

Address

Street	155 Moorgate
Town	London
Postcode	EC2M 6XB
Country	United Kingdom
Webpage	www.macegroup.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	13/09/2021 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Service	<p><i>Mace is an international consultancy and construction company that develops, consults, constructs and operates some of the world's most inspiring buildings and infrastructure programmes. We are the users of the materials within construction projects whilst generating volumes of waste. We are interested in reducing our carbon and material impacts through our projects and programmes, through reducing materials and waste consumption and reducing embodied carbon.</i></p>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
UKRI National Infrastructure Circular Economy Ce	<p><i>Industrial partner supporting post-doc research associate and other activities on the ICEC-MCM project. Working with UCL as centre lead to develop circular economy solutions within the construction industry with particular focus on offsite manufacturing and reducing lifecycle material impacts</i></p>
Reusable Net-Zero-Carbon Structures	<p><i>Innovate UK funded, fast start project to deliver prefabricated, re-usable structural slab made from recycled steel and low-carbon concrete, for use in commercial offices and infrastructure projects</i></p>
Co-funded PhD with UCL	<p><i>Mace are co-funding a PhD within UCL's Department of Chemical Engineering researching Life Cycle Assessment (LCA) in the construction sector to support decision-making</i></p>
Use of advanced piling technology	<p><i>Work with Keltbray Piling to trial and deploy their latest new piling technology (the HIPER PILE) or a variant thereof, to improve the whole life value (cost and materials) of piles</i></p>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Database	<p><i>Mace collects construction site data through a bespoke reporting tool. Project sites report materials use by type & volume, wastes and disposal routes. Data is validated internally and can be reported at site or business level. The data set will be made available to FutuRaM to interrogate.</i></p>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
920322421	LOVISAGRUVAN AB

Short name: LOVISAGRUVAN AB

Address

Street HAKANSBODA 1
Town STORA
Postcode 71104
Country Sweden
Webpage www.lovisagruvan.se

Specific Legal Statuses

Legal person yes
Public body no
Non-profit no
International organisation no
Secondary or Higher education establishment no
Research organisation no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status 09/11/2017 - no
SME self-assessment unknown
SME validation unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name	<i>Name of the department/institute carrying out the work.</i>	<input checked="" type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	<i>Please enter street name and number.</i>	
Town	<i>Please enter the name of the town.</i>	
Postcode	<i>Area code.</i>	
Country	<i>Please select a country</i>	

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr _____

Gender Woman Man Non Binary

First name* Jan-Erik

Last name* Bjorklund

E-Mail* jan-erik.bjorklund@lovisagruvan.se

Position in org. Managing Director

Department LOVISAGRUVAN AB

Same as organisation name

Same as proposing organisation's address

Street HAKANSBODA 1

Town STORA

Post code 71104

Country Sweden

Website www.lovisagruvan.se

Phone +46 70?204 07 11

Phone 2 +XXX XXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Jan-Erik	Bjorklund	Man	Sweden	Jan-erik.bjorklund@lovisagruvan.se				
Mr	Stefan	Sadbom	Man	Sweden	Stefan.sadbom@lovisagruvan.se				Senior Exploration geologist in partner organisation

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<p><i>The use of systematic sampling and XRF-XRT based scanning to determine potential recovery of metals from waste rock</i></p> <p>Sadbom, S., Sartz, L., Bjorklund, J-E., Svenlov, M., Bergqvist, M. and Backstrom, M.</p> <p>IMWA2021, International Mine Water Association Congress, virtual event 300</p> <p>Proceedings: Pope, J.; Wolkersdorfer, Ch.; Sartz, L.; Weber, A.; Wolkersdorfer, K.: Mine Water Solutions. p. 146 to 152; Christchurch, New Zealand (International Mine Water Association).</p>
Dataset	<p>Lovisagruvan has extensive own databases over historic mines within permits and through membership in Bergskraft Bergslagen Economic Association, also access to data on historic mines in the entire Bergslagen Mining District. The data contain amounts and indicative grades in mining waste piles.</p>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
X-MINE	<p>H2020 funded project (ended August 2021). The X-MINE project studied and developed X-ray and 3D vision based sensing technologies and 3D/4D ore deposit modelling technologies. The technologies were integrated in two complete large-scale prototypes, the so-called X-Analyser (also called drill core scanner) and X-AnalySorter (also called mobile sorter or mobile pilot sorting prototype).</p>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Sorter	<p>A full scale sorting plant using XRF/XRT is installed at mine site and may be utilised for mining waste sorting experiments.</p>
Permits	<p>Lovisagruvan AB is the holder of exploration permits over several historic mines with mining waste. The permit entitles Lovisagruvan to carry out sampling at the historic Hakansboda Copper-Cobalt mine and other mines within Lovisagruvan permits.</p>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999907138	EIDGENOSSISCHE MATERIALPRUFUNGS- UND FORSCHUNGSAINSTALT
Short name: EMPA	
Address	
Street	UEBERLANDSTRASSE 129
Town	DUBENDORF
Postcode	8600
Country	Switzerland
Webpage	www.empa.ch
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	01/01/1900 - no
SME self-assessment	01/01/1900 - no
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name	<i>Name of the department/institute carrying out the work.</i>	<input type="checkbox"/> not applicable
<input type="checkbox"/> Same as proposing organisation's address		
Street	<i>Please enter street name and number.</i>	
Town	<i>Please enter the name of the town.</i>	
Postcode	<i>Area code.</i>	
Country	<i>Please select a country</i>	

Department 2

Department name	Technology and Society Laboratory (TSL)	<input type="checkbox"/> not applicable
<input checked="" type="checkbox"/> Same as proposing organisation's address		
Street	UEBERLANDSTRASSE 129	
Town	DUBENDORF	
Postcode	8600	
Country	Switzerland	

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Charles	Marmy	Man	Switzerland	charles.marmy@empa.ch	Category D First stag	Team member	0000-0001-5843-5996	Orcid ID
Dr	Matthias	Rosslein	Man	Switzerland	matthias.roesslein@empa.ch	Category A Top grad	Team member	0000-0002-6858-4124	Orcid ID
Dr	Patrick	Waeger	Man	Switzerland	patrick.waeger@empa.ch	Category A Top grad	Leading	0000-0002-2109-6553	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	Crenna, E.; Gauch, M.; Widmer, R.; Wager, P.; Hischier, R. (2021) Towards more flexibility and transparency in life cycle inventories for Lithium-ion batteries. <i>Res., Conserv. Recycl.</i> 170, 105619 (9 pp.). https://doi.org/10.1016/j.resconrec.2021.105619
Publication	Mueller, S. R.; Kral, U.; Wager, P. A. (2020) Developing material recovery projects: lessons learned from processing municipal solid waste incineration residues. <i>J. Clean. Prod.</i> 259, 120490 (15 pp.). https://doi.org/10.1016/j.jclepro.2020.120490
Publication	Restrepo, E.; Lovik, A. N.; Wager, P.; Widmer, R.; Lonka, R.; Muller, D. B. Stocks, flows, and distribution of critical metals in embedded electronics in passenger vehicles. <i>Environ. Sci. Technol.</i> 2017, 51 (3), 1129-1139. https://doi.org/10.1021/acs.est.6b05743
Publication	L?vik, A.N., Marmy, C., Ljunggren, M., Kushnir, D., Huisman, J., Bobba, S., Maury, T., Ciuta, T., Mathieu, F., Wager, P. (2021) Composition of recent, current and future vehicles: updated datasets for selected critical raw materials and other metals. Joint Research Center, Luxembourg.
Publication	Wintersteller, A.; Heuss-Assbichler, S.; Stegemann, J.; Kral, U.; Wager, P.; Osmani, M.; Rechberger, H. (2021) The role of anthropogenic resource classification in supporting the transition to a circular economy. <i>J. Clean. Prod.</i> 297, 126753 (13 pp.). https://doi.org/10.1016/j.jclepro.2021.126753

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
COST MINEA	The COST project "Mining the European Anthroposphere" (MINEA) aimed to actuate the reporting of material resources/reserves in the anthroposphere, with a focus on construction and demolition waste, waste regained from landfills and solid residues from waste incineration. Empa contributed, in particular, to the development of the Specifications for the Application of the United Nations Framework Classification for Resources (UNFC) to Anthropogenic Resources, which were adopted by the UNECE Expert
EVA	Based on a quantification of mass flows of rare and critical metals in electrical and electronic devices embedded in cars, this ongoing project aims to provide concrete suggestions to the Swiss Federal Office for the Environment (FOEN) regarding the separate collection and treatment of such devices and the establishment of a system to continuously monitor the life cycle of embedded electronics in cars and their rare and critical metal contents.
ORAMA	The Horizon 2020 project "Optimising quality of information in RAw MAterial data collection across Europe" (ORAMA) seeked to contribute to better supply of raw materials by improving the quality of harmonised raw materials data collection and information sharing among the different levels within the European Union (EU). Empa contributed, in particular, to the inventory and analysis of data collection methods and sources, and the provision of recommendations for improving SRM datasets and harmoni
ProSUM	The Horizon 2020 project "Prospecting Secondary raw materials in the Urban mine and Mining wastes" (ProSUM) aimed to provide a state of the art knowledge base, which allows the recycling industry and policymakers to make more informed investment and policy decisions to increase the supply and recycling of secondary raw materials. ProSUM developed the very first EU-wide and open-access Urban Mine Platform (UMP) (http://www.urbanmineplatform.eu/homepage). Empa contributed, in particular, to the pr

Administrative forms

LIB-SARS	<p><i>The ongoing project commissioned by the Foundation Auto Recycling Switzerland (SARS) aims to support the implementation of an efficient, safe and sustainable take-back and recycling system for Lithium-Ion Batteries (LIB) from the automotive sector by designing LIB reverse logistics and recycling system variants, testing their behaviour against multiple possible evolution scenarios using computer models, and comparing the simulation results in order to provide useful insights to the sectoral sta</i></p>
----------	---

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Sampling and sample preparation laboratory	Laboratory for sampling and sample preparation of batteries and WEEE in view of their characterisation and analysis.

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889253709	Otanm?ki Mine Oy

Short name: Otanm?ki Mine Oy

Address

Street	Kiilakiventie 1
Town	Oulu
Postcode	90250
Country	Finland
Webpage	http://www.otanmaki.fi/

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	20/09/2021 - yes
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* not applicable

Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Removal of Ilmenite from Mine Tailings	A circular economy project to remineralise ilmenite from the old Otanmaki tailings
Re-opening Otanmaki Mine	Raw materials project to reopen the Otanmaki V-Fe-Ti mine

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Mine	Otanmaki Mine Oy owns rights to the historical Otanmaki mine site (Kajaani, Finland) and existing infrastructure, including tailings area, roads and buildings. It will be used in one of the project case studies.

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999429413	BUNDESANSTALT FUER GEOWISSENSCHAFTEN UND ROHSTOFFE
Short name: BGR	
Address	
Street	Stilleweg 2
Town	HANNOVER
Postcode	30655
Country	Germany
Webpage	www.bgr.bund.de
Specific Legal Statuses	
Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	01/12/1958 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Natural Resources not applicable

Same as proposing organisation's address

Street Stillegasse 2

Town HANNOVER

Postcode 30655

Country Germany

Links with other participants

Type of link	Participant

Administrative forms

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr _____

Gender Woman Man Non Binary

First name* **Antje**

Last name* **Wittenberg**

E-Mail* **antje.wittenberg@bgr.de**

Position in org. Senior scientist

Department BUNDESANSTALT FUER GEOWISSENSCHAFTEN UND ROHSTOFFE

Same as organisation name

Same as proposing organisation's address

Street Stilleweg 2

Town HANNOVER

Post code 30655

Country Germany

Website <https://www.bgr.bund.de>

Phone +49 511 6432564

Phone 2 +XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Frank	Lichtenberg	frank.lichtenberg@bgr.de	+XXX XXXXXXXXX
Christoph Sebastian	Wurl	christophsebastian.wurl@bgr.de	+XXX XXXXXXXXX
Jan-Egli	Gubenis	jan-egil.gubenis@bgr.de	+XXX XXXXXXXXX

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Antje	Wittenberg	Woman	Germany	antje.wittenberg@bgr.de	Category B Senior re	Leading	0000-0002-4219-6705	Orcid ID
Dr	Jeannette	Meima	Woman	Netherlands	jeannette.meima@bgr.de	Category B Senior re	Team member	0000-0003-4378-2500	Orcid ID
Dr	Britta	Bookhagen	Woman	Germany	Britta.Bookhagen@bgr.de	Category B Senior re	Team member	0000-0002-3486-9084	Orcid ID
Mr	Paul	Mahlitz	Man	Germany	Paul.Mahlitz@bgr.de	Category C Recognis	Team member	0000-0002-9749-2667	Orcid ID

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input checked="" type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input checked="" type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input checked="" type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	<i>Regular public reports and periodicals on raw materials (resources, demand, supply and forecasts) e.g. 'Rohstoffsituationsbericht', 'DERA Rohstoffinformation'</i>
Publication	<i>Kuhn, K.; Meima, J.A. 2019 Characterization and Economic Potential of Historic Tailings from Gravity Separation: Implications from a Mine Waste Dump (Pb-Ag) in the Harz Mountains Mining District, Germany. Minerals 9, 303. https://doi.org/10.3390/min9050303</i>
Publication	<i>Girtan, M.; Wittenberg, A.; Grilli, M.L.; de Oliveira, D.P.S.; Giosue, C.; Ruello, M.L. 2021 The Critical Raw Materials Issue between Scarcity, Supply Risk, and Unique Properties. Materials 14, 1826. https://doi.org/10.3390/ma14081826</i>
Service	<i>'Dialogplattform Recyclingrohstoffe' The aim of this 2-year dialogue platform is to develop options for action to increase the share of recycled raw materials in the raw material supply of German industry. The content focus is on metallic raw materials and industrial minerals.</i>
Dataset	<i>BGR Datenbank (Raw Materials Database) and supplementing information on metalliferous mining dumps in Germany</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
GeoERA Raw Materials	<i>GeoERA: Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe. The WP estimates the potential of Critical Raw Materials resource hosted in abounded mining sites Provided information and data on primary and secondary RM accessible throughout EGDI the European Geological Data Infrastructure of the European Geological Survey Organisations http://www.europe-geology.eu/.</i>
GERRI	<i>BGR coordinates the German Resource Research Institute (BMBF action). GERRI blends disciplines and competences together by linking the various interfaces along the value chain of mineral and metal-containing materials, enabling technically sound and sustainable operations, https://www.gerri-germany.org</i>
SCRREEN 2 (and SCRREEN)	<i>SCRREEN: Expert Support Action of the European Commission in the context of Critical Raw Materials (supply and demand; market and trading; forecasts); https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/Projekte/Rohstoffverfuegbarkeit_laufend_en/SCRREEN2_en.html?nn=1552528</i>
TReMin	<i>Networking and transfer project financed by the German State on resource efficient cycler economy ? focussing on building materials, https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/Projekte/Rohstoffverfuegbarkeit_laufend_en/TReMin_en.html?nn=1552528</i>
ROBEHA	<i>ROBEHA: Economic Potential of Mining and Metallurgical Dumps, Taking into Account the Sustainability and Example of the Western Harz Mountains (BMBF 033R105, 2012-2015); https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/Projekte/Mineralische_Reststoffe_abgeschlossen_en/ROBEHA_en.html?nn=1552528</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Mineralogical and geochemical laboratories	<i>Fully equipped analytical laboratories for mineralogical and geochemical material analysis (in-situ and bulk)</i>
BGR Datenbank	<i>Fully equipped analytical laboratories for mineralogical and geochemical material analysis (in-situ and bulk)</i>

Administrative forms

<i>German-wide cadastre on mining residues</i>	<i>German-wide cadastre with basic information on over 2000 metalliferous mining dumps (GIS database, to be published as WEB-GIS in 2022)</i>
--	---

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889270781	<i>Stiftung Gemeinsames R?cknahmesystem Batterien</i>
Short name: Stiftung GRS Batterien	
Address	
Street	Heidenkampsweg 44
Town	Hamburg
Postcode	20097
Country	Germany
Webpage	www.grs-batterien.de
Specific Legal Statuses	
Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes
SME Data	
Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.	
SME self-declared status	17/09/2021 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Forschung und Entwicklung not applicable

Same as proposing organisation's address

Street Heidenkampsweg 44

Town Hamburg

Postcode 20097

Country Germany

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Georgios	Chryssos	Man	Germany	chryssos@grs-batterien.de	Category B Senior researcher	Leading		
Dr	Julia	Hobohm	Woman	Germany	hobohm@grs-batterien.de	Category B Senior researcher	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Service	<i>20 year experience in collecting and recycling of batteries (Consumer and Industry batteries)</i>
Dataset	<i>Regulatory data analysis and reporting concerning quality and quantity of batteries for the last 20 years</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
<i>Collection and processing operation</i>	<i>Collecting and recycling infrastructure for consumer and industry batteries in Germany</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
889528025	EUROPEAN METAL RECYCLING LIMITED

Short name: EUROPEAN METAL RECYCLING LIMITED

Address

Street	Sirius House, Delta Crescent Westbrook, Warrington
Town	Warrington
Postcode	WA5 7NS
Country	United Kingdom
Webpage	https://uk.emrgroup.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	01/09/2021 - no
SME self-assessment	unknown
SME validation	unknown

Administrative forms

Departments carrying out the proposed work

Department 1

Department name Innovation & Technology not applicable

Same as proposing organisation's address

Street Sirius House, Delta Crescent Westbrook,

Town Warrington

Postcode WA5 7NS

Country United Kingdom

Links with other participants

Type of link	Participant

Administrative forms

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Roger	Morton	Man	United Kingdom	Roger.morton@emrgroup.com	Category A Top grad	Leading		
Dr	Joseph	Eke	Man	United Kingdom	joseph.eke@emrgroup.com	Category B Senior re	Team member		
Dr	Saeid	Moradi	Man	United Kingdom	saeid.Moradi@emrgroup.com	Category B Senior re	Team member		
Mr	Simon	Bryan	Man	United Kingdom	simon.bryan@emrgroup.com	Category B Senior re	Team member		
Mr	Rob	Chaddock	Man	United Kingdom	rob.chaddock@emrgroup.com	Category B Senior re	Team member		
Mr	Alexander	Thompson	Man	United Kingdom	alexander.thompson@emrgroup.com	Category D First stag	Team member		

Administrative forms

Role of participating organisation in the project

Project management	<input type="checkbox"/>
Communication, dissemination and engagement	<input checked="" type="checkbox"/>
Provision of research and technology infrastructure	<input checked="" type="checkbox"/>
Co-definition of research and market needs	<input checked="" type="checkbox"/>
Civil society representative	<input type="checkbox"/>
Policy maker or regulator, incl. standardisation body	<input type="checkbox"/>
Research performer	<input type="checkbox"/>
Technology developer	<input type="checkbox"/>
Testing/validation of approaches and ideas	<input checked="" type="checkbox"/>
Prototyping and demonstration	<input type="checkbox"/>
IPR management incl. technology transfer	<input type="checkbox"/>
Public procurer of results	<input type="checkbox"/>
Private buyer of results	<input type="checkbox"/>
Finance provider (public or private)	<input type="checkbox"/>
Education and training	<input type="checkbox"/>
Contributions from the social sciences or/and the humanities	<input type="checkbox"/>
Other If yes, please specify: (Maximum number of characters allowed: 50)	<input type="checkbox"/>

Administrative forms

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Good	<i>Processing and supply of 10 million tonnes a year of secondary raw materials (recycled metals, plastics and aggregates)</i>
Dataset	<i>Compositional analysis of many different waste streams used for the production of secondary raw materials</i>
Dataset	<i>Process performance data from the production of secondary raw materials</i>
Dataset	<i>Technical and economic feasibility studies into the production of secondary raw materials</i>

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
REAP	<i>Feasibility study on recycling of rare earth magnets from audio speakers (UK Driving the Electric Revolution funded)</i>
RECOVAS	<i>Developing a supply chain for the reuse and recycling of electric vehicle batteries (UK Advanced Propulsion Centre funded)</i>
Various	<i>Extensive experience over many years of processing and supplying secondary raw materials (recycled metals, plastics and aggregates)</i>

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure or equipment	Short description (Max 300 characters)
Process plant	<i>Large scale metal recycling equipment including shredders, shears, balers, screens</i>
Specialist facilities	<i>Fridge recycling, plastic recycling, cable recycling and dense media separation</i>
R&D facility	<i>Analysis of materials, process development and small scale production trials</i>

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below?

Yes No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
 - o work-life balance and organisational culture;
 - o gender balance in leadership and decision-making;
 - o gender equality in recruitment and career progression;
 - o integration of the gender dimension into research and teaching content;
 - o measures against gender-based violence including sexual harassment.

Administrative forms

Proposal ID 101058522

Acronym FutuRaM

3 - Budget

?

No.	Name of beneficiary	Country	Role	Personnel costs/€	Subcontracting costs/€	Purchase costs - Travel and subsistence /€	Purchase costs - Equipment/€	Purchase costs - Other goods, works and services/€	Internally invoiced goods and services/€ (Unit costs-usual accounting practices)	Indirect costs/€	Total eligible costs	Funding rate	Maximum EU contribution to eligible costs	Requested EU contribution to eligible costs/€	Max grant amount	Income generated by the action	Financial contributions	Own resources	Total estimated income
1	Waste Of Electrical And Electronical Equipment Forum Aisbl	BE	Coordinator	425,750	193,750	50,100		207,900		170937.00	1048437.00	100	1048437.00	1,048,437	1048437.00				1048437.00
2	Repic Limited	UK	Affiliated	86,385		7,800				23546.00	117731.00	100	117731.00	117,731	117731.00				117731.00
3	Erion Weee	IT	Affiliated	91,000	20,000	7,800		15,000		28450.00	162250.00	100	162250.00	162,250	162250.00				162250.00
4	Ecosystem	FR	Affiliated	85,527		7,800				23331.00	116658.00	100	116658.00	116,658	116658.00				116658.00
5	Technische Universität Berlin	DE	Partner	1,010,900	15,000	48,750		52,525		278043.00	1405218.00	100	1405218.00	1,405,218	1405218.00		50,640		1455858.00
6	University College London	UK	Partner	667,348		29,800		7,000		176037.00	880185.00	100	880185.00	880,185	880185.00				880185.00
7	Chalmers Tekniska Hoegskola Ab	SE	Partner	307,281		18,000				81320.00	406601.00	100	406601.00	406,601	406601.00				406601.00
8	Recharge	BE	Partner	27,430		7,200				8657.00	43287.00	100	43287.00	43,287	43287.00				43287.00
	Bureau De									1032320.00			1032320.00		1032320.00				1032320.00

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

9	Recherches Geologiques Et Minieres	FR	Partner	616,956	200,000	32,400		16,500		166464.00		100		1,032,320					
10	Geologian Tutkimuskeskus	FI	Partner	249,480	80,000	48,400		3,000		75220.00	456100.00	100	456100.00	456,100	456100.00				456100.00
11	Vlaamse Instelling Voor Technologisch Onderzoek N.v.	BE	Partner	627,000		20,700		7,000		163675.00	818375.00	100	818375.00	818,375	818375.00				818375.00
12	Geoloski Zavod Slovenije	SI	Partner	150,500		25,400		8,000		45975.00	229875.00	100	229875.00	229,875	229875.00				229875.00
13	Universiteit Leiden	NL	Partner	1,011,500		28,800		9,000		262325.00	1311625.00	100	1311625.00	1,311,625	1311625.00				1311625.00
14	United Nations Institute For Training And Research	CH	Partner	1,230,656		29,700		29,000		322339.00	1611695.00	100	1611695.00	1,611,695	1611695.00				1611695.00
15	Weecycle	FR	Partner	195,000		6,000				50250.00	251250.00	100	251250.00	251,250	251250.00				251250.00
16	Ludwig-maximilians-universitaet Muenchen	DE	Partner	806,400		33,300		43,000		220675.00	1103375.00	100	1103375.00	1,103,375	1103375.00				1103375.00
17	Sociedade Portuguesa De Inovacao Consultadoria Empresarial E Fomento Da Inovacao Sa	PT	Partner	225,000		29,700		38,000		73175.00	365875.00	100	365875.00	365,875	365875.00				365875.00
18	Sveriges Geologiska Undersokning	SE	Partner	403,200		46,000		40,000		122300.00	611500.00	100	611500.00	611,500	611500.00				611500.00
19	Duncan Kushnir	SE	Partner	45,000		1,800				11700.00	58500.00	100	58500.00	58,500	58500.00				58500.00
20	Boliden Mineral Ab	SE	Partner	110,500		8,600		50,000		42275.00	211375.00	100	211375.00	211,375	211375.00				211375.00
21	University Of Belgrade - Faculty Of Mining And Geology	RS	Partner	22,000		7,200		25,000		13550.00	67750.00	100	67750.00	67,750	67750.00				67750.00

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

22	Mace	UK	Associated						0.00	0.00	100	0.00	0	0.00		43,000		43000.00	
23	Lovisagruvan Ab	SE	Partner	92,300		7,400		50,000		37425.00	187125.00	100	187125.00	187,125	187125.00				187125.00
24	Eidgenossisch e Materialpru fungs- Und Forschungsanstalt	CH	Associated						0.00	0.00	100	0.00	0	0.00		1,221,750		1221750.00	
25	Otanm?ki Mine Oy	FI	Associated						0.00	0.00	100	0.00	0	0.00		65,000		65000.00	
26	Bundesanstalt Fuer Geowissenschaften Und Rohstoffe	DE	Partner	106,420		26,000		9,000		35355.00	176775.00	100	176775.00	176,775	176775.00				176775.00
27	Stiftung Gemeinsames R?cknahmesystem Batterien	DE	Associated						0.00	0.00	100	0.00	0	0.00		85,000		85000.00	
28	European Metal Recycling Limited	UK	Associated						0.00	0.00	100	0.00	0	0.00				0.00	
TOTAL				8,593,533	508,750	528,650	0	609,925	0	2433024.00	12673882.00		12673882.00	12,673,882	12673882.00	0	1,465,390	0	14139272.00

Administrative forms

Proposal ID 101058522

Acronym FutuRaM

4 - Ethics & security

Ethics Issues Table

Page
1. Human Embryonic Stem Cells and Human Embryos
Does this activity involve Human Embryonic Stem Cells (hESCs)? <input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve the use of human embryos? <input type="radio"/> Yes <input checked="" type="radio"/> No
2. Humans
Does this activity involve human participants? <input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve interventions (physical also including imaging technology, behavioural treatments, etc.) on the study participants? <input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve conducting a clinical study as defined by the Clinical Trial Regulation (EU 536/2014) ? (using pharmaceuticals, biologicals, radiopharmaceuticals, or advanced therapy medicinal products) <input type="radio"/> Yes <input checked="" type="radio"/> No
3. Human Cells / Tissues (not covered by section 1)
Does this activity involve the use of human cells or tissues? <input type="radio"/> Yes <input checked="" type="radio"/> No
4. Personal Data
Does this activity involve processing of personal data? <input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve further processing of previously collected personal data (including use of preexisting data sets or sources, merging existing data sets)? <input type="radio"/> Yes <input checked="" type="radio"/> No
Is it planned to export personal data from the EU to non-EU countries? Specify the type of personal data and countries involved <input type="radio"/> Yes <input checked="" type="radio"/> No
Is it planned to import personal data from non-EU countries into the EU or from a non-EU country to another non-EU country? Specify the type of personal data and countries involved <input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve the processing of personal data related to criminal convictions or offences? <input type="radio"/> Yes <input checked="" type="radio"/> No
5. Animals
Does this activity involve animals? <input type="radio"/> Yes <input checked="" type="radio"/> No
6. Non-EU Countries
Will some of the activities be carried out in non-EU countries? <input checked="" type="radio"/> Yes <input type="radio"/> No 45
Serbia, Switzerland, United Kingdom
In case non-UE countries are involved, do the activities undertaken in these countries raise potential ethics issues? <input type="radio"/> Yes <input checked="" type="radio"/> No
It is planned to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)? <input type="radio"/> Yes <input checked="" type="radio"/> No
Is it planned to import any material (other than data) from non-EU countries into the EU or from a non-EU country to another non-EU country? For data imports, see section 4. <input type="radio"/> Yes <input checked="" type="radio"/> No

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

Is it planned to export any material (other than data) from the EU to non-EU countries? For data exports, see section 4.

Yes No

Does this activity involve [low and/or lower middle income countries](#), (if yes, detail the benefit-sharing actions planned in the self-assessment)

Yes No

Could the situation in the country put the individuals taking part in the activity at risk?

Yes No

7. Environment, Health and Safety

Page

Does this activity involve the use of substances or processes that may cause harm to the environment, to animals or plants.(during the implementation of the activity or further to the use of the results, as a possible impact) ?

Yes No

Does this activity deal with endangered fauna and/or flora / protected areas?

Yes No

Does this activity involve the use of substances or processes that may cause harm to humans, including those performing the activity.(during the implementation of the activity or further to the use of the results, as a possible impact) ?

8. Artificial Intelligence

Page

Does this activity involve the development, deployment and/or use of Artificial Intelligence? (if yes, detail in the self-assessment whether that could raise ethical concerns related to human rights and values and detail how this will be addressed).

Yes No

9. Other Ethics Issues

Page

Are there any other ethics issues that should be taken into consideration?

Yes No

I confirm that I have taken into account all ethics issues above and that, if any ethics issues apply, I will complete the ethics self-assessment as described in the guidelines [How to Complete your Ethics Self-Assessment](#)



Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

Ethics Self-Assessment

Ethical dimension of the objectives, methodology and likely impact

Explain in detail the identified issues in relation to:

- objectives of the activities (e.g. study of vulnerable populations, etc.)
- methodology (e.g. clinical trials, involvement of children, protection of personal data, etc.)
- the potential impact of the activities (e.g. environmental damage, stigmatisation of particular social groups, political or financial adverse consequences, misuse, etc.)

Remaining characters **4594**

Compliance with ethical principles and relevant legislations

Describe how the issue(s) identified in the ethics issues table above will be addressed in order to adhere to the ethical principles and what will be done to ensure that the activities are compliant with the EU/national legal and ethical requirements of the country or countries where the tasks are to be carried out. It is reminded that for activities performed in a non-EU countries, they should also be allowed in at least one EU Member State.

Remaining characters **5000**

Administrative forms

Proposal ID **101058522**

Acronym **FutuRaM**

Security issues table

1. EU Classified Information (EUCI) ²	Page
Does this activity involve information and/or materials requiring protection against unauthorised disclosure (EUCI)?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Does this activity involve non-EU countries?	<input checked="" type="radio"/> Yes <input type="radio"/> No 45
Do participants from non-EU countries need to have access to EUCI?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Do the non-EU countries concerned have a security of information agreement with the EU?	<input checked="" type="radio"/> Yes <input type="radio"/> No 45
2. Misuse	Page
Does this activity have the potential for misuse of results?	<input type="radio"/> Yes <input checked="" type="radio"/> No
3. Other Security Issues	Page
Does this activity involve information and/or materials subject to national security restrictions? If yes, please specify: (Maximum number of characters allowed: 1000)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Are there any other security issues that should be taken into consideration? If yes, please specify: (Maximum number of characters allowed: 1000)	<input type="radio"/> Yes <input checked="" type="radio"/> No

²According to the Commission Decision (EU, Euratom) 2015/444 of 13 March 2015 on the security rules for protecting EU classified information, "European Union classified information (EUCI) means any information or material designated by an EU security classification, the unauthorised disclosure of which could cause varying degrees of prejudice to the interests of the European Union or of one or more of the Member States".

³Classified background information is information that is already classified by a country and/or international organisation and/or the EU and is going to be used by the project. In this case, the project must have in advance the authorisation from the originator of the classified information, which is the entity (EU institution, EU Member State, third state or international organisation) under whose authority the classified information has been generated.

⁴EU classified foreground information is information (documents/deliverables/materials) planned to be generated by the project and that needs to be protected from unauthorised disclosure. The originator of the EUCI generated by the project is the European Commission.

Future Availability of Secondary Raw Materials (FutuRaM)



List of Participants

Participant No.	Participant Organisation Name (ACRONYM)	Country
1 (Coordinator)	Waste of Electrical & Electronic Equipment Forum (WF)	BE
2*	Repic Ltd (Rep)	UK
3*	Erion WEEE (Erion)	IT
4*	ecosystem (eco)	FR
5	Technische Universität Berlin (TUB)	DE
6	University College London (UCL)	UK
7	Chalmers Tekniska Hoegskola AB (Chal)	SE
8	RECHARGE (RECH)	BE
9	Bureau de Recherches Geologiques et Minières (BRGM)	FR
10	Geological Survey of Finland (GTK)	FI
11	Vlaamse Instelling voor Technologisch Onderzoek (VITO)	BE
12	Geoloski Zavod Slovenije (GeoZS)	SI
13	Universiteit Leiden (ULEI)	NL
14	United Nations Institute for Training and Research (UNITAR)	CH/DE
15	WEEE Cycling (WC)	FR
16	Ludwig-Maximilians-Universitaät München (LMU)	DE
17	Sociedade Portuguesa de Inovação (SPI)	PT
18	Sveriges Geologiska Undersökning (SGU)	SE
19	Duncan Kushnir (DKu)	SE
20	Boliden Mineral AB (BOL)	SE
21	University of Belgrade Faculty of Mining & Geology (BU)	RS
22**	Mace (MACE)	UK
23	Lovisagruvan (Lovis)	SE
24**	Eidgenössische Materialprüfungs- und Forschungsanstalt (Empa)	CH
25**	Otanmäki Mine Oy (OM)	FI
26	Bundesanstalt fuer Geowissenschaften und Rohstoffe (BGR)	DE
27**	Stiftung Gemeinsames Rucknahmesystem Batterien (GRS)	DE
28**	European Metals Recycling (EMR)	UK

*Affiliated Entity of the WEEE Forum

**Associated Partner

1. EXCELLENCE

1.1 Objectives and ambition

1.1.1 Main objectives and relation to the work programme

Main aim

The Future Availability of Secondary Raw Materials (FutuRaM) project seeks to (1) develop knowledge on the availability and recoverability of secondary raw materials (SRMs) within the European Union (EU), with a special focus on critical raw materials (CRMs), to enable fact-based decision making for their exploitation in the EU and third countries, and (2) disseminate this information via a systematic and transparent Secondary Raw Materials Knowledge Base (SRM-KB).

Key summary

Access to raw materials drives the global economy. It thus determines the competitive position and resilience of industry, and our ability to transition toward a decarbonised world. CRMs are economically and strategically important for the European economy but have a high-risk associated with their supply. In many instances, CRM primary extraction is limited to few locations outside of Europe, and there are no viable substitutes for these materials with current technologies. To achieve a transition toward a decarbonised world, SRMs need to play an increasing role, which not only diversifies supply sources of CRMs, but also enables a move towards a circular economy.

The effective management of raw material supply and demand requires reliable, coherent, and complete information and foresight on SRM stocks and flows regarding products through their lifecycles. Furthermore, the feasibility of SRM recovery also depends on economic, technical and technological, geopolitical, regulatory, social, and environmental factors. Much of the data required to understand these factors is available, but scattered amongst a variety of institutions, including government agencies, universities, think tanks, and industry, and need to be harmonised to be fit for use in SRM availability assessment.

The **FutuRaM** project will establish a methodology, reporting structure, and guidance to improve the raw materials knowledge base up to 2050, and facilitate the exploitation of SRMs with a particular focus on CRMs. Various research projects and national statistical institutes in the EU are working to fill this gap, and FutuRaM aims to build on these previous accomplishments through collaboration with the relevant experts. For instance, state-of-the-art methodologies and harmonised datasets were created in the H2020 project Prospecting Secondary raw materials in the Urban mine and Mining wastes (ProSUM), and improvements in reporting practices have been identified in the H2020 project, Optimising data collection for Primary and Secondary Raw Materials (ORAMA). Furthermore, the Anthropogenic Resources Working Group of the United Nations Economic Commission for Europe (UNECE) Expert Group on Resource Management (EGRM) has developed specifications to communicate the viability of SRM recovery projects based on the United Nations Framework Classification for Resources (UNFC). The first test cases that applied UNFC to primary resources based on ORAMA findings were provided by the GeoERA¹ project Material intelligence for Europe (Mintell4EU). FutuRaM will integrate SRM and CRM data to model their current stocks and flows, and consider economic, technological, geopolitical, regulatory, social and environmental factors to further develop, demonstrate and align SRM recovery projects with the UNFC. Foresight models of future SRM supply and demand based on coherent scenarios will expand these assessments to the year 2050. FutuRaM will facilitate the commercial exploitation of SRMs and CRMs by manufacturers, recyclers, and investors, and support policy makers and governmental authorities through the development of an SRM-KB and ensuring that the key results of the project are communicated and disseminated widely. Importantly, the project includes for extensive exploitation and business planning to ensure the key outcomes are financially sustainable and can be utilised in the long-term.

FutuRaM will focus on six waste streams: Waste batteries (BAT); Waste Electrical and Electronic Equipment (WEEE); End-of-Life Vehicles (ELV); Mining waste (MINW); Slags and Ashes (SLASH); and Construction and Demolition Waste (CDW). These waste streams represent an important source of CRMs. For instance, in the manufacture of current electrical and electronic equipment (EEE), vehicles and batteries, 60% of global demand for gallium comes from optoelectronics and integrated circuits, 56% of indium from flat panel displays, 36% of tantalum from capacitors, 46% of cobalt, 32% of lithium and 8% of nickel from batteries, and 30% of rare earth elements from magnets.² CRM demand is expected to significantly increase in the transition towards a low carbon society. For instance, technologies for future vehicles will rely on Li-ion batteries, fuel cells, and electric traction motors, and electricity generation will rely on more wind energy and photovoltaic technologies. MINW and CDW are hugely significant as they are by far the largest post-production and post-consumption SRM flows, respectively.

¹ Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe (GeoERA)

² <https://rmis.jrc.ec.europa.eu/apps/rmp2/#/>

This ambitious project will be delivered by a consortium of 28 outstanding partners, representing the key partners of the ProSUM and ORAMA projects as well as key members of the UNECE EGRM Anthropogenic Resources Working Group involved in the development of the UNFC Specifications for Anthropogenic Resources, including its current chair, and vice chair. This will be done in close collaboration with industry players involved in collection, manufacturing and end-of-life processing of key technological applications for the transition to a low-carbon economy, as well as policy makers and governmental authorities.

Objectives

Table 1 How FutuRaM will achieve the specific objectives in relation to the work programme

Relation to the scope of the work programme	FutuRaM will...
A successful transition to a climate-neutral, circular and digitised EU economy relies heavily on a secure supply of raw materials. In order to strengthen EU autonomy and reduce over-dependency, we must boost domestic sourcing, both for primary and SRMs	... quantify the future availability of SRMs for three future scenarios for the EU material economy, from following current consumption trends, to moderate or rapid transitioning toward a climate-neutral, circular, and digitised EU economy (WP2). The material demand and the SRMs supply for each scenario and raw material imports to evaluate EU material autonomy.
Based on a common understanding of relevant terms and codes, develop an understanding of anthropogenic resources and derive the needed aspects for classification of recovery projects, and develop criteria for a transparent, consistent and objective classification, needed to establish a comprehensive resource classification approach.	... develop a consistent methodology throughout the project, including new guidelines for a more comprehensive assessment of the three axes addressed by the UNFC Specifications for Anthropogenic Resources, i.e. socio-economic viability (E-axis), project feasibility (F-axis) and degree of confidence of future quantities to be produced by recovery projects (G-axis), in consultation with the UNECE EGRM. (WP1, 5 & 7)
Acquire new data on SRMs via in situ sampling, collect existing data and present in a harmonised UNFC format. The action should build on and advance further the work of UNECE – UNFC Expert Group on Anthropogenic Resources regarding the classification of SRMs and the work of H2020 project ProSUM regarding collection of data and information on SRMs.	... through collaboration between key partners of the ProSUM project and the UNECE EGRM Anthropogenic Resources Working Group, develop a consistent classification methodology to assess the degree of confidence in recoverable quantities (G-axis of the UNFC Specifications for Anthropogenic Resources) of SRMs (WP1&5), with a particular focus on CRMs, using the ProSUM methodology as a consistent material and waste stream perspective (WP3-4).
Focus on the following streams of SRMs, with particular attention to critical raw materials: waste batteries, WEEE, mining waste, slags and ashes, and construction and demolition waste.	... apply and expand the methodology WEEE, (including WEEE-Directive, future products, and embedded WEEE), BAT (including industrial, portable and transportation), ELV, MINW, SLASH and CDW (WP 1-5).
Develop a proposal for EU statistics for SRMs.	... develop a practical proposal for collection of EU Statistics for SRMs in close consultation with National Statistical Offices and Eurostat (WP1).
All the data and information generated through these actions should be shared in open formats on a free of charge basis with the European Commission, for its own use and for publication.	... develop an open and free for anyone information system SRM-KB to query the final database. Final data sets will be shared with the Commission and with public authorities through the project dissemination data portal, via APIs and transferring data to e.g. Raw Materials Information System (RMIS) and Europe-geology.eu (EGDI). INSPIRE Directive obligations in terms of interoperability, metadata and accessibility to data will be respected. (WP6)
Envisage clustering activities with other relevant selected projects for cross-projects co-operation, consultations and	... explore with other relevant projects the opportunities for co-operation and joint activities on cross-cutting issues, as well as sharing of results (a specific task has been dedicated to clustering:

joint activities on cross-cutting issues and share of results as well as participating in joint meetings and communication events. To this end proposals should foresee a dedicated work package and/or task, and earmark the appropriate resources accordingly.	T7.6 Clustering activities). This collaboration extends to organising four clustering events and attending those events that are organised by other relevant projects and initiatives, such as currently ongoing projects (listed under 1.2.2) and projects that will receive funding under Horizon Europe e.g. CL4-2021-RESILIENCE-01-06 and CL5-2021-D3-01-16.
Contribute to improving the awareness of relevant external stakeholders and the general public across the EU and in non-EU countries of project's partners about the importance of raw materials for society, the challenges related to their supply within the EU and about proposed solutions which could help to improve society's acceptance of and trust in sustainable raw materials production in the EU.	FutuRaM's communication and dissemination activities will be a mixture of scene-setting and presenting the results of the research. When scene-setting, the project will discuss raw materials use as it currently stands, the challenges presented by the supply of these and how there are opportunities for obtaining raw materials through resources embedded in the objects and infrastructure of our societies. The methods FutuRaM develops for addressing these challenges will be communicated as one of the building blocks of a solution to these issues (WP7). The project will use the global networks and communication channels of its partners, particularly WF and UNITAR with their worldwide connections, to ensure that the messages are spread within and outside the EU. Tailoring communication to the intended target audience, including the general public.

1.1.2 Going beyond the state-of-the-art

FutuRaM will deliver foresight content for the SRM-KB and set the basis for reporting standards in alignment with the UNFC for Anthropogenic Resources to facilitate the increased recovery of SRMs and CRMs.

State-of-the-art: Future Scenarios for raw material markets

The ProSUM project was the first of its kind to provide consistent and detailed waste flow datasets on SRMs, (including CRMs), with detailed coverage of products and components for ELV, WEEE and BAT, and short-term projections to 2022. Presently, several socioeconomic scenarios have been developed at national, EU, and/or global scales to assess the energy and mobility transition.³ While some of these studies have partially included CRMs demand and focused on the potential supply risks for achieving climate targets, these prospective scenarios have not been effectively harmonised across industrial sectors, and generally lack information on SRMs and the recovery industry in general. Transitions toward sustainable societies are likely to involve major changes and increased complexity in the material economy. Further research into current and future SRMs and CRMs present in the urban mine is thus urgent to prepare industry for their eventual recovery. In addition, scenarios that include other Circular goals such as lifetime extension need to be better assessed in terms of material cycles.

Going beyond state-of-the-art: FutuRaM will develop stock-flow models for six waste streams based on holistic scenarios to map current and future material use in the economy of the EU-27 plus Iceland, Norway, Switzerland and United Kingdom (EU27+4) and quantify their eventual end-of-life fate. FutuRaM will extend existing model approaches by a set of distinct scenarios which cover circular economy (e.g. lifetime extension through repair and remanufacturing), high SRMs recoverability, and business as usual. These scenarios will incorporate emerging recycling technologies in line with stakeholder dialogues that consider normative boundary conditions such as carbon neutrality by 2050.

State-of- the art: Methodology for secondary raw material assessment in alignment with the UNFC

Classification has traditionally been applied to primary resources, with a focus on investors' needs. The UNFC (see also 1.1.1) is a principle-based classification system for the transparent communication of the availability of mineral and energy resources, which forms the basis of the United Nations Resource Management System (UNRMS). It aims to take a holistic view of resource availability, with classification of recovery projects on three axes: socio-economic-environmental viability, technical feasibility, and the degree of confidence in estimates of recoverable quantities. In

3 <https://www.iea.org/reports/world-energy-model/sustainable-development-scenario>

<https://www.sciencedirect.com/science/article/pii/S0959378016301790?via%3Dihub>

<https://www.iea.org/reports/global-ev-outlook-2021/prospects-for-electric-vehicle-deployment>

recent years, several case studies have been developed to demonstrate the applicability of the UNFC to SRMs. However, the implementation of the UNFC by practitioners is currently hindered by a lack of guidance regarding the detailed methodology to be applied, especially with respect to social and environmental sustainability, and an absence of reporting standards and case studies that demonstrate the assessment and reporting.

Going beyond state-of-the-art: FutuRaM responds to the current gaps for using the UNFC by developing a consistent and transparent methodology to be fit-for-purpose in the context of a transition to a sustainable circular economy. The three axes of the UNFC will be further specified by identifying and developing SRMs assessment factors, methods and criteria, with regard to SRMs resource estimates, technological feasibility; economic viability; environmental impacts, social impacts and policy/regulation. Those will be applied and tested in classification of case studies for SRMs and, in particular, CRMs recovery from the six FutuRaM waste streams, in alignment with the UNFC.

State-of-the-art: Commercial exploitation of EU secondary resource recovery projects

Currently, mining projects for primary raw materials within the EU use reporting codes and guidelines developed by the Committee for Mineral Reserves International Reporting Standards (CRIRSCO), as specified by the Pan-European Reserves & Resources Reporting Committee (PERC). CRIRSCO is used to report reliable information about exploration results, mineral resources and reserves to investors. No such standardised common tool exists that is directed at environmental authorities, or other government, inter-governmental and non-governmental bodies, for permitting and planning.

Going beyond state of the art: By providing guidance and case studies for the classification of SRMs in alignment with the UNFC, FutuRaM will provide a tool that can be used to communicate SRMs availability for exploitation, to all stakeholders, including industry, their investors and governing authorities, and also consultants, insurers, policy-makers, and NGOs, etc., providing transparent and consistent information that extends the three axes of the UNFC.

1.1.3. R&I maturity and TRL levels

FutuRaM will cover advances in knowledge, technologies, reporting structures and guidelines, and prediction models to help address the circularity challenges related to SRMs. The project builds on existing data and protocols from relevant previous H2020 projects and the work of the UNECE EGRM to support its methodological approach. This foundation will expand on the current knowledge base, which will support future reporting, regulations, policies and best practice, and facilitate the future recovery of SRMs. The FutuRaM consortium is composed of partners managing large data sets tested in research projects (TRL 3-5) and, as an EU Research and Innovation Action (RIA), it will inherit several existing methodologies developed in the projects outlined in Section 1.2.2 and expand them with technology assets mapped and analysed in WP2. It is expected that the overall FutuRaM system will reach TRL5 since the SRM-KB and the UNFC-aligned demonstrations of the enhanced SRMs recovery assessment will be validated in the relevant environment (WP5-7), along with the development of a proposal for EU-statistics on SRMs. Data models that estimate the SRM recovery potential will be designed, followed by recommendations on future reporting of product and waste flow composition. Once completed, the outcomes will be at the experimental proof of concept stage (TRL 3). In WP5, a new methodology for SRMs availability assessment in an EU circular economy in alignment with the UNFC will be developed and demonstrated in case studies, with the proposal of a reporting standard (TRL4). As a result, in the context of building an SRMs Intelligence system for EU, the SRM-KB platform will aggregate, combine, and balance all the information and data flows together with UNFC assessment following the newly defined methodology, and will be tested and validated in a relevant scale (TRL 5).

1.2 Methodology

1.2.1 Overall methodology

FutuRaM project scope

Table 2 provides an overview of the FutuRaM project scope including the waste streams, geographical areas and political entities covered and materials addressed.

Table 2 Overview of FutuRaM project scope

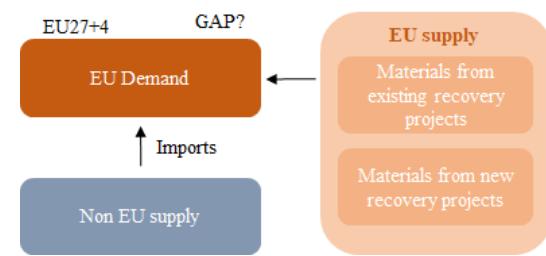
Waste stream	Waste stream scope	Geographical scope & resolution	SRMs / CRMs scope
BAT	BAT in the ProSUM project + TUB's 2018 batteries data update for the JRC: (portable, stationary and transport)	EU27+4 and global, national level	Metals and natural graphite, CRMs with particular focus on Co, Li and natural graphite
	Embedded batteries (e.g. in vehicles)		
WEEE	WEEE according to WEEE Directive 2012/19/EU (incl PV)	EU27+4, global, national or NUTS2/3	Bulk metals, relevant plastic fractions, CRMs with particular focus on very high, high and moderate supply risk (LREE, HREE, Mg, Nb, Ge, B, Sc, Sr, Co, PGM, nat. graphite)
	Embedded WEEE (e.g. in vehicles) not in the scope of WEEE Directive 2012/19/EU	EU27+4 national level	
ELV	ELV components addressed in ProSUM and Empa's/Chalmers' 2021 vehicles dataset update for the JRC	ELV addressed in ProSUM and the JRC vehicles data update	Bulk metals, relevant plastic fractions
MINW	Fresh and stockpiled residues from primary mineral extraction, including tailings and waste rock according to the Extractive Waste Directive 2006/21/EC	EU27+4 and Western Balkans, site specific where data is available, national level	Metals and minerals, CRMs with particular focus on those available in EU27+4 and Balkan mining sites (Sb, Ba, Be, Bi, Co, Ga, Ge, Hf, REEs, In, Nb, PGMs, Sc, Ta, W, V, Sr)
SLASH	Slags (fresh and old) from metal production	EU27+4, national level	Metals and minerals, CRMs with focus on V, Nb, Ga, Sc, Mg, P, Mo
	Bottom ash and fly ash from combustion of coal, sewage sludge other fossil fuels, biomass (e.g. wood, waste wood, energy crops, agricultural by-products, animal bedding), and/or Municipal Solid Waste (MSW))		Au, Cr, Cu, Pb, Zn, construction minerals, CRMs with particular focus on B, Ba, Ga, Ge, P, REE, Sc, Sr, V
CDW	Mineral- and metal-based materials used in buildings	EU27+4, national level and spatially explicit, resolution based on remote sensing tools	Concrete (cement, aggregate), steel, Al, Cu, timber, gypsum, CRMs with particular focus on alloying elements
	Electrical and electronic components in fixed installations (e.g. smart building infrastructure, fixed heating and cooling installations, wind turbines, tidal power plants, etc.)		Bulk metals, relevant plastic fractions, CRMs (e.g. LREE, HREE, Mg, Nb, Ge, B, Sc, Sr, Co, PGM, nat. graphite)

a) Waste streams addressed

As noted in Section 1.1.1, FutuRaM will focus on (i) BAT, (ii) WEEE, (iii) ELV (iv) MINW (v) SLASH and (vi) CDW, each selected for their current, and potential future, content of SRMs and, in particular, CRMs.

b) SRMs scope Bringing SRMs into commercial manufacturing is urgently needed for the EU27+4 to truly achieve circular economy. However, different waste streams account for different material compositions, and thus require specific approaches to assess and quantify the materials reaching their end-of-life. For BAT, ELV and WEEE the SRMs scope will include and extend the SRMs and broad CRMs scope defined in the ProSUM project and for the subsequent dataset updates undertaken for the JRC (BAT, ELV). For MINW, SLASH and CDW, both CRMs and bulk materials will be explored.

c) Geographical scope The geographical scope for mapping domestic supply of SRMs (including CRMs) from existing and future recovery projects is the EU27+4. For some end-of-life products and waste streams with current or expected future global waste or SRMs trade data expected to be available, such as BAT, ELV and WEEE, the project will expand the scope to national datasets of third countries (e.g. Balkan countries for MINW). This geographical range captures major European waste streams to be valorised for SRMs.



c) Temporal scope

The temporal scope of the project is methodologically split into three parts. First, annual datasets will be created from the past until today in close alignment with official statistical datasets. In case longer time series into the past are needed, and harmonised statistical datasets are incomplete or unavailable (for instance for international trade and PRODCOM statistics, datasets are available from 1996 onwards, but harmonised datasets before are missing), academically sound backcasting techniques will be applied, which have been tested and validated already in the ProSUM project and other projects members of the FutuRaM consortium were involved. The projections into the future will be made along three scenarios with annual datasets to 2050. These scenarios will evaluate three future socioeconomic storylines centred on EU27+4 approaches to the future economy with a special focus on the sectors governing the 6 waste categories. In essence, FutuRaM will cover 3 time periods addressed through: i) backcasting (1990 – 1995); ii) inclusion of effectively available data (1996 – 2020); and iii) scenario analysis (2021-2050).

FutuRaM's conceptual and methodological framework

Taking a resource life cycle perspective, the FutuRaM project architecture covers a) the description of product and waste composition to quantify SRM potential, b) stock and flow modelling of products and resources, c) foresights and scenarios to assess future demand and supply in a low carbon society under consideration of recoverability, d) a case study-tested framework enabling application of the UNFC to SRMs recovery, and e) the provision of an SRM-KB, which is compatible with and can feed into existing raw materials information systems such as RMIS and EGDI, to facilitate and accelerate commercial exploitation and development of EU SRMs recovery projects.

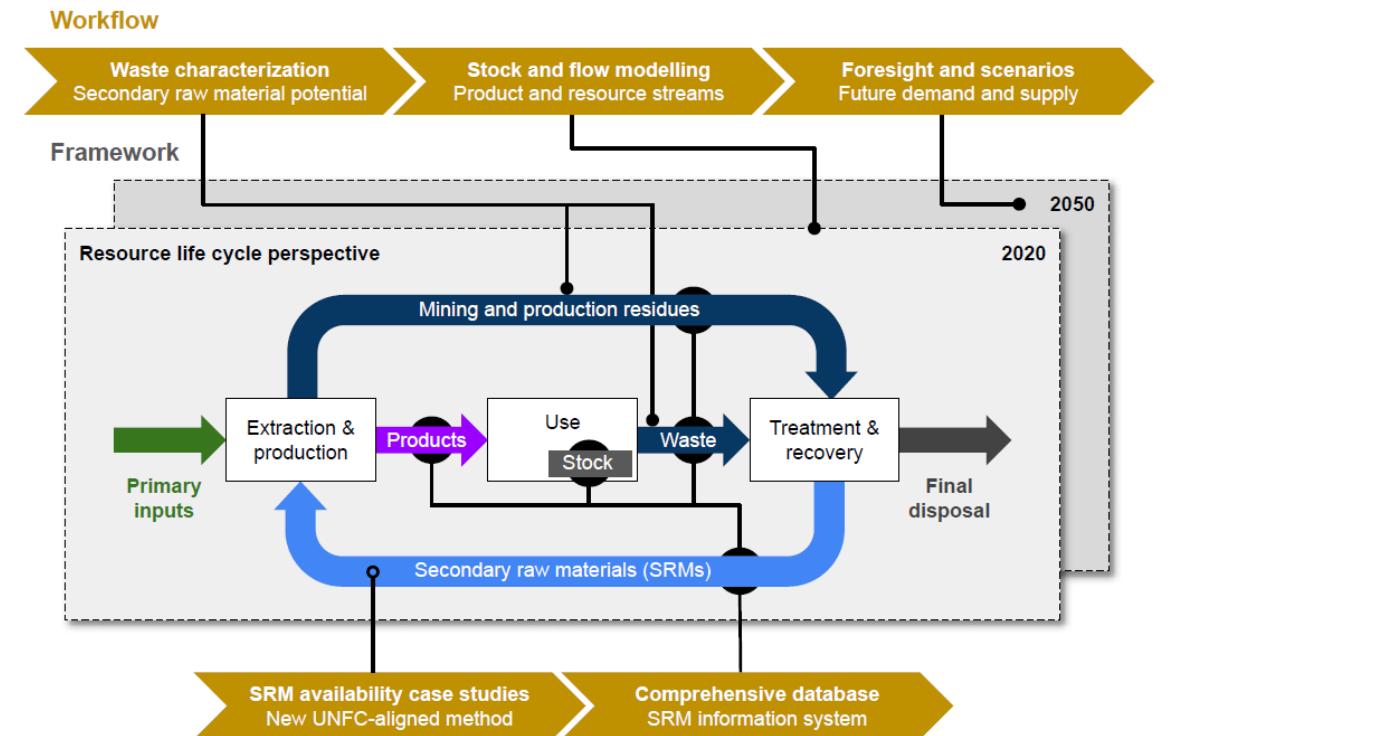


Figure 1 Conceptual framework including key methodological elements addressed by FutuRaM

Methodological key elements

a) Foresight on future SRMs demand and supply (WP 2)

The foresight on future SRMs demand and supply in FutuRaM will build upon three scenarios covering annual data to 2050, which will be based on qualitative narratives cutting across all economic sectors affecting the 6 waste

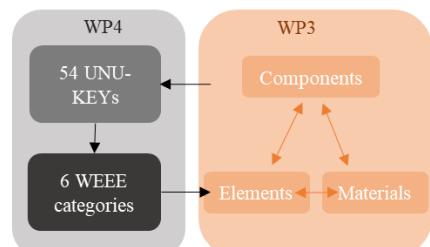
streams. This will include the assessment and discussion of narratives from established scenarios (e.g. the Shared Socioeconomic Pathways, the International Resource Panel Scenarios, the International Energy Agency Scenarios) with expert panels from each of the waste streams, complemented by sector-specific Delphi surveys, and mathematical modelling to steer and jointly develop quantitative data for the three scenarios. This data will be contextualised and matched with stated economic and sustainability policies and goals for each of the states assessed in the project (EU27+4). The foresight for generation and recovery of the 6 waste streams is hugely dependent on future and strategic technologies and systems in the transition towards a low carbon (e.g. PV panels, Li-ion batteries), circular (e.g. reuse, refurbish, remanufacture) economy. Novel circular business models (such as sharing, etc) and novel products will be inventoried, scaled on likelihood, and mathematically expressed in terms of stock levels and consumption changing material usage. Recycling technologies will be inventoried and mathematically described. Following this, FutuRaM will incorporate three possible futures, which vary in the speed of adoption of sustainable measures and policies: **Scenario 1 (Circularity)** envisages an ambitious sustainable future that includes a climate neutral, circular and digitised scenario, with energy transition, design for circularity, increased product lifetimes and high material recoverability from end-of-life production. This scenario would not only achieve the sustainability targets of each EU27+4 nation, it would also showcase an economy that puts reuse and repair at its core. **Scenario 2 (Recoverability)** follows the rapid implementation of the best current and foreseeable technologies for material recovery across the 6 waste streams. In this scenario, sustainability targets are met under the current economic system without a specific focus on waste prevention. **Scenario 3 (Business-as-usual)** assumes continuation of current trends that build on the historical stocks and flows from WP4, but that are still in line with the current goals of the EU27+4. Future compositions, technologies and products will be assessed based on technology outlooks and stakeholder interviews and will include sector-specific Delphi surveys. Information needs and availability for composition data as well as the type of relevant recoverable embodied SRMs varies across the waste streams. Thus, specific data collection strategies will be developed and used for each waste stream.

b) Secondary Raw Material composition (WP 3)

The characterisation of waste streams enables the estimation of their SRMs and, in particular, CRMs content, and further assessment of their recovery potential. It also provides relevant information on composition-influenced factors that affect SRM/CRM recoverability, such as grade, associations of elements, compositional variability, as well as the presence of hazardous substances. The composition of future SRMs from WEEE, BAT, ELV and CDW depends on that of the relevant products put on the market over time, and their rate of release from stocks. WP3 will therefore quantify product compositions from different times and regions, which provides a powerful tool to forecast SRMs composition. On the other hand, by-products from industrial processes such as MINW and SLASH depend on raw material properties and processing technologies, and frequently show systematic composition patterns. In the compositional characterisation, FutuRaM will follow a harmonised classification approach for products and waste streams, such as the UNU-KEYs 54 product categorisation, which is linked to material composition (elements, materials and components) and can be linked into six WEEE categories, that allows the stock and flow models to be linked to the composition data for estimation of the SRM and, in particular, CRM potential (see above). The project will produce harmonised composition datasets for each of the six FutuRaM waste streams for a wide set of SRMs and, in particular, CRMs, based on literature data, published datasets, and previously undisclosed in-situ datasets provided by FutuRaM partners and collaborators. Information needs and availability for composition data, including the relevant recoverable embodied SRMs, varies across the waste streams. Thus, specific data collection strategies will be developed and used for each waste stream assuring alignment with present and future practices for monitoring composition and quality of waste streams and SRMs at industrial scale.

c) Stock and flow modelling (Material flow analysis) (related to WP 4)

The stock and flow modelling in WP4 will produce consistent physical accounts per MS in the EU27+4 for SRMs with a particular focus on CRMs. Having access to the unpublished microdata data and protocols of the ProSUM project, FutuRaM will guarantee full consistency with the current available ProSUM datasets and the updates for BAT and ELV provided to the JRC after the ProSUM project completion. FutuRaM will furthermore extend time series via three scenarios up to 2050 (WP2). WEEE, BAT, and ELV will follow an expanded version of the model developed in the ProSUM project. For materials that have relatively short lifespans, such as WEEE and BAT, a sales-lifespan model will be implemented. It starts with mathematically relating products placed on the market (POM), stocks and waste generation, through lifespans in a product-oriented classification, such as the UNU-KEYs and the BATT-KEYs. For ELV, a method based on the stock of vehicles is used. The scope of the product groups will be extended to also fit future products, and embedded WEEE and BAT in other waste streams (such as ELV, or CDW,



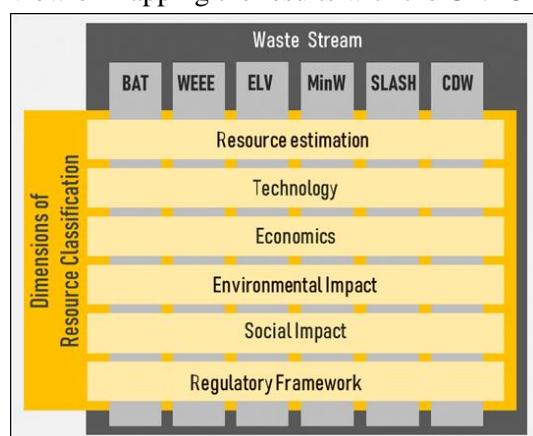
etc), considering the focus on EU strategic technologies. The resulting flows will be traced, focusing on separate collection of the respective waste type, collection of the respective waste type mixed

with other waste (for instance, WEEE mixed with metal scrap waste, or disposal in waste bin), and exports. This will ensure a link to official statistics such as domestic production, international trade, reporting for the WEEE and Battery directives, as well as published reports, literature and industry surveys. In addition, further treatment data on SRMs and, in particular, CRMs recovery will be assessed using reported data, e.g. in RepTool from WF members, and literature research and stakeholder interviews. Data will be harvested, harmonised, and gap-filled using best available proxies. Where feasible and when it fits user requirements, data collected at different scales (NUTS2/3, country, EU) will be harvested, integrated and harmonised. For some datasets, national data can be disaggregated top-down into regional datasets using demographic data. Links with material composition data sets will be provided from WP3 at product level (WEEE, BAT, ELV), or at waste stream level (for MINW and SLASH). For CDW, both product level (material intensities in the built environment) and waste stream level (Eurostat microdata for the 6-digit European List of Waste codes) will be collected, compared and harmonised.

d) Secondary Raw Material availability assessment in alignment with the UNFC (WP 5)

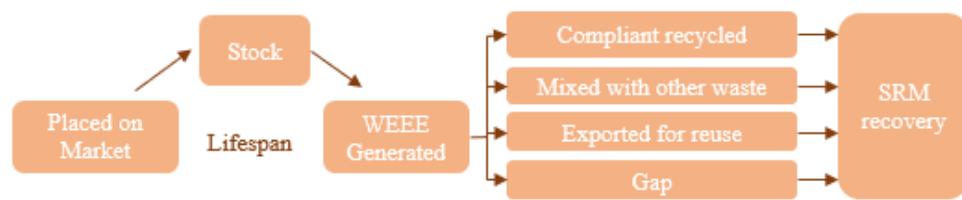
The UNFC enables presentation of the maturity level of a recovery project from the initial exploration phase to final commercial exploitation on three axes and communicated to stakeholders. The classification categories show the benefits of a project, but also the barriers to its exploitation. This not only enables identification of the drivers and barriers for an SRMs recovery project, but also provides guidance for strategic decisions. FutuRaM will develop a general approach, based on the six FutuRaM waste streams, to assess SRMs and classify their availability in alignment with the UNFC. To promote transparency, the consideration of technological feasibility, economic viability, environmental impacts, social impacts and regulatory aspects is essential to the approach.

With regard to the sustainable and circular use of post-production and post-consumer material flows, a wide range of factors will be considered, project evaluation methods selected and classification criteria developed. Literature reviews, internal consortium assessments and wider external stakeholder consultation will be used to systematically consider different stakeholder perspectives. In parallel, a site-specific MINW case study will be used as a pilot study to test the applicability of the draft UNFC methodology approach (Figure 2). The outcomes will be compared with existing approaches to applying UNFC for primary resource classification. The applicability of the concept will then be tested and validated using examples from the six waste streams with different SRMs and, in particular, CRMs. In view of mapping the results with the UNFC axes, a multi-criteria assessment approach will be used.



The selected case studies cover a variety of scales (site-specific, regional or cross-country scope) and recovery project maturity levels. They will be developed using existing data previously generated by research groups, or using new results collected in cooperation with FutuRaM partners. Continuous exchange with the other working groups, waste stream groups, industry partners and other stakeholders (in WP1) will be used to provide advice and feedback during execution of the case studies. Solving the methodological challenges encountered will guide development of practical solutions and will help to validate the approach. The focus is always on keeping the concept as simple and practical as possible, enabling consideration of stakeholder perspectives, and with user-friendly and pragmatic guidance. A guideline for use by practitioners in assessing and

classifying projects will be developed, considering the particularities of different waste streams. In collaboration with industry partners and stakeholders, a draft reporting standard will be developed to communicate the information requirements on the feasibility of SRMs recovery projects in line with stakeholders' perspectives (WP1, WP7). This will be communicated to the UNECE Expert Group on Resource Management / the UNECE Committee on Sustainable Energy Committee.



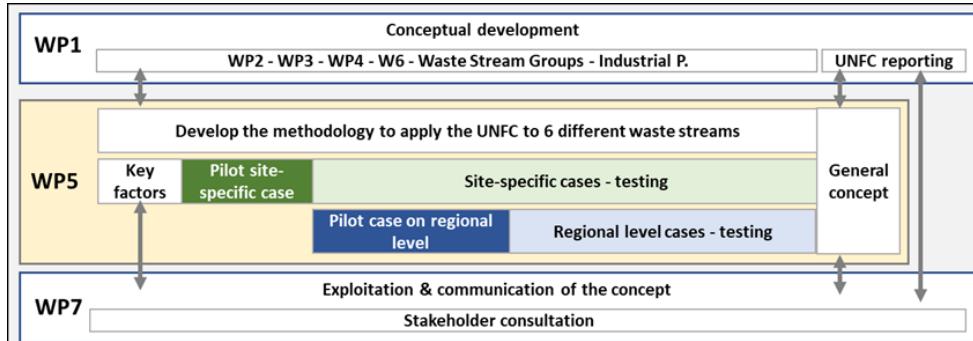


Figure 2 Process to develop the methodology for using the UNFC at site-specific or regional level

e) Development of Secondary Raw Material-Knowledge Base (SRM-KB) for EU (WP 6)

The Urban Mine Platform (UMP) website is presently the main portal disseminating ProSUM results for BAT, WEEE and ELV. Some ProSUM results are also available in the RMIS (BAT <https://rmis.jrc.ec.europa.eu/apps/bvc/#/>). The MINW inventory is accessible through EGDI. The future European geological survey (expected to be created in response to a CSA call for beginning 2022) will integrate a task for mining waste data collection among other actions concerning mineral resources. For mining wastes, both projects (FutuRaM and CSA) should be connected and share developments. In FutuRaM, the UMP website will migrate to a new portal, update its previous results, cover new assets (CDW and SLASH), integrate prospective foresight and deliver the national resource account based with UNFC classification. This new site will be more user-friendly, with data visualisation options including maps that are compatible with mobile devices; will have the possibility to access the data directly (by downloading data sets); will allow the public to access data via Application Programming Interfaces (APIs); and will develop user adaptable online tools like the estimation of SRMs present in an area delimited by users (e.g. amounts of Ni in batteries in a region based on per capita ratios, or user adaptable future scenarios). This system is expected to be more modular than the UMP and will seek to reduce the maintenance problems this type of portal usually encounters. FutuRaM partners and also stakeholders will be consulted regarding requirements in the design of these tools. Transparency of data acquisition, calculations, hypotheses, and methods used, will be prioritised. INSPIRE requirements will be respected for interoperability, accessibility to data and metadata catalogue. Likewise, consideration will be given to the process of updating the data once the project is closed. Thus, documents and guides will be drafted for any update of the website and data.

In FutuRaM, data collection and data mining will mostly be done in technical tasks (WP2-5), in accordance with the Data Management Plan established in WP8. WP6 is dedicated to integration of all IT and information system developments, across WPs and waste streams. Data models for each waste stream will be developed based on previous ones (ProSUM, Min4EU, ORAMA, Mintell4EU) and taking into account specific needs such as including UNFC assessment. Consequently, WP6 will aggregate, combine, and balance information and data flows generated in WP2-WP4 together with the UNFC assessment performed in WP5, following the methodology defined in WP1, which also will establish a data quality and uncertainty assessment framework for FutuRaM. WP6 will thus generate a public database (SRM-KB) that can provide background information in circular business model analyses, through a dissemination portal that provides direct access to data sets or via user friendly and data visualisation tools.

Waste stream specific approaches

a) Waste batteries (BAT)

FutuRaM will focus on reviewing the available data sources on historic sales and current stocks of in-use and end-of-life batteries in the EU27+4, including geographic, economic and demographic meta-data where possible. This will include reviewing publicly available data in published literature, funded studies, national registries, consumer surveys and statistical databases indicating stock levels for products present in households and businesses. In addition, the recent update of the ProSUM data to 2020, undertaken for JRC/Ispra, will be utilised. FutuRaM will review the data supporting the trends, sales and lifespan of products, and introduce new aspects such as a method and criteria to assess the effect of the potential development of second life application for batteries. The classification of the batteries by their chemistries, but also by their applications, will be updated to enable a better tracking of waste batteries embedded in other waste categories. The collection and recycling rates of embedded batteries are strongly dependent on the type of product they are embedded in, which necessitates using different models, depending of the type of product. This is particularly relevant to consolidate and harmonise the BAT data with WEEE and ELV data. In addition, the data will be extended to a world-wide assessment when possible. The number of chemistries used in the major applications is limited, and the materials used for each chemistry can be quite precisely characterised. Therefore, material (and CRMs) stocks and flows follow from the description of the chemistries. FutuRaM will

update the description of battery compositions to reflect technical progress since the ProSUM project. This is very relevant for the ELV application, where the cathode composition of the “NMC type” Li-batteries is evolving on a yearly basis.

b) Waste Electrical and Electronic Equipment (WEEE)

FutuRaM will focus on reviewing available data sources on EEE placed on the market (EEE POM), current stocks of in-use EEE, and lifespans of EEE. Consistent with the common methodology developed for article 7 of the WEEE Directive (from UNITAR’s ‘apparent consumption methodology’), WEEE generated will be calculated based on the time series of EEE POM and lifespans. ProSUM datasets will be extended to new products likely to enter the market post 2022 and phase out existing products in the various scenarios. The WEEE flows will be assessed to cover compliant recycling flows, and WEEE mixed in other waste flows consistent with the ProSUM method. To do so FutuRaM will use official statistics and detailed datasets from Eco, ERION and Repic, supplemented with detailed datasets from the latest WEEE flows studies. The UNU-KY classification and interlinkages with WEEE Directive categories will be updated and expanded to include embedded WEEE. Global harmonised datasets will be produced by applying established UNITAR calculation routines. Within the datasets EEE POM, EEE in-use, WEEE generated and the WEEE flows will all be mathematically interrelated in such a way that they easily can be adjusted with regard to the future scenarios addressed in FutuRaM. In addition, new aspects will be introduced, such as the method and criteria to assess the effect of the potential development of several circular economy options, such as second life application for EEE, sharing, etc. The ProSUM microdata for product composition is further enriched with novel composition data, waste SRMs/CRMs data in WEEE from RepTool and updated to cover recent product changes, future products, and to the expanded scope. For WEEE, global datasets are foreseen, utilising UNITAR’s methods and data from the Global E-waste Statistics Partnership.

c) End of life Vehicles (ELV)

FutuRaM will focus on reviewing available data sources for vehicle sales, in-use in-fleet and recycled ELV as well as the material composition of the vehicles. The main coverage is vehicles below 3.5 tonnes (as per the ELV directive) at country level in the EU27+4. The coverage can be expanded to heavy duty vehicles and other regions when possible. Vehicle keys are used to group vehicles in terms of drivetrain, curb weight and cylinder volume. For each vehicle key and cohort, a set of composition data is defined. The data to be reviewed includes publicly available data in official and industry statistics and other published literature. Vehicles will mainly be analysed in terms of embedded components such as batteries and EEE, with the data from the ProSUM project as the basis. In addition, the recent update of the ProSUM data to 2020, undertaken for JRC/Ispra, will be used. Datasets will be created on vehicles POM, Stock, Leaving the stock, Exported for reuse, ELV and Unknown whereabouts, which are all mathematically interrelated, and can be easily adjusted with regard to future scenarios. Similar to WEEE, new aspects can be introduced, such as a method to assess the effect of the potential development of several circular economy options, e.g. reuse of parts and remanufacturing. Consolidation with BAT datasets will be performed.

d) Mining waste (MINW)

Data on mining waste (MINW) (locations, compositions) on the territory of EU27+4+Balkans arise from mining of primary raw materials such as mineralised waste rock and tailings. Composition of MINW may differ from the original ore due to change of chemical composition e.g. due to ore processing (for example flotation or leaching), weathering or chemical reactions after deposition. There are also large variations in material compositions of the waste rock between the different extractive sites due to different geological environments and commodities. Hence, it is necessary to determine not only the amount of the commodity, but also to characterise the waste. The data collection process done in WP3 and WP 4 will include:

- collecting already available data review from literature and past projects (incl. data on mine wastes from 13 European countries already available on European Geological Data Infrastructure (EGDI) and data from national mine waste registries)
- organising four regional, one EU-wide, workshops covering EU27+4+Balkans to add data into the EGDI infrastructure, which will ensure sustainability of the FutuRaM mining waste data base.
- a potential extension of the data by covering data gaps by using Copernicus geospatial data.

The following regional workshops are planned: (1) Western Europe - SGU (Sweden, Norway, Denmark, UK, Ireland, Netherlands, Slovakia, Romania, Czech); (2) Baltic - GTK (Poland, Lithuania, Latvia, Estonia, Finland, Germany); (3) Southern Europe – BRGM (France, Spain, Italy, Portugal, Belgium, Austria, Malta); (4) Balkans & Cyprus – GeoZS (Slovenia, Croatia, Serbia, Montenegro, Bosnia, Northern M, Albania, Bulgaria, Cyprus and Greece). (5) a pan-European follow up workshop for final data assessments in Brussels, piggyback with ongoing Eurogeosurvey activities.

Six different mine waste projects will be assessed with UNFC (WP5), whereof one on national. Each case will highlight different CRMs. Using knowledge from primary assessments of UNFC and CRIRSCO the cases will address all axes of the UNFC. In order to achieve resource estimations, the cases will also highlight exploration methods considering homogeneity and heterogeneity of the waste. A waste site sometimes contains waste from different mines or a change of resource property from different periods of extraction as well as change in recovery technology.

e) Slags & ashes (SLASH)

SLASH arise from a variety of thermal processes such as incineration of coal, biomass, waste or smelting iron, steel and other metals. They contain various elements, both toxic and valuable, including some that are currently considered critical, such as P, Nb, V and REE. To date there is no comprehensive overview of the quantities of SLASH available in Europe that has a particular focus on recoverable CRMs.

FutuRaM will collect data on the quantities and composition of SLASH in the EU27+4, by reviewing publicly available data in published literature, funded studies, national registers and statistical databases. It is expected that the data will be very heterogeneous depending on the country and data such as volume and composition will often be absent. Based on a desktop study on their composition with a focus on CRMs, only the most promising sources will be selected for more detailed investigation. Factors that influence CRMs content in a specific slag/ash (e.g. type of waste incinerated, scrap used in the steel production) will be investigated and available recovery methods for CRMs will be screened. In particular, data from new streams will be examined in terms of both composition and quantities of SLASH, e.g. trends in steel production or waste treatment. Knowledge of historical stocks is currently limited to highly dispersed and unsystematic local knowledge, e.g. with information on permits distributed among local authorities and some EU Member States having inventories with information on the location and approximate quantities of slag disposal sites. In addition, information on current disposal practices in different legal contexts will be collected (WP2). Based on the ProSUM approach, a generic composition for specific types of SLASH across all EU member states will be proposed and validated by experts (WP3). For the selected SLASH the consolidated data will be provided to elaborate the stock and flows model (WP4).

f) Construction & Demolition Waste (CDW)

The building sector is characterized by long product lifespans, thus the in-use building stocks will be modelled primarily by remote sensing approaches (e.g. satellite and aerial-based data, prioritising Copernicus-derived products, as well as VIIRS night time lights, and lidar). This estimation will be followed by assessment using geographical information systems (built-up surfaces, building typologies, ages of construction) and using statistical data on material intensities. C&D stock composition will be estimated using the International Material Intensity Database Project (IMID)⁴, which comprehensively compiles material intensities (in kg/m² GFA) in the built environment as reported in the literature for different areas/regions. Compositional estimates will focus on bulk structural materials, (e.g aggregate, cement, steel, and timber), which can to some extent substitute for each other, and on other important relevant materials for this sector (e.g. gypsum, Al and Cu). Furthermore, material intensities from surveys of in-use building stocks will be compared with CDW surveys, and data provided by FutuRaM industrial and government collaborators regarding materials procurement and CDW management, to produce harmonised estimates of CDW composition as a function of time, and considering regional differences, including variability estimations. In parallel, embedded energy infrastructure (e.g. photovoltaics, stationary batteries, smart building infrastructure, heating and cooling, wind turbines, tidal power plants, etc.), which are expected to play an increasing role in sourcing of CRMs, will be considered, insofar as they are not already covered by the WEEE and BAT streams. For these technologies, FutuRaM will collect material intensities specific to Europe (e.g. at city-scale) in a format suitable for integration with the IMID.

SRMs and, in particular, CRM flows calculated based on compositions and published estimates for building demolition rates and stock age will be compared with CDW flows determined by collation of Eurostat microdata, which reports waste generation by the 6-digit code in the European List of Wastes (2000/532/EC), considering not only materials reported under Chapter 17 (CDW), but the many subcategories from other chapters that may be used to describe the same materials, with potential usefulness as SRMs.

Foresight scenarios will need to consider improvements in CDW recovery systems and technologies, changes in supply and demand due to strategies such as off-site construction, adaptability for re-use, and design-for-

deconstruction. Embedded energy infrastructure will also be particularly important in the foresight scenarios, along with decarbonisation and dematerialisation of new construction through material substitutions and new technologies, smartization, and variations in regional growth/shrinkage of the built environment as a function of e.g. regional differences, changing lifestyles and urbanisation, including both housing and infrastructure.

UNFC Case studies

FutuRaM will further develop and test the UNFC methodology for 19 case studies across the six FutuRaM waste streams. The case studies will test and further develop the UNFC method and gather data for its applicability to each of them. There will be two phases in the case studies, in which the method is iteratively tested on the extended three axes for recovery projects and national assessments for SRMs and CRMs. The case studies have been selected to provide a representative overview in relation to the SRMs content, and technological, socio-economic, environmental, and regulatory aspects of the six waste streams; for site specific cases, and regional / national case studies, and to cover aspects relevant to CRMs recovery and data from FutuRaM project or industry partners. The case studies differ in terms of the scope of SRMs and, in particular, CRMs, the maturity stage of the recovery project (e.g. prospective or commercial) and the challenges to be expected when testing and further developing the draft methodology to assess SRMs availability developed in WP5. In addition to new results developed in collaboration with industry partners, existing project results from within the consortium will be used. Developing a general methodology for applying the UNFC to SRMs is challenging because, even within a waste stream, there are many different possible settings of the different aspects. WP5 will first come up with a “long list” of potential factors affecting recoverability, which will be narrowed down to a smaller set of key indicators that are measurable, readily available, and conceptually not overlapping, followed by development of a ranking and weighting system. To achieve a common, transparent approach that is applicable to all of the case studies (and the six FutuRaM waste streams, as well as, ideally, others) will require a significant effort to understand the impact of each factor. Clustering analysis of all the case study results will help to reveal the common trends and identify and justify the key factors for the UNFC methodology, and to turn it into a pragmatic approach that can be implemented with less administrative burden by future practitioners.

- **MINW:** 6 case studies: *Site specific:* 1) Lovisa (Co, Cu, ...) by SGU, Lovis, 2) Lece tailings (In, Ag...) by GeoZS, BU, 3) Otamäki (Ti) by GTK, OM, 4) Salau tailings (W) by BRGM: *National:* 5) CRMs (Co, Ree) MINW in Sweden by SGU, GTK, Lovis, BOL, 6) Large tailings in Sweden by SGU, BOL.
- **SLASH:** 4 case studies: *Site specific:* 7) Sewage ashes (P) for City of Vienna, by LMU, 8) CRMs in steel slags (data from Industeel, HYPPASS Project) by BRGM, VITO. *National/Regional:* 9) Sewage sludge ashes (P) in Austria by LMU, 10) CRMs in steel slags in EU by VITO.
- **ELV/BAT/WEEE:** 3 case studies: *National:* 11) Li-ion-batteries in ELV and 12) WEEE in ELV in Switzerland by Empa, 13) Low-grade portable Li-ion- batteries (Co, Ni) by TUB, GRS
- **WEEE:** 2 case studies: *Site specific:* 14) CRMs recycling (various CRMs) by WC, UNITAR, *National and benchmark:* 15) WEEE management AT, UK, FR, IT (focus: CRMs) by UNITAR, Eco, Erion, REPIC.
- **CDW:** 4 case studies: *Site specific:* 16) MACE high speed rail building site (bulk materials) by UCL, MACE, 17) City of Leiden (bulk materials) by ULEI, *National/Regional:* 18) waste timber recovery for high value engineered timber (e.g. glulam and cross-laminated-(secondary)-timber) production in the UK by UCL. *Cross cutting:* 19) Permanent magnets in wind farms by BRGM, ULEI.

Cross-cutting conceptual and methodological aspects

a) Critical discussion, harmonisation and integration

Considering the multidisciplinary character of FutuRaM and its aim to provide consistent and robust data, procedures, models, and methods, a critical discussion, harmonisation and integration of the concepts, perspectives and is crucial for the success of the project. WP1 will therefore provide a platform to critically discuss, harmonise, integrate and consolidate concepts methods, models, procedures and data proposed by WPs 2-6, the waste stream leads and topical experts for cross-cutting aspects within the consortium (*i.a.* data models, data quality and uncertainty assessment and stakeholder integration) in a structured and systematic way, all along the conceptual and methodological development process. In the first phase of FutuRaM it is planned to have WP focused meetings enabling cross-project understanding of the underlying concepts, methods, models, procedures and data needs, and the identification of the interlinkages to the other WPs as well as to the waste stream-specific perspectives and approaches. These will then be continuously developed, harmonised and integrated into FutuRaM frameworks, methods, models and procedures

and translated into recommendations, guidelines, proposals and draft standards to the attention of the FutuRaM stakeholders.

b) Data management

Data classification / models

Data for the 6 waste streams will use existing classification systems to be interoperable with other information systems on product, commodity and waste flows. SRMs will be modelled according to the product – component – material (– element) approach of the ProSUM project to allow comparisons across waste flows. The existing ProSUM data model does not consider recoverability of SRMs in a waste flow and, in fact, characterisation of waste flows was poorer than for POM products. FutuRaM must overcome this ProSUM difficulty and propose a model capable of representing SRMs in waste streams. Further details on classifications and relevant materials tackled in each waste stream are outlined in Table 2. Data will be processed and assessed using open-source software, or in house software based on open-source programming languages (i.e., R, Python, Brightspace LCA).

Data collection

Data collection will consist mostly of manual work undertaken by the different data collection teams. Data acquired throughout the project will be initially stored at the local institution that collected the data and then made available to the consortium. Remote sensing and earth observation data will be obtained primarily from Copernicus and other EU data sources. Data subject to non-disclosure agreements (NDAs) will remain at the local institution and only provided to the consortium at an aggregated level or according to the stipulations of the NDA. Once the data has been included in the stock flow model, then the harmonised and balanced datasets will be hosted within the SRM-KB and be made available via APIs according to FAIR principles of open data⁵: Findability, Accessibility, Interoperability, and Reuse of digital assets (see section 1.2.5).

Data harmonisation framework and procedures, data interoperability

To enable a consistent approach to harmonising data and addressing data gaps in the FutuRaM project, *i.a.* in relation to mapping product and waste flow compositions or stocks and flows, a data harmonisation framework will be developed, including procedures to close data gaps. The development of the framework and procedures will take the data model developed in the ProSUM project for WEEE, vehicles, batteries and MINW as a starting point and, amongst other things, consider recent developments made in the Mintell4EU (UNFC classification for primary resources), RESEERVE and ORAMA projects. For new waste streams that were not covered in ProSUM (SLASH, CDW) a new data model will be developed. The harmonised data formats will be also linked to several statistical data sources at Eurostat (Prodcom, International Trade, WEEE Directive, ELV Directive, Battery Directive and Waste Statistics Regulation).

Through the creation of the SRM-KB in this project, a wide range of stakeholders along the value chain will be engaged. This will enable sharing of best practices and benchmarks, and provide opportunities for greater harmonisation and cooperation regarding the SRMs data pooling. This is particularly pertinent given the scattered nature of data amongst a variety of institutions including government agencies, universities, NGOs and industry. Data are often stored in databases with bespoke design and architecture making it difficult and time consuming to merge or compile. Moreover, where data relates to the composition of waste, different sampling and analytical approaches may have been used, which introduces an additional challenge to aggregate and compare those data. Consequently, there is a lack of accessible and harmonised qualitative and quantitative data. The ProSUM project utilised a pragmatic and academic sound approach to deal with data gaps, data availability, data complexity rising from multiple data providers. Existing data can often not be adequately shared due to the absence of interoperability of spatial data and services at both national and EU levels. This complexity in adequate comparing of data builds up a barrier for policy makers and actors in the value chain. Those barriers must be overcome by developing and deploying appropriate methods, networks and tools. This is the purpose of the INSPIRE Directive, with which this project will fully comply.

Data quality and uncertainty assessment framework and procedures

FutuRaM will develop a general framework for handling the data quality (DQ) that helps with assessing the uncertainties in both the collected and generated data. This incorporates indicators available from meta-data and raw data, such as the age of the data, their variability, and geographical representativeness. The development of the framework and procedures will be based, amongst others, on the recent work done in the context of UN's GLAD initiative⁶ for interoperability of databases and they will be in line with the essential FAIR principles of open data.

5 <https://www.go-fair.org/fair-principles/>

6 <https://www.globalcadataaccess.org/>

Prior to their integration into the SRM-KB, datasets generated in the FutuRaM project will be automatically evaluated and verified regarding their accuracy and precision, with procedures that include the identification of potential biases. These data discrepancies and potential errors will be handled in a dialogue between data calculation partners and the data manager (WP6 leader) inside the FutuRaM consortium. This will not only allow for uncertainty and DQ assessments but also for an evaluation of the variability and heterogeneity of product and waste flow compositions, which is an inherent and decisive quality criterion for material recoverability. A particular effort will be made in terms of data restitution accuracy and uncertainty (e.g. using a Monte Carlo approach) of the final data sets.

Data update protocols

Providing data handling protocols is a necessary precondition for updates after project completion and mostly for a project delivering data in annual time series. Throughout the project, FutuRaM will document the process of data acquisition and consolidation, the harmonisation of data into FutuRaM data model, data uncertainties evaluations, metadata and the reproducibility of models (prospective scenarios demand, stock and flows...) across all waste flows. To assure data update to be reproducible by agencies that are not participating in FutuRaM, a deliverable report will explain data update protocols and procedures used in the project (D1.1). The relevant models and codes will be shared with the science community. Furthermore, the development of APIs correctly documented about their functionalities and requirements are also an important aspect of updates after project.

c) Stakeholder involvement

FutuRaM will broaden the ownership of the process and results by cross-sectoral stakeholder engagement, including co-creation, co-development and co-implementation, to actively involve and empower citizens, policymakers, industry, investors and other stakeholders in FutuRaM's actions following Open Science principles. To achieve this, the involvement of stakeholders in all stages of project implementation (WP1-7), from the design of actions to demonstration and evaluation, will be solicited through dedicated workshops, focus groups, Delphi surveys and meetings. Capacity building and testing will enable early-adopters to use the SRM-KB and subsequently become ambassadors for its use. The project will follow a structured approach in the interaction with stakeholders with the design and deployment of a human-centric methodology on the uptake of co-creation both at the project level and as a framework for the sectoral and cross-sectoral workshops. Jointly with project partners, stakeholders will be given the opportunity to understand the challenges, define the needs, and initiate the solutions and these will feed into the wider project as the SRM-KB and case studies are developed.

1.2.2 International and national R&I activities linked with FutuRaM

The FutuRaM project will be carried out by a consortium that builds on a rich portfolio of projects portraying a wide range of expertise, including circular economy, material science, geology, life cycle assessment (LCA), material flow analysis (MFA), process engineering, waste management, and the UNFC Framework of Anthropogenic Resources. The partners play leading roles in various project clusters, not only in the academic sector but also as software developers and across industries through associations representative of the value chain (inter alia manufacturers, remanufacturers, retailers, recyclers, repairers and consumer associations). The following projects (past and ongoing) outline relevant experience of the members of the Consortium in different domains. FP6, FP7, H2020, COST and EIT RawMaterials projects that have developed comprehensive intelligence regarding material and product flows, feeding into the Raw Materials Information System or methodological developments:

- EXIOPOL, CREEA, and DESIRE (FP6) created environmentally extended input-output analysis (ULEI),
- Minerals4EU (H2020) focused on the development of the EU Minerals Knowledge Data and Mintell4EU improves access to raw materials information through the EGDI including test of UNFC classification (BRGM, GeoZS, GTK, SGU),
- MinLand (H2020) developed a framework and guidances on permitting, environmental, land use aspects that have direct impact upon FutuRaM including metals with CRMs studied (BOL, BRGM, GeoZS, GTK, SGU).
- ORAMA (H2020) aimed at optimising reporting of primary and secondary raw materials, producing guidelines for harmonisation of resource and reserve data using UNFC (BRGM, Chal, Empa, GeoZS, GTK, TUB, ULEI, UNITAR/UNU),
- PANORAMA (EIT RawMaterials) will provide insights into global value chains by detailing the global input-output EXIOBASE database (BRGM, ULEI, UNITAR),
- ProMine (FP7, [http://promine gtk.fi/](http://promine	gtk.fi/)); developed, amongst others, the first pan-European GIS-based database containing the known and predicted (non-)metalliferous resources (BRGM, BOL, GTK).
- ProSUM (H2020) developed the Urban Mine Platform (www.urbanmineplatform.eu); (WF, UNITAR(UNU), BRGM, Chal, Empa, GeoZS, SGU, Rechar, TUB),
- RESEERVE (EIT RawMaterials) developed an inventory of mining wastes in the Balkans (BRGM, GeoZS),

- RISALICE (EIT RawMaterials) investigates the possibilities of the (re)use of Al containing industrial and mine residues (GeoZS) <https://www.alice-registry.eu/>
- SCRREEN and SCRREEN2 (H2020) developed an EU-Critical Raw Material Knowledge Data Platform (BGR, BRGM, ULEI, UNITAR).

Projects around supply chain security and bill of materials

- ARGOS (German Federal Ministry of Education and Research) aimed at enhancing functional metal recycling along the value chain with real-time analysis of metal-rich processing residues (TUB),
- CERA (EIT RawMaterials) will define methods and approaches for responsible sourcing of materials (ULEI) CEWASTE (H2020) created, validated and launched a voluntary scheme for collection, transport and treatment facilities of key types of waste containing CRMs such as WEEE and batteries (UNITAR, WF)
- IRTC and IRTC Business (EIT RawMaterials) aim at advancing criticality assessment on a global level and supporting companies in identifying and managing materials critical to them (BRGM, Empa, ULEI),
- SURFER provided a ‘Bill of material’ for energy sector technologies and national material needs in France. (BRGM).

Projects aimed at inter alia promoting circularity, modularity, eco-design, refurbishment, recycling and recovery:

- CECILIA2050 & CARBON-CAP-EU (FP7) modelled carbon mitigation / adaptation scenarios from a production and consumption perspective with EXIOBASE (ULEI),
- C-SERVEES (H2020) aims at the development, testing, validation and transfer of new circular economic business models, including novel Blockchain-based solutions advancing circularity in WEEE (WF),
- Greensense (H2020) aims to develop a sustainable nanocellulose-based biosensing platform and derive general eco-design principles (including recycling)) for paper-based electronics (Empa),
- LACE (Swiss National Science Foundation) developed an MFA- and LCA-based framework to evaluate Circular Economy strategies and applied it for selected companies in Switzerland (Empa),
- Si-Drive (H2020) aims to develop the next generation of rechargeable Li-ion batteries using sustainable and recyclable components (Empa),
- SusCritMat and SusCritMOOC (EIT RawMaterials) aim at educating PhD students, master students, junior engineers or researchers and managers from industry to cover a series of important aspects regarding CRMs, including e.g. urban mine characterisation (BRGM, Empa, ULEI).

Projects around new recovery methodologies for mining wastes recovery or recycling wastes:

- CHROMIC (H2020) aims to develop new processes to recover chromium, vanadium, molybdenum and niobium from industrial waste (BRGM, VITO).
- CROCODILE (H2020) aims to increase the efficiency of recovery processes for cobalt (BRGM).
- EXTRADE and VALOMAG EIT (EIT RawMaterials) projects about recycling rare earth from permanent magnets (BRGM, Ecosystem, ULEI).
- ForCYCLE I + II (Bavarian Research Alliance) aims to develop new technologies and production processes to recover SRMs in a sustainable circular economy (LMU),
- HISER (ULEI, BRGM, VITO) and ICEBERG (VITO, ULEI, UCL) projects for the innovative recycling and re-use of construction and demolition wastes.
- HYPASS (ANR-FR): steel slag management for new and old wastes, based on an Industeel case study (BRGM)
- NEMO (H2020): innovative methods to recover wastes from sulphidic mining wastes (BOL, BRGM, VITO).
- METGROW+ (H2020) aims to develop innovative metallurgical technologies for metal recovery from low grade ores and wastes (VITO).
- NEXT-LIB (ERA Min 2) about novel circular economic approaches for efficient extraction of valuables from spent Li-Ion batteries (BOL, GTK),
- RAWMINA (H2020): CRMs recovery from mines wastes (BRGM).
- SULTAN (H2020) is a training network for sulphidic mining wastes reprocessing (GTK, VITO).
- UKRI Interdisciplinary Circular Economy Centre for Mineral-based Construction Materials (UCL)

Projects and initiatives around United Nations Framework Classification for Resources (UNFC)

- MINEA (COST) in cooperation with UNECE aimed at promoting the classification of material resources in the anthroposphere by I.a. proposing the UNFC specifications for Anthropogenic resources (BRGM, Empa, GeoZS, LMU, UCL, VITO).
- Mintell4EU (H2020), <https://geoera.eu/parties/>, improved the European Knowledge Base on raw materials by updating the electronic Minerals Yearbook produced in the Minerals4EU project and extending the spatial

- coverage and quality of data currently in the Minerals Inventory (BGR, BRGM, GeoZS, GTK, SGU) with a specific WP for UNFC classification⁷,
- 16 case studies in various projects on resource classification covering resource recovery from landfills, ashes from municipal waste incineration, WEEE, CDW, slags, MINW (Empa, LMU, UCL, VITO).
 - UNECE EGRM Anthropogenic Resources Working Group, (EAA (chair), Empa, LMU (vice-chair), SGU (vice-chair), UCL, VITO).

1.2.3 An interdisciplinary approach

The FutuRaM consortium represents a well-balanced mixture of interdisciplinary skills and expertise, entrepreneurial spirit, well-established academic partners, businesses, and reputable network organisations. The expertise covers the objectives set out in the call. Each partner has a clearly defined role within the project and will contribute specific knowledge that will enable a successful project. It is acknowledged that the disciplines are diverse and one of the aims of WP1 will be to ensure that these disciplines integrate and combine effectively. The partners have expertise in mass balancing, foresight, recycling technologies, economic assessment, environmental assessment, and state-of-the-art methodologies, datasets from official statistics. They have demonstrated the ability to research unique datasets from Geological Surveys, industry, producers and recyclers, and utilise novel satellite-based earth observation techniques. The data will be enriched with input from the consortium's strong and existing networks and stakeholder groups such as national and EU policy makers, manufacturing and recycling industry, producer organisations, official statistics, and the UNECE Working Group Anthropogenic Resources. It will utilise and engage during the project with existing networks (such as the UNECE Working group on Anthropogenic Resources, Working Groups at Eurostat, UNECE/OECD/Eurostat Working Group on Statistics for Sustainable Development, The European Environment and Sustainable Development Advisory Councils Network, The European Statistical System community, European Raw Materials Alliance, European Expert Network on CRMs - SCRREEN) to gather and enrich the information and to disseminate.

1.2.4 How the gender dimension is taken into account in FutuRaM's R&I content

Within the FutuRaM project no specific population group will be targeted. In contrast, the consortium is aware that research often has a diversity problem since many groups are underrepresented, e.g. women, ethnic minorities, people with disabilities and socially disadvantaged populations and we will consider specific measures that will help to address specifically these groups. We will especially consider the involvement of a variety of stakeholders in WP7. In WP2,3,5 we will use Delphi panels, which have an equal representation of gender and an appropriate age distribution that encapsulate the multiple perspectives. In the modelling of WP2 and 4 (foresight and stock and flow models), consumption of household electronics may increase with increasing gender equality, and behavioral aspects waste separation which could be an aspect of foresight of stock and flows. Gender dimension is one of the factors of social aspects in the UNFC methodology being developed in WP5. In WP7, we also target several relevant audiences and will try to create information that is accessible and available to society as a whole. Within the research consortium, we will follow the Best Practices Principles in Equity, Diversity and Inclusion (EDI) introduced by the Canadian Government⁸ that is often seen as a role model.

Equity is defined as the removal of systemic barriers and biases enabling all individuals to have equal opportunity to access and benefit from the project. An example of something we will consider is if the graphs are readable for colour-blind people. If, for example, services are now only offered via the smartphone, people with an affinity for technology, who may also be younger, are addressed. The scope of the application can be significantly improved if the needs and requirements of people who are remote from technology, critical of technology or older are taken into account. This will be taking into account in WP6 specifically.

Diversity is defined as differences in race, color, place of origin, religion, immigrant and newcomer status, ethnic origin, ability, sex, sexual orientation, gender identity, gender expression and age. A diversity of perspectives and lived experiences is fundamental to achieving research and training excellence. WP7 is to include this diversity of perspectives.

Inclusion is defined as the practice of ensuring that all individuals are valued and respected for their contributions and are equally supported. Ensuring that all team members are integrated and supported is fundamental to achieving research and training excellence. This will be a recurring topic for consortium meetings.

7 Case study in Finland (GTK) https://unece.org/sites/default/files/2021-04/06_Pasi_Eilu_UNFC_CS_Guidelines_Finland_UNECE_2021.pdf

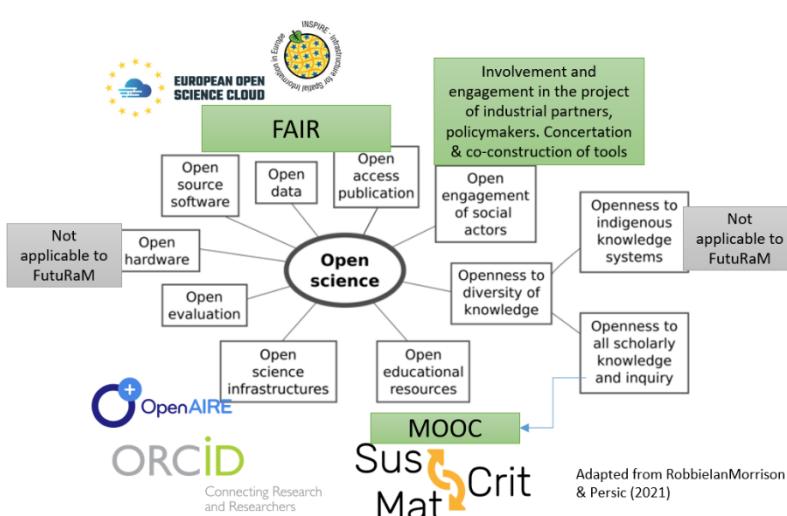
8 <https://www.sshrc-crsh.gc.ca/funding-financement/nfrf-fnfr/edi-eng.aspx>

1.2.5 FutuRaM's Open Science approach

The Consortium is committed to promoting open science following UNESCO's recommendations. The research results and interpretations will be published so that they are open and transparent, respecting the confidentiality of data or findings when legitimately required. Thus, it will implement the principle as open as possible, and as closed as necessary in full accordance with the FAIR principles of open data promoted by the EU commission and across all actors and stakeholders. Concerning geospatial data, EU research organisations have a unique opportunity regarding achieving FAIRness in the sense that most FAIR criteria can be achieved by fulfilling INSPIRE requirements & recommendations⁹.

Cooperative work will be a core principle and promoted at all stages during the course of the project. The open science approach will be set in the Consortium Agreement signed by all beneficiaries of FutuRaM. In order to achieve full credibility and utmost quality of our knowledge base FutuRaM needs to accommodate the second aspect of Open Science i.e. involving all relevant knowledge actors including citizens, civil society, scientific community, policy makers and business actors. Thus, the engagement with the stakeholders is seen as crucial for the success of the FutuRaM project, particularly by providing wider perspectives and input for the project's execution. This engagement is carried out in practice by for instance, a series of Co-creation workshops along with different WPs, case studies, communication and dissemination of the results with industry and policymakers (e.g. Eurostat, UNECE expert group, local authorities).

The reproducibility of the project calculations and results and the facilitation of past end of project data update will be the objective of a task about protocols (cf. Section 1.2.1.6). This concerns the algorithms, workflows, models, software and data in open accessible repositories.



All the scientific articles and papers produced are published according to open access principles and beforehand all published data will be made available in public data repositories, e.g. EOSC. Geospatial data follows INSPIRE. Peer-reviewed scientific publications will be stored in Open Access repositories during and after the project's life. FutuRaM opts for "green access" whenever possible alternatively when this is not possible FutuRaM will use 'gold' open access. A dedicated budget is assigned to facilitate Open Access (payment model) publications via open science infrastructures like OpenAIRE (<https://www.openaire.eu/>) or

national infrastructures. Some partners of FutuRaM (Empa, BRGM, ULEI) are engaged in a project (<https://suscritmat.eu/>) developing learning content about critical raw materials, including introductions into urban mine characterisation and methods such as MFA or LCA, and disseminating it through a Massive Open Online Course (MOOC). FutuRaM outcomes F (e.g. UNFC guidelines) could serve to complement and update these contents.

1.2.6 Research data & research output management

The management of open data will be based on the resources needed to make research data quality-controlled, FAIR-compliant and as open as possible. During the project, consortium partners will be responsible for managing datasets securely in their possession. To manage the lifecycle of datasets collected, processed, or created throughout the project duration, a Data Management Plan (DMP) following the recommendations of the Commission and DMP's templates available in OPIDoR will be developed for the project and delivered in M5 in WP8 by the project management team and will be formally updated as part of the Periodic Technical Reports at M18, M36 and M48. 4 main principles of FAIR will be respected:

Findability: FutuRaM data will be registered with community accepted metadata registries as recommended by FAIR guiding principles: with a globally unique and persistent identifier, with rich description of data with help of metadata registries, with a clear and explicit identification of data described in the metadata and with an indexation of data & metadata in searchable format.

⁹ <http://geowww.agrocampus-ouest.fr/web/?p=2977>

Accessibility: Published and FAIR-compliant data will be archived in an open data repository, e.g. EOSC. When applicable, the focus of the data sharing will be on data underlying prospective scientific publications ensuring the validation of results presented in publications. The Consortium partners will take all the appropriate measures to make relevant data openly available and usable for third parties for study, teaching and research purposes (as described in section 1.2.5). Privacy of data subjects will be secured by fully complying with the General Data Protection Regulation (Regulation (EU) 2016/679 of the European Parliament and of the Council). It should be emphasised that the Consortium has appropriate technical and organisational measures in place to carry out data protection during the project. (see section 3.2).

Interoperability: Variables and value names will be constructed and provided following general data processing conventions common to the research subject. Examples of vocabulary information to be managed within the project will be e.g. units of observation, list of variables with the name and label to each variable. After project closure, metadata of opened datasets will be made available via FAIR compliant repository for research and re-use as described above. Formats used for the datasets are anticipated to be e.g. csv, txt.

Reusability: Potential re-utilisation will be enabled and the quality of the data ensured by careful documentation of data collection methods as well as the contents of the datasets. After the project completion, the final datasets are open accessible in the public repositories SRM-KB.

Types of data generated: Non-confidential data and information, in the form of project deliverables, will be available for public access through the project website that will be updated and maintained throughout the project (WP7). In addition, open-source public applications will be developed to communicate product data to end-of-life processors, for certification

Curation and storage/preservation costs; BRGM will contribute to the Data Management Plan which will be linked to the project during its duration. In particular, the volume of stored data in common information systems grows steadily, and it is obvious that the subject must be anticipated on FutuRaM because the sustainability of the project also depends on the estimation of the volumes and the cost (financial and societal) of hosting these data, and the retention of such data. In this sense, a methodology will be made available in WP8, and the delivery of data and system shall be handled at WP6&7.

Management of Intellectual Property Rights (IPR): See section 2.2.2 Strategy for managing IP-related aspects.

2. IMPACT

The FutuRaM project has been developed to meet the expected impacts set out in the work programme Horizon Europe Digital, industry and Space 2021-2022. Through the implementation of its work plan, FutuRaM will achieve short, medium and long-term impacts for promoting circular economy action plan and the sustainable exploitation of SRMs.

2.1 FutuRaM's pathways towards impact

2.1.1 Contribution to the outcomes (during or shortly after the project), as set out in the HE Call

FutuRaM will contribute to the expected outcomes set out in the HE call, as follows:

Improve knowledge base of EU and third country SRMs (potential, resource estimation, production and refining); Develop reports on future trends in raw materials markets. The trends should be linked with change of demand related to the transition to a low-carbon and circular economy; Facilitate identification of supply and demand bottlenecks of future secondary raw materials supply.

FutuRaM will provide a consistent dataset of composition, stocks and flows of SRMs with focus on CRMs found in the six waste streams at MS level for the EU27+4 and third countries (WP3&4). Future raw material demand will be assessed with prospective scenarios (low carbon and circular economy, high SRMs recoverability, and business as usual) considering different options in terms of technological, economic development and primary resources reserves for materials critical to the EU economy, or materials that have significant impacts on EU sustainability because of their large volumes (WP2). Future material bottlenecks risk assessment will combine raw material demand, SRMs contribution and global raw materials market behaviour. Data will be presented in the SRM-KB dissemination portal thus improving the knowledge base across the relevant territories. The project communication, dissemination and exploitation (CDE) activities will ensure widespread knowledge of the SRM-KB.

Requirements: Widespread use of the SRM-KB after the project has ended; Trust in the data produced;

Barriers: Achievement relies on industry's willingness or ability to describe future trends

Target groups: Policy makers; SRMs related industry; Circular economy practitioners; Research peers; EU & MS government.

Assessment indicators: I) SRM-KB delivery (one), II) Number of waste streams in SRM-KB (at least six), III) Number of countries covered in SRM-KB (at least 75). III) Scenarios considered in SRM-KB (at least three), IV) Report: Future supply and demand scenarios and bottlenecks for CRMs and bulk material (at least one).

Related WPs: WP2, WP3, WP4, and WP6.

Promote the utilisation of the Specifications for Application of the UNFC to Anthropogenic Resources approved in 2018; Facilitate and accelerate commercial exploitation development of EU secondary resource recovery projects; Support identification of the key factors, including socio-economic factors, drivers and barriers affecting development of a recovery project, and enable comparison of different options and projects.

As of 2021, the application of the UNFC to SRMs is still limited and no consistent method to assess SRMs recovery projects exists. FutuRaM will develop a concept for application of the UNFC to all wastes covered in the project and demonstrate the methodology in the UNFC cases studies, while further refining it. The analysis of the 19 different case studies with varying degrees of complexity shows the range of possible applications for practitioners and the conclusions they can draw from them. Methodological development and demonstration will focus on inclusion of multiple stakeholder perspectives in the evaluation of the aspects in the UNFC's E-axis (socio-economics, environmental impact, social impact, policy/law), which are currently neglected, as well as the F-axis (feasibility) and G-axis (degree of confidence). Recovery project classification based on the UNFC will reveal the drivers and barriers to their development, and enables the comparison of different options and projects. A key finding is the extent to which the method can be applied equally to all SRMs and where a differentiated approach is required with respect to the waste streams. The consolidated outcomes of the methodological and case study development will be submitted to the UNECE EGRM through the chair and vice chair of the EGRM Anthropogenic Resources Working Group (both members of the FutuRaM consortium). They and the other Anthropogenic Resource Working Group members and project partners will continue to act as knowledge carriers and multipliers of SRMs recovery based on UNFC and UNRMS principles.

Requirements: Develop sound method, in alignment with UNFC, and practically easy to execute by practitioners

Barriers: Achievement relies on the practicality and ease of reporting, in line with the UNFC, by industry

Target groups: SRMs-related industry; Investors; Policy makers; EU & MS government; NGOs

Assessment indicator: I) number of successful case studies with a UNFC application (at least 10). II) Administrative burden to execute a UNFC assessment for a company (maximum 1 month). III) UNFC application user guide (one). IV) Draft guidelines submitted to the UNECE EGRM (one). V) Workshops to promote UNFC use (at least 3).

Related WPs: WP1, WP5, WP7.

Dissemination and exploitation of projects outputs is tailored for EU institutions, Member States and industry dealing with raw materials;

Stakeholder engagement will be central to the project and will ensure that end user needs and expectations are met as far as possible. Key stakeholders will be those in EU institutions and MS, and a FutuRaM policy working group (PWG) will be established to engage specifically with these groups. In addition, industry will be targeted and engaged through the consortium network and the case studies and in-depth interaction through FutuRaM industry partners. The infrastructure created in the project will allow feeding the SRMs knowledge to the EU RMIS 2.0 and EGDI for mining wastes. Particular attention will be given to propose EU statistics on SRMs.

Requirements: Engagement from these stakeholder groups throughout the project

Barriers: Lack of interest from stakeholders

Target groups: 1. Industry (manufacturers, recycling, etc), 2. Investors, 3. EU/MS governments, institutions & policy makers, 4. Environment sector, 5. Research peers, 6. General public

Assessment indicator: I) The API will be provided to the EU at project end it will contain all the public data records II) Proposal for EU statistics on SRMs to Eurostat (at least one) III) Engagement with relevant stakeholders (at least 6 stakeholder groups)

Related WPs: WP6, WP1 and WP5.

2.1.2 Contribution to the wider impacts in the long term, as specified in HE Destination 2

FutuRaM is expected to contribute to the following wider impacts as described under Destination 2: "Increased autonomy in key strategic value chains for resilient industry".

Resilient, sustainable and secure (critical) raw materials value chains for EU industrial ecosystems, in support of the twin green and digital transformations.

FutuRaM aims to promote the exploitation of SRMs and, in particular, CRMs in a sustainable circular economy, improving its utilisation through applying the UNFC to Anthropogenic Resources and the foresight of SRMs and

CRMs, in particular. The project will address the need from EU industry to identify and facilitate upcoming SRMs projects and the demand for CRMs information on the future supply of raw materials in waste streams that is economically and technically feasible, as well as environmentally and socially sustainable. Policy recommendations will enable and improve the sustainable production and supply of SRMs in the EU. This will support the transition to an inclusive decarbonised circular economy. Thus, the project contributes to this wider impact, providing support to the EU industrial ecosystems in the transition to a twin green and digital transformation in the long-term in line with the Green Deal, the new Circular Economy Action Plan (CEAP) and related actions.

Requirements: Uptake of the project outcomes in the EC and industry after project closure

Barriers: Lack of accuracy of foresight and lack of practicality of the UNFC method for industry

Mitigation measures: Ensuring that the UNFC is practical and efficient to use by the industry

Target groups: EC, Industry (Recycling, manufacturing, etc), Government, Investors, Citizens

Leadership in producing materials that provide solutions for clean, toxic/pollutant free environment, decarbonising industry, and safeguarding civil infrastructures.

FutuRaM will analyse the different factors affecting SRMs production, leading to a cleaner and safer environment, and promoting a sustainable circular economy. The actions to be developed to collect SRM and, in particular, CRM data and maps of stocks and flows for materials and products will facilitate the exploitation by recyclers, smelters and investors. Furthermore, the project will have a direct impact on civil infrastructures, as the approach for assessing the availability of anthropogenic resources for the current and future production of SRMs will focus on CDW, among others. Further, improved recoverability from MINW will lead to less land used and improved local environment and cheaper remediation lessening the CO₂ footprint. This action will foster the development of new products in the construction sector, have a positive impact on the changes in markets shares of construction materials and products, as well as long-term effects for low-carbon strategies and pollutant free material cycles at EU and Member State levels.

Requirements: Target groups use outcomes for decision making, and outcomes are updated after project closure

Barriers: Outcomes do not cater the needs of stakeholders, and business model of data updates is not sustainable

Mitigation measures: Close interaction with target groups and development of business model early in the project

Target groups: Industry, Investors, Scientific Community, EC, Government

Leadership in circular economy that strengthens cross-sectoral cooperation along the value chain and enable SMEs to transform their activities and business models; Increased adoption of key digital and enabling technologies in industrial value chains and strategic sectors, paying particular attention to SMEs and start-ups.

The increase in use of SRMs and CRMs will inevitably cause a diversification of sources of supply and thus the promotion of a circular economy in the long-term is essential to the future low carbon society EU Action Plan on CRMs. One of the main goals of FutuRaM is to contribute to the circular economy agenda at the EU level through the improvement of the methodology of the UNFC, proposal for EU statistics, and harmonised datasets on the availability of SRMs to facilitate novel and innovative data driven circular economy business models. In addition, the actions related to future demand and supply foresight will directly impact industry actors, in particular businesses, which will be able to uptake this knowledge for decision-making purposes (such as green investment decisions) and risk assessment, promoting the use of SRMs and thus the circular economy. This will necessarily lead to the transformation of the activities and business models of the actors along the value chain, including SMEs. FutuRaM involves partners and activities that are positioned across the whole value chain of raw materials, which will be involved in all stages of the project. FutuRaM will establish a digital SRMs knowledge base (SRM-KB),

Requirements: developed standards on UNFC & SRM-KB datasets are used for industry circular decision making

Barriers: Outcomes do not cater the needs of stakeholders; lack of policy support

Mitigation measures: Close interaction with target groups

Target groups: Industry (including SMEs), EC, national policy makers

2.1.3 Scale and significance of FutuRaM's contribution to the expected outcomes and impacts

The scale and significance of FutuRaM's expected successful contributions to the expected outcomes and impacts are described and quantified below.

- **Increase of minimum 5 percentage point in end-of-life recycling rates of CRMs (as calculated for the Raw Materials Scoreboard 2020/21) by 2030, and by 20 percentage point by 2050:** In the short term, the SRM-KB will allow investors and industry to make informed business decisions thanks to knowledge about recovery bottlenecks and quantified recycling gains. In the mid-term, thanks to factual insights that lead to policy

interventions, more and more waste streams containing CRMs will be diverted from sub-standard non-compliant treatment to official channels, it is expected that the end-of-life recycling rate will further increase. Thus, factual insights facilitate targeted concrete interventions diverting the flows into improved compliant facilities to extract of CRMs

- **100-fold increase in visits to the SRM-KB compared to Urban Mine Platform (developed in ProSUM):** The project will develop the SRM-KB and a suite of user friendly and adaptable online tools, which will increase website visit and support informed business decisions. Currently, the www.urbanmineplattform.eu has 300 unique monthly visits and the French Raw Materials portal has 7,000 unique monthly visits. FutuRaM expects that the more user-friendly tools, download options, and EU wide and improved datasets will result in 30,000 unique monthly visits to the SRM-KB, i.e. improving the “knowledge” of SRMs by 100 fold.
- **Uptake of the UNFC methodology for recovery projects by 5 countries by 2030.** FutuRaM will develop workshops/actions to disseminate the results to member countries and beyond. It is expected that the UNFC methodology will be widely used for the assessment of mining wastes in particular. The project will also target policy makers that can influence the mandatory uptake of UNFC.
- **At least 3 capital investments with a combined value in excess of €100,000,000 that ascertain using SRM-KB in their decision-making in Europe by 2030:** Recovery of certain CRMs are not currently technologically feasible. The SRM-KB will allow for informed and strategic investment decisions. A major investment in the recycling industry should be expected.
- **Uptake of at least 1 climate related impact when assessing SRM recovery projects using the UNFC methodology.** FutuRaM will develop at the very minimum a methodology to incorporate the impacts of greenhouse gas emissions (CO₂-equivalent units) in the E-axis of the UNFC to help assess the impacts of recovery project on climate.
- **Uptake of 5 countries for official SRMs datasets at national level by the national statistical office, or by Eurostat by 2030.** Currently, very few countries, the Netherlands is one example, have SRMs statistics in development. The project will generate a proposal for EU statistics for SRMs, which can be adopted by Eurostat to generate EU wide statistics on SRMs, and by national statistical offices.
- **1,000 experts and young professionals are in a position to assure global leadership and cooperation in the UNRMS framework:** During the project 50 professionals in industry, academia, and institutions at all career stages are directly involved in the project and will continue to work as change agents. Methods and tools developed will increasingly enter higher education. It is expected that at least 1,000 experts will be in a position to fulfil the increasing demand for multi-disciplinary sustainable resource management.

2.2 Measures to maximise impact – Communication, Dissemination and Exploitation

2.2.1 Draft plan for Communication, Dissemination and Exploitation

The approach

To ensure that the outcomes and benefits of FutuRaM are widely known, understood and utilised by the relevant stakeholders, the consortium will implement a coherent plan, the initial draft of which is provided here. FutuRaM will engage in a focused communication, engagement, dissemination, education, networking and exploitation programme that aims to ensure use of the data and wider application of the UNFC methodology to SRMs in the future. The plan for CDE will be developed by M6 and updated in M18, M30 & M42 with the support of the Horizon Results Booster service.

Stakeholder mapping and key messages

At the outset of the project, FutuRaM will map the relevant stakeholders it will target with CDE activities (D7.1) and repeated every 12 months during the project. Mapping will include analysis of stakeholder needs and the potential for early adoption of the new processes and data outputs. Stakeholders will be consulted throughout the project to develop an understanding of end user needs, expectations and project feedback. Initial stakeholder mapping is shown in the table below, alongside the key messages to be delivered to each stakeholder group.

Table 3 Stakeholders & key messages

Stakeholder	Key Messages
Industry (including SRMs value chain) Industry will be a key beneficiary of the UNFC method and data, reports and scenarios produced, using them to make decisions on future business direction. Not only will it allow SRMs processors/recyclers to plan, it will also give	Improved insights in environmental and financial benefits from FutuRaM project. The FutuRaM data and UNFC methodology will give increased confidence in future material markets and in discussions with investors. The application of the UNFC methodology to SRMs scenarios and greater knowledge of the projected arisings of materials

manufacturers increased confidence in the future supply of SRMs.	in waste streams and the SRMs available will improve business planning and decision making.
Investors Investment will be needed to improve the infrastructure for SRMs utilisation. Developing tools and data that can improve investment decisions make this stakeholder group central to the project.	The piloting of UNFC methodology to SRMs will enable a reliable system to aid SRMs infrastructure investment building on the trusted primary raw materials method. This, coupled with future projections for raw materials markets will increase confidence in investment in SRMs projects and developments.
EU/MS governments, policy makers & institutions Governments, policy makers and their institutions have an interest in FutuRaM because it will assist with the transition to a climate neutral, circular and digitised economy with the effect of enabling a path to understanding and boosting domestic sourcing of raw materials, and provide EU statistics on SRMs. The project will target individuals and departments that develop strategic planning on economy and sustainability and on raw material use and recycling at EU, national and regional level.	The application of FutuRaM outcomes allows better informed decisions to be made on industrial developments, relation to policies, and planning strategy that increase the availability and use of SRMs and help achieve environmental targets. For instance, developing policy and regulation that considers a UNFC compliant reporting standard for all countries inside and outside of the EU will lead to greater investment in SRMs and assist EU/MS governments in achieving environmental and circular economy targets. In addition, FutuRaM will provide MS with data, proposals for SRMs statistics and foresight that will increase their understanding of the current and future SRMs and potential within Europe.
Environment sector This is a broad term for those stakeholders involved in the wider green economy and includes politicians, campaign groups and related 'green' sectors.	New data and knowledge, and ways of using these will lead to greater use of SRMs. The outcomes will have the positive environmental impact of reducing demand for primary raw materials through increasing SRMs use and reduce the impacts of the extractive industry (carbon emissions, land biodiversity degradation, etc).
Research peers The academic sector has a role to play in ensuring the FutuRaM knowledge base and methodologies are widely utilised and future advances are made by building on the data generated.	Open access to the data during and after the project will enhance the research work of peers and lead to wider advancement in the extraction and use of SRMs.
General public The general public is key to ensuring future demand for SRMs meets supply. Societal acceptance and trust in SRMs are essential to future use. Moreover, without the cooperation of consumers much of the materials embedded in e-waste, batteries and ELV, could be lost to the general waste stream.	Key messages are that raw materials supply in future and relation to circular economy and low-carbon technologies is an increasingly important issue; that their lives are directly affected by raw materials. Other advantages to the consumer of developing efficient material cycles is that it will make end products that utilise SRMs less environmentally unfriendly and increase jobs through more localised utilisation of SRMs.

Methods & tools for communication, dissemination & exploitation

An overview of the methods and tools for communication, dissemination and exploitation as well as Key Performance Indicators (KPIs) is shown in Table 4. The KPIs will be used to monitor and assess the planned communication, dissemination and exploitation activities. Additional indicators might be considered and monitored throughout the project.

Table 4 Communication, Dissemination and Exploitation Tools and Methods, and KPIs

Tool/Method	Tool/Method	KPI
Project website		
The project website, futuramproject.eu, will be created by M04 of the project. The website will comprise the main communication channel for FutuRaM for all external and internal stakeholders. It will contain project news, partner info, network registration, events, and resources (reports, videos, infographics etc) and will be linked to partners' websites to increase traffic and exposure. The website will be established and updated by WF. KPI: 40,000 unique visits over the project duration.		

Webinars

Webinars will be held to demonstrate and provide guidance on the use of the SRM-KB as well as to provide information on the application of UNFC to SRMs scenarios. They will be aimed primarily at end users and those that can influence use. The training elements of these will remain available after the end of the project.

KPI: 4 webinars with 200 attendees in total.

Conferences and other presentation-based events

FutuRaM's activities and outcomes will be disseminated through presentations at project and non-project events. The project will organise four project specific events including a final event in M48 to present the outcomes to stakeholders. These events will be used to disseminate project results, communicate next steps and obtain stakeholder input.

KPI: 20 presentations at non-FutuRaM events.

Stakeholder consultation events

Stakeholder consultation is critically important to FutuRaM and will be facilitated under WP7 and performed in partnership with WPs 1-6 to understand end user needs, collect data, test outcomes and raise awareness.

Stakeholder consultation events are outlined below. The FutuRaM consortium is flexible to the needs of the end users and wishes to understand them and keep an open dialogue with key stakeholders. A formal FutuRaM Stakeholder Network will be established.

KPI: as per those indicated * below

Co-creation workshops

To engage relevant external stakeholders on the topic of FutuRaM, to support co-development and uptake of the new solutions to determine end-users' expectations from the Key Exploitable Results (KERs) and plan for their future implementation, and to test the commercialisation of the KERs. Aspects such as what outputs are required, user-experience and user interface, process analysis, and co-design methodologies will be used.

*KPI: 1 internal & 3 external workshops

Business modelling interviews & sessions

Design and validate business models for uptake of FutuRaM technologies, knowledge and processes with early adopters such as industry and policymakers as well as with consortium members.

*KPI: 20 interviews & 2 sessions

Capacity building sessions

Demonstrate and test the SRM-KB with consortium members and a set of pre-identified, cross-stakeholder early adopters to receive feedback to refine the end product. These sessions will also serve to promote use of the SRM-KB and produce 'ambassadors' for wider utilisation.

*KPI: 2 capacity building sessions

Policy meetings

To develop a dialogue with relevant policy makers and government officials at EU, national and regional level. These meetings will also involve stakeholders in locations targeted by the case studies and will provide an exchange of views on the institutional uptake of the UNFC methodology.

*KPI: 9 policy meetings

UNFC workshops

Each UNFC workshop will revolve around one specific group of stakeholders: 1) to identify expectations and barriers in the development of recycling projects from recyclers' perspective; 2) supporting instruments / identify barriers to secondary raw material production and supply from the perspective of investors, authorities and NGOs; and 3) internal workshop together with the industrial partners to identify factors and methods for assessing the viability of recovery projects using the UNFC and approaches for its application at regional/national level. These topics will be repeated in mid-term (M18), after the draft guidance for the UNFC is developed, and M36, when the final results are obtained.

*KPI: 9 UNFC workshops

Statistics meetings

To ensure a regular two-way dialogue with Eurostat and EU national statistical offices specific stakeholder meetings will bring together EU Statistics, UNECE EGRM, EC including DG JRC, institutions that compile raw material production, resource/reserve data, and leading experts and innovative national statistical offices and environmental agencies.

* KPI: 2 meetings

Clustering events

FutuRaM commits to organising four clustering events and attend events organised by other relevant projects and initiatives (those currently live that are listed under 1.2.2 and others that are yet to commence). The clustering events will be structured to enable the sharing of information and collaboration, with one dedicated to supporting the exploitation and results including demonstration of the KERs. A specific task and budget is allocated for this in WP7.

KPI: Outreach to 10 related projects and four FutuRaM events.

Scientific publications

FutuRaM papers will be published in peer reviewed and green or gold model open access papers and budget has been included for this.

KPI: 10 papers during the project

Newsletters, news releases & social media

A bi-annual project newsletter will be directed at all stakeholders. News releases will promote the project and its results and be circulated globally using a media distribution tool. LinkedIn, Twitter and YouTube accounts will be created (other platforms will be explored) to allow stakeholders to keep abreast of the project and foster two-way communication. These will be some of the key tools for communicating with the general public.

KPI: 8 newsletters, 4 news releases. 200,000 combined views on social media

Videos

Three videos will be produced, one at the outset of the project outlining what FutuRaM aims to achieve and why; one during the project to promote a specific aspect; and another at the end presenting the outcomes and results. These will be suitable for raising awareness across all stakeholder groups including the public.

KPI: 3,000 online views

Infographics

Infographics will provide an easily understandable and attractive overview of FutuRaM as a whole or focus on discrete aspects. These will mainly be used digitally but will also be in a format that can be printed and will play a key role in communication with the public.

KPI: 4 infographics, 2,000 online views

Brochures and flyers

Digital and hard copy brochures and flyers will be designed for different stakeholders and requirements and will use language appropriate to that target.

KPI: Distributed to more than 3,000 people at events

FutuRaM's draft exploitation pathway and key exploitable results

The FutuRaM consortium has developed a draft pathway for the sustainability of the project's key exploitable results (KERs) (see Table 5). The four stages of this pathway are presented in Table 6 and represent the exploitation lifecycle, set out the basis for commercial exploitation, and build towards the business plan (BP). The Consortium foresees two main sources (S) from which KERs will originate: **S1: KERs resulting from the work in WPs 1, 2, 3, 4 and 6**, primarily related to collection and analysis of data and establishing the SRM-KB; and **S2: KERs resulting from work performed under WP5** associated with the application of the UNFC methodology to anthropogenic resources.

The consortium is committed to making the data available in open formats during the project and free of charge for the EC and all stakeholders to use and publish, along with other relevant reports tailored for the use of the EC and respecting FutuRaM's open science principles. For the post-project period, one of the key challenges will be balancing this with the need to develop revenue streams to finance the maintenance and further development of the SRM-KB. It is anticipated that because the data will be open source, the consortium's high level of knowledge of this data will be key to the exploitation of results. The KERs are shown below.

Table 5 Key Exploitable Results (KERs)

Source	KER	WP	Potential End Product/Service	Description of the potential product/service
S1	SRM-KB dissemination portal and APIs	6	SRM-KB	The portal/platform will provide a user interface and be the main access point to all exploitable data from FutuRaM.
S1	Harmonised datasets of stocks and flows	2, 3, 4, 6	Access to SRMs datasets on the SRM-KB	The user will gain access to datasets aggregated by different types of wastes.

	on SRMs and impacts			
S1	Methodology for the assessment of future demand estimates and supply risks until 2050	1, 2	Commodity outlook Reports	A customised report containing outlook for a specific commodity will be developed upon order. The report will involve scenario building for a different commodity based on the current status quo regarding various (PESTEL ¹⁰) aspects that affect the SRMs.
S2	Proven application of UNFC to anthropogenic resources	5	Training/certification/auditing system for practitioners of the UNFC methodology to anthropogenic Resources.	A training and capacity building programme aimed at equipping practitioners with the ability to apply the UNFC methodology to SRMs.
		2,3,4,6	Data development and further analysis.	Ad-hoc services for analysis or development of the FutuRaM data. Use the experience, knowledge and insight of the FutuRaM team to analyse the data generated in the project based on specific client requests.

To deliver a sustainable output to different stakeholder groups and maximise the project's impact, the FutuRaM exploitation plan will be composed of three layers, each representing a cluster of intended end-users: **L1) Research community; L2) Government and their institutions** (EU and MS); and **L3) Private sector** (industry, investors etc. dealing with (secondary) raw materials). Frequent engagement and interaction with all three layers throughout the exploitation lifecycle will be crucial in ensuring the project understands the needs and delivers the desired outcomes to all stakeholders. The exploitation pathway is outlined below; the activities outlined are interwoven with tasks in WPs 1-6, with which it will develop the KERs and deliver stakeholder consultation.

Table 6 Four-stage exploitation pathway

Stage	Objective	Activities	
1: Understand target market	<ul style="list-style-type: none"> Identify stakeholder groups and end-users for each layer Collect and analyse early inputs from the “field” (S1: WP1-P4 and S2: WP5) Draft exploitation scenario at the intra-consortium level 	<ul style="list-style-type: none"> Finalise intra-consortium relationships Perform a broader industry analysis and evaluation of the current status quo Analyse the exploitable outcomes from previous projects involving large data sets and the UNFC methodology and lessons learned (e.g. PROSUM, ORAMA, PANORAMA) Produce written outline of the commercial scenario and circulate to the consortium for feedback Conduct a half-day workshop with all consortium partners 	
2: Facilitate exploitation	<ul style="list-style-type: none"> Develop exploitation plan Examine and assess end user needs and specifications Develop roadmap for market introduction of KERs 	<ul style="list-style-type: none"> Finalise all agreements relating to exploitation aspects of FutuRaM outputs. Implement co-creation workshop with consortium partners for assessing needs related to the end product Finalise relationships with relevant industry and public authority bodies Define and analyse specific target markets and sub-sectors 	Advocate the uptake of the KERs
3: Test	<ul style="list-style-type: none"> Test design and usability aspects of KERs Obtain feedback on aspects that can be improved 	<ul style="list-style-type: none"> Implement co-creation workshops to determine expectations of end users regarding KERs (L1, L2, L3) Implement capacity building sessions for the utilisation of SRM-KB Policy meetings 	

4: Business plan	<ul style="list-style-type: none"> • Develop a business plan for the post-project sustainability, commercialisation and uptake of the KERs • Business modelling sessions • Develop guidelines for the usability of SRM-KB (per layer) • Interviews/consultations with end-users • Produce and validate business, governance and financial model for FutuRaM KERs 	
------------------	---	--

Business Plan (BP)

The BP will consider the incipient and expanding market opportunities to ensure the long-term uptake of the FutuRaM KERs and address legal and security aspects. The BP will involve analysis of business modelling and financial forecasting in accordance with, as a minimum, Business Model Canvas (BMC) supported by Value Stream Mapping, SWOT, PESTLE and Marketing Mix tools, resource efficiency, competitive advantage, opportunity cost, value proposition, return on investment, market positioning as well as IPR management activities. The analysis also takes into consideration the potential for the gradual consolidation and expansion of the FutuRaM network, particularly the inclusion of additional partners, public entities and possible investors. The work will also assess the feasibility of establishing a market observatory for key SRMs as formulated in the new Circular Economy Action Plan (COM(2020) 98 final). Based on the outcome of the analysis, a quantifiable list of needs will be developed and include aspects such as infrastructure and personnel together with an estimation of costs. FutuRaM envisions the following options as viable alternatives for the FutuRaM governance model: 1) Creation of a separate legal entity in the form of a private company or an association; 2) Establishment of a cluster partnership for SRMs that would be connected to the European Cluster Collaboration Platform; and 3) Establishment of a European Economic Interest Group.

Post-project, FutuRaM may have a different financial model depending on the target customer. It is common for different policies to be applied to academic users, government users and commercial users; "use for research" or "use for public reporting" is usually considered differently to "use for commercial gain" and this differentiation will be explored in FutuRaM. The Consortium will consider models to maintain a zero-cost approach post-project. The future revenue generation could thus be a mixture of:

1. Fee-for-services (FFS) model will be targeted for an unbundled, single-item services.
2. Membership or subscription model in which a customer will be charged annually for continuous access to specific services, e.g. datasets on the SRM-KB platform.
3. Benefiting from the FutuRaM network and partners' networks, as a separate entity, FutuRaM may consider applying for public funding/grants in the fields that align with its strategic objectives for future expansion and development efforts.
4. Other revenue streams, such as the introduction of selected advertisements.

The FutuRaM consortium acknowledges that the model produced by the business plan could conclude that public funding could be the major revenue stream.

2.2.2 Strategy for managing IP-related aspects

Knowledge Management and Intellectual Property Rights (IPR)

The FutuRaM knowledge management strategy will use the principles and guidelines of the EU publication of IPR¹¹, which provide guidance on how IPR can be protected and used by the consortium members. The project coordinator, Project Steering Committee will manage (i) providing space, structures, and opportunities for identifying, consolidating and curating the co-created knowledge, (ii) monitoring the process and assess its coherence with FutuRaM objectives (iii) ensuring that participation and gender issues are adequately taken into account and (iv) providing incentives to encourage and reinforce those emerging patterns that benefit the project (and discourage those that do not). The technological aspects of knowledge management (i.e. data management) will be dealt with in the FutuRaM project management (WP8).

Intellectual property management will be vital in FutuRaM due to the pre-existing know-how distributed among the consortium partners and the need for proper sharing to positively impact the project's results and long-term implementation. The project will adopt a policy of protection of the project's results whenever results are expected to be commercially exploitable and whenever protecting them is possible, reasonable and justified. Before the signature of the Grant Agreement (GA), all partners will sign a Consortium Agreement (CA). All procedures related to intellectual property will be described in this CA (based on the DESCA 2020 model). CA will formalise project management procedures, API issues and exploitation of results describing the rules for sharing access rights to the FutuRaM results on the principle that each partner gets the information required both to achieve the project objectives

¹¹ <https://euipo.europa.eu/ohimportal/en/online-services/ideas-powered-for-business>

and exploit the results thereafter. During and after the project (as will be established in the CA), the partners will preserve the confidentiality of any data, documents, or other material identified as confidential. Partners will define in the CA the background needed for the purposes of FutuRaM. The granting of access rights to the background will depend on the acceptance of specific conditions aimed at ensuring that these rights will be used only for the scope of FutuRaM and with the appropriate confidentiality obligations. Foreground knowledge will be the property of the partner generating it. When two or more partners have carried out the design or work, they shall have joint ownership of this foreground. In case of transfer of foreground ownership, each partner concerned shall pass on its obligations regarding that foreground to the assignee. The partners concerned shall provide to the other consortium members and the EC prior notice of any envisaged transfer and a copy of any relevant information. In addition to CA, non-disclosure commitments and IPR clauses will be contained in the following legal documents: GA (to be signed at the start of the project between consortium partners and the EU) and Partnership Agreement (to be signed at the start of the project between consortium partners, and other entities involved in the project implementation), thus constituting for the IPR framework. Suitable strategies for innovation and IPR management will be defined within WP8 in close liaison with all other WPs, and particularly WP7, and integrated in the project data management plan. IPR management will be discussed in consortium and WP meetings.

2.3 Summary

Table 7 Key elements of the section on Impact

Specific needs	Expected results	CDE measures
Robust information of SRMs and, in particular, CRMs in the EU under the transitions towards a low carbon and circular economy. EU autonomy of sourcing of raw materials and causing an environmental impact. Conceptual approach and guidance to assess SRMs using the UNFC for Anthropogenic Resources.	SRM-KB covering current and future demand estimates, and supply risks of SRMs and, in particular, CRMs under three future pathways to 2050 covering six waste streams and 75 countries (including EU27+4) and providing dynamic visualising tools. Development, and testing of UNFC with 19 case studies resulting in a methodology. Increased knowledge and awareness of the importance of raw materials to society.	E: Developing workshops involving the key target groups to ensure that FutuRaM results are informing and contribute to decision making. D: Report on the Future SRMs and CRMs supply demand and supply risk in 2050. The consolidated datasets (and tools) are available in the SRM-KB. One proposal on the development of EU wide statistics. One draft guideline in alignment with UNFC. 10 publications. C: To the general public will be realised via a global media campaign, social media, open-source datasets, and attractive visualisations.
Target groups	Outcomes	Impacts
Industry (including SRMs value chains), Investors, EU/MS governments policy makers & institutions (DG GROW, DG Joint Research Center, Eurostat, national counterparts, UNECE EGRM etc), Environment sector, Research peers and general public.	Uptake by the EC and 10 MS of methods and datasets to assess implications for SRMs of existing demand and supply risk estimations for CRMs . Uptake of the UNFC methodology by 5 member states to assess the availability of SRMs	By 2030, set the basis for future research to assess SRMs, at least €100,000,000, uptake of the UNFC methodology for recovery projects by 5 countries, the SRM-KB has 30,000 monthly visits, uptake of 5 countries for official SRMs datasets at national level, or by Eurostat, 1,000 experts and young professionals use UNRMS framework:

3. QUALITY AND EFFICIENCY OF THE IMPLEMENTATION

3.1 Work plan and resources

FutuRaM is a four-year project structured into 8 work packages (WP). Each WP is split into a specific set of tasks to reach the objectives, produce the deliverables, goals and milestones set out in the work plan. The overall conceptual development and iterative integration between research in all WPs is done in WP1 (see Figure 3). WP2 will develop the foresight and integrate the material composition data (WP3) and physical stock and flow of SRMs (WP4) with the environmental and social aspects (T2.4) in T2.5 to assess the quantities, impacts and bottlenecks of future SRMs recovery (T2.5). The insights of WP3-4 are used in WP5 for the resource assessment according to the UNFC framework, and insights of WP5 also feed back into the foresight aspects in T2.3-2.4. The final datasets flow into the

information system (SRM-KB) (WP6). The exploitation, dissemination and communication (WP7) covers and works with all WPs, and involves external stakeholders; it is not visualised in Figure 3.1.

Thematic groups around the six waste streams are created to ensure consistency across the WPs: **WEEE**, lead by UNITAR with the support of Empa, TUB and WF. **BAT**: lead by TUB and supported by RECH, UNITAR and Empa. **ELV**: lead by Chal, supported by Empa. **CDW** jointly lead by UCL and ULEI and supported by BRGM and TUB. **MINW** lead by SGU and supported by GTK, GeoZS, BRGM, BU, LMU and BGR. **SLASH** lead by VITO and supported by BRGM, UCL, LMU and GeoZS.

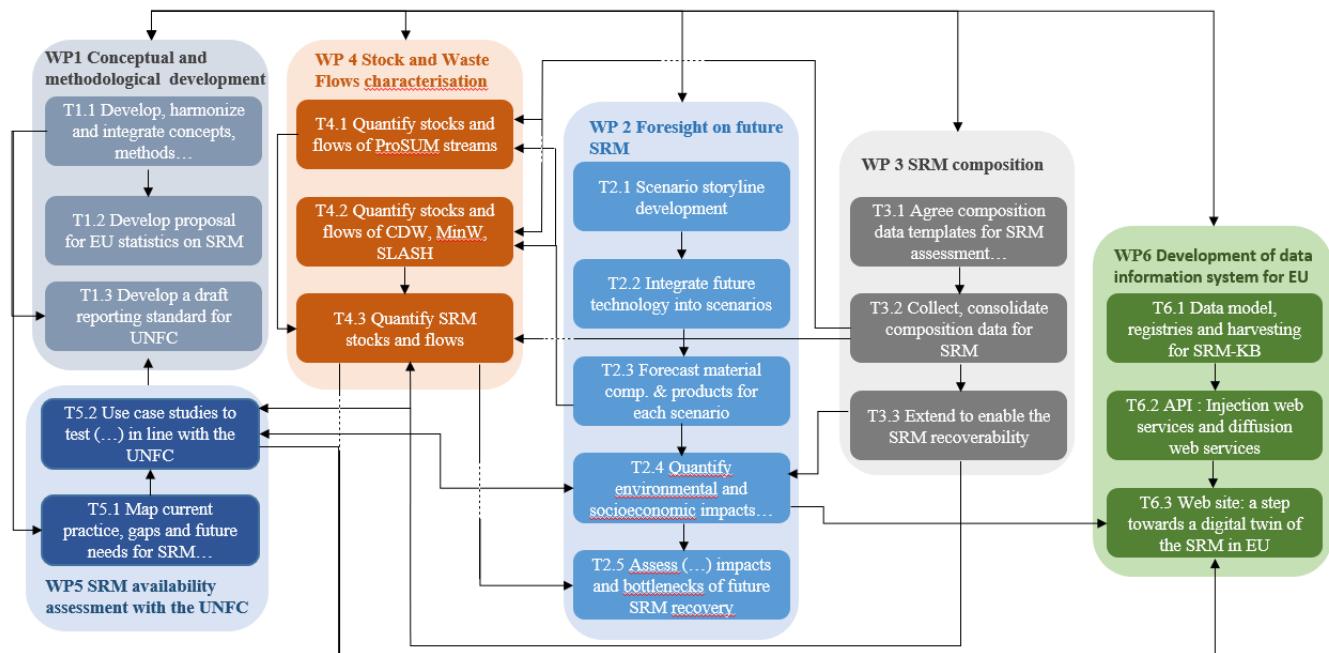


Figure 3 Pert chart

Table 8 List of Work Packages (WPs)

WP No	WP Title	Lead Part' No	Lead Participant Short Name	Person Months	Start Month	End Month
1	Conceptual and Methodological Development	24	Empa	151.5	01	45
2	Foresight for Future Secondary Raw Materials	13	ULEI	151.0	01	47
3	Secondary Raw Material Composition	5	TUB	200.0	01	36
4	Stock and Waste Flow Characterisation	14	UNITAR	184.5	01	30
5	SRMs availability assessment in line with the UNFC	16	LMU	253.5	03	36
6	Development of data information system for EU	9	BRGM	60.0	03	47
7	Communication, Dissemination & Exploitation	17	SPI	148.5	01	48
8	Project Management	1	WF	93.5	01	48
				TOTAL Person Months	1,242.5	

The timing of the tasks milestones and deliverables are further illustrated in the Gantt chart in Figure 3.2. FutuRaM has created a limited set of deliverables as per requirements set out in the EC EU Funding & Tenders Online Manual¹², which states the number should be between 10 and 15. As this is the case, we have limited deliverables to outcomes that are distributed throughout the project and are of general interest to the scientific community or other stakeholders. Other outcomes are included as milestones, e.g. website, Advisory Board Terms of Reference, reports on some intermediate WP findings.

¹² https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/om_en.pdf

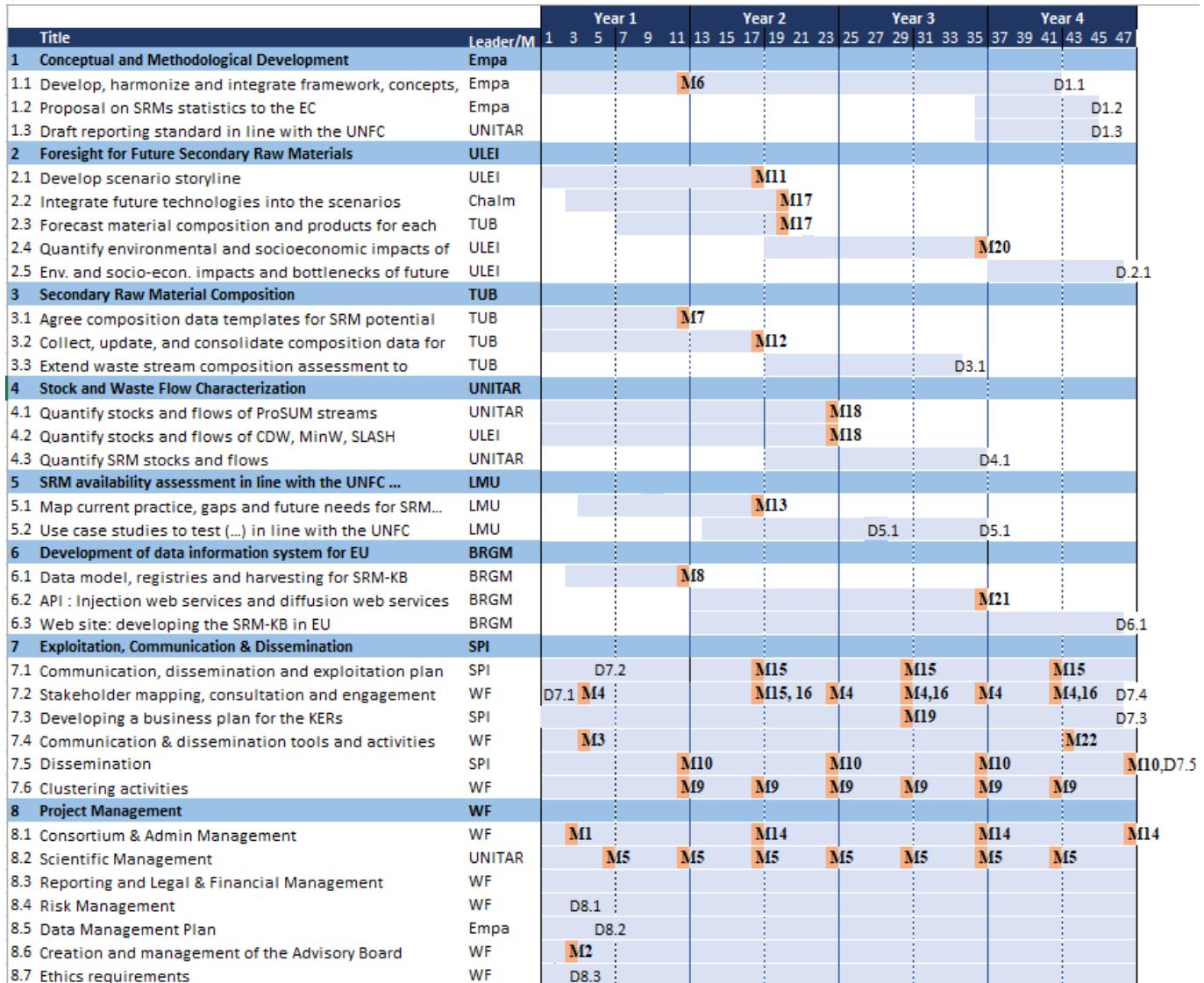


Figure 4 Gantt chart

WP1	Conceptual and Methodological Development								Lead		Empa				
Partic. #	1	5	6	7	9	10	11	12	13	14	16	17	18	24	26
Name	WF	TUB	UCL	Chal	BRGM	GTK	VITO	GeoZS	ULEI	Unitar	LMU	SPI	SGU	<u>Empa</u>	BGR
PMs	3	20	8.5	3	10	3	15	1	11	12	20	3	8	28	6
Start	M1		End			M45									

The overall objective of WP1 is to support the development, harmonisation and integration of the concepts, methods, models and procedures required to reach the goals of the FutuRaM project.

T1.1 Develop, harmonise and integrate concepts, methods, models and procedures (*Empa, ULEI, TUB, LMU, UNITAR, BRGM, SPI, Chal, SGU, UCL, VITO, GTK, BGR, WF*) (M1-M42) Considering the goals and scope of the FutuRaM project and the needs of key stakeholders identified in WP7, T1.1 will consist in discussing, further developing, harmonising, integrating and consolidating the concepts, methods, models and procedures proposed by WP 2-6, the waste stream coordinators and the project’s topical experts for cross-cutting issues such as data management and stakeholder involvement. As an early milestone in M12 (Milestone 6) a first draft of consolidated FutuRaM concepts, methods, models and procedures will be provided, which will be further consolidated in the second phase of Task 1.1, under consideration of (i) insights from their application in the respective WPs, including the case studies in WP5, (ii) the specificities of the waste streams addressed in FutuRaM, and (iii) the stakeholder perspectives. Based on this, waste stream- and stakeholder-specific guidelines and recommendations regarding

FutuRaM's key methodological elements will be provided and, alongside the consolidated FutuRaM concepts, methods, models and procedures, presented, amongst others, in D1.1.

T1.2 Develop a proposal for EU statistics on SRMs (UNITAR, TUB, Empa, ULEI, UCL, SGU, VITO) (M36-M45) Based on the methods developed in the FutuRaM project and building on existing official statistics such as waste statistics, PRODCOM, Economy Wide Material Flow Accounts and trade statistics, T1.2 will draft one proposal for EU statistics on SRMs to Eurostat (D1.2). The practicability and usability will be tested through consultations in WP7 with official statistics stakeholders such as National Statistical Offices, and Eurostat (in advisory board), and ensure consistency with global SDGs and UNECE Circular Economy Statistics and UNECE Waste Statistics taskforces.

T1.3 Develop a draft reporting standard in line with the UNFC (Empa, VITO, LMU, UCL, SGU, GTK, GeoZS, BGR) (M36-M45) Based on the outcomes of T1.1 and WP5, a methodological standard to report the viability of material recovery projects in line with the UNFC and under consideration of waste stream - specificities and stakeholder perspectives will be drafted for the attention of the UNECE EGRM (D1.3).

Deliverables

D1.1 Consolidated and harmonised FutuRaM concepts, methods, models, procedures and recommendations (M42) Report on consolidated and harmonised concepts, methods, models and procedures, including recommendations and guidelines regarding FutuRaM's methodological key elements.

D1.2 Proposal on SRMs statistics to the EC (M45) Proposal for EU statistics on SRMs to Eurostat.

D1.3 Draft reporting standard in line with the UNFC (M45) Draft reporting standard to report the viability of material recovery projects in line with the UNFC for the attention of the UNECE EGRM.

WP2	Foresight for Future Secondary Raw Materials								Lead	ULEI			
Partic. #	1	5	6	7	8	9	10	11	13	14	16	18	24
Name	WF	TUB	UCL	Chal	RECH	BRGM	GTK	VITO	ULEI	Unitar	LMU	SGU	Empa
PMs	3	21	7	10	1	8	2	4	46	19	21	1	8
Start	M1	End		M47									

WP2 will conduct foresight studies for materials critical to the EU economy, or materials that have significant impacts on EU sustainability because of their large volumes. WP2 will develop a set of coherent scenarios for material use and waste/recovery over time in various sectors in the EU: WEEE, ELV, BAT, CDW, MINW, SLASH.

T2.1 Develop scenario storyline (ULEI, TUB, Empa, Chal, WF, BRGM, UNITAR, SGU) (M01-M18) This task involves scanning, mapping, and assessing scenarios used in the grey, scientific, policy, and industry literature/reporting for the different waste streams, (e.g. the Shared Socioeconomic Pathways, the International Resource Panel Scenarios, the International Energy Agency Scenarios, etc) to develop cogent storylines for the three planned scenarios. These will cut across sectors and will be used for the Stock-Flow models (WP4) and will include the translation of general concepts such as stated policies, sustainable development, circular economy, to each sector. FutuRaM will develop at minimum three scenarios (1. Sustainability, 2. Recoverability, and 3. Business-as-usual).

T2.2 Integrate future technologies into the scenarios (Chal, ULEI, TUB, Empa, WF, BRGM, UNITAR, UCL, LMU, SGU, VITO) (M03-M20) This task will review current and emerging technologies used in the various sectors for product manufacturing and end-of-life handling, with a special emphasis on material production, use, and recycling. Together with the storylines developed in Task 2.1, it will adapt the market share of these technologies for each sector to determine the future development of each sector.

T2.3 Forecast material composition and products for each scenario (TUB, ULEI, UNITAR, Chal, BRGM, Empa, VITO) (M7-M20) Following the scenarios from T2.1, the material compositions and future products for each sector will be determined based on the product and commodity demand and technology realisation (T2.2). This task will be coupled to the data collection in WP3 and WP4.

T2.4 Quantify environmental and socioeconomic impacts of SRM recovery under each scenario (ULEI, TUB, Empa, UNITAR, WF, BRGM, UCL, LMU) (M18-M36) This task will use the information generated in Tasks 2.1-2.3, together with the material flow analysis from WP4, to quantify the future environmental and socioeconomic feedbacks for each waste sector and scenario according to future recovery technology.

T2.5 Assess the environmental and socioeconomic impacts and bottlenecks of future SRM recovery (ULEI, TUB, Empa, UNITAR, Chal, UNITAR, WC) (M37-M47) This task will develop a report based on an assessment on the pressures and bottlenecks associated with environmental and socioeconomic issues related to each waste sector, including the associated changes and impacts on imports and of primary raw materials production (D2.1).

Deliverables

D2.1 Report on environmental and socio-economic barriers to SRM recovery (M47) Will present and discuss the results of the Stock-Flow model for the various future scenarios, with a special emphasis on the end-of-life material availability and recoverability, environmental and social impacts from the various sectors

WP3	Secondary Raw Material Composition									Lead		TUB		
	Partic. #	1	2	3	4	5	6	7	8	9	10	11	12	13
Name	WF	Repic	Erion	Eco	<u>TUB</u>	UCL	Chal	RECH	BRGM	GTK	VITO	GeoZS	ULEI	Unitar
PMs	1.5	2	3	3	53	17	9	1	15	6	20	8	8	18
Partic. #	16	18	20	23	24	26	27							
Name	LMU	SGU	BOL	Lewis	Empa	BGR	GRS							
PMs	4	9	1	1	14	5	1.5							
Start	M1	End		M36										

The central objective of WP3 is to provide harmonised and consolidated data sets on current and future product and waste compositions of WEEE, BAT, ELV, CDW, MINW, SLASH, and to suggest a framework for future product and waste composition forecast and monitoring to be harmonised and extended with the requirements of UNFC.

T3.1 Agree composition data templates for SRM potential assessment for each waste stream (TUB, Empa, Chal, WF, Eco, Rep, BRGM, UNITAR, ULEI, UCL, VITO, GTK, Eco, Repic, Erion, BGR, GRS) (M01-M12) This task involves adapting the existing ProSUM_data templates for waste composition assessment for the different waste streams and developing per waste stream a consistent approach to update and further develop datasets on composition of products and waste generated. This task includes the definition of the data demand on composition for the UNFC assessment and its dimensions (T5.1).

T3.2 Collect, update, and consolidate composition data for SRM potential assessment (TUB, Empa, Chal, WF, BRGM, UNITAR, ULEI, UCL, VITO, GTK, Eco, Repic, Erion, BGR, GRS) (M01-M18) This task involves collecting, updating, and consolidating data on composition and material intensity based on existing data published in the grey, scientific, policy, and industry literature/reporting for the different waste streams. Generated data sets will be consolidated based on stakeholder interactions (Delphi technique) and provided to T2.3 and T4.3. Furthermore, the consolidated and unconsolidated data sets will be assessed in depth and complemented in T3.3.

T3.3 Extend waste stream composition assessment to enable assessment of SRM recoverability (TUB, Empa, Chal, WF, BRGM, UNITAR, UCL, SGU, GeoZS, GTK, VITO, LMU, Eco, Repic, Erion, BGR) (M19-M36) The task will develop and establish a framework for composition analyses, to enable the future exploitation of SRMs. Through statistical data analysis, literature research, waste stream specific recovery trials and extended batch tests and stakeholder workshops, the composition aspects that affect technical recoverability, environmental and economic impacts of SRMs, will be identified. This task will extend the assessment of T3.2 by including information on grades and their variability, and SRMs associations and hazardous substances. In addition, this task will analyse upcoming product-centric reporting (e.g. digital product passport, digital logbooks for buildings and harmonised recyclability assessment). The outcomes (D3.1) are used in T2.5 and T1.2 and T1.3.

Deliverables

D3.1 Extended waste stream composition assessment to enable SRM assessment (M34) Will summarise per waste stream how composition influences factors of recoverability (technical, economic, environmental, legal) and how specification can be extended to enable SRM assessment and suggest methodologies for consistent waste characterisation and product composition reporting.

WP4	Stock and Waste Flow Characterisation										Lead		UNITAR													
Partic. #	1	2	3	4	5	6	7	8	9	10	12	13	14	16												
Name	WF	Repic	Erion	Eco	TUB	UCL	Chal	RECH	BRGM	GTK	GeoZS	ULEI	<u>Unitar</u>	LMU												
PMs	4	3	3	3	14	19	12	1	17.5	6	10	32	36	2												
Partic. #	18	19	24																							
Name	SGU	DKu	Empa																							
PMs	6	4	12																							
Start	M1	End		M30																						
WP4 will create a consistent dataset of stocks and flows of SRMs with an attention to CRMs found in the WEEE, BAT, ELV, CDW, MINW, SLASH at MS level for the EU, and other countries.																										
All datasets will cover 2010 until 2050, consistent with current official statistics, relevant studies, industry data, national registries, sorting analysis, etc. Where possible, georeferenced data (obtained through satellite-based earth observation), detailed statistics, or using sensible proxies (such as demographic data) to create sub-national datasets, preferably at NUTS 2 or 3 level depending on user needs from WP7. It will be followed by creating a gap filling, data imputation and consistency between the various stocks and flows. The methodology will depend on data availability and characteristics of that waste type (see more in the methodology section), and it will be ensured that stocks and flows are mathematically consistent and harmonised.																										
T4.1 Quantify stocks and flows of ProSUM streams (<u>UNITAR</u>, TUB, Empa, Chal, WF, RECH, DKu) (M01-M24) quantifies the stocks for WEEE, BAT, ELV following the ProSUM methodology including the expanded scope of WEEE embedded in ELV. It will harvest, clean, harmonise the data, and apply relevant modelling and gap filling methods. The flows will be researched for waste generation, separate (formal) collection, collection in mixed waste streams (for instance in municipal solid waste, or metal scrap), exports of used items, transboundary movement of waste, and undocumented waste flows.																										
T4.2 Quantify stocks and flows of CDW, MINW, SLASH (ULEI, TUB, BRGM, GeoZS, GTK, SGU, UCL) (M01-M24) further develops the methodology and collect data for CDW, MINW, SLASH. Data on MINW based on mine waste data collection strategy based on 4 strategies, and SLASH using official statistics data and also data from industry associations reports, based on the production to which they relate (e.g. steel production) (see 1.2.1.4). CDW waste using satellite data and material intensities.																										
T4.3 Quantify SRM stocks and flows (<u>UNITAR</u>, TUB, Empa, Chal, BRGM, WF, ULEI, GeoZS, GTK, SGU, Eco, Erion, Rep, LMU, DKu) (M18-M36) : characterises and quantifies the SRMs for all six waste streams by combining information from T4.1 and T4.2 on the product stocks and flows with the compositional assessment of T3.2, and integrate this with additional data, e.g. from industry reporting on WEEE on recovery of SRMs and uncertainty analysis using Monte Carlo simulation. The outcomes (D4.1) will be used in T2.5.																										
Deliverables																										
D4.1 Future trends of SRMs and CRMs (M36) Report and dataset on the quantities, data sources of SRMs supply from stocks and flows.																										

WP5	Secondary raw material availability assessment in line with the United Nations Framework Classification for Anthropogenic Resources										Lead	LMU		
Partic. #	2	3	4	5	6	9	10	11	12	13	14	15	16	18
Name	Repic	Erion	Eco	TUB	UCL	BRGM	GTK	VITO	GeoZS	ULEI	Unitar	WC	<u>LMU</u>	SGU
PMs	4	4	4	15	30	13	10	11	6	9	19	10	60	24
Partic. #	20	21	22	23	24	25	27	28						
Name	BOL	BU	Mace	Lovis	Empa	OM	GRS	EMR						
PMs	7	6	1	7	10	1	1.5	1						
Start	M3	End		M36										

Development of a methodology to assess the recoverability of SRMs and demonstrate its application to the six waste streams at different scales (e.g. project or regional).																								
T5.1 Map current practice, gaps and future needs for SRM availability assessments (<u>LMU, UCL, SGU, VITO; Empa, GTK</u>) (M03-M18) . The communication of recovery project viability according to the UNFC requires a comprehensive resource availability assessment. This task will use internal workshops, stakeholder consultations (from WP7), and literature reviews to determine current practice for resource availability assessments, and identify the gaps and future needs in the context of a sustainable circular economy. In detail, this task covers the following steps: (1) Definition of the key factors (e.g., economic, environmental, social, policy/legal, technological) that impact the viability of recovery projects and are represented on the UNFC E-, and F- axes, and methods to assess the degree of confidence of future quantities to be produced by a recovery project (UNFC G-Axis); (2) Identification of methods to assess the key factors; (3) Development of a multi-criteria assessment method to integrate the resource availability assessment results into the UNFC. The outcome will be a draft methodology to assess the viability of recovery projects in alignment with the UNFC.																								
T5.2 Use case studies to test, further develop, validate and demonstrate the new concept in line with the UNFC (<u>LMU, BRGM, BOL, Empa, GTK, Lovis, UCL, UNITAR, SGU, TUB, VITO, WC, ULEI, BU, GeoZs, Erion, Repic, Eco OM, Mace, EMR, GRS</u>) (M14-M36) . The draft methodology from T5.1 will be used to test and further develop UNFC case studies (A) at site-specific (project) and (B) national level, and the results will be used to develop a guideline for resource assessment. In a first phase, the draft methodology, including factors, methods, and scoring against the three E-, F- and G-axes of the UNFC will be tested for the six waste streams; and then iteratively improved and validated in a second phase, by their application to additional case studies (see 1.2.1 for list of case studies). Development of case studies will take place in interaction with the industry partners and other stakeholders, to enable feedback and improvement, for development of efficient user-friendly protocols, and also ensure their practicability for identification of the drivers and bottlenecks for SRM recovery. The outcomes (D5.1) and experiences will be further used in T1.3 to draft a reporting standard in line with the UNFC.																								
Deliverables																								
D5.1: Reports of the case studies for SRM availability assessment in alignment with the UNFC (M27, M36)																								
Each of the case studies will be described in a separate report section, according to an agreed format on how to present method and outcomes of the case study. M27 will cover 7 case studies, and, by M36, 19 will have been performed.																								
WP6	Development of data information system for EU											Lead	BRGM											
Partic. #	1	5	9	10	11	12	13	14	16	17	18	24												
Name	WF	TUB	<u>BRGM</u>	GTK	VITO	GeoZS	ULEI	Unitar	LMU	SPI	SGU	Empa												
PMs	2	2	20	3	2	12	3	4	6	2	2	2												
Start	M3		End		M47																			
The main objectives are to structure, ensure the consistency (EarthRessourceML compliance) of datasets in other WP2-5 and build an API to disseminate final datasets of the project using INSPIRE-compliant web-services.																								
T6.1. Data model, registries and harvesting for SRM-KB dissemination portal (<u>BRGM, GeoZS, GTK, Empa, LMU, ULEI, UNITAR, TUB, SGU, VITO</u>) (M3-M12) In ProSUM a data model was developed for ELV, WEEE, MINW and BAT. In EGDI there is a specific data model for MINW. However, new waste streams will be covered in FutuRaM and new data models would be required. Additionally, UNFC classification would need probably the addition of new items in data models based on WP4 of Mintell4EU project. This task will build a data model for SRM-KB which is EarthResourceML-compliant. A catalogue of metadata will also be built and implemented in this task, and the harvesting of catalogue and existing data will also be made. A particular focus will be given on the consistency of all data generated and produced in the project. Finally, the series of structured and standardised files containing the data sets to be further harmonised and integrated in SRM-KB will be injected in the database. Technical WP leaders will be implicated in order to give specifications.																								
T6.2. API: Injection web services and diffusion web services (<u>BRGM, GeoZS</u>) (M12-M36) FutuRaM aims to produce a web site that is not ‘dead-end’, but to settle the basement of a digital twin for secondary resource in the EU. Once the model, data and catalogue will be settled in T6.1, this task will handle the requirements specifications and the development of INSPIRE-compliant web services to be able to inject data and registries, and to diffuse data. The compliance of these services will make the use of SRM-KB possible for external diffusion platforms (such as EGDI), and will let third parties use these data. FutuRaM aims to deliver data and services to be re-used																								

by stakeholders, citizens or companies to create extra-value services. Moreover, the architecture of web-services will allow the ecosystem of FutuRaM to be alive after the project: any stakeholder will be technically able to update catalogue and data. A protocol for database updating will be included in the deliverable and will feed the more global reflection on FutuRaM updates done in WP1.

T6.3. Web site: developing the SRM-KB in EU (BRGM, SPI, WF, UNITAR, ULEI, LMU). (M12-M47). This task will be related to T7.2 from WP7 and will identify the needs for FutuRaM dissemination portal coming from different stakeholders' categories. These needs will be converted into specifications for the architecture of FutuRaM portal. The website will be a stand-alone application, but it will be also an example of the use of injection and diffusion web-services designed in T6.2 (D6.1).

Deliverables

D6.1 SRM-KB dissemination portal (M47) The portal will permit access to full data sets produced in FutuRaM based on APIs developed in WP6. Tools and architecture will be constructed considering feedback from waste stream and WP leaders, stakeholders, and end users. Additionally, links with RMIS and EGDI are expected.

WP7	Communication, Dissemination & Exploitation										Lead	SPI		
Partic. #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name	WF	Repic	Erion	Eco	TUB	UCL	Chal	RECH	BRGM	GTK	VITO	GeoZS	ULEI	Unitar
PMs	26	2	2	1.5	6	3	3	1	7	4	3	4	6	10
Partic. #	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Name	WC	LMU	<u>SPI</u>	SGU	DKu	BOL	BU	Mace	Lovis	Empa	OM	BGR	GRS	EMR
PMs	2	9	36	4	1	3	3	0.5	3	5	0.5	2	0.5	0.5
Start	M1		End		M48									

To ensure that FutuRaM activities and results are widely known by stakeholders, to secure and build interest in the research and results, and develop a plan to ensure the longevity of the outputs.

T7.1: Communication, dissemination and exploitation (CDE) plan (SPI, all) (M1-M48) A CDE plan (D7.2) will be developed early in the project (M6) and will build on the draft plan in Section 2.2. The task will also develop dissemination and exploitation measures to ensure FutuRaM legacy and ongoing exploration of the KERs. Stakeholders identified in T7.2 will be central to the plan.

T7.2: Stakeholder mapping, consultation and engagement (WF, all) (M1-M48) This will focus on mapping, recruiting and coordinating thought leaders, experts and other FutuRaM stakeholders and consulting and engaging with them to support all other WPs. A formal FutuRaM Stakeholder Network will be established. A report (D7.1) relating to the identification of stakeholders will be developed by M3 and updated every 12 months. As well as specific data gathering sessions, consultation will take the form of: Co-creation workshops; Business modelling sessions; Capacity building sessions; Policy meetings specific to the case studies; UNFC workshops and Statistics meetings (see Table 4 for further details). In addition, a Policy Working Group of partners and stakeholders will be established that will provide steer and recommendations on the exploitability of the results from a policy perspective. An Advocacy Report (D7.4) will be developed to reflect the outcomes of these meetings.

Task 7.3: FutuRaM business plan (SPI, WF, BRGM, UNITAR, ULEI) (M1-M48) This task will use the outputs of Tasks 7.1 & 7.2 to develop a detailed business plan which will identify go-to-market strategies, based upon the unique market structures and characteristics per potential user base. Business and financial planning will be supported by methods outlined in Section 2.2 (D7.3). This task will be closely tied to T7.2 using the ongoing consultation sessions to develop the business plan and strategy.

T7.4 Communication & dissemination tools and activities (WF, all), (M1-M48) Here the project will develop the digital and hard copy communication and dissemination materials that will be used by all partners and other organisations associated with FutuRaM. These tools and activities are outlined in Table 4. Promotion, distribution and use of these materials will be coordinated by WF, utilising consortium networks and tools. A record will be kept of the audiences reached through the communication materials.

T7.5 Dissemination (SPI, all) (M1-M48) The task will ensure dissemination opportunities are taken with regards to distributing FutuRaM results at key stages using the most effective channels from those outlined in Table 4. As well as producing items such as deliverable reports and the project final report and event, FutuRaM will target

presentations at relevant conferences and produce articles for scientific/peer reviewed journals. FutuRaM will organise four project events for disseminating results, communicating next steps and engaging with stakeholders.

T7.6 Clustering activities (WF, all partners), (M1-M48) The primary objective here is to engage with other relevant projects and initiatives identified in T7.2. As well as former and existing projects, there are those that will be funded under Horizon Europe e.g. under CL4-2021-RESILIENCE-01-06 and CL5-2021-D3-01-16. FutuRaM will explore the opportunities for cooperation and joint activities on cross-cutting issues, as well as sharing of results. Examples of projects and initiatives form part of Section 1.2.2 The consortium will contribute to the EC's assessment of the feasibility of establishing a market observatory for key SRMs, as required by the 2020 Circular Economy Action Plan.

Deliverables

D7.1 Report on stakeholder groups and relevant initiatives and projects identified (M3) will outline the key stakeholder groups, initiatives and projects with which FutuRaM can exchange information in a structured fashion.

D7.2 Communication, dissemination & exploitation plan (M6) will outline the project's CDE strategy i.e. objectives, KPIs, tools, methods and activities to engage with stakeholders throughout the project duration.

D7.3 Business plan to ensure sustainability in the long-term (M47) will support the financial sustainability of the project's KERs, describing the most suitable business, financial, governance, legal and operational models, target markets, early adopters, communication channels and tools.

D7.4 Advocacy Report (M47) will highlight parameters necessary to ensure the sustainability of good practices, also containing a set of recommendations for policymakers that would support the institutional uptake of the project's KERs.

D7.5 Project Final Report (M48) Will report the results of the whole project.

WP8	Project Management									Lead		WF		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Name	<u>WF</u>	Repic	Erion	Eco	TUB	UCL	Chal	RECH	BRGM	GTK	VITO	GeoZS	ULEI	Unitar
PMs	26	2	2	1.5	4	2	2	1	4	2	2	2	4	16
Partic. #	15	16	17	18	19	20	21	23	24	26				
Name	WC	LMU	SPI	SGU	DKu	BOL	BU	Lovis	Empa	BGR				
PMs	1	4	4	2	1	2	1	2	5	1				
Start	M1	End		M48										

WP8 ensures effective management and co-ordination of the project to achieve the aims defined in the project Grant Agreement through coordination of actions, monitoring of the research progress, accurate reporting, risk and quality management, and knowledge and IPR management.

T8.1 Consortium & Admin Management, and Governance (WF, Repic, Erion, Eco, TUB, UCL, Chal, RECH, BRGM, GTK, VITO, GeoZS, UNITAR, WC, LMU, SPI, SGU, DKu, BOL, BU, Lovis, Empa, BGR) (M01-48). This task will oversee the management of all aspects of the project including internal project communication between partners and between the parts of the management structure (Consortium (GA), Project Management Team (PMT) and Project Office (WF & UNITAR)). It includes administering and chairing biannual meetings of the Consortium and of the PMT. Consortium meetings will include addressing research and administrative topics covering project progress, resource use, exploitation and any issues that may arise. The PMT (monthly online meetings) will comprise the WP Leaders and ensure integration of research efforts, report regularly on progress and action on issues. Administrative management will include overseeing the project filing system and contact management system. Governance will determine the mechanisms for engagement and decision making are adhered to and the management structure of the project is maintained. A project management plan will be developed by M03 (Milestone 1).

T8.2 Scientific Management (UNITAR) (M01-48) The scientific management of the project will be undertaken by UNITAR in its role as Scientific Coordinator. UNITAR will ensure that deliverables, milestones and tasks are completed effectively and on-time and that the overall research objectives of the project are being effectively coordinated and met. UNITAR will also deal with any disputes with regards to the scientific and research direction of the project.

T8.3 Reporting and Legal & Financial Management (WF, Repic, Erion, Eco, TUB, UCL, Chal, RECH, BRGM, GTK, VITO, Goezs, UNITAR, WC, LMU, SPI, SGU, DKu, BOL, BU, Lovis, Empa, BGR) (**M01-48**) A six-monthly internal reporting system will be established to gather and monitor financial and effort information from all partners and Affiliated Entities. The formal periodic technical and financial reports will be delivered to the European Commission for the periods M01-18, M19-36 and M37-48. WF will be the single point of contact for the EC, responsible for the preparation and submission of all documentation, enquiries and discussions as well as maintaining and updating the Grant and Consortium Agreements.

T8.4 Risk Management. (UNITAR, Empa, ULEI, TUB, LMU, SPI, WF) (**M1-48**) UNITAR will be responsible for managing the Risk Register for the project. This will be created and submitted in M03 and based on the critical risks and mitigation measures identified in

Table 11. The Risk Register will be discussed at meetings of the PMT and Consortium and updated and submitted to the EC as part of each periodic report. WP leaders will contribute to updating the Risk Register.

T8.5 Data Management Plan (DMP). (Empa, BRGM, ULEI, TUB, LMU, SPI, WF, UNITAR) (**M01-M48**) A DMP will be developed for the project and delivered in M05. This will also cover IPR and will be updated and re-submitted to the EC as part of each periodic report. Data management is discussed earlier in Section 1.2.6.

T8.6 Advisory Board (WF, UNITAR) (**M01-48**) is administered by WF and chaired by UNITAR. The FutuRaM Advisory Board (see 3.2.3 for further details on its members) is a further insurance to our scientific and technical quality and soundness. The AB will guarantee that a wide network of allies and change agents provides important input, other relevant actors are identified, and the network is extended. The AB will meet two times per annum, once online and once face to face. Face to face meetings will be combined with in-person FutuRaM events. At other times contact will be made when input is required to a specific task of the project. The mechanism for AB engagement will be outlined in the Terms of Reference drawn up, agreed and signed by M3 (Milestone 2).

T8.7 Ethics requirements (WF, UNITAR) (**M01-48**) will define the ethics requirements that the project must comply with in accordance with the EC. This task concerns the ethical issues arising from any research involving the processing of personal data (POPD) regardless of the method used (e.g. interviews, questionnaires, direct online retrieval, etc.) and, specifically, the POPD - Requirement No. 2 (corresponding to providing detailed information on the procedures that will be implemented for data collection, storage, protection) of which procedures will be implemented complying with national and EU legislation (e.g. General Data Protection Regulation).

Deliverables

D8.1 Risk Register (**M03**) will detail the risks to the delivery of the project, their likelihood and severity plus mitigation measures. It will be formally updated as part of the Periodic Technical Reports

D8.2 Data Management Plan (**M05**) will describe the data management lifecycle for the data to be collected, processed and generated by FutuRaM, as well as an outline of IPR for the project. It will be formally updated as part of the Periodic Technical Reports.

D8.3 Procedures on Ethics Requirements (**M03**) A description of the technical and organisational measures that will be implemented to safeguard the rights and freedoms of the research participants will be defined.

Table 9: List of Deliverables

DEL	Deliverable name	WP #	Lead Part'	Type	Disse m' level	Deliv' date (M)
D1.1	Consolidated and harmonised FutuRaM concepts, methods, models, procedures and recommendations	1	Empa	R	Pub	42
D1.2	Proposal on SRMs statistics to the EC	1	UNITAR	R	Pub	45
D1.3	Draft reporting standard in line with UNFC	1	Empa	R	Pub	45
D2.1	Report on environmental and socio-economic barriers to SRM recovery	2	ULEI	R	Pub	47
D3.1	Extended waste stream composition assessment to enable SRM assessment	3	TUB	R	Pub	34
D4.1	Future trends of SRMs and CRMs	4	UNITAR	R	Pub	36
D5.1	Reports of case studies for SRM availability assessment in alignment with the UNFC	5	LMU	R	Pub	27, 36
D6.1	SRM-KB dissemination portal	6	BRGM	O	Pub	47

D7.1	Report on stakeholder groups and relevant initiatives and projects identified	7	WF	R	Pub	3
D7.2	Communication, dissemination & exploitation plan	7	SPI	R	Pub	6
D7.3	Business plan to ensure sustainability in the long-term	7	SPI	R	Pub	47
D7.4	Advocacy Report	7	SPI	R	Pub	47
D7.5	Final Project Report	7	UNITAR	R	Pub	48
D8.1	Risk Register	8	WF	R	Pub	3
D8.2	Data Management Plan	8	EmPa	R	Pub	5
D8.3	Procedures on Ethics Requirements	8	WF	R	Pub	3

Table 10 List of Milestones

M #	Milestone name	W P	Due date (M)	Means of verification		
1	Project Management Plan	8	3	Project Management Plan circulated to the Consortium		
2	Advisory Board Terms of Reference signed	8	3	Signed AB Terms of Reference available		
3	Public Website	7	4	Public website live.		
4	Co-creation workshops for the identification of end-user needs	7	5,18,24, 30,40,44	Workshops are organised and held. WP5 (M5, M18 and M30). Capacity building (M40). Business modelling (M24, M44). 3 Co-creation workshops around M18, one Internal M5		
5	Scientific management meetings held	8	6,12,18,24, 30,36,42	Meetings held and minutes produced		
6	FutuRaM conceptual and methodological framework	1	12	Internal report is available		
7	Composition data templates for SRMs assessment for each waste stream	3	12	Templates on material composition WP3 are available for Project partners		
8	Database modelling and harvesting implementation	6	12	Report is available that covers SRM-KB data model for all the waste streams.		
9	PWG meetings held	7	12,18,24,30 ,36,42,40	Policy meeting held and minutes produced		
10	FutuRaM events including final event	7	12, 24, 36, 48	Meetings held and minutes produced		
11	Mapping of published scenarios and Storyline/scenario description	2	18	Dataset on available scenarios is fed into D1.1 and qualitative descriptions of 3 futures for the six waste streams are circulated		
12	Consolidated dataset on composition data for SRMs	3	18	Datasets on consolidated composition data for SRMs potential assessment ready for T4.3		
13	Concept of UNFC methodology	5	18	Report that covers literature review, stakeholder consultation and concept for methodology		
14	Periodic Technical Report	8	18, 36, 48	Formal report to the EC for each project period		
15	Updated version of the CDE plan	7	18, 30, 42	Revised versions of the CDE plan produced and circulated to consortium		
16	Updated stakeholder mapping	7	18, 30, 42	Revised versions of stakeholder mapping report produced and circulated to consortium		
17	Mapping of future technologies for each sector	2	20	Dataset covering sector-specific current and emerging technologies in both the production of products and their end-of-life treatment made available to WP1 Lead and consortium members, including quantitative descriptions of future product market shares related to 6 waste streams		

18	Consolidated dataset on stocks and flows	4	18	Dataset on stocks and flows for all six waste streams ready for the T4.3
19	Roadmap for the market introduction of KERs	7	30	Roadmap document produced and provided to the Consortium
20	Integration of social, environmental, and economic assessments	2	36	Social, environmental, and economic impacts of SRM recovery have been quantified for each scenario and waste stream. Information delivered to the consortium.
21	API and web-services specifications and protocol for database updating	6	36	API and web services are ready to be used in the task 6.3. Technical guidelines are revised.
22	Guidelines for utilising the SRM-KB platform	7	42	Guidelines document available

Table 11 Critical Risks for Implementation

Description of risk (level of likelihood P; Severity S: Low/Medium/High)	WP	Proposed risk-mitigation measures
Administrative risks		
Partner leaving the consortium ($P = \text{low}$; $S = \text{medium}$)	All	Tasks assigned to the leaving participant will be reallocated among the consortium or new participant could be invited and integrated to the consortium.
Underperforming participants, deliverables not on schedule ($P = \text{low}$; $S = \text{medium}$)	All	Regular follow-up of progress and work packages; possible deviations and discrepancies will be taken to MC for resolution; realised risks will be handled by the GA.
Key persons leaving or not available ($P = \text{medium}$; $S = \text{low}$)	All	Nomination of reserve person for WP leaders and other key persons during the project.
Financial Risks		
Inadequate funding ($P = \text{low}$; $S = \text{medium}$)	All	Mitigated by regularly comparing the work plan to the actual progress. PMT will prioritise work to achieve the deliverables even when the budget is stretched.
Bankruptcy (or other force major) of a partner ($P = \text{low}$; $S = \text{medium}$)	8	Possible needs for reallocation of budget between different WPs and/or participants may be considered, also the possibility to involve a new partner will be considered.
Technical and Operational Risks		
Insufficient communication among partners and WPs may cause delays in deliverables and make fulfilment of objectives challenging ($P = \text{medium}$; $S = \text{medium}$)	All	Roles and responsibilities between participants will be clearly defined in project meetings. Up-to-date communication is ensured by organising meetings and tele-meetings at regular intervals within WPs. Coordinator will monitor needs for cross-WP meetings and organise these meetings when necessary.
New COVID-19 wave after project begins ($P = \text{medium/high}$; $S = \text{low}$)	All	All participants have experience in working digitally. At the start of the project as part of the project management plan a COVID-19 risk management plan will be integrated to assess what-if impacts on on-site physical in-person activities
Exploitation, dissemination and communication risks		
Target audience not reached ($P = \text{low}$; $S = \text{high}$)	7	Updates to the CDE plan & stakeholder mapping; use of optimum tools and channels; relevant materials (content based on audience/target group, visual aspects and interactive means).
Conflicts in ownership and user rights of results ($P = \text{low}$; $S = \text{high}$)	7	Defined in the CA; transparent and efficient Exploitation Plan. Timely identification of new results and agreement of ownership and user rights between contributing partners.
Results fall in the area in which IPR is not owned by the consortium ($P = \text{low}$; $S = \text{high}$)	All	If results fall in the area in which IPR is not owned by the consortium, licensing possibilities are investigated or research is redirected.

Barriers and obstacles to achieving impacts		
Discrepancies in method, data quality, uncertainty analysis and gap filling ($P = medium$; $S = low$).	1-5	The methodology is harmonised in WP1, and will follow the similar approaches.
Lack of scenarios, emerging technologies and data for a specific sector in the academic and/or grey literature ($P = medium$; $S = low$).	2	FutuRaM will work with industry experts to establish realistic scenarios for the sector in question.
Data may fall under confidentiality restrictions ($P = high$; $S = low$).	3	Confidential dataset will be handled under NDAs and only be made available in aggregated or anonymised formats
Insufficient data on lifespans, waste product flows, primarily in the unreported, mixed and informal collection streams ($P = high$; $S = low$).	4	The consortium has key partners that cover expertise which will allow the project to have better insights in order to fulfill this task, and to also find academically sound statistical models and already proven statistical gap filling methodologies.
Complexity of the case studies to draw a general methodological approach ($P = medium$; $S = medium$).	5	The consortium has key partners and industry partners that cover expertise to develop efficient data reporting frameworks, despite methodology complexities, which will limit the risk.

Table 12 Summary of Staff Effort

#/name	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	Total
1. WF	3.0	3.0	1.5	4.0	-	2.0	26.0	26.0	65.5
2. Repic	-	-	2.0	3.0	4.0	-	2.0	2.0	13.0
3. Erion	-	-	3.0	3.0	4.0	-	2.0	2.0	14.0
4. Eco	-	-	3.0	3.0	4.0	-	1.5	1.5	13.0
5. TUB	20.0	21.0	53.0	14.0	15.0	2.0	6.0	4.0	135.0
6. UCL	8.5	7.0	17.0	19.0	30.0	-	3.0	2.0	86.5
7. Chal	3.0	10.0	9.0	12.0	-	-	3.0	2.0	39.0
8. RECH	-	1.0	1.0	1.0	-	-	1.0	1.0	5.0
9. BRGM	10.0	8.0	15.0	17.5	13.0	20.0	7.0	4.0	94.5
10. GTK	3.0	2.0	6.0	6.0	10.0	3.0	4.0	2.0	36.0
11VITO	15.0	4.0	20.0	-	11.0	2.0	3.0	2.0	57.0
12. GeoZS	1.0	-	8.0	10.0	6.0	12.0	4.0	2.0	43.0
13. ULEI	11.0	46.0	8.0	32.0	9.0	3.0	6.0	4.0	119.0
14. UNITAR	12.0	19.0	18.0	36.0	19.0	4.0	10.0	16.0	134.0
15. WC	-	-	-	-	10.0	-	2.0	1.0	13.0
16. LMU	20.0	21.0	4.0	2.0	60.0	6.0	9.0	4.0	126.0
17. SPI	3.0	-	-	-	-	2.0	36.0	4.0	45.0
18. SGU	8.0	1.0	9.0	6.0	24.0	2.0	4.0	2.0	56.0
19. DKu	-	-		4.0	-	-	1.0	1.0	6.0
20. BOL	-	-	1.0	-	7.0	-	3.0	2.0	13.0
21. BU	-	-	-	-	6.0	-	3.0	1.0	10.0
22. MACE	-	-	-	-	1.0	-	0.5	-	1.5
23. Lovis	-	-	1.0	-	7.0	-	3.0	2.0	13.0
24. Empa	28.0	8.0	14.0	12.0	10.0	2.0	5.0	5.0	84.0
25. OM	-	-	-	-	1.0	-	0.5	-	1.5
26. BGR	6.0	-	5.0	-	-	-	2.0	1.0	14.0
27. GRS	-	-	1.5	-	1.5	-	0.5	-	3.5
28. EMR	-	-	-	-	1.0	-	0.5	-	1.5
Total	151.5	151.0	200.0	184.5	253.5	60.0	148.5	93.5	1,242.5

Table 13 Subcontracting Costs Items

1/WF	Cost (€)	Description of tasks and justification
Subcontracting	193 750	This is to enable the input of Ulrich Kral who works for Environment Agency Austria (EAA). Mr Kral has been pivotal in the development of FutuRaM but the EAA cannot join the consortium as a beneficiary due to its internal financial structure. However, it has committed to allowing Mr. Kral to be involved in the project as a subcontractor (subject to a successful tender). Mr. Kral is an expert in the assessment of material flows from sources to final sinks to manage use resource use. He chairs the Anthropogenic Resource WG, as mandated by the UNECE Expert Group on Resource Management; his role has been central to the development and promotion of the UNFC. EAA's contribution will be in key areas of the project, including data acquisition in Austria and project internal review cycles in alignment with UNFC, that would complement and extend the consortium's ability to deliver an excellent result. Furthermore, the EAA governmental network will open further doors to stakeholders in regulation and policy making. Tasks are defined and the contract will focus on outputs.
3/Erion		
Cost (€)	Description of tasks and justification	
Subcontracting	20 000	Batch tests of WEEE to be performed in treatment operators' facilities during WP3. This will allow for an assessment of the content of the WEEE stream coming into the facility and to understand downstream movement. Erion does not have the in-house ability to do this.
5/TUB		
Cost (€)	Description of tasks and justification	
Subcontracting	15 000	For batch test technical support plus a calibration of a sensor-based onsite measurement device. This will assess WEEE and battery flows central to the work of WP3. TUB does not have the in-house ability to perform this.
9/BRGM		
Cost (€)	Description of tasks and justification	
Subcontracting	200 000	For IT developments in WP6: implementation of the specific APIs and harvesting; implementation of specifications for vocabulary and semantics; final dissemination portal web development. To enable enhanced features of the SRM-KB to be developed to improve user experience.
10/GTK		
Cost (€)	Description of tasks and justification	
Subcontracting	80,000	To perform drilling and sampling during the Otanmaki mine case study in WP5. GTK cannot deliver in-house.

Table 14 Purchase Costs Items – where Purchase Costs exceed 15% of Personnel Costs

1/WF	Cost (€)	Justification
Other goods, works and services	107,500	WF holds the comms budget for the project. This includes for website, design, project events, videos, infographics etc.
	40 000	Update of the RepTool platform with CRM data
	50 000	Hosting of consortium meetings
Remaining purchase costs	60 500	
Total	258 000	
3/Erion		
Cost (€)	Justification	
Other goods and services	15 000	Publication of article in prominent Italian online magazine with a focus on raw materials and important to citizens.
Remaining purchase costs	7 800	
Total	22 800	
8/RECH		
Cost (€)	Justification	
Travel and subsistence	7 200	To enable attendance at consortium meetings
Remaining purchase costs	0	
Total	7 200	
12/GeoZS		
Cost (€)	Justification	
Travel and subsistence	25 400	For attendance at consortium meetings but also travel for consultation and case study work.
Remaining purchase costs	8 000	
Total	33 400	
10/GTK		
Cost (€)	Justification	
Travel and subsistence	23 400	For attendance at consortium meetings but also travel for consultation and case study work.
Remaining purchase costs	28 000	
Total	51 400	

18/SGU	Cost (€)	Justification
Travel and subsistence	30 000	For attendance at consortium meetings but also travel for consultation and case study work.
Remaining purchase costs	56 000	
Total	86 000	
17/SPI	Cost (€)	Justification
Travel and subsistence	29 700	Attend consortium meetings and consultation meetings
Other goods and services	32 000	Rooms etc. for 16 x consultation meetings
Remaining purchase costs	6 000	
Total	67 700	
23/Lovis	Cost (€)	Justification
Other goods and services	50 000	Sampling and analysis in case study work
Remaining purchase costs	7 400	
Total	57 400	
21/BU	Cost (€)	Justification
Other goods and services	25 000	Drilling, sampling, laboratory testing, stakeholders consultations for case studies
Remaining purchase costs	7 200	
Total	32 200	
26/BGR	Cost (€)	Justification
Travel and subsistence	26 000	Attend consortium and other project meetings and involvement in consultations
Remaining purchase costs	9 000	
Total	35 000	

3.2 Capacity of participants and consortium as a whole

3.2.1 Consortium as a whole

The FutuRaM consortium has a well-balanced composition of interdisciplinary skills that brings together a wealth of expertise, entrepreneurial spirit, well-established businesses, reputable network organisations and top researchers, including partners having access to critical datasets, and networks covering the entire value chain. Each of the participants in the project covers complementary expertise and has demonstrated to effectively cooperate and deliver as it is built around previous large EU successful research projects. The presence of main actors in the whole value chain demonstrates the critical mass of complimentary resources that will enable the FutuRaM project to achieve its targeted societal, industrial, and scientific goals. Each partner has a clearly defined role within the project and will contribute specific expertise that will enable the project success.

3.2.2 Access to critical infrastructure

The project partners have the infrastructure critical for the execution of FutuRaM. **Computing power for heavy calculations** can be performed in the [ALICE \(Academic Leiden Interdisciplinary Cluster Environment\)](#), which is the high-Performance Computing facility of the Leiden University. Critical data for the project can be accessed from various sources, which is needed throughout the entire project, such as from [European Geological Data Infrastructure](#), which is European Geological Data Infrastructure, providing access to Pan-European and national geological datasets and services from the geo-surveys of Europe, and the [Mintell4EU Application](#), which collects statistical data related to the mineral resources and reserves and production on country level. **Critical datasets from industry** will be coming from [RepTool](#) (WF, Erion, Eco, REPIC) which will be expanded to cover mass balance information on SRMs and, in particular, CRMs in WEEE, and other [industry in-situ measured datasets](#) and national logistics and waste treatment operator from industry and producer compliance partners of WEEE (WF, EMR, WC) and BAT (RECH, GRS) in the project, CDW (ULEI, UCL, MACE), MINW and SLASH (GeoZS, BRGM, BOL, OM, SGU, BU, GTK., VITO). Many institutes own **experimental platforms, laboratories** (GeoZS, BRGM, SGU, GTK, LMU, WC, BOL, ULEI), which will be used to gather in-situ data required for the case Studies in WP5. For instance, [Field surveying equipment](#) is available such as georadar with array of antennas, equipment for seismic reflection measurements, borehole logging system, sampling system with shallow corers, [Material characterisation laboratories](#) for samples preparation systems, with modern analytical and observational techniques to characterise (geo-)materials including raw material extraction, pollutant dispersion etc) and remote sensing, X-Ray computed tomography (XCT) and the recently ordered Field Emission gun electron probe microanalyser, etc. Several institutes have **Pilot plants** (GTK, BRGM) on to develop innovations for mineral grinding and beneficiation processes and to provide research services for different industries. is an experimental pilot facility for the treatment of mineral raw materials, waste and industrial by-products, or own large **industrial plants** (BOL, WC, GRS, EMR) where waste is treated, refined, and/or smelted into final SRMs ready for the market.

3.2.3 Complementarity and value chain approach

Each of the participants in the project covers complementary expertise and roles along the value chain:

Research (RO) partners comprise researchers from top EU research institutes, leading Geological Surveys to be able to achieve the high-quality data for all waste streams (977 person months (PM), 79% of total). The institutes comprise the leading partners from the ProSUM project (UNITAR, Empa, TUB, Chal, BRGM, GeoZS, SGU, DKu); and partners strongly involved in the development of UNFC for Anthropogenic Resources Resources as well as one vice-chair of the UNECE EGRM (Erika Ingvald from SGU and we also plan to engage the chair) (LMU, VITO, UCL, Empa, BRGM, BU, SGU, GTK, GeoZS, BGR); experts in foresight and scenarios development (ULEI, TUB, Chal, UCL, UNITAR); have strong ties to industry and producers, to get unique industry and producer data (such as micro data from ProSUM and novel in-situ waste and product composition data) into FutuRaM; Produce official statistics on mining activities (BRGM, SGU, GTK, GeoZS, BGR) and co-custodian for monitoring of SDG 12 (UNITAR), having close contacts to official statistics Eurostat and are nationally mandated to work on circular economy monitoring of SRMs and raw materials demand (BRGM, ULEI, BGR, SGU); participate in recycling/recovery experimental projects (BRGM, GTK, VITO, TUB).

Commercial/Industry partners are partners from SMEs (OM, SPI), and large **Industry** (WC, BOL, MACE, Lovis, GRS, EMR) will ensure applicability and usefulness to industry (110PM, 9%). They will contribute to the UNFC case studies in WP5 (Lovis, WC, EMR, MACE, OM, BOL, GRS) lead the exploitation in WP7 (SPI), or contribute with specific expertise (DKu) in WP4.

The **Other Partners** (RECH, WF, and Affiliated Entities: Rep, Erion, Eco) are industry associations or producer responsibility organisations (155.5PM, 13%). They will provide unique and previously undisclosed industry and producer data into the project, use their extensive knowledge to provide expert opinion and access to relevant research (WP3-5), and will contribute industry data and knowledge to WPs2, 3 & 4 and also actively network with the stakeholders they represent and ensure input and dissemination channels (WP7).

All partners have networks across the value chain and good networks among policy makers.

The **Advisory Board**—composed of 16 individuals that have already submitted a letter of interest are world-class researchers, decision-makers in the field of SRMs and mining waste, statisticians, manufacturing and recycling industry and European and global thought leaders representative of the value chains covered by FutuRaM. The AB will guarantee that a wide network of allies and change agents provides important input, other relevant actors are identified, and the network is extended. All AB letters of interest are in Annex 1.

There are also **letters of support (Annex 3)** provided by Tata Steel, Stiftung Auto Recycling Schweiz, ALBA, Serbian Ministry of Mining & Energy, Swiss Federal Department of the Environment, Transport, Energy and Communications, and TU Wien, that state their commitment to providing input to the project covering knowledge and data.

3.2.4 Unique contribution per participant

Each consortium member has demonstrated a long-term commitment to the development of their own research, policy and commercial activities within the industry targeted by the project. All of them, therefore, offer expertise for a lasting integration of activities and the creation of a pan-European culture for the developed FutuRaM. Table 15 gives a brief overview of each partner specific business and their expertise, and the main tasks in the project allocated to them based on that expertise.

Table 15:Project participants and main roles.

No. Name	Cou ntry	Description, role
1. WF	BE	International association speaking for 45 (36 EU) WEEE producer responsibility organisations (PRO). Previously Project Coordinator for ProSUM, involved in 10 FP7/H2020 projects. Admin coordinator and (co-)lead of WP9 with input to WP4-7.
2. Repic	UK	REPIC is the largest PRO for WEEE, BAT and packaging in the UK, REPIC will participate in WP3-5, focused on industry insights, provision of data, and the piloting of case studies.
3. Erion	IT	Erion is the largest Italian PRO for WEEE, BAT and packaging. Affiliated Entity of WF. Involved in several H2020/EIT projects, participate in WP3-5.
4. Eco	FR	Ecosystem is the largest French system PRO for WEEE. Affiliated Entity of WF. Involved in ProSUM, holder of compositional data on WEEE, input in WP3-5.

5. TUB	DE	University with major knowledge about waste characterisation, recycling technologies for ELV, WEEE, BAT. Supported by extensive EOL network partners and in various H2020 projects. Will lead WP3, and participate in WP1, WP2, WP4, WP6, WP7 and WP8.
6. UCL	UK	Leader of £8M UKRI Interdisciplinary Circular Economy Centre for Mineral-based Construction Materials, with 50+ industrial partners; active participant in UNECE Anthropogenic Resources Working Group. CDW; participant in WP1,2,3,4,5,7&8
7. Chal	SE	University with major knowledge on MFA, life cycle assessment and circular economy. Partner in ProSUM and ORAMA, update for the JRC/Ispra on CRMs in vehicles, national projects on circular economy and recycling. Lead task 2.3 and participate in WP1-4,7,8.
8. RECH	BE	EU-Battery Industry assoc., experts in batteries, production and recycling technologies, compositions and environmental impacts. Involved in ProSUM. Participate in WP3,4.
9. BRGM	FR	Geo-Survey of France. Involved in projects like MICA, ProSUM, SCRREEN2, Mintell4EU, ORAMA, PANORAMA, etc., closely working with JRC on the EU RMIS and host of the Urban Mine Platform. Will lead WP6 and participate in WP1-5, 7, 8.
10. GTK	FI	Geo-Survey of Finland. Expert in mine waste data, resource database creation and management (also related to UNFC), and element recovery. Coordinator of ORAMA, Minerals4EU and ProMine projects. Will participate in WP3-6, 7, 8.
11. VITO	BE	Flemish Institute for Technological Research, major knowledge about circular economy, UNFC, MFA, LCA, SLASH, CDW, MINW and BAT. Involved in CHROMIC, METGROW+, MINEA and UNECE EGRM; lead on SLASH and input to WP1-8
12. GeoZS	SI	Geo-Survey of Slovenia. Involved in projects like MINEA, ProSUM, Mintell4EU, etc. Has the registry of mine waste on national level and for the South Eastern Europe area, plays a vital role in developing of European Geological Data Infrastructure. Work on WP1-8
13. ULEI	NL	ULEI is a global pioneer in LCA, MFA, and environmental input output databases. It co-created EXIOBASE and is improving it via the EIT RM project PANORAMA. ULEI will lead WP2 and contribute in all other WPs. ULEI will coordinate the SLASH and CDW stock-flow models and the social and environmental assessments of SRMs recovery.
14. UNITAR	CH/ DE	United Nations Institute for Training and Research (previously UNU-SCYCLE). Previously Scientific Coordinator of ProSUM, and in 13 EU research projects. Major knowledge about WEEE, circular economy and official statistics, Scientific Coordinator and (co-)lead of WP9 and lead in WP4 and provide input to all other WPs.
15. WC	FR	WEEECycling is a recycler company in France, processing producing high purity recycled PGM metals, and pilots with CRMs. Contributor to a case study in WP5 and WP2 foresight.
16. LMU	DE	1st ranking University in Germany. Profound knowledge in (geo)material sciences, mineralogical analysis. Leader of the WG "Classification and reporting of material resources/reserves" within MINEA and vice-chair of the UNECE Anthropogenic Resources Working Group. Leads WG5 and participate in WP1-8.
17. SPI	PT	Private consulting company created in 1996 as an active centre of national and international networks connected to the research and innovation sectors. SPI is leading communication, dissemination, and exploitation activities (WP7).
18. SGU	SE	Geo-Survey of Sweden: ProSUM, Minerals4EU, EURARE, MinLand, SCRREEN, X-Mine. 2017-2022 national project mapping mining waste, supply and risk CRMs. MINW lead and participate WP1-WP8. UNECE EGRM vice-chair.
19. DKu	SE	Expertise in material flow analysis. Partner in ProSUM and update for the JRC/Ispra on CRMs in vehicles. Will participate in WP4, 7 and 8.
20. BOL	SE	Major European mining company including smelter. Owner of Laisvall case study area, participant in several EU projects: MinLand, SUMEX. Contributes to WP5 case study.
21. BU	RS	University of Belgrade, Faculty of Mining and Geology. Members of REESERVE project. Mining waste stream member in FutuRaM, involved in Balkans case studies (WP6).
22. MACE	UK	International construction company; >£2bn turnover (2019); awarded £570M London high speed rail station contract; Providing CDW data (WP3) & case study (WP5)
23. Lovis	SE	Active mining company with exploration permit for the Håkansboda mining waste area. Participants in X-Mine H2020, national project mapping MINW. Contributes to WP5.
24. Empa	CH	Swiss research institute on materials science and technology. Major knowledge about MFA, LCA, BAT, ELV and WEEE. Involved in e.g. MINEA, ORAMA, ProSUM (WP lead), UNECE EGRM, update for JRC on CRM in vehicles. Will lead WP1 and input to WP2-8.

25. OM	FI	Otanmäki Mine Oy is a company planning to reopen the historical Otanmäki V-Ti-Fe mine and remining the old tailings for ilmenite. Provides a case study and UNFC expertise.
26. BGR	DE	Geo-Survey of Germany. Member of SCRREEN1&2. Contributes to WP1, 3, 7 and 8.
27. GRS	DE	A non-profit organization founded by leading battery manufacturers in Germany. GRS operates safe nationwide collection and recycling of batteries in Germany. GRS will support the case study work in WP 5 as well as data collection in WP3.
28. EMR	UK	European Metal Recycling (incl. ELV, WEEE); stakeholder for consultation in WP5; providing data/case study for CDW

The budget proposed for FutuRaM is **€14,154,272** and the maximum EC contribution requested is **€12,673,882**. There are 12 countries present as Partners, Affiliated Entities or Associated Partners.

3.2.5 Industrial/commercial involvement

The six industry partners are central to the delivery of the case studies for FutuRaM and form the backbone of this aspect of the work. These partners cover the six different waste streams and have an interest in testing the UNFC method and applying the data generated by the project to their own situation. These organisations are already advocates of the FutuRaM project and their experience will be essential for convincing other organisations within and outside their sector of the reliability and benefits of the FutuRaM outputs. Moreover, their input, regarding their own needs as end users before during and after the pilots will be key to developing useful and exploitable results that are tailored to relevant industry players. In addition to the formal industry partners in the project, FutuRaM also has letters of support from other industrial organisations, Tata Steel, UK, ALBA recyclers, DE and SA Recycling, CH.

3.2.6 Other countries and international organisations

In FutuRaM, there is a partner from Switzerland, Empa. As Switzerland is a non-associated third state for Horizon Europe, the project has received from the Swiss Federal Department of Economic Affairs, Education & research the financial guarantee for Swiss participants in Horizon Europe projects (see Annex 2). There are also partners from the UK and Serbia, both of which are associated countries under Horizon Europe. There are no other countries from outside EU or ICPC and all three of these countries have Data security agreements

The UN Institute for Training and Research (UNITAR), headquartered in Switzerland, is operating in this project through its SCYCLE Programme under the UNITAR Bonn office. SCYCLE is now in transition from United Nations University to UNITAR and therefore co-hosted by both. Therefore, SCYCLE is participating presently under UNU and UNITAR in H2020 projects. The SCYCLE team were the scientific coordinator in the H2020 ProSUM Project, regularly participates in EU funded and other research projects, delivers experts that participate in many global and EU expert groups on circular economy. FutuRaM will benefit from SCYCLE's experience in the field of sustainable use of raw materials, high competence in research, statistics, characterisation of waste products especially WEEE management, flow modelling and recycling technologies. Being an established international organisation with a global network, network of offices and its direct outreach into international research and trainings on pressing problems of humankind helps to substantially further the visibility and impact of FutuRAM, also supporting the lead role of the EU in this domain.

3.2.7 In-kind contributions provided by third parties

Table 16 In-kind contributions provided by third parties

8 RECH		
Third Party Name	Category	Cost
EC Consulting	Internally invoiced goods & services	19,200

Justification: RECH envisages that approximately 85% of the costs and tasks involving RECH in FutuRaM will be through support by third party with in-kind contributions against payment from EC Consulting. Recharge will mainly be involved in documents review, provision of insights on batteries and contribution to communication and dissemination. EC Consulting is a French SME (PIC: 919343691) of two employees, provides consulting expertise in the field of batteries, wines and spirits. Its main activity is related to the mission of, Claude Chanson, who is hired full-time by RECH as its General Manager. Mr Chanson is Engineer in chemistry and physics from Bordeaux ENSCPB (1982) and has obtained a PHD in Electrochemistry in Bordeaux 1 University (1986). He served as Division Technical Manager and then, the mission of Director of the Li-ion technology for Saft Group. RECHARGE is involved in FutuRaM because of its network and because of Mr Chanson's expertise.

Annex 1

Advisory Board Expressions of Interest

Drafter:Ignacio Calleja
Phone:
Email:
ignacio.calleja@eitrawmaterials.eu
Ref:

Date: 3/09/2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

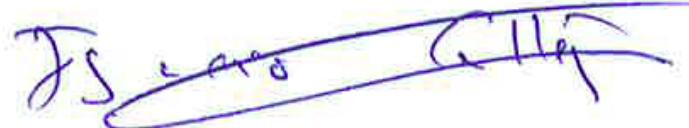
On behalf of EIT Rawmaterials, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

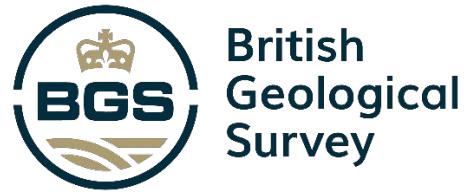
We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



Ignacio Calleja
Senior Advisor for Circular And Recycling
EIT Rawmaterials



Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

10 September 2021

Dr Karen Hanghøj
Director

Nicker Hill
Keyworth
Nottingham NG12 5GG

Direct line +44 (0)115 936 3226
E-mail : khanghoj@bgs.ac.uk
Web www.bgs.ac.uk

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy

On behalf of the British Geological Survey, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Karen' followed by a stylized surname.

Dr Karen Hanghøj
Director

 Bld. Brand Whitlock 114
B-1200 Brussels
 +32 2 738 78 10
 hello@applia-europe.eu
 www.applia-europe.eu



APPLiA Home Appliance Europe AISBL
VAT BE 0460 033 584

Brussels, 17th September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of APPLiA, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Paolo Falcioni (Sep 17, 2021 10:00 GMT+2)

Paolo Falcioni
Director General
APPLiA

Mr Mark Saxon
+61 421 492 614
msaxon@medallionresources.com

18th September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of Medallion Resources Ltd, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



Mark Saxon
CEO

Nedal T. Nassar
Phone: +1 703-638-2012
Email: nnassar@usgs.gov
September 7, 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of National Minerals Information Center at the U.S. Geological Survey, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



Nedal Nassar
Chief, Materials Flow Analysis Section
National Minerals Information Center
Mineral Resources Program
U.S. Geological Survey



Mathias Schluep / Shahrzad Manoochehri
Managing Director / Project Manager
World Resources Forum
St.Gallen, Switzerland
Date: 05.09.2021
Phone: +41 71 554 0903
Email: mathias.schluep@wrforum.org
shahrzad.manoochehri@wrforum.org

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to Horizon Europe Proposal “FutuRaM” Advisory Board

Dear Mr Leroy,

On behalf of the **World Resources Forum Association**, we would like to express our support to the WEEE Forum and its partners in the project proposal FutuRaM responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, we are interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, we will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Mathias Schluep

A handwritten signature in black ink, appearing to read "M. Schluep".

Managing Director

Shahrzad Manoochehri

A handwritten signature in black ink, appearing to read "Manoochehri".

Project Manager

Drafter: Sigurd Heiberg
Phone: +4797579731
Email: sh@petronavitas.com
Ref: SH

Date: 14th of September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

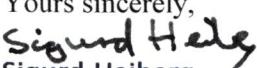
As Chairperson of the Commercial Applications Working Group of the UNECE Expert Group on Resource Management and of the firm Petronavit a.s, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,


Sigurd Heiberg

m: +47 97579731
e-mail: sh@petronavitas.com

Petronavit a.s.
www.petronavitas.no
Enhetsregisteret/Foretaksregisteret Org. no. 913 009 843 MVA

Main address:
Stokkahagen 23, 4022 Stavanger Norway
Subsidiary address:
President Harbitz gate 15c, 0259 Oslo, Norway



16 September 2021

Ref.: 2021/SED/029

Subject: Membership of FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of the Expert Group on Resource Management of the United Nations Economic Commission for Europe (UNECE), I am pleased to express our interest in the project proposal **FutuRaM** developed by the WEEE Forum and its partners. We note that the proposal responds to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”. Should the proposal be selected for funding, we would be pleased to offer our support since the proposal and its aims are fully aligned with the work plan of the Expert Group on Resource Management.

We view this Horizon Europe project proposal as critical to improve the knowledge base of both the EU and third country raw materials and to identify bottlenecks in future secondary raw materials supply. In offering support for this project, we note and are supportive of the objectives and activities outlined in the proposal.

In the event the proposal is favorably evaluated and retained for funding and in response to your invitation, I confirm my interest to join the FutuRaM Advisory Board or cooperate in the project in another capacity.

We look forward to cooperating with you and your affiliates.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Slavko Solar".

Slavko Solar
Economic Affairs Officer
Sustainable Energy Division

Mr. Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Drafter: Alessandra Hool
Phone: +41 76 511 9655
Email: alessandra.hool@esmfoundation.org
Ref:

Bern, September 14, 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of ESM Foundation, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



e s m
ENTWICKLUNGSFONDS SELTENE METALLE

Alessandra Hool
CEO ESM Foundation

Drafter: Amy Peace
Phone: +44 7925 352194
Email: amy.peace@innovateuk.ukri.org

Date: 13th September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

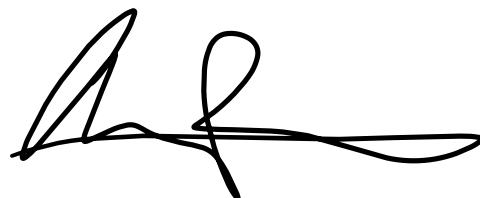
I would like to express my interest in the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

I regard this Horizon Europe project proposal as being important in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. As member of the AB, I will seek to advance your project.

I look forward to working with you and all affiliates.

Yours sincerely,



Amy Peace
Innovation Lead – Circular Economy
Innovate UK

Drafter: Arturo de la Fuente
Phone: +352 4301 32461
Email: arturo.de-la-fuente@ec.europa.eu
Ref:
Date: 2 September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

In my personal capacity, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in the event the proposal is favourably evaluated and is retained for funding, I am interested in joining the FutuRaM Advisory Board.

I believe that this Horizon Europe project proposal is critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply.

I am hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Arturo de la Fuente
Deputy head of unit Eurostat E.2
‘environmental statistics and accounts,
sustainable development’

Drafter: Bernd Wagner
Phone: 08253 7000
Email: wagner@wzu.uni-augsburg.de
Ref: FutuRaM

Date: Sep 5, 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of Resource Lab - University of Augsburg (www.resource-lab.de), and VfU - Network of Sustainable Finance Professionals (VfU.de), I would like to express my support to the WEEE Forum and its partners in the project proposal FutuRaM responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Bernd Wagner, Prof. Dr.
MoB Resource Lab, University of
Augsburg, Germany
Honorary President VfU, Network of
Sustainable Finance Professionals

Drafter: Christer Forsgren
Phone: +46707752019
Email:
christer.forsgren@stenametall.se

Date: 2021-09-10

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of Stena Recycling International AB, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



Adj Prof. Christer Forsgren, Senior Advisor, Stena Recycling Int AB





Drafter: Constantin Herrmann (Dr.-Ing.)
Phone: M: +49 172 8351681
Email: O: +49 711 341817 55
cherrmann@sphera.com

Ref: Sphera Solutions GmbH,
Hauptstraße 111-113,
70771 Leinfelden-Echterdingen,
Germany

Date: 6.9.2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of Sphera Solutions GmbH, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Constantin Herrmann (Dr.-Ing.)
Director Sustainability Consulting Manufacturing &
Electronics

Ekaterina Poleshchuk
ekaterina.poleshchuk@un.org

03 September 2021

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of the United Nations Environment Programme, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: “Identifying future availability of secondary raw materials”.

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,

Ekaterina Poleshchuk
Statistician
SDGs and Environment Statistics Unit
Science Division
United Nations Environment Programme
(UNEP)

Drafter: Northvolt AB
Phone: +46-72 744 80 74
Email:hildevig.svaizer@northvolt.com
Ref: Hildevig Svaizer

Date: Sept 9, 2021

Stockholm, Sweden

Pascal Leroy
Director General
WEEE Forum
Auguste Reyerslaan 80
BE-1030 Brussels
pascal.leroy@weee-forum.org

Subject: Nomination to FutuRaM Advisory Board

Dear Mr Leroy,

On behalf of **Northvolt AB**, I would like to express my support to the WEEE Forum and its partners in the project proposal **FutuRaM** responding to the Horizon Europe call HORIZON-CL4-RESILIENCE-01-03: "Identifying future availability of secondary raw materials".

In particular, in response to your invitation, I am interested in joining the FutuRaM Advisory Board, in the event the proposal is favourably evaluated and is retained for funding.

We regard this Horizon Europe project proposal as being critical in improving the knowledge base of both the EU and third country raw materials and in identifying bottlenecks of future secondary raw materials supply. In supporting this project, we endorse the objectives and activities outlined in the proposal. As member of the AB, I will seek to advance your project.

We are hopeful that your proposal will be favourably evaluated and obtain funding and look forward to working with you and all affiliates.

Yours sincerely,



Hildegard Svaizer
Director Cathode Raw Materials
Purchasing

Annex 2

Financial Guarantee for Swiss participants



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**
The State Secretary

Bern, 13 July 2021

Funding of Swiss Participants in the EU Framework Programme for Research and Innovation 'Horizon Europe' and other Related Programmes and Initiatives in the Calls 2021

To whom this may concern

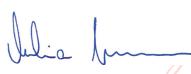
This is to state that based on Article 2 Paragraph b of the Federal Decree on the financing of Swiss participation in European Union activities in the field of research and innovation in the years 2021-2027 as well as on Article 10 of the Ordinance of 20 January 2021 on the measures for Switzerland's participation in European Union programmes in the field of research and innovation (FIPBV), **funding for researchers and innovators based in Switzerland (including companies and SMEs) for their participation in collaborative projects as associated partners from a non-associated third state will be provided by the Swiss Government for all 2021 calls of Horizon Europe and the Euratom programme.**

Funding will be directly paid by the State Secretariat for Education, Research and Innovation SERI to the Swiss participant, under the condition that the full project application is assessed as eligible for funding by the European Commission or by the agency commissioned for this purpose.

Please contact the [EU Framework Programmes Section at SERI](#) in case of any question.

Yours faithfully,

State Secretariat for Education,
Research and Innovation SERI


Digital unterschrieben von
Hirayama Martina 75JFPC
Datum: 2021.07.13
08:14:30 +02'00'

Martina Hirayama
State Secretary

State Secretariat for Education, Research and Innovation SERI
Martina Hirayama
Einsteinstrasse 2, 3003 Bern
Tel. +41 58 462 64 97, Fax +41 58 464 96 14
martina.hirayama@sbfi.admin.ch
www.sbfi.admin.ch

Enquiries:
EU Framework Programmes Section
Hotline +41 58 463 50 50
europrogram@sbfi.admin.ch

Annex 3

Letters of support

ALBA Europe Holding plc & Co.KG| Kneesebeckstr. 56-58|10719 Berlin

Prof. Dr.-Ing. Vera Susanne Rotter
Technische Universität Berlin
Sekr. Z 2
Strasse des 17. Juni 135
D-10623 Berlin

Thorsten Greb
Director
+49(30)35182-7740
thorsten.greb@alba.info

Berlin, 21.09.2021

Letter of Support: ALBA Europe Holding supports the FutuRaM Project – Future Availability of Secondary Raw Materials (HORIZON-CL4-2021-RESILIENCE-01-03)

Dear Prof. Versa Susanne Rotter,

Thank you for contacting us about participating in the FutuRaM proposal, which is being submitted in application for funding by Horizon Europe, under Call HORIZON-CL4-2021-RESILIENCE-01-03 on “Identifying future availability of secondary raw materials”.

A transparent classification system for secondary resources that considers all aspects of sustainability would be a game-changing tool to enable progress to more sustainable resource management and identification of drivers and barriers to secondary raw materials from many different sources.

The ALBA Group, one of the leading recycling and environmental services companies as well as raw material providers worldwide, operates with its two brands – ALBA and Interseroh – within Germany, Europa and Asia. In 2020 its divisions generated an annual turnover of 1.9 billion Euros and employed a staff of approx. 8,700 employees. In 2019 alone ALBA Group saved 4.2 million tonnes of greenhouse gases compared to primary production and at the same time 32.3 million tonnes of primary raw materials through its recycling activities.

As a full-service provider, we cover the entire spectrum of environmental services, from consultation on waste management to packaging licensing in markets using the German "dual system", to the provision of dependable recycling solutions state-of-the-art sorting technologies and innovative logistics and product development, waste management and the delivery of raw materials worldwide. As a family-owned and run company, we don't rely on short-term capital market interests. Therefore, we're able to plan in the long term.

Our thinking is market-based and geared towards our customers' requirements – without losing sight of environmental considerations or the needs of future generations.

The ALBA Europe Holding would be delighted to contribute to the knowledge of European and third countries on future availability of secondary raw materials and therefore on a sustainable circular economy. In our line of work, we strongly believe that the substitution of primary raw materials through recycling products is the key to lasting economic sustainability. The above-mentioned business activities of ALBA are allowing us to share holistic insights and data on the availability and recoverability of secondary raw materials, spanning different countries and continents. We could bring value to technical, legal, and economic topics, exploring feasibilities and limitations.

The ALBA Europe Holding commits to supporting the project through facilitating exchange of secondary raw material specifications with the FutuRam researchers. The company can provide material samples from shredder plants, support batch tests and treatment and sorting of trials using state-of-the-art sorting technologies for ELV and construction metal scraps. We can participate and share our knowledge in stakeholder consultations and review and discuss developed concepts and results with the FutuRam consortium members.

We look forward to seeing the project's progress.

Yours sincerely,



Thorsten Greb
Director



Alessandro Leonetti
Director

Swiss Federal Laboratories for Materials Science and Technology
Lerchenfeldstrasse 5
9014 St. Gallen
Switzerland

Berne, 21/09/2021

Letter of Commitment to support the project FutuRaM

To whom it may concern,

I, undersigned Daniel Christen, in my quality of managing director commit to support the FutuRaM project submitted within the call HORIZON-CL4-2021-RESILIENCE-01-03 on "Identifying future availability of secondary raw materials", should the proposal be funded.

In particular, Stiftung Auto-Recycling Schweiz (SARS) will be involved in the demonstration of UNFC-based assessment of secondary raw materials, as part of FutuRaM Work Package 5, as planned in this project, including

- the provision of access to non-confidential data relevant for the research activities of Work Package 5;
- the availability for discussions on specific aspects (e.g. economic and policy implications) regarding the two case-studies adressed by Empa (related to projects EVA II and SARS LIB)

I hereby declare that I am entitled to commit into this process the entity I represent.



Daniel Christen
Managing Director

Professor Julia Stegemann
Co-Director, UCL CircEL (The Circular
Economy Laboratory)
Department of Civil, Environmental &
Geomatic Engineering
University College London
Chadwick Building
Gower Street
London WC1E 6BT

9th September 2021

Our reference: [Our reference]
Your reference:-

Subject:
Tata Steel support for FutuRaM proposal

Dear Julia,

Thank you for contacting us about participating in the FutuRaM proposal, which is being submitted in application for funding by Horizon Europe, under Call HORIZON-CL4-2021-RESILIENCE-01-03 on “Identifying future availability of secondary raw materials”.

A transparent classification system for secondary resources that considers all aspects of sustainability would be a game-changing tool to enable progress to more sustainable resource management and identification of drivers and barriers to secondary raw materials. I am therefore writing to confirm that we will provide in-kind support for development and demonstration of UNFC-based assessment of secondary raw materials, as part of FutuRaM Work Package 5.

Tata Steel is one of the largest steel producers in Europe (and the largest in the UK) and we recognise both the environmental impact of steelmaking and the opportunity we have through intelligent use of steel and steelmaking by-products to contribute to a more sustainable future. In work to reduce our emissions, we have invested heavily in energy efficiency installations throughout our European sites, are continuing to do so through projects to capture and re-use waste heat and are leading efforts in the steel industry seeking step-change novel technologies to make radical reductions in emissions and improvements in resource efficiency. We also recognise that we have opportunities to develop

new products, by-products and services to reduce the environmental impact of steel over product life-cycles and to help our customers and other industrial sectors to improve their own use of resources.

Tata Steel has a strong commitment to sustainable development, including making sure we source our raw materials and produce and transport our steel in a responsible way. Our long term ambition is to be a carbon neutral steelmaker and we are investing heavily in alternate technologies for ironmaking, for example HIsarna, which we see as a pivotal technology to deliver our ambition for a low carbon and circular economy.

As a company with a strong European and also global presence, we can add value by participating in the stakeholder consultation process in Task 5.1. Our Product Sustainability team has extensive experience in Life Cycle Assessment, life cycle thinking more broadly and sustainability assessments, as applied to many different aspects of our business. We would be delighted to bring this to bear, by helping the FutuRaM researchers develop an extended UNFC assessment methodology that more comprehensively addresses social and environmental sustainability, including also providing advice on standards, policy and regulation. I expect that colleagues from other Tata Steel departments could also advise on technical and technological aspects of secondary resource recovery, whether different grades of steel, or iron- and steel-making residues.

We could also work with you to identify case studies from within our business, with which to demonstrate the new secondary resource assessment approach in Task 5.2. Our recovery projects that could conceivably be used for this purpose include schemes to recover different grades of steel at higher value; closed-loop steel systems; and recovery of alloying elements from slags and other by-product streams. Obvious candidate case studies could be related to the HIsarna process, which has the potential to replace conventional blast furnaces with a 20% reduction in CO₂ emissions, and recovery of elements such as Zn and V. This process was originally developed through the European ULCOS project, and has been proven at pilot scale. It is my understanding that case studies with future potential could be developed for FutuRaM Work Package 7.

I know you are aware that Tata Steel Europe is in the process of separating into Tata Steel UK and Tata Steel Netherlands. Both businesses will remain accountable to our parent company, Tata Steel Limited, with the capability of pursuing common interests, including sharing of information with the FutuRaM project, together. Participation in research of this kind is fundamental to maintaining Tata Steel's position as one of the leading steel companies in both Europe and the rest of the world. Sustainability is at the heart of our business strategy and steel is at the heart of global sustainability. We have set ourselves a target to reduce our steelmaking emissions in Europe by 30-40% by 2030. Optimisation of our resource use, including recovery of secondary materials is part of this.

Yours sincerely,



Dr Peter Hodgson
Manager, Product Sustainability



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of the Environment, Transport,
Energy and Communications DETEC
Federal Office for the Environment FOEN
Waste and Resources Division

3003 Bern

FOEN; BI

POST CH AG

Swiss Federal Laboratories for Materials Science
and Technology
Lerchenfeldstrasse 5
9014 St. Gallen
Switzerland

File: BAFU-457.244.42-2264

Business event:

Your reference:

Ittigen, 22 September 2021

Letter of Commitment to support the project FutuRaM

To whom it may concern,

I, undersigned Michel Monteil, in my quality of Head of the Waste and Resources Division commit to support the FutuRaM project submitted within the call HORIZON-CL4-2021-RESILIENCE-01-03 on "Identifying future availability of secondary raw materials", should the proposal be funded.

In particular, the Federal Office for the Environment (FOEN) will be involved in the demonstration of UNFC-based assessment of secondary raw materials, as part of FutuRaM Work Package 5, as planned in this project, including

- the provision of access to non-confidential data relevant for the research activities of Work Package 5;
- the availability for discussions on specific aspects (e.g. economic and policy implications) regarding one case-study addressed by Empa related to project EVA II.

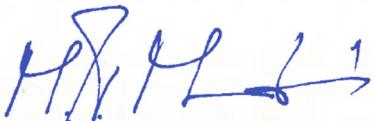
Federal Office for the Environment FOEN
Isabelle Baudin
3003 Bern
Location: Worblentalstrasse 68, 3063 Ittigen
Tel. +41 58 46 470 95, Fax +41 58 46 303 69
isabelle.baudin@bafu.admin.ch
<https://www.bafu.admin.ch>



I hereby declare that I am entitled to commit into this process the entity I represent.

Kind regards

Federal Office for the Environment

A handwritten signature in blue ink, appearing to read "MBM".

Michel Bertrand Monteil

Head of division

Copy to:

– JI, BI

TU Wien, IWR, A-1040 Vienna, Karlsplatz 13/226

Faculty of Civil Engineering
Institute for Water Quality and
Resource Management
**Research Unit of Waste and
Resource Management (FAR)**

To
Professor Soraya Heuss-Aßbichler
Department of Earth and Environmental Sciences
Ludwig-Maximilians Universität München
Theresienstr. 41
80333 München

Karlsplatz 13/226-2, A-1040 Vienna
iwr.tuwien.ac.at/ressourcen

Univ.-Prof. Dipl.-Ing. Dr.techn.
Helmut Rechberger
Head of Institute

T +43 1 58801 22645
helmut.rechberger@tuwien.ac.at

17-09-2021

Reference: Letter of Intent for FUTURAM

Dear Soraya,

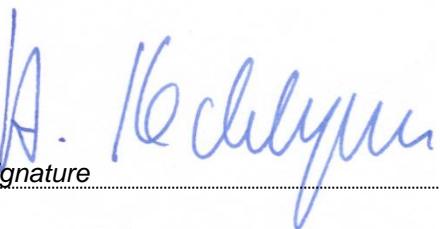
Many thanks for inviting TU Wien to participate in the FUTURAM proposal to the Horizon Europe Call HORIZON-CL4-2021-RESILIENCE-01-03 (Identifying future availability of secondary raw materials). Please find our declaration of commitment as an Associated Partner (providing in-kind support) at the bottom of this letter.

TU Wien works since more than 30 years in the field of waste and resource management and I am familiar with your objectives in Work Package 5 on the development and demonstration of the United Nations Framework Classification for Secondary Raw Materials. We welcome the further development of the UNFC as a transparent tool to communicate the availability of secondary raw materials, in particular to identify the factors to be considered and the barriers to their use.

I am very pleased to have the opportunity to work with you on a case study regarding Phosphorus Recycling in Austria. Your coworker is welcome at TU Wien to get an introduction to our database and to be in regular exchange to develop and test together the implementation of the UNFC framework both at national and municipal level. For the latter we have good contacts to the City of Vienna that is currently implementing a Phosphorus recovery concept and, given the consent of the City of Vienna, we will support you to make this a case study for the FUTURAM project.

We very much hope that the FUTURAM team is successful in obtaining funding for this worthwhile project and look forward to the continued collaboration with you.

I, the undersigned, Helmut Rechberger, in the position of the Head of the Institute confirm the commitment of the organisation to take support your activity in the proposal FUTURAM which will be submitted to the Horizon Europe Call: HORIZON-CL4-2021-RESILIENCE-01-03: Identifying future availability of secondary raw materials.


Signature

Place and Date Vienna, 17.09.2021

Helmut Rechberger
Name of the Signatory

Head of Institute
Function of the Signatory



Република Србија
ПОТПРЕДСЕДНИЦА ВЛАДЕ
МИНИСТАРСТВО РУДАРСТВА И ЕНЕРГЕТИКЕ
Број: 310-02-1947/2021-02
Датум: 20.09.2021. године

Универзитет у Београду Рударско-геолошки факултет

Министарство рударства и енергетике подржава учешће Универзитета у Београду, Рударско-геолошког факултета да са осталим учесницима конкуришу у оквиру пројекта HORIZON-CL4-2021-RESILIENCE-01-03 на тему “*Identifying future availability of secondary raw materials*”.

Сам пројекат, а вероватно и његови резултати ће допринети одрживом управљању минералних ресурса, као и идентификацији и класификацији секундарних сировина добијених из различитих извора.

Министарство рударства и енергетике ће уколико напред наведени учесници на конкурсу добију пројекат на тему “*Identifying future availability of secondary raw materials*”, подржати њихово истраживање у области секундарних сировина.

И само Министарство рударства и енергетике је заинтересовано за истраживања која би као резултате дала валоризацију секундарних сировина.

С поштовањем,

Доставити:
Наслову,
Архиви

ПОТПРЕДСЕДНИЦА ВЛАДЕ
И МИНИСТАРКА

Проф. др Зорана З. Михајловић



REPUBLIC OF SERBIA
DEPUTY PRIME MINISTER
MINISTRY OF MINING AND ENERGY
Number: 310-02-194/2021-02
Date: 20.09.2021.

University of Belgrade, Faculty of Mining and Geology

Ministry of Mining and Energy supports involvement of University of Belgrade, Faculty of Mining and Geology to apply with other participants for project HORIZON-CL4-2021-RESILIENCE-01-03 on the subject "***Identifying future availability of secondary raw materials***".

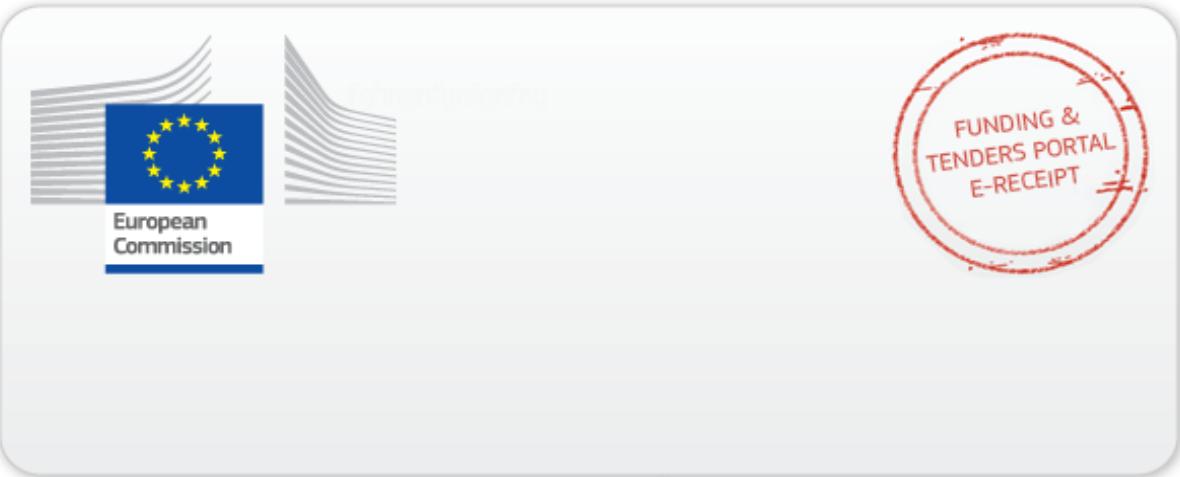
The project itself, and probably its results will contribute to sustainable management of mineral resources, as well as to identification and classification of secondary raw materials obtained from various sources.

Ministry of Mining and Energy will, if the project is acquired on the subject "***Identifying future availability of secondary raw materials***", support their research in field of secondary raw materials.

Ministry itself is interested in research that will give results regarding valorisation of secondary raw materials.

Truly,

DEPUTY PRIME MINISTER and MINISTER OF MINING AND GEOLOGY
Prof. dr Zorana Mihajlović



This electronic receipt is a digitally signed version of the document submitted by your organisation. Both the content of the document and a set of metadata have been digitally sealed.

This digital signature mechanism, using a public-private key pair mechanism, uniquely binds this eReceipt to the modules of the Funding & Tenders Portal of the European Commission, to the transaction for which it was generated and ensures its full integrity. Therefore a complete digitally signed trail of the transaction is available both for your organisation and for the issuer of the eReceipt.

Any attempt to modify the content will lead to a break of the integrity of the electronic signature, which can be verified at any time by clicking on the eReceipt validation symbol.

More info about eReceipts can be found in the FAQ page of the Funding & Tenders Portal.

(<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/faq>)