I4-GREEN
(Public Progress Report M24)
D1.7
31/10/2024

I4-GREEN Consortium

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General information				
Work Package	WP1 - I4-GREEN Management and coordination			
Deliverable	Public Progress Report M24			
Due Data	M24 31 October 2024			
Submission Date	M24 31 October 2024			
Deliverable Lead	ICAMCYL			
Dissemination Level	X	Public (PU)		Confidential (CO)
Document Nature	X	Report (R)		Other (O)
Description of the related task and the deliverable. Extract from DoA	The coordinator will be responsible for all contractual obligations towards the EC as defined by the Grant Agreement, including daily administrative management; submission of periodic/final reports and cost statements to the EC; control of work progress including timely preparation and submission of project results (Deliverables); control of budget expenditure in relation to the foreseen tasks and activities; update of the work plan accounting for risks and contingency planning. A smooth communication mechanism will be implemented between the participating organisations and with the project officer/EC through progress meetings and both online and off-line interactions between project leader and the EC. In addition, under this Task: A Consortium Agreement (CA) will be signed by all beneficiaries at the beginning of the project, including access rights to background and foreground knowledge, IPR and confidentiality arrangements (D1.1). The project Steering Committee (SC) will be established which will gather one representative from each full partner organisation and shall take key strategic and potential conflict management decisions. It will be gathered every 3 months, starting from the Kick-Off meeting in M1. A Management Plan (Task 1.2) will be delivered at the beginning of the project (M2) that will depict management and delivery modalities, internal procedures, I4-GREEN management structure. Progress, technical and financial reports will be submitted by the coordinator as per the project timeline and in line with I3 requirements (D1.5-D1.8).			
Authors	ICAMCYL			
Reviewers	All partners			
Status		Draft	X	Final

Revision History				
Version	Date	Author	Organisation	Status
V1	13/09/2024	AG, RC, AF	ICAMCYL	Draft
V2	04/10/2024	AG,RC,AF, RA, AJ, AV, SA, LH	ICAMCYL, LEONORE, ISMC, VENTURA, LAIN, NANOFABER	Draft
V3	16/10/2024	AG, RC, AF	ICAMCYL	Draft
V4	17/10/2024	André Carvalho, Giulia Resta, Marta Peres, Tânia Peças, Luís Martins	ACPMR	Draft
V5	22/10/2024	AG, RC, AF	ICAMCYL	Draft
V6	30/10/2024	AG, RC, AF	ICAMCYL	Final

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Acronym	Meaning
OC	Open Call
EC	European Commission
PO	Project Officer
GA	Grant Agreement

1. Executive Summary

I4-GREEN project has successfully completed its twenty-fourth month, marking a significant milestone in our mission enabling a more sustainable access to critical raw materials, a crucial requisite for ensuring Europe's recovery and is essential to preserve and further improve the environment and the life quality.

The 24M of the I4-GREEN project has been marked by significant advancements in technology development, pilot plant installations, collaborative research, and public outreach. On the other hand, the management of the open call has been a success where the companies have developed innovation projects providing great value to the pilots. All the SMEs reports were approved by the pilot leaders meaning that the projects have brought great value to the pilots. The project remains steadfast in its commitment to driving sustainability in the mining sector and is well-positioned to achieve its long-term goals.

Previous deliverables have covered the progress of the project over the past months of the project, with D1.5 (Public Progress Report M12) that covered M1 to M12 and D1.6 (Mid-term technical and financial report) that collected information until M15.

The present deliverable D1.7 presents I4-GREEN project, its objectives, developments and achievements during the last months of execution, from M16 to M24.

2. Introduction

2.1. I4-GREEN

Enabling access to raw materials is a crucial requisite for ensuring Europe's recovery and is essential to preserve and further improve the environment and the life quality. I4-GREEN is an industry-driven project wishing to deploy regional circular economy innovations in the mining processes.

I4-GREEN is an industry-driven project, entailing the following 2 green strands:

- Iron Holm Oak creates an EU lighthouse of a forefront technology to recover rare earth minerals from iron mining waste, reducing environmental impact and alleviating EU dependency on foreign rare earth elements Rare Earth Elements (REE) in particularly for Neodymium element.
- Riotinto will innovate with a SME-owned Green Tech to extract strategic raw materials (Cu, Zn, Co and PGMs).

Main objectives:

1. Unleashing the green innovation power of EU interregional Ecosystems and fostering the green transition of other EU regions facing similar challenges in mining/extractive industry.
2. Turning mining green, circular and social through joint innovation investments for the green and circular extraction and the processing of raw materials.
3. Re-evaluating of mining dumps and wastes.
4. Reviving the ecosystems that are (often hardly) touched by the deindustrialization.
5. Establishing a unique interregional ecosystem, a node for the green transformation of extractive industries and the emergence of an EU sustainable mining value chain.
6. Generating a concept for forefront sustainable and environmentally friendly processing recovery technologies and of low environmental impact.

An interregional system is growing thanks to innovative tools as well as enablers ready to align regional investments to turn the mining process into a green one.

3. I4-GREEN Organisation structure

3.1.I4-GREEN project structure

I4-GREEN is industry-driven, with two pilots (Figure 1) at its core which will deploy circular innovations to the market:

Pilot 1 – Extremadura, Spain - With the objective to create and develop a forefront technology to recover minerals from iron mining waste, reducing environmental impact and alleviating EU dependence.

Pilot 2 - Andalusia, Spain - Will be implemented for scaling up hydrometallurgical leaching of primary sulphide minerals for the sustainable recovery of essential metals for the green transition.

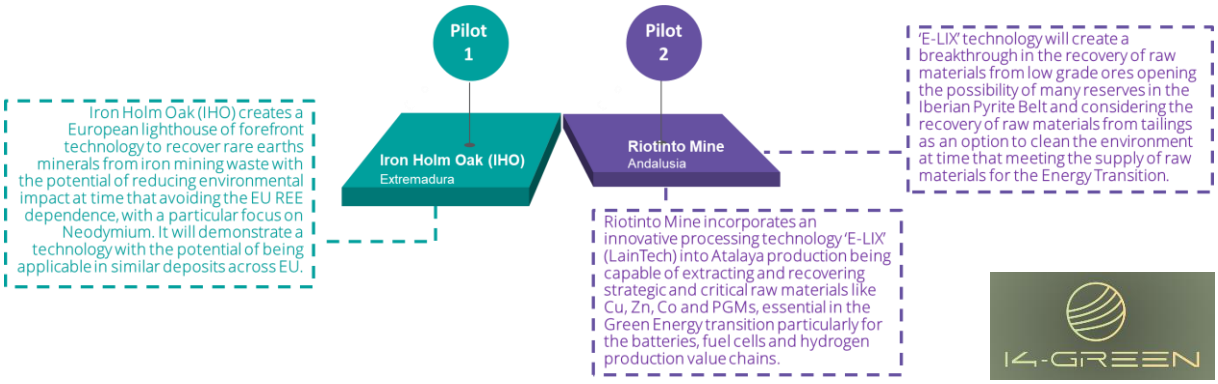

FIGURE 1 - I4-GREEN PILOTS

In parallel, and within the overall I4-GREEN project, several actions will are being carried out that are essential and necessary for the success of the final achievement of the entire project, and they were reflected in the scope of cascade funding actions.

In this development of actions, it was establish a system of cascade funding for SMEs, for the development of innovation projects within the two industrial pilots, with the objective of establishing new interregional and inter-sectoral value chains.

The open and competitive call required SME-driven innovation projects to foster the inclusion of new products, processes and/or technical services in Pilot 1 and Pilot 2 projects.

For this purpose, a budget of 356.265,75 € has been financed, where 12 SMEs received up to 30.000,00 € each to develop innovation projects within the two industrial pilots.

4. Consortium Overview

Around these 2 pilots, an interregional system (Figure 2) will is growing organically with investors, tech partners, regional governments (which bring their own resources to I4-GREEN), and other enablers were identified and aligned in regional investments to improve green mining.

Partners	Type
ACPMR cluster	Cluster
ISMC Cluster	Cluster
ICAMCYL	NGO
GEVORA	Industry
NANOFABER	Industry
LEONORE	Industry
LAIN TECHNOLOGIES	Industry
ATALAYA MINING	Industry
VENTURA ORTS	Industry
Associated partners	**Type**
UNIVERSITY OF OVIEDO	RTO
INTRAW	NGO
National Technical University of Athens	RTO
GTK Mintek	RTO
Business Joensuu	Industry
University of Jaen	RTO
University of Extremadura	RTO
EIT Raw Materials Andalusia Hub	EU association
CSIC-EIT Raw materials Hub-Andalusia	NGO
ASSIMAGRA	Cluster
University of Evora	RTO
Junta de Castilla y León	Government
University of Lisboa	RTO
N-ABLE	RTO
Junta de Andalusia	Government
Supporting Institutions & Entities	**Type**
Government of Extremadura	Government
Junta de Extremadura	Government
EU Cluster Alliance	Cluster
EIT Raw Materials GmbH	EU association
AMINER	Association
S3P Mining Industry	EU association
S3P Advanced Materials for Batteries	EU association

FIGURE 2 - I4-GREEN ECOSYSTEM

Associated Partners are I4-GREEN supporters, academics, environmental actors, NGOs and general society through local communities.

Supporting Institutions & Entities are policy makers at local, regional and EU levels, and professional networks and platforms, among others, setting the base of mining regions development.

Partners (Figure 3) are I4-GREEN core Agents, mining and raw materials providers & suppliers, mining companies, application enterprises, technological companies dedicated indirectly to raw materials, cross-regional & sectoral organisations, professional platforms.

FIGURE 3 - I4-GREEN PARTNERS

4.1. Management structure

The management structure of I4-GREEN (Figure 4) project has been designed to ensure smooth operability of project activities, provide effective leadership, and promote cooperation between the consortium and external supporters and partners. The final aim is the successful completion of tasks and deliverables, the two pilots and the parallel planned Open Call and support services to SMEs, the two main crucial activities within the project. An effective cooperation between the coordinator and the project officer will also ensure that no major deviations are taking place, corrective measures are being considered and activities are being successfully implemented in compliance with the European Commission standards and rules for I3 projects. Considering the wide range of activities to be implemented, an efficient and effective coordination, decision-making and communication is therefore required.

FIGURE 4 - I4-GREEN MANAGEMENT STRUCTURE

5. WP1 – I4-GREEN Management and coordination

Leader: ICAMCYL
Contributor: ALL
Timeline: M1-M30

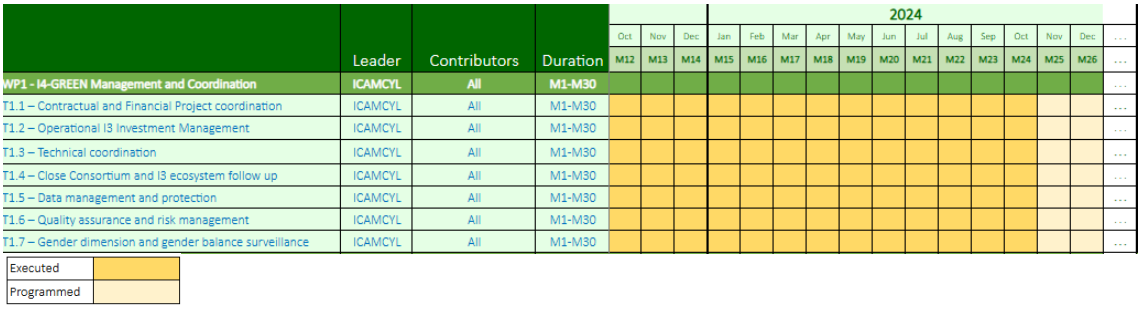

FIGURE 5 – WP1 GANTT CHART

Developments (Timeline M16-M24):

- The management and coordination of I4-GREEN project has been developed in a good progress according to the available budget, timeline, milestones, tasks and deliverables.
- Regular internal progress reports have been requested to the consortium for ensuring a correct management in line with EC and legal requirements. ACPMR, with support from ICAMCYL, managed these reports until the first amendment that came into effect on 26th February 2024, which changed the I4-GREEN project coordination entity. Following this, ICAMCYL took over full responsibility for managing progress checks and reports, with the support of all I4-GREEN consortium partners.
- Regular, internal and effective channels (telcos, phone calls, meetings) within the consortium and between consortium and with EC have been employed for correct communication.
- Internal and external interactions have taken place with stakeholders, industrial associations and other projects in external events suitable for synergies.
- Risk management and quality assurance protocols have been applied to detect and avoid potential challenges or issues.
- Operational needs have been analysed to plan and ensure that cascade funding applicability is maintained to seek for independence in the 2 leading pilots under development.
- Management of the Amendment approved by the European Commission.
- All the partners contributed to ensure a correct management of the project, leaded by ICAMCYL, coordinator of the project.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Benef.**	**Diss Level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP1	D1.1	Consortium agreement	ACPMR	SEN	30 Nov 2022	-	02 Dec 2022	Approved
WP1	D1.2	Management Plan and Project Management Handbook	ACPMR	SEN	31 Dec 2022	-	16 Dec 2022	Approved
WP1	D1.3	Shared digital platform	ACPMR	SEN	30 Nov 2022	-	22 Nov 2022	Approved
WP1	D1.4	Quality assurance (Manual) risk management, data management and protection plan	ACPMR	SEN	31 Jan 2023	-	23 Jan 2023	Approved
WP1	D1.5	Public Progress Report M12	ACPMR	PU	31 Oct 2023	-	31 Oct 2023	Approved

WP1	D1.6	Mid-term technical and financial report	ICAMCYL	SEN	31 Mar 2024		18 Jun 2024	Approved
WP1	D1.7	Public Progress Report M24	ICAMCYL	PU	31 Oct 2024	-	Current report – Oct 2024	Pending

TABLE 1 - WP1 DELIVERABLES (UNTIL M24)

5.1. T1.1 - Contractual and financial project coordination

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

Work was monitored to ensure that deliverables, milestones and tasks were taking place on time and accordingly to the Grant Agreement. Effective communication with EC and the consortium was ensured, having progress meetings to check the state of the play in the project. Internal meetings were taking place regularly every six months, but in addition, several meetings were set at demand of the partners and coordinator. The progress done in I4-GREEN project, until M15, was sum up in D1.6 (Mid-term technical and financial report) and submitted in M20. The present deliverable D1.7 (Public progress report) is summarising the technical progress between M16 and M24.

Task deviations (Timeline M16-M24):

- D1.6 was initially planned for M17 and was finally submitted in M20, in agreement with the Project Officer.

Two amendments were handled during this time:

1. Amendment n° 101084028-9, entered into force on 26th February 2024. The main change was to transfer the coordinator from ACMPR to ICAMCYL. Moreover, Annex 1 and Annex 2 were reviewed and replaced.
2. Amendment n°101084028-12, entered into force on 13th September 2024. This change was motivated by the need to incorporate a new partner, Ventura Orts, with the budget not covered by the open call applicants. This partner brought the necessary capability and experience to address the challenges and requirements of Pilot 2, which were not fully fulfilled under the I4-GREEN open call.

5.2. T1.2 - Operational I3 Investment Management

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

Guidelines defined in the project management handbook, including the quality manual, were followed by the management and quality process of the I4-GREEN project. The use of that guidelines aimed to ensure better collaboration among the project partners. All the project partners followed this handbook to ensure the quality assurance during the whole project and to facilitate the detection and prevention of possible deviations from the work plan.

Direct financial support to SMEs was distributed, accordingly to the implementation of the I4-GREEN open call, described in the D2.2 - Open Call Package and following the signed SubGA. The 1st payment of 50% of the total global cost of the SubGA was handled 30 days after signing the contracts and the final payment of the remaining 50% of the total amount was handled 60 days after final report approval by the respective Pilot Project Manager linked to the application and solution.

Task deviations (Timeline M16-M24):

N/A.

5.3. T1.3 - Technical coordination

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

The project coordinator organised individual and group meetings and performed continuous communication with partners involved in pilot tasks execution (GEVORA, LEONORE, LAINTECH, ATALAYA), for ensuring a correct involvement in the project, and for ensuring a correct understanding of their duties and responsibilities. In addition, consortium meetings were held at least every six months for the proper monitoring of the project execution with all partners in I4-GREEN.

During the last consortium meeting (M20) a Visit to Pilot 2 E-LIX (Atalaya-LAIN) was organised for all partners in order to know the state of progress of this pilot.

Task deviations (Timeline M16-M24):

N/A.

5.4. T1.4 - Close Consortium and I3 ecosystem follow up

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

A physical meeting was held during the period of this report in Seville (M20) (Figure 6). The next meeting (M26) is planned to be held online in November 2024.

FIGURE 6 - I4-GREEN M20 MEETING IN SEVILLE (ES)

Communication flows, activities and their monitoring were jointly established. Moreover, different events took place during this period to integrate the ecosystem into other interregional activities for scaling the interregional impact of I4-GREEN, such as the Investing Forum in Raw Materials (M20).

Task deviations (Timeline M16-M24):

N/A.

5.5. T1.5 - Data management and protection

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

Monitoring of the Data Management Plan (DMP) covering the full data life cycle and including security measures was conducted to prevent unauthorised access to personal data or the equipment used for processing. For internal purposes, D1.3 described the Shared Digital Platform. It's a digital shared space and channels related with I4-GREEN project management, coordination, execution, and internal communication that allows a fast, secure and private way for project partners to share files, ideas, meeting and short messages.

Task deviations (Timeline M16-M24):

N/A.

5.6. T1.6 - Quality assurance and risk management

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

The quality assurance process was launched in M3 (D1.4) and was monitored by the project management team until the moment of writing, and it is expected to be continued until the end of the project.

ACPMR and ICAMCYL reviewed all the deliverables submitted until M24 following the quality assurance process.

Task deviations (Timeline M16-M24):

N/A.

5.7. T1.7 - Gender dimension and gender balance surveillance

Leader: ICAMCYL
Contributor: All
Timeline: M1-M30

Developments (Timeline M16-M24):

Equality work-life balance and encourage female team members to lead teams and take responsibility were applied and are expected to be maintained to the entire project duration. Additionally, specific measures to ensure gender balance were applied when appointing external experts forming the Strategic Advisory Board (50% female representation).

Task deviations (Timeline M16-M24):

N/A.

6. WP2 - SME Engagement and Interregional Industrial Ecosystem Creation

Leader: ICAMCYL
Contributor: ACPMR, ISMC
Timeline: M1-M30

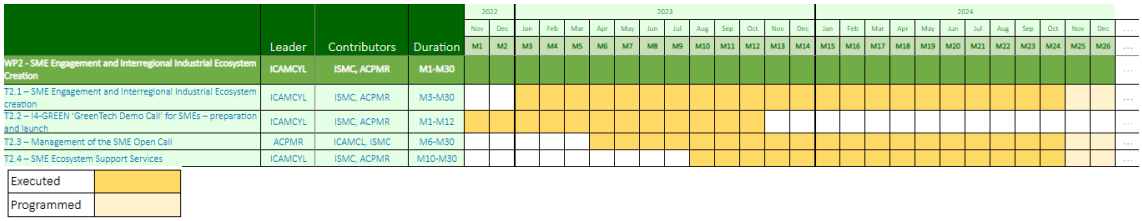

FIGURE 7 - WP2 GANTT CHART

Developments (Timeline M16-M24):

Closure and finalisation of tasks related to the open call for third-party support (SMEs) were carried out. This included:

- Management of the correct implementation of the open call.
- Integration of the needs of the 2 pilots in the open call solutions to be applied.
- Monitoring of the development of the open call and awarded projects, including the administrative and technical revision of intermediate (M15) and final reports (M18).
- Promotion and management of communication between I4-GREEN pilot partners and awarded SMEs.
- Promotion of the expert services to awarded SMEs with the preparation of a Guidance Document.
- Implementation of the business investment with the management of the intermedium and final payments.
- Monitoring of the progress and satisfaction of awarded SMEs through a satisfaction survey.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Beneficiary**	**Diss Level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP2	D2.1	SME and ecosystem engagement report	ICAMCYL	PU	31 Jan 2023		31 Jan 2023	Approved
WP2	D2.2	Open call package	ACPMR	PU	28 Feb 2023	30 Jun 2023	12 Jul 2023	Approved
WP2	D2.3	Individual, Consensus Evaluation and Integrated Evaluation reports	ICAMCYL	SEN	30 Jun 2023		30 Nov 2023	Approved
WP2	D2.4	SME project follow up Report	ICAMCYL	PU	31 Oct 2023		21 Mar 2024	Approved
WP2	D2.5	SME project final monitoring Report	ICAMCYL	SEN	30 Apr 2024		26 Jul 2024	Approved
WP2	D2.6	Expert Final Services Report	ICAMCYL	SEN	31 Oct 2024		11 Oct 2024	Approved

WP2	D2.7	Implementation of the business investments (open call) belonging to the portfolio including information on the compliance with the 70% company investment rule	ACMPR	SEN	30 Sep 2024		30 Sep 2024	Approved

TABLE 2 - WP2 DELIVERABLES (UNTIL M24)

6.1. T2.1 - SME Engagement and Interregional Industrial Ecosystem creation

Leader: ICAMCYL
Contributor: ACPMR, ISMC
Timeline: M3-M30

Developments (Timeline M16-M24):

Engagement actions of the ecosystem actors identified in the technological sector and mining networks in the regions involved in I4-GREEN (Alentejo, Andalusia, Extremadura, Castilla y León). Identification and description of the enablers and stakeholders, that could join I4-GREEN's interregional innovation network and facilitate and/or directly exploit the project results were completed. This included outlining the common structural objectives and action lines being created and supported by the I4-GREEN implementation.

Task deviations (Timeline M16-M24):

N/A.

6.2. T2.2 - I4-GREEN 'GreenTech Demo CALL' for SMEs – preparation and launch

Leader: ICAMCYL
Contributor: ACPMR, ISMC
Timeline: M1-M12

Developments (Timeline M1-M12):

N/A. This information was provided in D1.5 (Public Progress Report M12) and D1.6 (Mid-term technical and financial report).

Task deviations (Timeline M1-M12):

N/A.

6.3. T2.3 - Management of the SME Open CALL

Leader: ACPMR
Contributor: ISMC, ICAMCYL
Timeline: M6-M30

Developments (Timeline M16-M24):

Different deliverables were elaborated to summarise information related to the monitoring and analysis of the results of the Open Call during this period such as D2.4 (SME project follow up Report), D2.5 (SME project final monitoring Report) and D2.7 (Implementation of the business investments (open call) belonging to the portfolio including information on the compliance with the 70% company investment rule), including all the progress of the projects of each pilot as well as the analysis of the benefits of the different works for the pilots and I4-GREEN industrial ecosystem.

Task deviations (Timeline M16-M24):

ACPMR and ICAMCYL jointly managed and monitored the implementation of the open call and awarded projects. Deliverables were delayed considering the deviation of the launch of the open call explained in D1.5 (Public Progress Report M12) and D1.6 (Mid-term technical and financial report), in agreement with the Project Officer:

- D2.4 was initially planned for M12 and was finally submitted in M17.
- D2.5 was initially planned for M18 and was finally submitted in M21.

6.4. T2.4 - SME Ecosystem Support Services

Leader: ICAMCYL
Contributor: ACPMR, ISMC
Timeline: M10-M30

Developments (Timeline M16-M24):

Different activities were carried to support SMEs awarded in the I4-GREEN Open Call. ICAMCYL prepared a Guidance Document to inform enterprises about different webinars, B2B or other workshops that were currently available. This information was sent to all SMEs in M20.

Furthermore, a satisfaction survey was carried out to determine the degree of fulfilment of the companies with the development of the Open Call, having positive results in terms of project development, effective communication and the importance of this type of funding for innovation procurement.

Task deviations (Timeline M16-M24):

N/A.

7. WP3 - IHO Pilot – Demonstrating Combined Circular Processing for Rare Earth and Iron Ore

Leader: GEVORA
Contributor: LEONORE, ICAMCYL, NANOFABER, ACPMR, GTK, UNIOVI, ISMC, JDA
Timeline: M1-M30

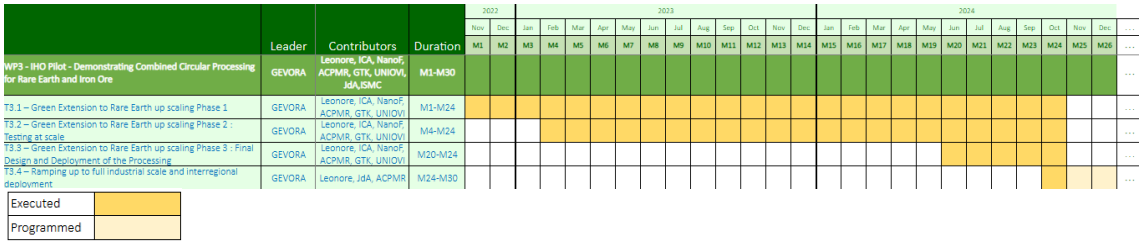

FIGURE 8 - WP3 GANTT CHART

Developments (Timeline M16-M24):

During these months the main activities were focused on field studies for new drillings and laboratory studies:

- Geological and geophysical studies to locate areas of interest for the recovery of monazite ($REE(PO_4)$).
- Drilling activities and laboratory analysis.
- Initial activities for the digital and techno economic design.
- Mineral and metallurgical studies.

During the next steps of the project the team will work to incorporate the results of Phase 1 and 2 into the final process plant design including equipment, water and energy consumption.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Beneficiary**	**Diss Level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP3	D3.1	Global report on IHO operation design & extension plan to REE, incl. technology benchmarking, digital models & maps, specialised tests results and preliminary validation for scaling up the pilot.	GEVORA	SEN	31 Oct 2024	-	31 Oct 2024	Submitted
WP3	D3.2	Tier 1 & Tier 2 technology report integration into IHO pilot for tech providers focusing on optimisation of IHO plant for REE recovery.	GEVORA	SEN	31 Oct 2024	-	31 Oct 2024	Submitted
WP3	D3.3	Innovative water treatment solutions at the IHO pilot.	NANOFABER	SEN	31 Oct 2024	-	29 Oct 2024	Submitted

TABLE 3 – WP3 DELIVERABLES (UNTIL M24)

7.1.T3.1 - Green Extension to Rare Earth up scaling Phase 1

Leader: GEVORA
Contributor: LEONORE, ICAMCYL, NANOFABER, ACPMR
Timeline: M1-M24

Developments (Timeline M16-M24):

The main activities related to this task have been developed in field studies.

The beginning has been to carry out geological and geophysical studies to locate and describe the areas of interest for the recovery of monazite ($REE(PO_4)$) within the magnetite (iron ore) deposits.

With this information, a drilling campaign has been carried out aimed at the recovery of drill cores that has allow us to carry out a detailed study of the monazite contents in the magnetite.

Subsequently, subcontracted suppliers were selected according to the provisions of this task for the execution of the drilling campaign. Three offers were presented from which the supplier was chosen based on competitive criteria such as technical, equipment, task execution time and budget.

The drilling campaign has been completed collecting the following data:

- The first line of drilling has been completed in the concession area called "Colmenar", carrying out 10 drillings with a total of 2,200 m. Samples were taken from the drill cores to develop a complete analysis in the laboratory. With these surveys we have achieved an approximate mesh with 100 x 75 m intersections up to elevation 150 m. With the results of this campaign, a first geostatistical treatment was carried out allowing us to define the optimal mesh to have measured and indicated resources.
- A second line of drills was completed in the Santa Justa area. Two boreholes have been drilled with 631.10 m of depth. With these surveys we would have an approximate mesh with 100 x 150 m intersections up to level 100 m. Samples of the drill cores have also been taken for chemical study by X-Ray Fluorescence.
- All the planned drills have been carried out.

The boxes of drill cores have been organized and stored for conservation and the study of the laboratory results has been carried out to establish the average grades of the reservoir for the different elements of interest with special attention to REE.

Finally, with the information collected in the studies carried out, the digital and techno economic design of the IHO full scale operation pilot has been carried out, completing the information with the Phase 1 studies.

ISMC, ICAMCYL helped on the integration of advance processing tech blocks (via NANOFABER). In particular, NANOFABER worked on water treatment strategies focused on sequestration and recovery of monazite, REE at large and raw materials from the patented method implemented at IOH, which throughout the project may allow improving on OPEX and overall sustainability. In the reference period, the focus was on design of prototypical membranes by incorporating electrospun nanocoatings and biopolymers into potentially commercial products to improve antifouling and selectivity, while improving water flow. The work proceeds in parallel to the developments in T4.3 for ATALAYA's plant, primarily changing feedstock and optimizing the coating.

Monitoring and guiding the creation of this solution to be inserted into an innovative circular mine of the future in the context of interregional demonstrators was performed by ACPMR with its position as mineral resources cluster, by ICAMCYL as raw materials technological centre and by ISMC as sustainable mining cluster.

Task deviations (Timeline M16-M24):

N/A.

7.2. T3.2 - Green Extension to Rare Earth up scaling Phase 2: Testing at scale

Leader: GEVORA
Contributor: LEONORE, ICAMCYL, NANOFABER, ACPMR
Timeline: M4-M24

Developments (Timeline M16-M24):

The activities developed will be carried out through "layer 1", "layer 2" and "layer 3" of the scope of tasks.

Completed tasks:

- Selection of the service provider for the mineral and metallurgical tests of the project, both for the separation of iron and for the recovery of REE and other possible elements of interest. The Technology Centre selected was GTK Mintec in Finland.
- Design of the scope and structure of the tests to be carried out, establishing two phases of work:
    - Phase 1 - Studies of separation of the iron ore to achieve a product free of contaminants and of high quality. These tests were completed satisfactorily, achieving final products around 70/71% Fe and free of contaminants such as sulphide.
    - Phase 2 - Mineralogical characterization and metallurgical studies of REE element separation and other elements of interest contained in the tailings of the iron ore separation process.
- IHO evaluation of the sampling area for the collection of 25 Mt of product to be sent to GTK for carrying out the studies.

All studies to be carried out in GTK have been successfully completed including the following tasks and technologies:

- Mineralogical studies to determine the separation sizes of the main minerals of interest such as magnetite (iron ore) and monazite ($REE(PO_4)$).
- Shredding to different sizes for subsequent processing by magnetic means:
  - (Focus on phase 1) grinding to d80 of 38µm and low intensity magnetic separation.
  - (Focus on phase 2) grinding to d80 of 38µm followed by low intensity magnetic separation and reverse flotation to remove sulphur bearing minerals.
- Continuous magnetic separation in dry and wet ways.
- Flotation for the study of the separation of sulphur contents.
- Sample taking of each process variant.
- Laboratory analysis of these samples using X-Ray fluorescence technology for complete chemical analysis, determining in each case the contents of iron ore and the REE elements of interest contained in the monazite from the tailings.
- Flotation incorporating different reagents for the separation of sulphides associated with pyrite (FeS_2). As a result of these tests, very significant recoveries of sulphide were achieved as well as other possible elements of interest such as nickel, cobalt and copper.
- High intensity magnetic separation for the recovery of REE concentrates.
- Flotation incorporating different reagents for the recovery of REE.
- Combined flotation and high intensity magnetic separation techniques for REE recovery.

Task deviations (Timeline M16-M24):

N/A.

7.3. T3.3 - Green Extension to Rare Earth up scaling Phase 3: Final Design and Deployment of the Processing

Leader: GEVORA
Contributor: LEONORE, ICAMCYL, NANOFABER, ACPMR
Timeline: M20-M24

Developments (Timeline M20-M24):

Different operating methods were studied for mineral extraction, combining open-pit and underground technologies to be more efficient in mineral recovery as well as reducing the environmental impact created.

Rock stability and hydrogeology studies were carried out.

The process plant designs for Phase 1 of iron separation were completed, incorporating the description of equipment and energy consumption.

Work was carried out on the techno-economic digital design to incorporate designs for the adaptation of the Phase 1 process plant and the Phase 2 process technology for the recovery of sulphides and REE elements

A study of water was carried out including local supply sources, consumption and recovery and recycling technologies. Studies for recycling and reinjection of process water were evaluated by NANOFABER.

The information developed in the M1-M24 period was incorporated into a business model including CAPEX, OPEX, financial ratios and Cashflow studies.

Task deviations (Timeline M20-M24):

N/A.

7.4. T3.4 - Ramping up to full industrial scale and interregional deployment

Leader: GEVORA
Contributor: LEONORE, JDA, ACPMR, ISMC
Timeline: M24-M30

Developments (Timeline M24-M24):

During this time negotiations with different parts begin:

- Offtakers for the marketing of iron concentrate. The quality of the iron will allow it to be a key supply source for the development of new European green steel projects such as H2Green and Blastr.
- Potential offtakers for TREO concentrate (Técnicas Reunidas, Solvay, REE Tech).
- Conversations with other similar projects developed in other regions that may share interests and technologies (Nordic Iron).

Moreover, a study is being carried out for the implementation of comprehensive logistics from the mine to the Port of Huelva including storage, truck transportation, rail transportation and port operation.

Task deviations (Timeline M24-M24):

N/A.

8. WP4 - ATALAYA-E-LIX Pilot – Scaling up the Hydrometallurgical leaching of primary sulphide minerals to a sustainable recovery of metals essential for the green transition

Leader: LAINTECH
Contributor: ATALAYA, JDA, ACPMR
Timeline: M1-M30

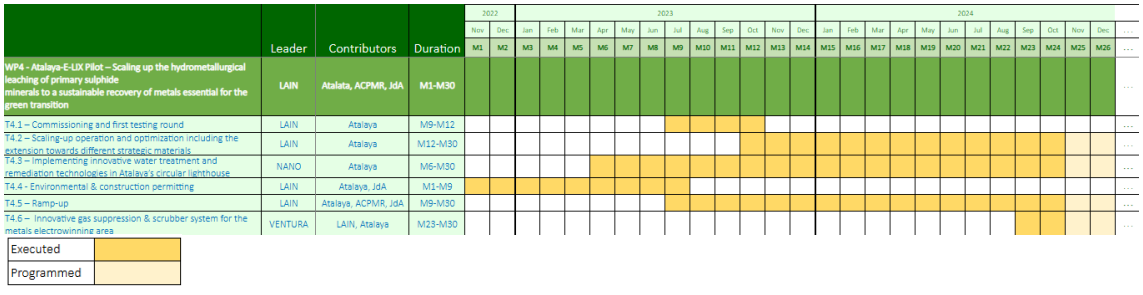

FIGURE 9 - WP4 GANTT CHART

Developments (Timeline M16-M24):

During these months, the team was working on running the full plant on maximum capacity in order validate the design criteria (CAPEX, OPEX, metal recoveries, plant availability, etc.) and the plant commissioning started in M14 and was continued.

In the long term (until the end of the project), the hidromet plant would be stabilised which would allow to extend the technology to new mineralogies through the Iberian Pyrite Belt and overseas.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Beneficiary**	**Diss Level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP4	D4.1	Contracts and technical plans, including Service contracts, EPCM (Tech) package contract signed.	LAIN	SEN	30 Nov 2022		02 Dec 2022	Approved
WP4	D4.2	Plant operational benchmark and optimisation adjustment for different raw materials and operation modes.	LAIN	SEN	31 Oct 2024	31 Dec 2024		Pending
WP4	D4.3	Innovative water treatment solutions at the Atalaya pilot.	NANOFABER	SEN	31 Oct 2024		29 Oct 2024	Submitted

TABLE 4 - WP4 DELIVERABLES (UNTIL M24)

8.1.T4.1 - Commissioning and first testing round

Leader: LAINTECH
Contributor: ATALAYA
Timeline: M9-12

Developments (Timeline M9-M12):

N/A. This information was provided in D1.5 (Public Progress Report M12).

Task deviations (Timeline M9-M12):

N/A.

8.2. T4.2 - Scaling-up operation and optimization including the extension towards different strategic materials

Leader: LAINTECH
Contributor: ATALAYA
Timeline: M12-M30

Developments (Timeline M16-M24):

The scaling-up operation and plant optimisation keeps moving forward. The plant ramp-up is scaling up and most of the process flowsheet were successfully commissioned.

Due to the continuous operation, a lot of issues related to the plant design, operations and maintenance were tackled and improved.

The Owners Team was almost 100% recruited and under training while the plant was operating.

The control philosophy was implemented in most of the operating processes improving the plant operation.

First copper metal was produced and the Team keeps moving forward on the learning curve.

Continuous improvement was applied since the day one of commissioning.

Moreover, the modular aspect of the plant flowsheet & design, allowed the operations to improve as the commissioning was moving forward, implementing the same process optimisations to the rest of the plant, no commissioned yet.

The plant commissioning is helping significantly to the operations continuous improvement and moving forward on the learning curve to be ready to reach nameplate production faster and safer.

Task deviations (Timeline M16-M24):

Full production was suffering some delays as expected in any complex hydrometallurgical plant using novel technology.

8.3. T4.3 - Implementing innovative water treatment and remediation technologies in ATALAYA's circular lighthouse

Leader: NANOFABER
Contributor: ATALAYA
Timeline: M6-M30

Developments (Timeline M16-M24):

In the reference period, the activities were designed and prototypical membranes produced to assess the feasibility of electrospun membranes working on a wide range of operating pressures, made of recyclable and biodegradable materials for durability, separation and separation and antifouling properties. Antifouling function was pursued by two routes: 1) adding a nanoweb of carbon nanotubes and 2) by adding lignin. Interestingly the addition of the lignin layer improved the wettability of the membrane and improved by one order of magnitude the bacterial proliferation. The work is ongoing and applications in ATALAYA's are under discussion. The main results by NANOFABER are reported in deliverable D4.3 (Innovative water treatment solutions at the Atalaya pilot).

Task deviations (Timeline M16-M24):

The application of the electrospun membranes functionalised with lignin has been laid aside by discussing with LAIN to favour an implementation of granular ion-exchanging materials namely a well-established technology in the water treatment industry. This deviation, to membranes to granular resins, was justified by the interesting proprieties of two alternatives and sustainable ion-exchanging materials within NANOFABER know-how, lignin included. Moreover, such technologies have showed better margins of industrial scalability in E-LIX pilot. However, lignin membranes work was published acknowledging I4GREEN funds on Polymers open access journal (*Bergamasco, S.; Fiaschini, N.; Hein, L.A.; Brecciaroli, M.; Vitali, R.; Romagnoli, M.; Rinaldi, A. Electrospun PCL Filtration Membranes Enhanced with an Electrosprayed Lignin Coating to Control Wettability and Anti-Bacterial Properties. Polymers 2024, 16, 674*), contributing to the dissemination of the project.

8.4. T4.4 - Environmental & construction permitting

Leader: LAINTECH
Contributor: ATALAYA, JDA
Timeline: M1-M9

Developments (Timeline M1-M9):

N/A. This information was provided in D1.5 (Public Progress Report M12).

Task deviations (Timeline M1-M9):

N/A.

8.5. T4.5 - Ramp-up

Leader: LAINTECH

Contributor: ATALAYA, JDA, ACPMR
Timeline: M9-M30

Developments (Timeline M16-M24):

Project ramp-up started after the pre-commissioning, cold and hot commissioning.

JDA and ACPMR supported the study of applicability of sustainable resources in the South of Europe towards the Green transition.

Task deviations (Timeline M16-M24):

N/A.

8.1. T4.6 – Innovative gas suppression & scrubber system for the metals electrowinning area

Leader: VENTURA
Contributor: LAIN, ATALAYA
Timeline: M23-M30

Developments (Timeline M23-M24):

During the first month of this task, the measurements of the current installation were carried out, plans were drawn up and a suction simulation with collector and bonnets designed by the VENTURA engineering department using SOLIDWORKS FLOW SIMULATION fluid software.

In this way, work continues on the study of the optimisation of the suction in the E-LIX electrolysis line as well as on the implementation of improvements in the electrolysis tanks.

Task deviations (Timeline M23-M24):

N/A.

9. WP5 – Interregional Ecosystem Integration for Circular and Sustainable Tech Deployment

Leader: ISMC
Contributor: All
Timeline: M1-M30

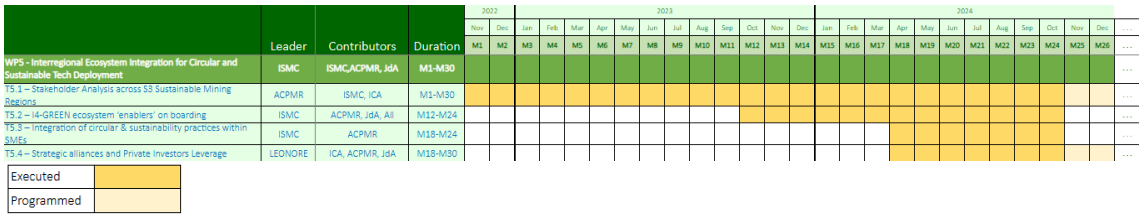

FIGURE 10 – WP5 GANTT CHART

Developments (Timeline M16-M24):

ISMC, ICAMCYL, ACPMR and JDA started to leverage I4-GREEN project within the alliances they were participating in and building strategies with investors and stakeholders to support the interregional ecosystem. For this, events to on-board enablers and investor were set up. Moreover, the stakeholder's database was defined and shared to engage with key players to generate opportunities for actors within the ecosystem.

Deliverables								
Work Package No	**Deliverable Related No**	**Deliverable Name**	**Lead Beneficiary**	**Diss Level**	**Due date**	**New Due Date (if delay)**	**Delivery Date**	**Status**
WP5	D5.1	Stakeholder database and Map of 'Enablers'.	ACPMR	SEN	31 Oct 2024		31 Oct 2024	Submitted
WP5	D5.2	Review of sustainable practices	ISMC	PU	31 Oct 2024		11 Oct 2024	Approved
WP5	D5.3	SME Guide on transition support instruments.	ISMC	PU	31 Oct 2024		17 Oct 2024	Approved
WP5	D5.4	Emulation sessions Sustainable Practice Exchange Platform Report	ISMC	SEN	31 Oct 2024		31 Oct 2024	Submitted

TABLE 5 – WP5 DELIVERABLES (UNTIL M24)

9.1. T5.1 - Stakeholder Analysis across S3 Sustainable Mining Regions

Leader: ACPMR
Contributor: ISMC, ICAMCYL
Timeline: M1-M30

Developments (Timeline M16-M24):

Stakeholders database was defined by ACPMR with the support of ISMC and ICAMCYL, and included in M24 for D5.1. This database incorporated companies, studies and generation organizations (RTOs), universities and research centres, technology providers, policymakers at regional, national, and EU levels, investors, generation systems, intermediaries together with clusters, agencies, and tech parks, in addition to networks and partnerships which included S3P partnerships (e.g. EU mining regions) and the Advanced Materials for Batteries Partnership (AMBP).

The main goal of this action was to identify the maximum pertinent stakeholders to interact with I4-GREEN project, especially Interregional Ecosystem Integration for Circular and Sustainable Tech Deployment (WP5), and to promote the connection between the EU mining ecosystems. Additionally, the database will serve WP7 to improve Communication, Dissemination, and Social Acceptance.

Task deviations (Timeline M16-M24):

N/A.

9.2. T5.2 - I4-GREEN ecosystem 'enablers' on boarding

Leader: ISMC
Contributor: ACPMR, JDA, All
Timeline: M12-M24

Developments (Timeline M16-M24):

Led by ISMC and with the support of ACPMR, JDA and ICALCYL, this task focused on integrating enablers (ecosystem helix partners) approach through the I4-GREEN consortium alliances and I4-GREEN and external events during this period, such as:

- EIT Raw Materials (Brussels, 15-16 May 2024).
- Investors' Forum (Seville, 17 June 2024).
- Clustering in European Innovation for Sustainable Practices (Seville, 14 October 2024).
- MMH Seville 2024 (Seville, 15-17 October 2024).

Additional, desk research was performed (website search, CORDIS and fed to the Stakeholder DDBB (T5.1).

The work done through this task yielded a significant involvement of European, Portuguese and Spanish companies in the mining sector, as well as academia, policy makers and investors, suitable to mirroring strategies in the future.

Task deviations (Timeline M16-M24):

N/A.

9.3. T5.3 - Integration of circular & sustainability practices within SMEs

Leader: ISMC
Contributor: ACPMR
Timeline: M18-M24

Developments (Timeline M18-M24):

Led by ISMC, with the support of ACPMR, this task focused in building sustainable capacity within SMEs and has four differentiated activities:

- Sustainable practices (subtask 1, D5.2)
- Transition support instruments (subtask 2, D5.3)
- Pan-EU emulation sessions (subtask 3, D5.4)
- Sustainable Practice Exchange platform (subtask 4, D5.4)

The goal of these activities was to offer European SMEs - and specifically the I4-GREEN regions' SMEs - the necessary tools and knowledge to drive, boost and research applicable innovations in the sector, through detailed information about modern sustainable practices and European funding schemes, and the sharing of these practices at a regional, national and European level. The results of these activities were included in D5.2, D5.3 and D5.4 (all of them due on M24, October 2024).

Task deviations (Timeline M18-M24):

N/A.

9.4. T5.4 - Strategic Alliances and Private Investors Leverage

Leader: LEONORE
Contributor: ICAMCYL, ACPMR, JDA, ISMC
Timeline: M18-M30

Developments (Timeline M18-M30):

Led by LEONORE, with the support of ICAMCYL, ACPMR, ISMC and JDA, this task, intended to leverage the company's contacts and its presidency of the Madrid Mining Club to implement alliances and map

further strategic collaborations (including investors) for the I4-GREEN ecosystem. These investors are involved in the project through a series of dedicated events (named in the project GA 'innovation and investment breakfasts, e.g., the one carried out during the Investing Forum in Raw Materials -Sevilla, June 2024).

During this period, synergies between ISMC and Madrid Mining Club (under the presidency of Leonore Development) were established. This alliance includes a series of working sessions for EU funding raising opportunities and investment (organised by ISMC) such as the Raw Materials Spring Summit (León, March 2023), the Investing Forum in Raw Materials (Sevilla, June 2024), and the Clustering in European Innovation for Sustainable Practices (Seville, October 2024).

Moreover, at least a last investors session and final funding workshop will be carried out in order to contribute to the generation and consolidation of new project ideas and concepts (planned for M29).

Task deviations (Timeline M18-M30):

N/A.

10. WP6 - Interregional deployment and replication to full EU Scale

Leader: ICAMCYL
Contributor: ISMC, ACPMR, JDA
Timeline: M1-M30

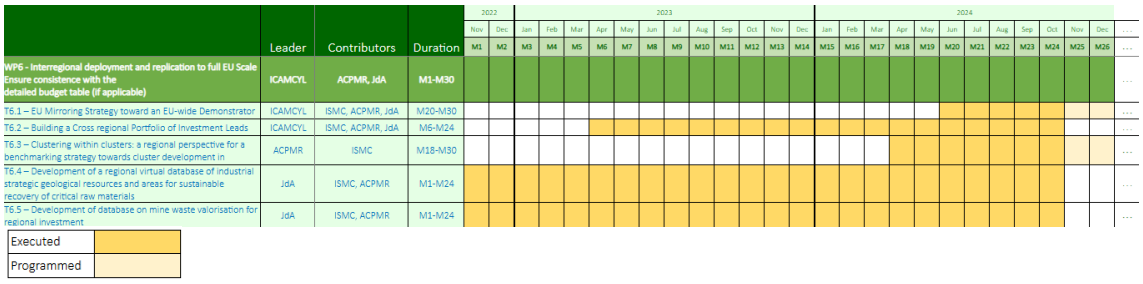

FIGURE 11 - WP6 GANTT CHART

Developments (Timeline M16-M24):

Working towards building a cross regional portfolio of Investment and a deep search of the most updated information about geology and mineral deposits of the target area was done. Moreover, develop joint strategic intelligence and coordinated actions (cross-cluster action plan, mine waste valorisation database) to ground future sustainable mining investments within partner regions.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Beneficiary**	**Diss level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP6	D6.2	Pilots Action Plan & Portfolio of Investment Leads	ICAMCYL	PU	30 Apr 2024		28 Jun 2024	Approved
WP6	D6.5	Regional database of industrial strategic geological resources and areas for sustainable	JdA-SGIM	PU	31 Oct 2024		31 Oct 2024	Submitted

		recovery of critical raw materials						
WP6	D6.6	State of the art study on mine waste valorisation technologies	ISMC	PU	31 Oct 2024		11 Oct 2024	Approved
WP6	D6.7	Mine waste Database and Report on interregional mine sites	JdA-SGIM	PU	31 Oct 2024	31 Dec 2024		Pending

TABLE 6 - WP4 DELIVERABLES (UNTIL M24)

10.1. T6.1 - EU Mirroring Strategy toward an EU-wide Demonstrator

Leader: ICAMCYL
Contributor: ISMC, ACPMR, JDA
Timeline: M20-M30

Developments (Timeline M20-M24):

Led by ICAMCYL and with the support of ACPMR, ISMC and JDA, a study of potential sites (mines and mining projects) for replication was carried out, considering the geological similarities with the pilot locations and the importance of these sites in terms of their theoretical/estimated mining resources. To promote cross-regional replication of the I4-GREEN pilot projects, a Pilots Action Plan was designed. The actions proposed in this Plan aimed to raise awareness among companies in the mining sector and administrations about the opportunity to implement such pilots.

All this information was included in D6.2 submitted in M20.

Task deviations (Timeline M20-M24):

N/A.

10.2. T6.2 - Building a Cross regional Portfolio of Investment

Leader: ICAMCYL
Contributor: ISMC, ACPMR, JDA
Timeline: M6-M24

Developments (Timeline M16-M24):

ICAMCYL, ISMC, ACPMR, and JDA jointly collaborated with S3P/TSSP-Industrial Modernisation partnerships of the EC to promote SME investment projects opportunities, since S3P-Mining Industry is co-led by Castilla y León through ICAMCYL, as well as "Advanced Materials for Batteries" is co-led by JDA. There, a study of the S3 Partnerships (TSSPs) was carried out, assessing overlaps between the project and the TSSPs, to find out for which of them the I4-GREEN project could represent an investment opportunity. A Portfolio of Investment Leads was designed for this selected group of TSSPs as a tool to exploit synergies with the I4-GREEN project, promoting new projects and attracting investments for their respective regions. Finally, a brief study on funding opportunities for the replication of the I4-GREEN pilots was conducted, highlighting three EU funding sources as the most suitable: I3, INTERREG and Horizon Europe.

All this information was included in D6.2 submitted in M20.

Task deviations (Timeline M6-M24):

N/A.

10.3. T6.3 - Clustering within clusters: a regional perspective for a benchmarking strategy towards cluster development

Leader: ACPMR
Contributor: ISMC
Timeline: M18-M30

Developments (Timeline M18-M24):

During this period several clustering Workshops between I4-GREEN clusters and other relevant regional clusters were carried out to identify joint cluster collaboration actions, such as: cluster innovation and international deployment, strategic analysis, regional ecosystem benchmarking, cluster partnerships in Europe and beyond. Until now ACPMR participated in the European Cluster Conference (M19) and ISMC together with ICAMCYL participated in the EIT Raw Materials Summit (M19) and Mining and Minerals Hall Seville (M24).

Task deviations (Timeline M18-M24):

N/A.

10.4. T6.4 - Development of a regional virtual database of industrial strategic geological resources and areas for sustainable recovery of critical raw materials

Leader: JDA
Contributor: ISMC, ACPMR
Timeline: M1-M24

Developments (Timeline M16-M24):

Led by JDA, with the support of ACPMR and ISMC, deep research of the most updated information about geology and mineral deposits of the target area was made and a specific sheet and survey were prepared to be spread to regional Governments to contribute to the geological study, the strategic analysis and mapping in Alentejo, Extremadura, Castilla y León and Andalusia.

The ERDF INTERREG POCTEP project GEO_FPI"GEO-FPI: CROSS-BORDER OBSERVATORY FOR THE GEOECONOMIC VALUATION OF THE IBERIAN PYRITIC BELT", where National Geological Surveys from Spain and Portugal and Junta de Andalusia were partners, produced the most updated planning for geology and mining in the Iberian Pyrite Belt IPB (Alentejo and the west part of Andalusia) and was studied for potential inputs to I4-GREEN. Under the project website (https://geo-fpi.igme.es/es/default.htm) the most updated information about geology and mineral deposits in West Andalusia and Alentejo is available (Figure 12).

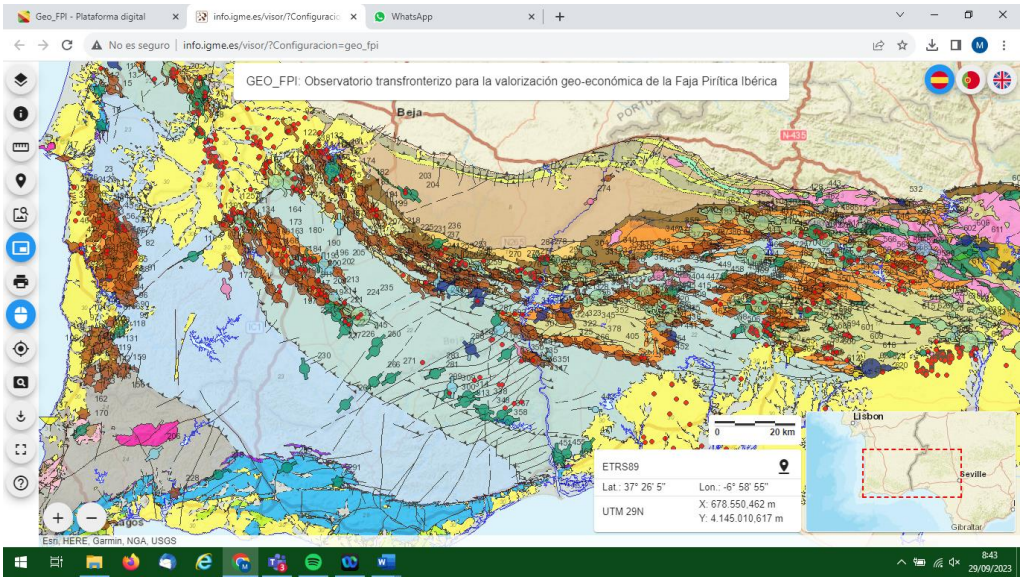

FIGURE 12 – GEOLOGIC AND MINERAL DEPOSITS INFORMATION VISUALIZER IN WEST ANDALUSIA AND ALENTEJO (HTTPS://INFO.IGME.ES/VISOR/?CONFIGURACION=GEO_FPI)

Additionally, under the same project, a memory of metallogenetic description, main deposits and their mineral potential (Figure 13) was produced and is available on the project's website.

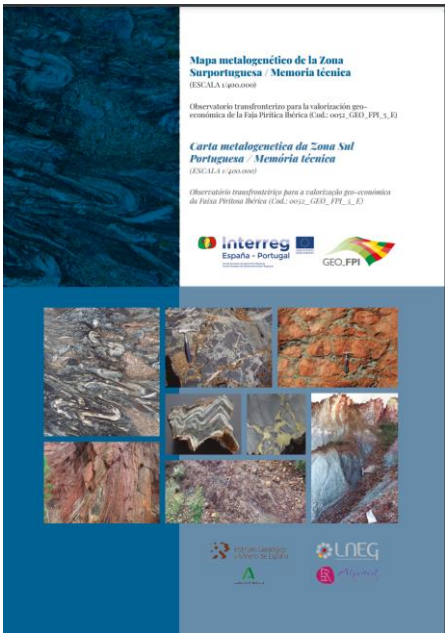

FIGURE 13 – MEMORY OF METALLOGENETIC DESCRIPTION, MAIN DEPOSITS AND THEIR MINERAL POTENTIAL (HTTPS://INFO.IGME.ES/GEOFPI/DOCS/MAPAS/METALOGENETICO_ZSP_400K_MEMORIA.PDF)

Regarding the rest of Andalusia territory, the main source of information was analysed: The Mineral Resources Mapping of Andalusia (Figure 14).

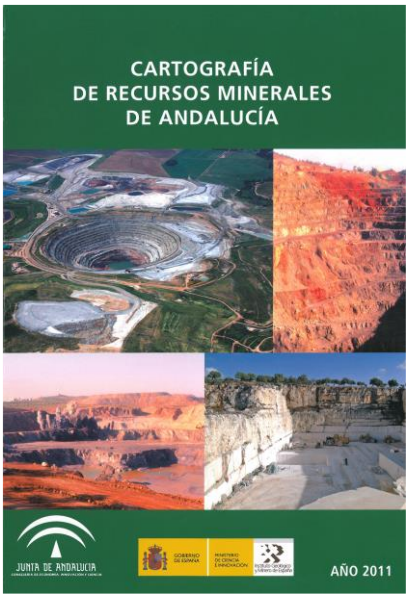

FIGURE 14 – MINERAL RESOURCES MAPPING OF ANDALUSIA (HTTPS://WWW.JUNTADEANDALUCIA.ES/PORTALANDALUZDELAMINERIA/APDOGEOLOGIA)

This information was completed with the monographies about Critical Raw Materials distribution in Andalusia, JdA and IGME 2023, that shows the potential of future exploitation of these strategic minerals (Figure 15) for I4-GREEN.

POTENCIALIDAD DE ANDALUCÍA PARA EL APROVECHAMIENTO DE MATERIAS PRIMAS CRÍTICAS

Adánez Sanjuán, P.; Boixereu Vila, E.; Fernández-Leyva, C. (c.fernandez@igme.es) Sánchez García, T.; Santiago Martín, A.; Martínez Orio, R. ; Vega Martín, L.

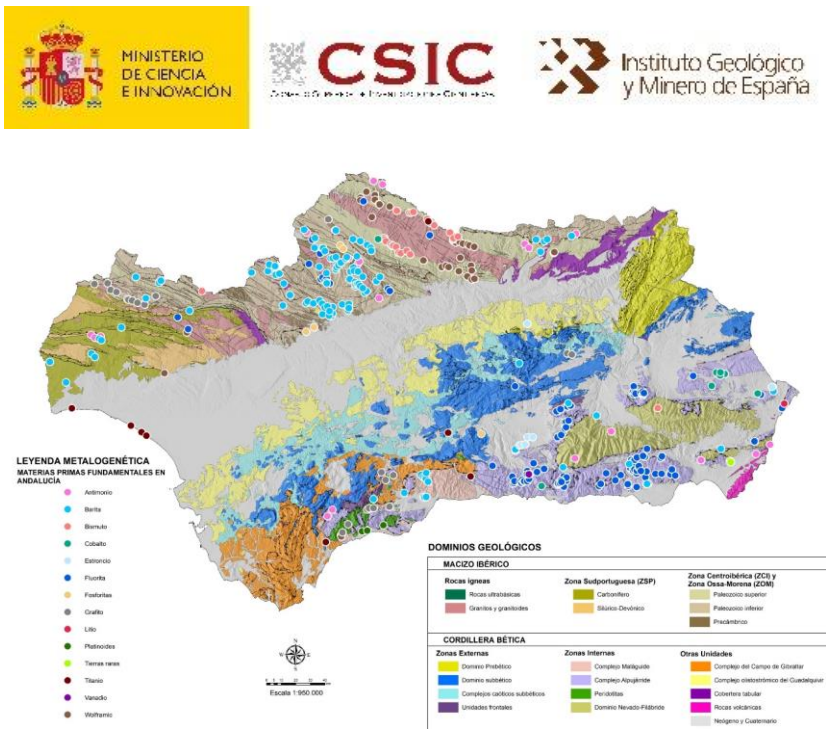

FIGURE 15 – CRITICAL RAW MATERIALS DISTRIBUTION IN ANDALUSIA (HTTPS://WWW.JUNTADEANDALUCIA.ES/PORTALANDALUZDELAMINERIA/MINERALESCRITICOS)

According to these sources studied, in Andalusia more than 550 mineral occurrences have been found for Critical Raw Materials, 7 mines are in operation and 3 more projects are ready for ramp-up after approval of the last permits.

Regarding Castilla y León, data was obtained from the Mapa Geológico y Minero de Castilla y León E:1/400.000, published in 1997 and updated by means of consults to the regional government Junta de Castilla y León.

In the case of Extremadura, all the databases and related information were studied and are available on the website SIGEO, created, managed and updated by the regional administration of Extremadura (Junta de Extremadura).

Copper, strontium and fluorite are the main minerals exploited in Andalusia and tungsten in Castilla y León and Extremadura, but several investigation permits, with tens of millions of euros investment are running nowadays, allowing us to better evaluate the potential of the regions involved in I4-GREEN.

D6.5, D6.6 and D6.7 have been submitted in M24 that gathers all this information.

Task deviations (Timeline M16-M24):

N/A.

10.5. T6.5 - Development of database on mine waste valorisation for regional investment

Leader: JDA
Contributor: ISMC, ACPMR
Timeline: M1-M24

Developments (Timeline M16-M24):

Led by JDA, with the support of ISMC and ACPMR information about inventories of mine waste deposits in the target regions, including dimension, ore type, location, and administrative status was studied.

A database about interregional mine sites in Andalusia and Alentejo was developed.

A survey was conducted to be spread into the regional authorities participant of this project, regarding:

a) Mine wastes Country Directive/law requirements.
b) Mining industry – overall description (productivity value, employment).
c) Main minerals and mining wastes (quantification and possible value).
d) Current exploration and processing technologies.
e) Previous national and EU mine waste recovery projects.

The Spanish National Inventory of Mining Waste Deposits was analysed for this project as an important source of information (Figure 16). The main waste deposits will be described and evaluated in a preliminary way. In Andalusia, 832 mining waste deposits are defined by Regional Mining Authority. Besides, abandoned mines that exploited barite, manganese, copper, tungsten, fluorite (CaF_2), nickel, etc have waste deposits that are potential targets for exploration in the long term.

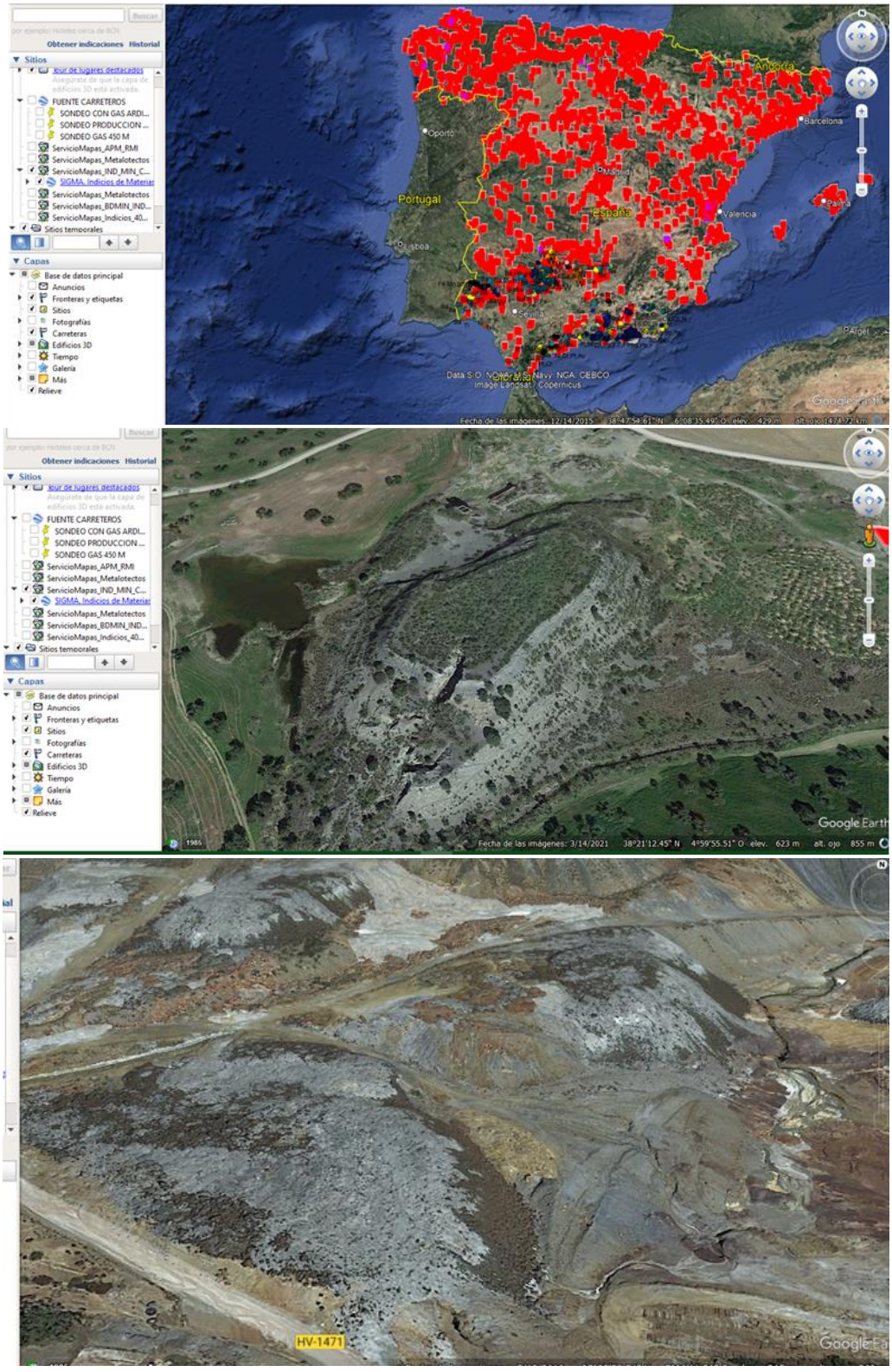

FIGURE 16 – SPANISH NATIONAL INVENTORY OF MINING WASTE DEPOSITS

A report on the most updated mine waste processing technologies was carried out jointly with the main mining companies and consultant in the target regions of I4-GREEN.

Most of the old mineral waste deposits were built many years ago, when the processing technique was not well developed, so it could remain important amount of fundamental, strategic and critical raw materials in them. Some preliminary studies and analysis were researched and shown that some of the important minerals and elements are present in the wastes, but a more in-depth study is planned to be done with the support of Regional Mining Authority in Andalusia and CE ERDF funds.

Task deviations (Timeline M16-M24):

N/A.

11. WP7 - Communication and dissemination

Leader: ISMC
Contributor: All
Timeline: M1-M30

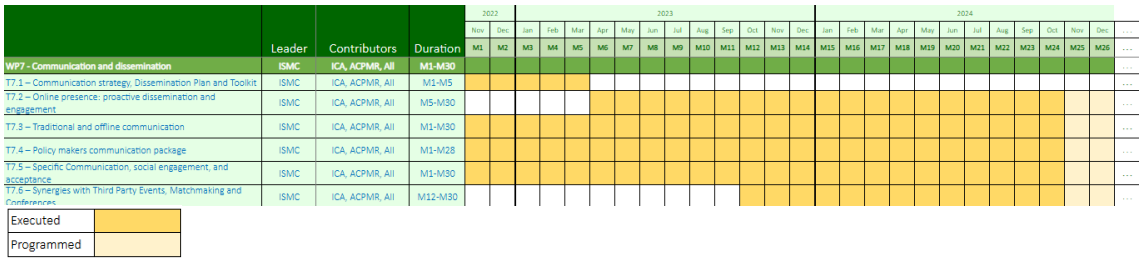

FIGURE 17 - WP7 GANTT CHART

Developments (Timeline M16-M24):

Considering that communication impact will be measured at the end of our project, it was vital to strategically plan the different actions from the very beginning. This means that, initially, efforts were concentrated to the basics: the visual identity and the necessary platforms and tools to spread the project.

Some developments of this WP, during the reporting period, cover what will be specified separately further on:

- Maintenance of a project website and social media accounts (LinkedIn, Twitter/X and YouTube).
- Newsletters.
- Events.
- Publications.

C&D activities are creating a broad impact generating awareness about the sustainability of mining processes and green production techniques to engage people from local communities, mining sector and general audience with the project objectives, activities, results, and outputs.

Deliverables								
WP	**D**	**Deliverable Name**	**Lead Beneficiary**	**Diss Level**	**Due date**	**New Due Date**	**Delivery Date**	**Status**
WP7	D7.1	Communication strategy and Dissemination Plan.	ISMC	SEN	31 Mar 2023		28 Jun 2023	Approved
WP7	D7.2	Communication Toolkit: Final Logo, Branded Portal (website), Social Media Pages, YouTube Channel.	ISMC	PU	31 Mar 2023		31 Mar 2023	Approved

WP7	D7.3	e-Newsletters.	ISMC	PU	31 Aug 2023		30 Aug 2023	Approved
WP7	D7.4	Promotional Videos.	ACPMR	PU	31 Aug 2023		24 Aug 2023	Approved
WP7	D7.5	Press releases	ISMC	SEN	30 Apr 2024		29 Apr 2024	Approved

TABLE 7 - WP7 DELIVERABLES (UNTIL M24)

11.1. T7.1 - Communication strategy, Dissemination Plan and Toolkit

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M1-M5

Developments (Timeline M1-M5):

N/A. This information was provided in D1.5 (Public Progress Report M12).

Task deviations (Timeline M1-M5):

N/A.

11.2. T7.2 - Online presence: proactive dissemination and engagement

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M5-M30

Developments (Timeline M16-M24):

Project website (Figure 18) was maintained by ISMC for the effective promotion of the project's purpose, news in the raw materials and mining sectors, activities, partners, public documents, videos, and other C&D material. Information provided by all consortium members was crucial to feed the website contents.

Website address: www.i3-i4green.eu

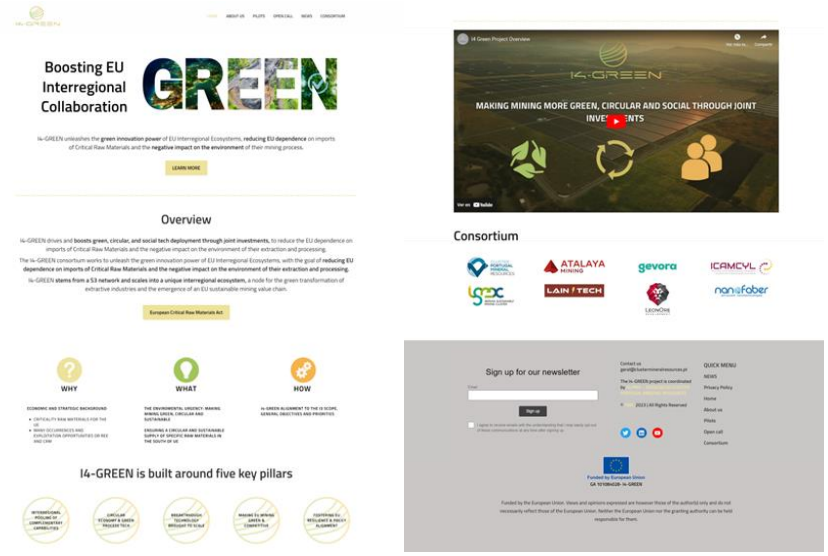

FIGURE 18 - I4-GREEN WEBSITE (WWW.I3-I4GREEN.EU)

The website was designed considering its living nature and possible updates in favour of the needs of the project, e.g. the open call of I4-GREEN. Sections for general information about the project, consortium and the I4-GREEN pilots were included, as well as specific tabs for the project news and resources (printing materials, press releases and public deliverables. A repository specific section with the useful information of about the I4-GREEN Open Call, as well as documents for the submission of proposals by SMEs were implemented on the website (Figure 19).

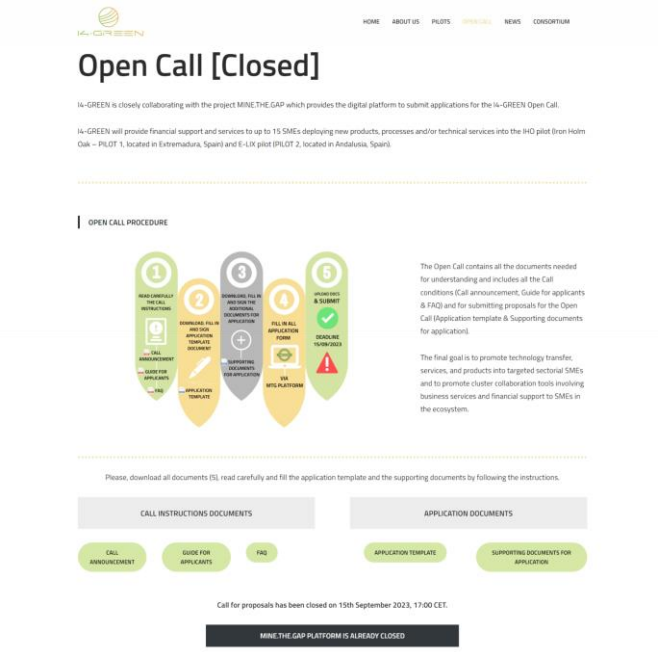

FIGURE 19 – I4-GREEN OPEN CALL REPOSITORY (WWW.I3-I4GREEN.EU/OPENCALL)

The social media strategy, (including goals, audiences, targets and KPIs) was included in the Communication Strategy and attached to the Dissemination Plan.

Twitter/X and LinkedIn (Figure 20) profiles are the main platforms used to promote the project activities and especially the Open Call and Ecosystem building and expansion sessions and events falling under WP5-6. The first one, however, was discarded as an effective communication tool due to its extremely low impact during the project execution, which was confirmed recent general sensations - obtained also through de experience in previous or parallel European - that the platform is probably no longer used as it was in the past by the user profile targeted.

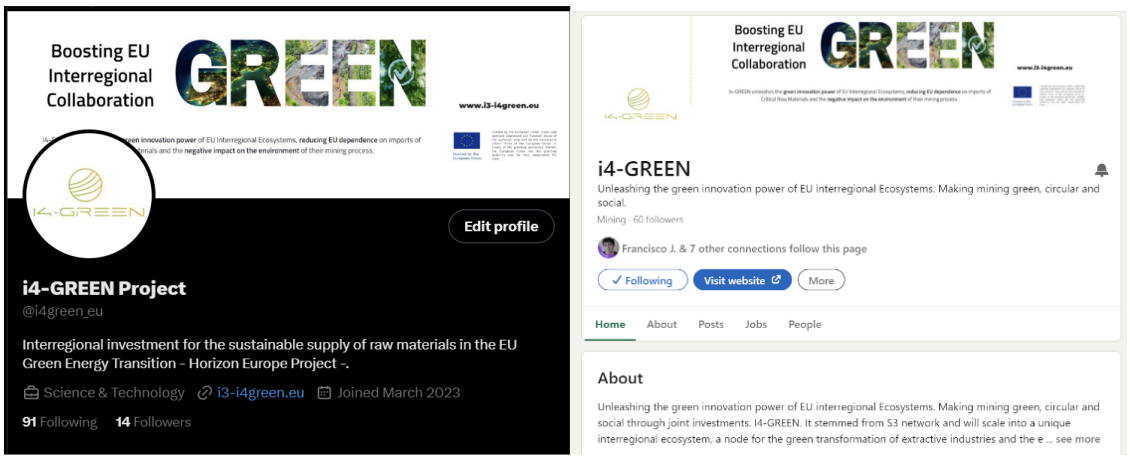

FIGURE 20 – I4-GREEN SOCIAL NETWORKS: TWITTER: @I4GREEN_EU AND LINKEDIN: @ I4-GREEN

YouTube channel was used to showcase video and visual material (Figure 21).

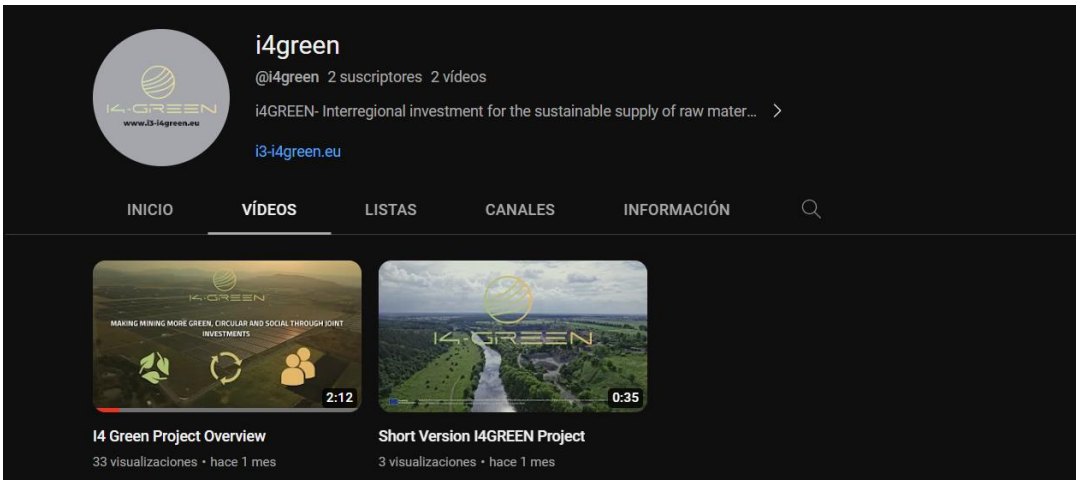

FIGURE 21 – I4-GEEN YOUTUBE CHANNEL: @I4GREEN

Task deviations (Timeline M16-M24):

Twitter/X it was determined as ineffective for the C&D activities of the project. Usage of the tool was discontinued to avoid low-impact and time-consuming dedication.

11.3. T7.3 – Traditional and offline communication

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M1-M30

Developments (Timeline M16-M24):

The newsletter tool was used during this period. The Twitter/X and LinkedIn were both used initially to share the existence of the newsletter subscription possibility, as well as the website. Currently, only the latter is being used for this purpose. Additional dissemination about the newsletter is being done through events and other C&D actions.

The newsletter included a brief description of the project as an introduction section and it followed with brief information pills related to project actions, activities, and news.

The first issue entitled "Welcome to the i4-GREEN newsletter" (Figure 22) was sent to the subscribers using the platform Mailjet.

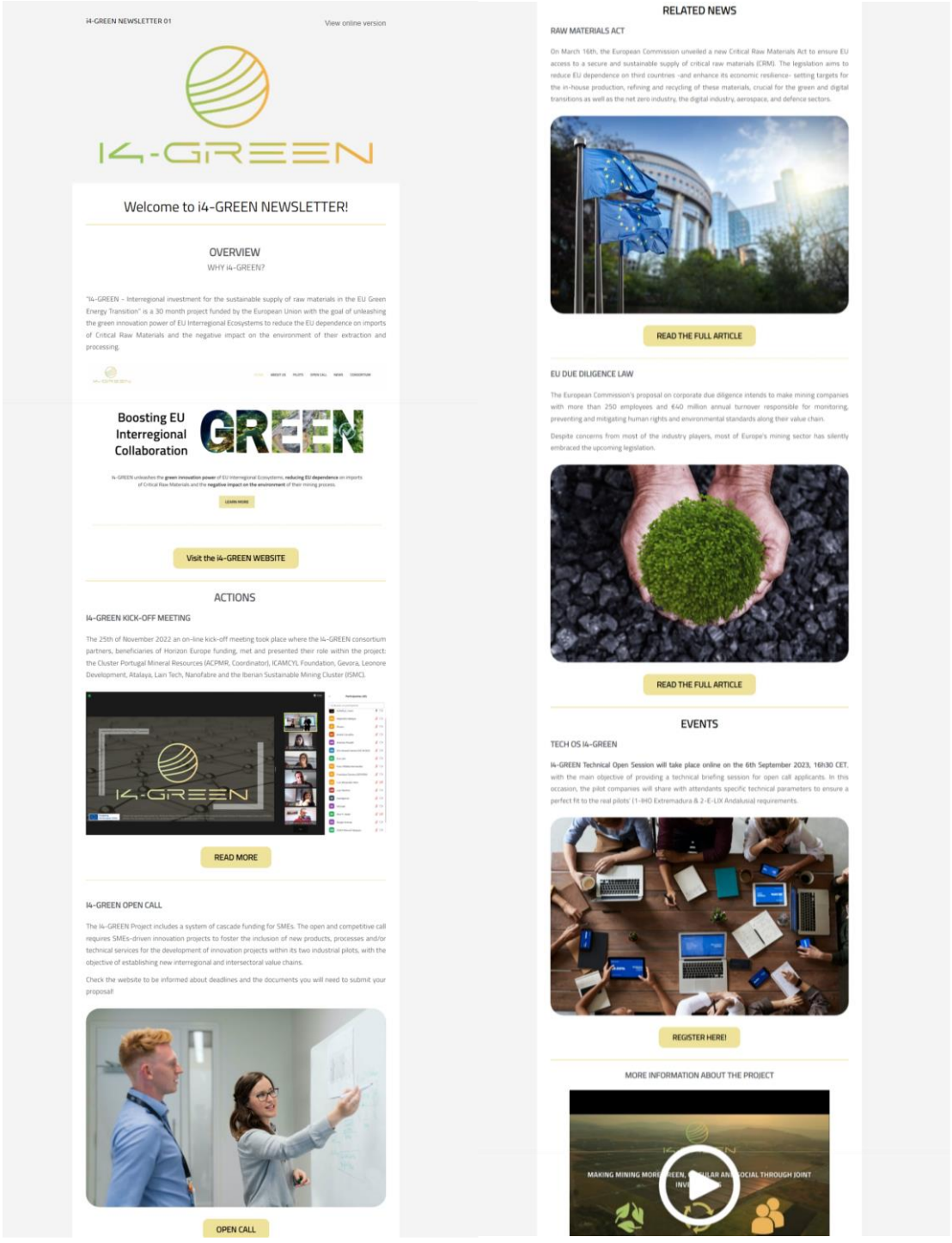

FIGURE 22 - WELCOME TO THE I4-GREEN NEWSLETTER

The 2nd newsletter was shared on the July 12, 2024. It contained information regarding the I4-GREEN consortium meetings and visit to the Riotinto mine, the Open Call results, the consortium participation in external events and development of internal events, the approval of the CRM Act and an informative post about the I3 Instrument.

The 3rd newsletter will be published at the end of the project (M29 or M30) and will include updated project results and conclusions, amongst other project-related news.

FIGURE 23: I4-GREEN NEWSLETTER 02

Moreover, 5 press releases were published until M24 of the project including during this period the change of coordinator (M16) and the Investors Day in Seville (M20).

Both the newsletters and the press releases are available for download through the project website Resources Tab.

FIGURE 24: PRESS RELEASES PUBLIC IN I4-GREEN WEBSITE

Other external news were promoted I4-GREEN Project such as: newspaper, blogs, etc.

FIGURE 25: EXTERNAL NEWS OF I4-GREEN

Task deviations (Timeline M16-M24):

N/A.

11.4. T7.4 - Policy makers communication package

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M1-M28

Developments (Timeline M16-M24):

Common advances were performed for T7.4 and T7.5 starting the project engagement with specific audiences, throughout the participation in different relevant events for industry, investors and policy makers. Examples of that events during this period are:

- EIT Raw Materials (Brussels, 15-16 May 2024).
- Investors' Forum (Seville, 17 June 2024).
- Clustering in European Innovation for Sustainable Practices (Seville, 14 October 2024).
- MMH Seville 2024 (Seville, 15-17 October 2024).

Task deviations (Timeline M16-M24):

The partners leading this task, supported by the consortium, will continue once there is significant content that might be published to promote and therefore, relevant actions by the project, such as were the news of I4-GREEN call.

11.5. T7.5 - Specific Communication, social engagement, and acceptance

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M1- M30

Developments (Timeline M16-M24):

Partners spread the project in their networks in a local, national and international levels, as well as in their usual instruments of communication such as social media or website. During the M20 Consortium Meeting, these contents and messages were revised and confirmed. Special emphasis was put into adequation of the messages directed towards the civil society, to give a new image about the mining sector and promote social acceptance.

These messages were included in the C&D material, which was shared during all the events with I4-GREEN presence.

Task deviations (Timeline M16-M24):

N/A.

11.6. T7.6 - Synergies with Third Party Events, Matchmaking and Conferences

Leader: ISMC
Contributor: ICAMCYL, ACPMR, All
Timeline: M12-M30

Developments (Timeline M16-M24):

In addition to the social media and website posts, newsletters and press releases, broad impact communication efforts were also focused on the presentation of the project goals, activities and results through third party events (including matchmakings and conferences). One activity has been the EIT Raw Materials (Brussels, 15-16 May 2024), the European Cluster Conference (M19) and Mining and Minerals Hall Seville (M24).

Task deviations (Timeline M16-M24):

N/A