



**MSA-based circular hydrometallurgy for
sustainable, cost-effective production of NMC
cathode materials
(CICERO)**

D6.2

**Interim report on outcomes of clustering
activities**

Public

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EXECUTIVE SUMMARY

CICERO develops a circular hydrometallurgical Ni, Co & Mn processing/refining scheme that uses methanesulphonic acid (MSA) – a commercial, green, REACH-compliant & affordable acid – rather than H₂SO₄. CICERO recovers, refines and converts Ni, Co and Mn from domestically available secondary raw materials: (a) post-mining raw materials (sulphide & laterite tailings) and (b) Ni/Co/Mn-bearing intermediates incl. MSP, FeNi, Ni-matte and Mn-anode sludge. To achieve this, CICERO develops a suite of novel metallurgical unit processes for advanced MSA leaching and solution purification, the conversion to battery-grade MSA salts, and the synthesis of NMC cathodes in MSA media, with sound reagent regeneration & iron recovery in line with the Twelve Principles of Circular Hydrometallurgy.

WP6 “Clustering with other EU projects” aims to cluster CICERO with projects from past (e.g., H2020/HE projects such as ENICON, EXCEED, Battery 2030) and present related calls (e.g., CL5-2023-D2-01, CL4-2023-RESILIENCE-01-03); to contribute to the objectives of Batteries Europe, the European Raw Materials Alliance and the European Critical Raw Materials Act (CRMA); and to reach out to partners in Africa, the Mediterranean Region and the US in view of international cooperation and increased impacts.

This interim report serves as a comprehensive overview of the project’s progress spanning the period from its commencement to the completion of month 18. It meticulously details all the activities undertaken within the context of Work Package (WP) 6, encompassing the preliminary activities crucial for clustering, the clustering events organized or co-organized by the CICERO project, and all other clustering activities, including participation in the Cluster Hub for the production of raw materials for batteries from European resources and the BATTERY 2030+ initiative. Additionally, the report provides insights into the capacity-building seminar organized and the future plans within the scope of WP 6.

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1. Clustering Activities

1.1 Identification of related projects for clustering

To initiate the clustering activities, Technical University of Crete (TUC) employed a two-step process to identify relevant projects for clustering purposes. This effort was undertaken in the context of Task 6.1 Identification and monitoring of related projects.

Initially, an extensive search was conducted in EU databases and on the Internet to identify projects whose scopes and objectives aligned with [CICERO](#). All the extracted essential information was meticulously compiled in related tables. Specifically, an extensive search was performed using [CORDIS](#) - the European Commission's primary source of results from the projects funded by the EU's framework programmes for research and innovation (FP1 to Horizon Europe). (<https://cordis.europa.eu>All projects from the same call were selected. Subsequently, a detailed survey was conducted on projects within the same thematic area. This process resulted in the selection of 24 projects for further analysis. The related projects are presented in Table 1.

Table 1: CICERO's clustering projects list¹

ID	Project's Name	Related Call	Type of Project	Start Date	End Date
1	Sustainable Technologies for Reducing Europe's battery raw Materials dependence (STREAMS)	HORIZON-CL5-2023-D2-01-01: Technologies for sustainable, cost-efficient and low carbon footprint downstream processing & production of battery-grade materials (Batt4EU Partnership)	HORIZON RIA	1/1/2024	31/12/2026
2	Sustainable processing of Europe's low-grade sulphidic and lateritic nickel/cobalt ores and tailings into battery-grade metals (ENICON)	HORIZON-CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials (Batteries Partnership)	HORIZON RIA	1/6/2022	31/5/2026
3	Lithium recovery and battery-grade materials production from European resources (LICORNE)	HORIZON-CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials (Batteries Partnership)	HORIZON RIA	1/10/2022	30/9/2026
4	Recycling of Lithium from Secondary Raw Materials and Further (RELIEF)	HORIZON-CL5-2021-D2-01-01: Sustainable processing, refining and recycling of raw materials (Batteries Partnership)	HORIZON RIA	1/7/2022	30/6/2025
5	Feasible recovery of critical raw materials through a new	HORIZON-CL5-2021-D2-01-06: Sustainable, safe and	HORIZON RIA	1/9/2022	31/8/2026

¹ The links provided in Table 1, are the ones to the official description of each project to the CORDIS site

	circular ecosystem for a Li-Ion battery cross-value chain in Europe (FREE4LIB)	efficient recycling processes (Batteries Partnership)			
6	Integrated innovative pilot system for critical raw materials recovery from mines wastes in a circular economy context (RAWMINA)	CE-SC5-07-2020 CE: Raw materials innovation for the circular economy: sustainable processing, reuse, recycling and recovery schemes	HORIZON IA	1/5/2021	30/4/2025
7	Flexible, safe & efficient REcycling of Li-on batterieS for a comPetitive, circular, and sustainable European ManufaCTuring industry (RESPECT)	HORIZON-CL5-2021-D2-01-06: Sustainable, safe and efficient recycling processes (Batteries Partnership)	HORIZON RIA	1/7/2022	30/6/2026
8	Batteries reuse and direct production of high performances cathodic and anodic materials and other raw materials from batteries recycling using low cost and environmentally friendly technologies (RHINOCEROS)	HORIZON-CL5-2021-D2-01-06: - Sustainable, safe and efficient recycling processes (Batteries Partnership)	HORIZON RIA	1/9/2022	31/8/2026
9	Recycling of end-of-life battery packs for domestic raw material supply chains and enhanced circular economy (BATRAW)	HORIZON-CL4-2021-RESILIENCE-01-04: Developing climate-neutral and circular raw materials (IA)	HORIZON IA	1/5/2022	30/4/2026
10	REcycling of low Value components using high purity pre-treatment, direcT recycling And green hydrometallurgical approaches for recycling of Lithium Ion and Sodium Ion Batteries (REVITALISE)	HORIZON-CL5-2023-D2-01-02: New processes for upcoming recycling feeds (Batt4EU partnership)	HORIZON RIA	1/11/2023	31/10/2026
11	Cost-effective processing and refining of lithium into lithium hydroxide from strategic European multi-mineral lithium hard-rock projects (LITHOS)	HORIZON-CL4-2023-RESILIENCE-01-03: Technologies for processing and refining of critical raw materials (IA)	HORIZON IA	1/1/2024	30/6/2027
12	Sustainable European Rare Earth Elements production	HORIZON-CL4-2023-RESILIENCE-01-03:	HORIZON IA	1/1/2024	31/12/2027

	value chain from primary Ores (SUPREEMO)	Technologies for processing and refining of critical raw materials (IA)			
13	Efficient direct recycling for low-value LFP battery for circular and Sustainable waste management (ReUse)	HORIZON-CL5-2023-D2-01-02: New processes for upcoming recycling feeds (Batt4EU partnership)	HORIZON RIA	1/1/2024	31/12/2026
14	A circular and chemistry-neutral approach for recycling and recovery of battery waste feeds (RENOVATE)	HORIZON-CL5-2023-D2-01-02: New processes for upcoming recycling feeds (Batt4EU partnership)	HORIZON RIA	1/1/2024	31/12/2026
15	Cost-effective, sustainable and responsible extraction routes for recovering distinct critical metals and industrial minerals as by-products from key European hard-rock lithium projects (EXCEED)	HORIZON-CL4-2022-RESILIENCE-01-07: Innovative solutions for efficient use and enhanced recovery of mineral and metal by-products from processing of raw materials (IA)	HORIZON IA	1/1/2023	31/12/2026
16	Demonstration of battery metals recovery from primary and secondary resources through a sustainable processing methodology (METALLICO)	HORIZON-CL4-2022-RESILIENCE-01-07: Innovative solutions for efficient use and enhanced recovery of mineral and metal by-products from processing of raw materials (IA)	HORIZON IA	1/1/2023	31/12/2026
17	CRM-geothermal: Raw materials from geothermal fluids: occurrence, enrichment, extraction (CRM-geothermal)	HORIZON-CL4-2021-RESILIENCE-01-06: Innovation for responsible EU sourcing of primary raw materials, the foundation of the Green Deal (RIA)	HORIZON RIA	1/5/2022	30/4/2026
18	Material and digital traceability for the certification of critical materials (MaDiTraCe)	HORIZON-CL4-2022-RESILIENCE-01-05: Technological solutions for tracking raw material flows in complex supply chains (RIA)	HORIZON Research and Innovation Actions	1/1/2023	30/6/2026
19	Advanced sensing, monitoring and self-HEALING mechanisms to self-repair BATteries (HEALING BAT)	HORIZON-CL5-2022-D2-01-06: Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair	HORIZON RIA	1/6/2023	31/5/2027

		battery cells) (Batteries Partnership)			
20	Development of operando techniques and multiscale modelling to face the zero-excess solid-state battery challenge (OPERA)	HORIZON-CL5-2022-D2-01-02: Interface and electron monitoring for the engineering of new and emerging battery technologies (Batteries Partnership)	HORIZON RIA	1/6/2023	31/5/2026
21	Operando analyses and modelling of interface dynamics and CHARGE transport in lithium-ion batteries (OPINCHARGE)	HORIZON-CL5-2022-D2-01-02: Interface and electron monitoring for the engineering of new and emerging battery technologies (Batteries Partnership)	HORIZON RIA	1/6/2023	31/5/2026
22	Building more reliable and performant batteries by embedding sensors and self-healing functionalities to detect degradation and repair damage via advanced Battery Management System (PHOENIX)	HORIZON-CL5-2022-D2-01-06: Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells) (Batteries Partnership)	HORIZON RIA	1/5/2023	30/4/2027
23	Coordination of large-scale initiative on future battery technologies (Batteries Partnership) (SALAMANDER)	HORIZON-CL5-2022-D2-01-06: Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells) (Batteries Partnership)	HORIZON RIA	1/5/2023	31/10/2026
24	Zero Emission electric Vehicles enabled by haRmonised circulaRity (ZEVRA)	HORIZON-CL5-2023-D5-01: Circular economy approaches for zero emission vehicles (2ZERO Partnership)	HORIZON RIA	1/1/2024	31/12/2026

For each of the projects presented in Table 1, a table has been created and presented in [1], which contains the following information: (i) Project's title, (ii) Acronym, (iii) Webpage, (iv) Related Call, (v) Contact person's name and email, (vi) Starting and Ending date, (vii) The project's description. It is worth mentioning that Table 1, was compiled according to the relevance of the project to the objectives and goals of CICERO. The projects which are more relevant to CICERO are placed higher on the list.

1.2 Joining the Cluster Hub for the production of raw materials for batteries from European resources

Considering the outcomes and responses received during the initial contact with all pertinent projects, the following course of action was implemented. It was determined that [Cluster Hub for the production of raw materials for batteries from European resources](https://www.materialsforbatterieshub.eu/), (<https://www.materialsforbatterieshub.eu/>), was highly relevant to the scope and goals of the CICERO project. Consequently, CICERO applied to join the Hub as a full member.

The Cluster Hub is a collaboration-driven community, which shares a common mission: to advance the knowledge necessary for fostering more sustainable and circular production of raw materials for the European battery industry. The hub currently comprises 22 members, with several other projects expressing interest in potential participation. CICERO is an active member, participating in all hub meetings, which are held bi-monthly, as well as in all related online activities. Additionally, CICERO collaborates with other hub members to organize events that align objectives.

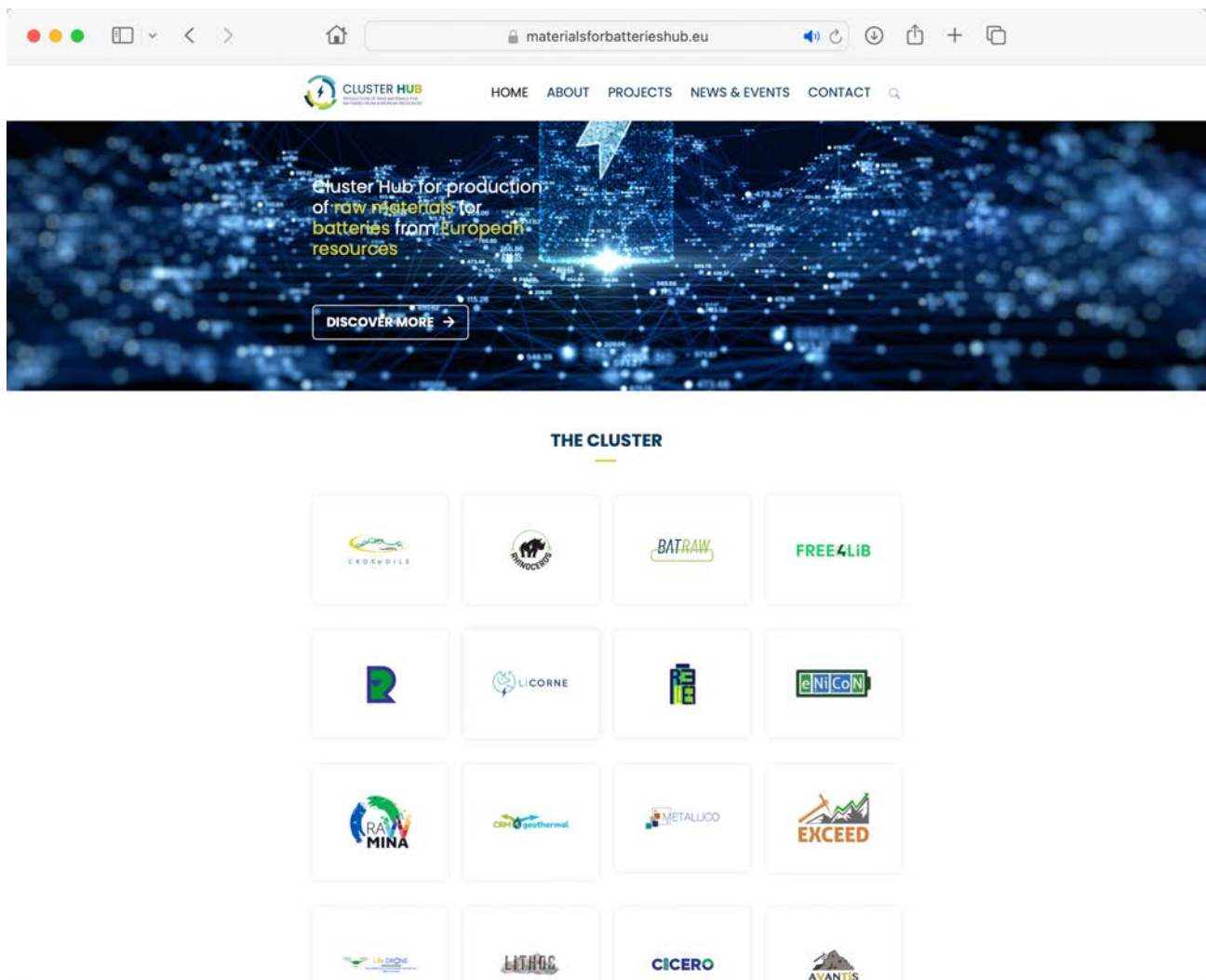


Figure 1-1 Home page of the Cluster Hub for the production of raw materials for batteries from European resources

1.3 Clustering Events

A series of clustering events was organized or co-organized by the CICERO project as they are described in detail in the following paragraphs.

1.3.1 1st Clustering event: “Towards responsible mining and processing of energy-transition metals in Europe: A mere pipedream or a realistic opportunity?”

Introduction

Critical Raw Materials are essential in the modern-day economy, for renewable energy technologies, electric vehicles, long-duration energy storage (LDES) and digitalisation, allowing our society to meet the Sustainable Development Goals (SDGs). The European Commission’s (EC) Critical Raw Materials Act (CRMA) sets mining, processing and recycling benchmarks to reduce Europe’s dependency on just a few third countries for many of its strategic/critical raw materials (SRMs/CRMs). The CRMA’s main objective is to secure a resilient, sustainable and ethical supply of CRMs for the transition to a net-zero economy.

However, Europe’s current CRM dependency problem is huge. For example, Europe is almost 100% reliant on imports of lithium for the Li-ion batteries that are central to decarbonising the energy and mobility sectors. On the other hand, Europe hosts 27 Li hard-rock deposits, representing vast lithium resources. 11 of those 27 deposits are currently being considered for commercial exploitation.

However, the European potential to explore and mine its resources and produce strategic and critical elements, such as lithium, remains largely untouched, partly due to a reluctant attitude towards mining in several European countries. Most of the disputes among companies and various stakeholders occur as a result of conflicting land uses or due to an advanced risk for affecting the environment, the communities and the ecosystems in the area of concern. The recent protests in Serbia concerning the Jadar project highlight the complexity of initiating mines in Europe. The social license to operate (SLO) / public acceptance (PA) is an informal social contract to improve the relations between the mining industry and the society. A successful social contract is a prerequisite for the implementation of any socially responsible exploration / mining project. During the last years, mining companies operating in Europe have taken many important initiatives to improve their performance and to promote stakeholder engagement and company–community relationships. They also use new low-impact mineral exploration and mining technologies that address health, safety and environmental issues and have competitive advantages over the traditional ones. Intense research activities are carried out for the promotion of breakthrough technological innovation in exploration, mining, beneficiation, metallurgy and waste valorisation as well as optimisation of water management in the broader mining industry. This proposed approach is in line with the United Nations Economic Commission for Europe (UNECE) Framework for CRMs that involves, among others, the establishment of a comprehensive Socio-Environmental-Economic Contract to Operate, integrating impacts on societies and communities, the need for a just transition, climate change mitigation and adaptation, and environmental stewardship.

Event

In this context CICERO project, co-organized with [AVANTIS \(https://avantis-horizon.eu\)](https://avantis-horizon.eu), [LITHOS \(https://lithos-horizon.eu\)](https://lithos-horizon.eu), [EXCEED \(https://exceed-horizon.eu\)](https://exceed-horizon.eu) and [ENICON \(https://enicon-horizon.eu\)](https://enicon-horizon.eu) Horizon Europe projects a clustering event entitled “Towards responsible mining and processing of energy-transition metals in Europe: A mere pipedream or a realistic opportunity” (<https://cicero-horizon.eu/event/towards-responsible-mining-and-processing-of-energy-transition-metals-in-europe-a-mere-pipedream-or-a-realistic-opportunity/>), in conjunction with the 1st International Circular Hydrometallurgy Symposium (<https://ichs2024.cirmet.eu>) in Mechelen, Belgium, in Martin’s Patershof hotel (9th of September, 2024).

The event was organized in two different sessions. The first session included presentations from the organizing projects related to several aspects of their approach to SLO. The second session included a round-table discussion with representatives from different entities (EU, academia, research institutions, industry, SMEs, NGOs etc.) aiming to shed light on SLO issues (in particular with respect to the CRMA target to endorse and fast-track “Strategic Projects”), inform society about the requirements of the green energy transition, the responsibility of the mining industry to manage its impacts and identify the most critical aspects to fundamentally transform society’s trust in mining. The detailed program is presented in Figure 1-2.

Towards responsible mining and processing of energy-transition metals in Europe: a mere pipedream or a realistic opportunity?	
EU Clustering event & High-level stakeholder panel Martin's Patershof - Mechelen, Belgium, 9/9/2024	
Timetable	
Session 1: Projects Presentation and the Critical Raw Material Act 9.00-10.30	
Topic	Speaker
“Setting the scene: battery raw materials in the context of the energy transition”	William Todts <i>(Transport & Environment (T&E))</i>
“The ENICON & CICERO approach towards SLO”	Anders Sand <i>(Boliden Mineral AB)</i>
“The EXCEED & LITHOS approach towards SLO: the Barroso Lithium project”	Thomas Gaultier <i>(Savannah Resources)</i>
“The AVANTIS approach towards SLO”	Kostas Komnitsas <i>(Technical University of Crete)</i>
Coffee Break	
Session 2 Round Table 11.00-12.30	
Introduction by Susana Xará (European Health and Digital Executive Agency) “The Critical Raw Material Act (CRMA) and the role of the Strategic Projects” (on-line presentation)	
Closing panel discussion [Moderator: Peter Tom Jones (KU Leuven Institute for Sustainable Metals and Minerals (SIM²))]	
Participants	Toni Eerola (GTK)
	Anders Sand (Boliden Mineral AB)
	Antoine Oger (Institute for European Environmental Policy - IEEP)
	Emily Stewart (Global Witness)

Figure 1-2 Detailed program of the clustering event “Towards responsible mining and processing of energy-transition metals in Europe: A mere pipedream or a realistic opportunity”

The event was successful and attracted 111 registered participants with a total number of 80 actual attendees (Figure 1-3) from different organizations including but not limited to EU, academia, research institutions, industry, SMEs, NGOs etc.



Figure 1-3 The venue of the clustering event “Towards responsible mining and processing of energy-transition metals in Europe: A mere pipedream or a realistic opportunity”

1.3.2 2nd clustering event: “From mining to recycling. The R&I journey of battery raw materials in EU”

On 12 December 2024, the third edition of the annual workshop of the Cluster Hub Production of Raw Materials for Batteries from European Resources, entitled “From mining to recycling. The R&I journey of battery raw materials in EU” took place in Brussels, being co-organised by EU-funded projects [RHINOCEROS](https://www.rhinoceros-project.eu) (<https://www.rhinoceros-project.eu>), [CRM-geothermal](https://crm-geothermal.eu) (<https://crm-geothermal.eu>) and [CICERO](https://cicero-horizon.eu) (<https://cicero-horizon.eu>).

The hub’s annual workshop, held as a satellite event of [Raw Materials Week 2024](https://single-market-economy.ec.europa.eu/sectors/raw-materials/week_en) (https://single-market-economy.ec.europa.eu/sectors/raw-materials/week_en) (Brussels, Belgium), provided a platform for presenting the most promising results from participating projects. Two technical sessions covered the entire battery value chain, from raw materials mining to recycling. The opening session conveniently portrayed the policy, regulatory, and strategic frameworks that support and drive EU R&I initiatives in the battery sector. The workshop was attended by the European Commission’s relevant services and representatives from academia, RTOs, and the private sector. The event commenced with an overview of the recently adopted legislation in the sector, including the Critical Raw Materials Act (https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act_en) and the Net-Zero Industry Act (https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act_en).

This was followed by a presentation on the available R&D funding opportunities at the European level. The detailed proceedings of the event are available (<https://www.materialsforbatterieshub.eu/news/from-mining-to-recycling-the-ri-journey-of-battery-raw-materials-in-eu-proceedings-from-the-hubs-annual-workshop-2024/>).



Figure 1-4 The announcement of the annual clustering event of the Cluster Hub “Production of Raw Materials for Batteries from European Resources”

The event was successful and gathered 35 on-site participants and around 60 online participants



Figure 1-5 The venue of the clustering event of the Cluster Hub “Production of Raw Materials for Batteries from European Resources”

1.3.3 3rd clustering event: “To mine or not to mine?”

CICERO project, co-organized with [AVANTIS](https://avantis-horizon.eu) (<https://avantis-horizon.eu>), [LITHOS](https://lithos-horizon.eu) (<https://lithos-horizon.eu>), [EXCEED](https://exceed-horizon.eu) (<https://exceed-horizon.eu>) and [ENICON](https://enicon-horizon.eu) (<https://enicon-horizon.eu>) Horizon Europe projects a clustering event entitled “To mine or not to mine?”, at the premises of Technical University of Crete at Chania (07 April 2025, 18:30). The event was attended by more than 50 university students, researchers and faculty members. During the event a screening of the documentary film “Not In My Country: Serbia’s Lithium Dilemma” (https://www.youtube.com/watch?v=of_ADK3yW8g) took place. The film was followed by an extensive debate addressing different aspects of the challenges of mining projects in Europe.

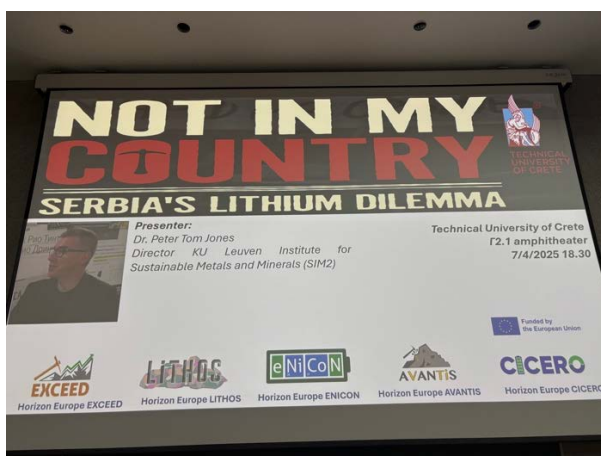


Figure 1-6 Clustering event: “To mine or not to mine?”

1.3.4 4th clustering event: “To mine or not to mine energy transition metals in Europe?”

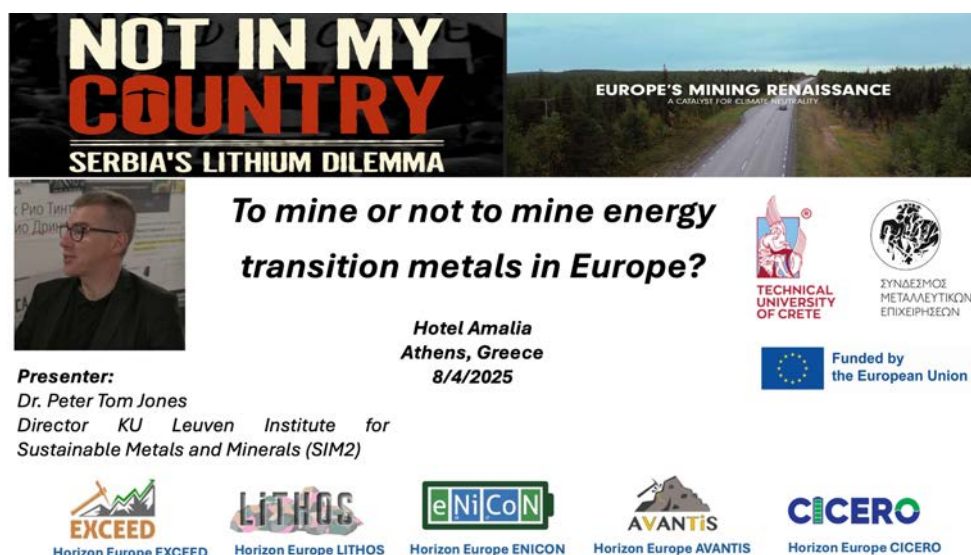
CICERO project, co-organized with [AVANTIS](https://avantis-horizon.eu) (<https://avantis-horizon.eu>), [LITHOS](https://lithos-horizon.eu) (<https://lithos-horizon.eu>), [EXCEED](https://exceed-horizon.eu) (<https://exceed-horizon.eu>) and [ENICON](https://enicon-horizon.eu) (<https://enicon-horizon.eu>) Horizon Europe projects and the [Society of Mining Enterprises of Greece](https://sme.gr) (<https://sme.gr>) a clustering event entitled “To mine or not to mine energy transition metals in Europe?”, at the premises of the Amalia Hotel, Athens, Greece (8/4/2025). In the clustering event a screening of two documentary films “Not In My Country: Serbia’s Lithium Dilemma” (https://www.youtube.com/watch?v=of_ADK3yW8g) and “Made in Europe: from Mine to Electric Vehicle” (<https://www.youtube.com/watch?v=jeAwlkvjERA>) took place. The audience included members of the Society of Mining Enterprises of Greece, representatives from the Ministry of Environment and Energy (<https://ypen.gov.gr>), the [Hellenic Survey of Geology & Mineral Exploration \(H.S.G.M.E.\)](https://hsgme.gr) (<https://hsgme.gr>).

(<https://www.linkedin.com/company/eagme/>), as well as researchers and students from the [National Technical University of Athens](https://www.ntua.gr/en/) (<https://www.ntua.gr/en/>).

The detailed program was the following:

- 15:30 – 16:00 Welcome coffee
- 16:00 – 16:30 Introduction and opening statements
- 16:30 – 17:15 Screening of the *Made in Europe: from Mine to Electric Vehicle* documentary
- 17:15 – 18:00 Screening of the *Not In My Country: Serbia’s Lithium Dilemma* documentary
- 18:00 – 19:00 Discussion and Q&A
- 19:00 – 21:00 Working dinner

Both documentaries sparked animated debates, more than 1 hour, with the audience.



NOT IN MY COUNTRY
SERBIA'S LITHIUM DILEMMA

EUROPE'S MINING RENAISSANCE
A CATALYST FOR CLIMATE NEUTRALITY

To mine or not to mine energy transition metals in Europe?

Hotel Amalia
Athens, Greece
8/4/2025

Presenter:
Dr. Peter Tom Jones
Director KU Leuven Institute for Sustainable Metals and Minerals (SIM2)

TECHNICAL UNIVERSITY OF CRETE
ΣΥΝΔΕΣΜΟΣ ΜΕΤΑΛΛΕΥΤΙΚΩΝ ΕΠΙΧΕΙΡΗΣΕΩΝ

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CICERO Horizon Europe CICERO

Figure 1-7 Clustering event: “To mine or not to mine energy transition metals in Europe?”

The event was successful and attracted 55 on-site participants.



Figure 1-8 The venue of the clustering event “To mine or not to mine energy transition metals in Europe?”

1.3.5 5th clustering event: “CRM And Batteries – State Of The Art & Future Developments on Technology and Sustainability”

CICERO project participated in the organization of a Clustering and Cross Fertilisation Event event led by [Li4Life](https://li4life.eu) (<https://li4life.eu>) project along with the [BATTERY 2030+](https://battery2030.eu) (<https://battery2030.eu>) and the [STREAMS](https://streams-project.eu) (<https://streams-project.eu>) project. The event took place in hybrid format in Oviedo, Spain (11/3/2025) and it was entitled “CRM And Batteries – State Of The Art & Future Developments on Technology and Sustainability” (<https://li4life.eu/agenda>). CICERO’s vision, scope and objectives were presented by Marja Salo from VTT. The detailed agenda of the event is presented in Figure 1-9.

CRM & BATTERIES		
State of the art & future developments on technology and sustainability		
A clustering and cross-fertilisation event		
Organised by Li4Life in collaboration with B2030+ and featuring Cicero and Streams projects Tuesday 11th March 2025 – 9:30 - 16:00 – Sala Clarín, Oviedo University, Oviedo, Spain		
AGENDA		
Welcome coffee and registration		09.00
Institutional welcome introduction to the day	University of Oviedo Filippo Compagni ISMC	09.30
B2030+ & cluster projects on Raw Materials & Recycling		09.40
Battery 2030+ supporting the European battery “ecosystem” for the sustainable batteries of the future	Marcel Meeus MD at Sustesco BATTERY2030+	
CICERO: MSA-based circular hydrometallurgy for sustainable, cost-effective production of NMC cathode materials	M.Sc. Marja Salo Research Scientist Metals and Materials Recovery group, VTT	
STREAMS: Innovative technologies to strengthen Europe’s battery materials supply chain	Damian Cupid Thematic Coordinator Austrian Institute of Technology	
Li4Life: sustainable Li from European sources	Adriana Gutiérrez Project Manager ICAMCYL	
Coffee break & networking – Poster gallery		11.00
Technologies & sustainability challenges		11.50
RESILEX: Resilience enhancement of the Silicon value chain in Europe: Revitalizing Silicon from EoL PV panels in LIBs	Dr. Hamid Oubaha R&D Project Manager Université de Liège	
METALLICO: The COOL+ process – a hybrid approach for lithium recovery from primary and secondary sources	Prof. Martin Bertau Director Chemistry Institute TU Bergakademie Freiberg	
RENOVATE project: A Circular and Chemistry-Neutral Approach for Recycling and Recovery of Battery Waste Feeds	Alberto González Cano Sustainability Technical Officer, LOMARTOV	
Li4Life: Harmonised Processing Pathways: From Upstream Lithium Extraction to High-Purity Li ₂ CO ₃ Production	Prof. Yousef Ghorbani Professor in Energy Materials and Chemistry University of Lincoln	
Roundtable - technical challenges and solutions	Adriana Gutiérrez Project Manager ICAMCYL	
Lunch & networking – Poster gallery		13.10
Private sector viewpoint & international supply chains		14.40
Li value chain Latin America overview	Prof. Oscar Jaime Restrepo Professor materials and mining Universidad Nacional de Colombia	
LEMUR - Operation, management, and optimisation of Li-ion batteries in behind-the-meter applications”	Prof. Pablo García Fernández Principal investigator LEMUR Group Universidad de Oviedo	
LCA approach for Li and batteries market	Dr. Vasiliki Alexiou Principal Investigator; sustainability studies MNL Innovations PC	
Roundtable - Lithium value chain: present and future challenges	Prof. Juan M. Menéndez Aguado Professor in Mineral Processing Technology Universidad de Oviedo	
Closing		16.00
Guided visit to ASRAM (Asturias Raw Materials) the Institute for Research in Raw Materials of the University of Oviedo and research facilities. (optional) 16:00 – 18:00	Filippo Compagni ISMC	
	Transport from the venue to the Mieres campus and return is provided by the event. Registration is mandatory. Timing is indicative and subject to traffic.	

Participation to the event is free.
Registration is compulsory.
[Register here.](#)

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Figure 1-9 Agenda of the Clustering event: “CRM And Batteries – State of the art & Future Developments on Technology and Sustainability”

1.4 Other Clustering activities

CICERO project is participating in [BATTERY 2030+](https://battery2030.eu) (<https://battery2030.eu>), a coordination and support action project (CSA) which has 5 keys objectives towards: (i) Coordinating, facilitating and monitor the implementation of the Battery 2030+ roadmap to ensure a strong European battery knowledge-base in long-term research, (ii) Maintain the Battery 2030+ roadmap, (iii) identify common best practises in Battery research, (iv) developing European curricula in future battery technologies by transforming the results from B2030+ projects and the themes in the roadmap into curricula and (v) contribute to the communication, dissemination and stakeholder engagement. To optimize efficiency, the Battery 2030+ initiative organizes participating projects into distinct sub-groups. CICERO has been designated as a member of a sub-group known as “raw materials and circularity.” This subgroup convenes meetings as required to enhance alignment and facilitate internal exchange within its specific sub-field.

2. Standardisation Activities

CICERO participated in the Horizon Standardisation Booster’s (<https://hsbooster.eu>) event which took place in Brussels, Belgium (5th of March 2025). The HSbooster was funded under the Horizon Europe Research and Innovation Programme, managed by the European Research Executive Agency (REA) and aimed at raising awareness of how contributing to standardisation can increase value of research results across different areas the EU’s Work Programme. The event entitled “HSbooster.eu Final Event: Impact through Research, Innovation and Standards” (<https://hsbooster.eu/events/hsboostereu-final-event-impact-through-research-innovation-and-standards>), had as goal to bring closer experts from the domain of standardization with interested projects and other entities and present the related tools, services and the training academy which was developed. The tangible impact of the community of standardisation experts that HSbooster.eu has created was highlighted along with their crucial role in providing direct and tailored support to EU projects. The aforementioned information is of key importance since it can significantly help the CICERO’s project standardization activities by adopting some of the tools developed for its purposes. The detailed program of the event along with the related presentations can be found in the following link (<https://hsbooster.eu/events/hsboostereu-final-event-impact-through-research-innovation-and-standards>).

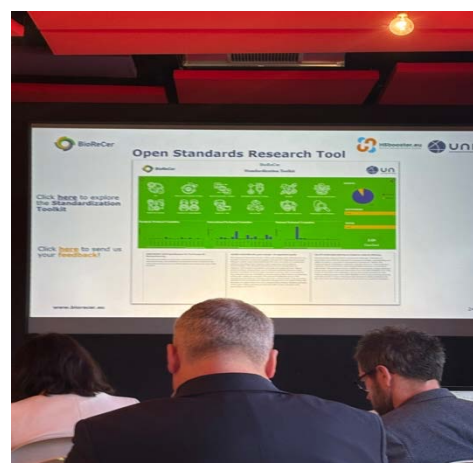


Figure 2-1 Snapshots from the event entitled “HSbooster.eu Final Event: Impact through Research, Innovation and Standards”

3. Capacity building Actions

The CICERO consortium has organized the first capacity building seminar (<https://cicero-horizon.eu/event/capacity-building-webinar/>) in a hybrid format, in conjunction with the LITHOS (<https://lithos-horizon.eu>) project. Four lectures were delivered by esteemed academics and researchers affiliated with CICERO’s partners. The primary topics covered included: the production of lithium hydroxide via the alkaline leaching process of spodumene concentrate, the role of MSA in the crystallization of battery metals, and the significance of Life Cycle Assessment (LCA) in mining and metallurgical endeavours. The webinar’s target audience comprised graduate and postgraduate students, as well as early-stage researchers.

Eero Kolehmainen from Metso presented a comprehensive overview entitled: “Alkaline Leaching Process for Spodumene Concentrate to Produce Lithium Hydroxide”. Kerstin Forsberg from KTH Metso presented a detailed discussion on “Crystallization of Battery Metals from MSA”. Konstantinos Komnitsas from TUC presented a compelling analysis on “The Importance of Life Cycle Assessment in Mining and Metallurgical Projects”. Tobias Urban’s from BASF presentation was entitled “Methane Sulfonic Acid: A Versatile and Sustainable Acid”.

The event was effectively promoted through various networks, including CICEROS’s partners, EURECA-PRO European University (<https://www.eurecapro.eu>), Society of Petroleum Engineers (SPE) (<https://www.spe.org/en/>), and the Cluster Hub for Production of Raw Materials for Batteries from European Resources (<https://www.materialsforbatterieshub.eu>).

In total, the event garnered 56 registered participants.

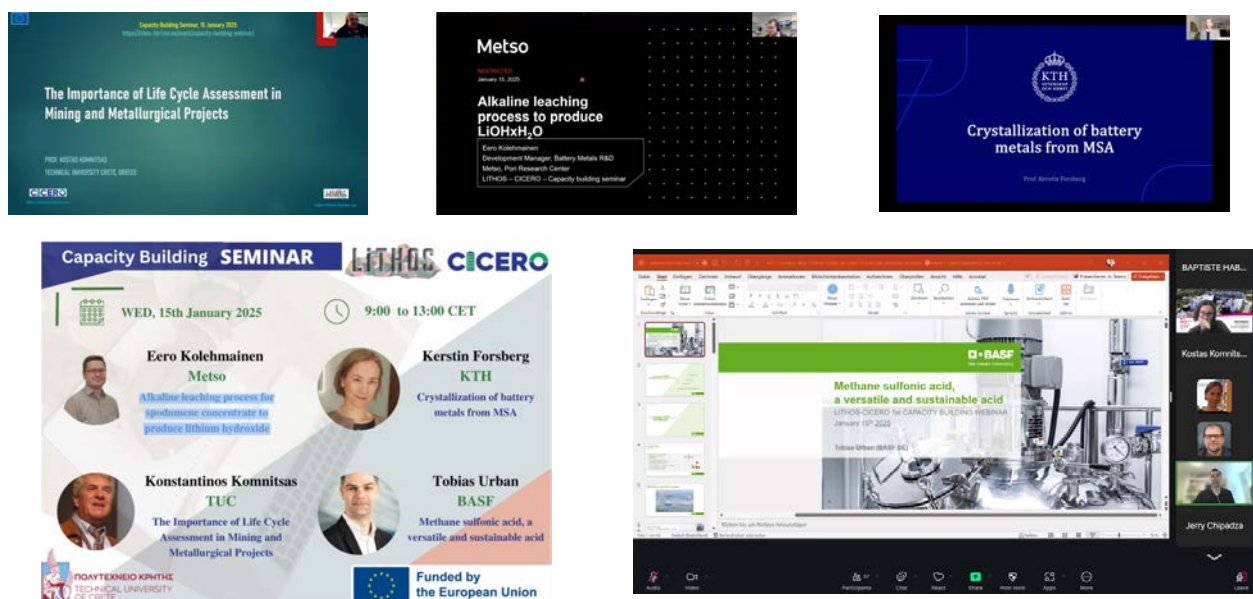


Figure 3-1 CICERO's first Capacity Building Semina

4. Future Plans

In the remaining period of the project, the active tasks in WP6 are T6.2 Contribution to clustering workshops and standardisation activities and T6.3 Capacity-building seminars, therefore our activities will focus on them. As far as it concerns T6.2 Contribution to clustering workshops and standardisation activities, CICERO will participate at the Raw Materials Week 2025, Brussels, Belgium. The participation is going to be through a common event with the *Cluster Hub for production of raw materials for batteries from European resources*. Details will be provided in a future deliverable.

CICERO is participating in the Battery 2030+ annual conference on 6-7 May, in Münster, Germany. The programme includes presentations from industry, keynote presentations, Young scientists' sessions, poster pitches and poster sessions, as well as lots of networking between key stakeholders of the battery research community to engage in meaningful discussions to empower green innovation in the field. CICERO's project activities will be presented in a session dedicated to raw materials for batteries, followed by a moderated debate with representatives from similar EU-funded projects, such as [Li4Life](#) and [STREAMS](#).

CICERO will also participate in a one-day clustering event for EU-funded projects, scheduled for 18 June 2025, in the context of the [2025 OECD Conference of Mining Regions and Cities](https://www.oecd.org/en/events/2025/06/2025-oecd-conference-of-mining-regions-and-cities.html) (<https://www.oecd.org/en/events/2025/06/2025-oecd-conference-of-mining-regions-and-cities.html>). The 2025 edition will gather stakeholders from across the public and private sectors, academia, civil society organisations, and Indigenous representatives to discuss well-being in mining regions, focusing on two pillars: (i) Improving community participation, trust and communications in mining, (ii) Advancing research and innovation for sustainable mining practices. Details will be provided in a future deliverable / report since the agenda will be finalized by the organizers until the end of April/beginning of May.

As far as it concerns the activities in T6.3 Capacity-building seminars, one more capacity building seminar will be organized in the next 12 months, while the last two will be organized in the final phase of the project, in order to better highlight the outputs of the project.

5. Conclusions

The clustering activities are of paramount importance for communicating and expanding the reach of CICERO's outputs. In this context, the CICERO consortium has taken all the necessary steps towards achieving this objective. Initially, all the related projects, closely associated with CICERO, have been identified and contacted for potential collaboration. Out of the total number of projects contacted, 12 provided a positive response regarding potential clustering collaboration. The outcome of this initiative was the participation in the Cluster Hub for the production of raw materials for batteries from European resources, the continuous participation in the Battery 2030+ initiative, and several joint clustering activities with other related projects. Overall CICERO has organized or co-organized **5 clustering events** during the 1st 18 months of the project.

The CICERO project has also participated in a standardization event and is involved in monitoring the relevant aspects. During the initial 18 months of the project, one capacity-building seminar has been organized.

Overall, all activities are progressing satisfactorily and adhere to the Grant Agreement. No substantial deviations are anticipated during the subsequent phase of the project.

6. References

[1] A. Kritikaki, L. Doitsidis, K. Komnitsas, "Report on clustering with other EU projects", Deliverable 6.1, CICERO project (MSA-based circular hydrometallurgy for sustainable, cost-effective production of NMC cathode materials), 2024, <https://cicero-horizon.eu/>