



CRM-GEOTHERMAL DELIVERABLE D6.7

CLUSTERING NETWORK MAP

Summary:

This deliverable describes the methodology implemented to search and engage with projects and other initiatives related to CRM-geothermal pillars, as well as the joint activities and collaboration throughout the first 48 months of the project.

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1 EXECUTIVE SUMMARY

The present deliverable is dedicated to reporting the cooperation measures and the respective map of clustering initiatives that were engaged as part of the CRM-geothermal Task 6.6 – Clustering. The task has the purpose of establishing a network of projects and initiatives, mainly funded under Horizon Europe, related to the pillars of CRM-geothermal: sourcing of critical raw materials and geothermal energy. From this network, researchers and other representatives of the projects co-generate opportunities to organise discussions and other joint activities to discuss common topics and mutually contribute to each other's research efforts.

The consortium partners of CRM-geothermal were contacted by the leader of Task 6.6 in order to collect potential clustering candidates from their network of contacts, which were contacted with the support of a clustering form template. The template allowed CRM-geothermal and the contacted projects to learn more about each other and to assess the mutual interest and respective ideas for joint collaboration. In parallel, partners have been making contacts and redirecting clustering opportunities and events in which CRM-geothermal can participate to the clustering task leader, on an *ad-hoc* basis.

As a result, CRM-geothermal was invited to join the 'Materials for batteries Cluster Hub', together with 25 other EU initiatives dedicated to sourcing of raw materials for the production of batteries from EU resources. Two projects from the cluster invited CRM-geothermal to deliver a presentation at their Plenary Meetings.

The representatives from the members of the Cluster Hub co-organise an annual workshop in Brussels, which was attended by CRM-geothermal in the 2023, 2024 and 2025 editions, each time with active participation from the partners (presenter or panellist). The outcome of the event was the idea of organising a joint public webinar with the RAWMINA project, to raise awareness and discuss extraction technologies that are similar between both initiatives. In addition, a structured social media campaign with projects related to raw materials were conducted during the Raw Materials Week 2023, enhancing the outreach capacity of CRM-geothermal towards this sector on social media.

In addition, further engagement with the current network of initiatives is envisaged through presentations at consortium meetings, technical webinars to discuss common topics, and via promotion of each other's results and updates on social media, strongly supporting Task 6.4: 'Disseminate project results'.

The second half of the project saw an extension of the cluster network beyond the Cluster Hub with various types of clustering activities. A bilateral relationship with the CEEGS project organised three joint activities:

- an online clustering workshop on multi-use geothermal applications (April 2025),
- an in-person workshop in Lisbon on commercialisation challenges (September 2025), and
- a joint webinar on social acceptance (October 2025).

Direct policy engagement included:

- the RESPECT event on the Critical Raw Materials Act in Brussels (December 2024),
- the project conference 'Navigating the Energy Transition' at the European Parliament (November 2025), connecting project results with EU legislative and policy processes.
- 'Invisible Mining in Action' bootcamp at Vulcan Energy Resources facilities in Insheim and Landau (September 2025),

Thematic clustering events included:

- the CRIRSCO/UNFC reporting workshop at the University of Miskolc (May 2024),
- the DLE Symposium at KIT (October 2024),
- the START workshop on the Critical Raw Materials Act, and
- the LITHOS workshop on responsible mining.

In addition, industry-facing engagement included the meeting with Aquatech, and the project's presence at PDAC 2025 and the project's final conference and presence at the GeoTHERM trade fair in Offenburg in February 2026.

This report is the final version of Deliverable 6.7, due in M48, and reports the clustering and networking activities carried out in the first 48 months of the CRM-geothermal project.

2 INTRODUCTION

Geothermal systems are increasingly recognised not only as a renewable energy source but also as potential providers of strategic raw materials including CRMs, which are essential for the EU's green and digital transition. Co-production of heat and CRMs from geothermal reservoirs could contribute to the diversification of supply, improved resource efficiency, and reduced dependency on imported raw materials. To explore this potential, the CRM-geothermal project is investigating knowledge gaps around the occurrence of CRMs in geothermal fluids, the development and optimisation of extraction technologies and the environmental-social-economic viability.

This document consists of deliverable D6.7 – Clustering Network Map, which is the second version of the D6.7 series, due in April 2026 (M48). This final version includes clustering and networking activities from the second half of the project, covering the first 48 months of the project. It provides information on the progress of the task related to clustering, the main purpose of which includes:

- Cultivating relationships with other projects addressing similar subjects and challenges as CRM-geothermal.
- Establishing long-term research partnerships.
- Enhancing the project's visibility.
- Supporting dissemination of its results.

This task aims to establish a network of projects and other initiatives working with similar research topics as CRM-geothermal, spanning from the extraction of critical raw materials, production of geothermal energy, as well as social engagement strategies and social license to operate (SLO). From this network, these projects, primarily funded by Horizon Europe and other EU programmes, have the opportunity to co-organise joint activities to discuss the progress, share results and comment on the research challenges that are being encountered. While the primary objective of conducting clustering activities is to find joint solutions and develop new ideas for collaboration, a secondary impact is related to raising awareness and visibility to the involved initiatives and the Horizon Europe programme at large.

The clustering activities are published on the CRM-geothermal website and shared on social media channels, in order to disseminate the findings and outcomes from these activities, and to welcome new initiatives that can potentially become clustering candidates with CRM-geothermal.

3 METHODOLOGY

This section describes the methodology implemented since the start of the project to map and engage with the potential clustering candidates, including projects and initiatives that could mutually benefit from joint activities with CRM-geothermal project.

Based on desk research and the network of project partners, a list of potential clustering projects, companies, and other players, was developed based on the alignment with CRM-geothermal concept and research topics.

After screening and building a list of clustering candidates, a clustering form (section 3.2) was submitted to their contact persons, to structure the networking process and foster collaboration ideas for the future, including joint seminars, workshops, networking sessions, webinars, and others.

The expected results involve producing knowledge, optimizing processes and techniques, enhancing public acceptance, and supporting the objectives of WP6 – Dissemination, communication and exploitation – in CRM-geothermal.

During the implementation of Task 6.6, for drafting and reviewing text (email communications, social media, reports) Generative AI (Anthropic Claude, Sonnet and Opus models) has been used for improving clarity or grammar, generating clustering ideas and identifying potential synergies. No AI generated content has been used in the task outputs without review and adaptation by the authors, fact-checking against source materials, and assessing whether the drafted content meets the task objectives. The objective was to augment the work of the researchers participating in the task by supporting the content drafting, adjusting tone and formulation, surfacing new connections, and generating clustering and networking ideas.

3.1 SPREADSHEET TO COLLECT POTENTIAL CLUSTERING CANDIDATES

The task leader on clustering initiated the discussions with the partners at the kick-off meeting of the CRM-geothermal project, in Potsdam, Germany. The proposed idea was to create an online spreadsheet in which consortium members were invited to list potential clustering candidates, e.g., projects and other initiatives, based on their network of contacts in the industry, research and academia, structured in a template illustrated in Table 1.

Table 1: Collection of clustering candidates.

Name of the project/company/individual	Start-end dates (if it is a project)	Description	Key words related to CRM-geothermal
-	-	-	-

3.2 CLUSTERING FORM TEMPLATE

Concomitantly, a clustering form was created with the idea of gathering key information about the initiatives collected in the above-mentioned spreadsheet and assess the possibilities and interest in clustering with CRM-geothermal.

The clustering form template (Annex 1) is a document with a two-fold purpose:

- a) a communication material, to raise awareness about CRM-geothermal and the clustering task to the collected contacts from the previous step. The first section of the document contains the overview of the CRM-geothermal project, as well as the purpose and methodology of the clustering task.
- b) to learn more about the potential clustering candidates and to assess whether there is a good fit and interest in conducting joint activities with CRM-geothermal. The following section contains the clustering form itself (Table 2) to be filled and sent back to the leader of Task 6.6 – Clustering. The purpose of this section is to result in a 'soft agreement' with the selected candidates, and to assess their expectations and potential ideas of clustering.

Table 2: Clustering form.

Item	Description
Acronym	-
Short abstract	-
Website	-
Contact person and email	-
Clustering main points, common challenges (keywords)	-
Clustering expectations/interest <i>(Example: key topics for cooperation, suggested joint activities, expected results from clustering...)</i>	-

3.3 EMAILS

Direct contact via email is also being used as an effective one-to-one engagement with representatives from clustering candidates, representatives of events, as well as other initiatives that may qualify as clustering opportunities for CRM-geothermal. For example, a CRM-geothermal partner connected the task leader on clustering with one of the organizers of the EU SUPERCLUSTER LAPLAND event via email exchange. This exchange resulted in the inclusion of CRM-geothermal in the official programme of the event, which is further described as a clustering activity in section 4 of this report.

3.4 SOCIAL MEDIA ENGAGEMENT

Mutually following and reacting to social media posts of the projects and initiatives related to geothermal energy and critical raw materials are aimed to raise visibility about these research topics and foster engagement with related social media profiles. Joint social media campaigns, for example, allow project representatives to learn more about each other's research topics while raising awareness and visibility about their respective achievements.

4 ACTIVITIES AND PROGRESS

This section will list the clustering activities that have been conducted in the first 48 months of the project implementation, covering individual clustering or networking activities in chapter 4.1, and events related to the Materials for Batteries Cluster Hub in chapter 4.2.

4.1 CLUSTERING AND NETWORKING ACTIVITIES

4.1.1 Collection of clustering forms of potential clustering candidates

The campaign of distributing clustering forms to the selected candidates resulted in the return compilation of a number of initiatives that were included in the cluster network map of CRM-geothermal:

- BrineRIS: Locating brines in Europe suitable for economically feasible metal recovery and test the emerging recovery technologies in the lab.
- CHPM2030: Combined Heat, Power and Metal extraction.
- Elementary: measure rare earth elements and Yttrium concentrations in different species collected at potential release hot-spots in coastal environments in Norway.
- GWatt: Studies of rock stress, fracture networks, permeability, heat/fluid transport, and optimisation, to maximise reservoir utilisation whilst minimizing risks.
- LiCORNE: Building up strategic reserves of Lithium to ensure the green and digital transformation of the European economy.
- WING: a global network that aims to promote the education, professional development and advancement of women in the geothermal community.

4.1.2 Preliminary meeting with WING project

On March 3rd, 2023, the CRM-geothermal Project Coordinator and the task leader on clustering organised an introductory meeting with representatives of the Women in Geothermal Turkey (WING) initiative to discuss potential synergies between both projects. WING aims to promote education, professional development, and advancement of women in the geothermal community, which is one of the CRM-geothermal pillars. The discussions involved not only awareness raising about each other's work, but also the common objective of fostering public engagement in geothermal projects. In addition, representatives from both sides mentioned the importance of social media for this goal, and both initiatives have been following each other's Twitter accounts to foster engagement.

4.1.3 Introduction to and follow up meeting with GeoScience Ltd.

GeoScience Ltd. provides consultancy on geology and geothermal-related projects, and one of the projects that they were involved in was related to the study about geothermal heat from Cornish metal mines (UK), which raised awareness of one of CRM-geothermal partners. After an exchange of emails with GeoScience Ltd., representatives from both teams met online on October 4th, 2023, to introduce each other and to find common

topics that can be jointly discussed and/or promoted in the future. The identified topics with potential for collaboration were: a) Communication & dissemination; b) SLO/ public engagement; and c) Potential assistance of GeoScience Ltd. in the market deployment task within CRM-geothermal, contributing to Task 4.4. Both projects demonstrated interest in supporting each other on social media and to engage in follow up networking sessions whenever suitable for both teams.

4.1.4 CRM-geothermal at the EU SUPERCLUSTER LAPLAND GEOCONFERENCE

The EU SUPERCLUSTER LAPLAND GEOCONFERENCE was a one-and-a-half-day event on 30-31 October 2023, bringing together various projects funded by the European Union in the field of mineral raw materials. Thirteen EU-funded raw materials projects, including EIS, AGEMERA, CIRAN, EXCEED, GOLDENEYE, GREENPEG, M4MINING, MaDiTraCe, MinExTarget, MultiMiner, S34I, SEEMS DEEP and SEMACRET, as well as the University of Queensland (Australia) participated. CRM-geothermal was welcomed to submit an abstract and present the project on site, which was represented by the Project Coordinator Simona Regenspurg (Figure 1). This clustering-oriented event was a valuable opportunity to raise awareness about the project, network with other initiatives, facilitate discussions, and exchange ideas surrounding the current technological challenges and topics within the raw materials sector.



Figure 1: Simona Regensburg presenting CRM-geothermal at the EU SUPERCLUSTER LAPLAND event. Joint social media campaign during the RawMaterialsWeek23¹

During the Raw Materials Week 2023, a network of 10 projects conducted a joint social media campaign with the purpose of mutually raising awareness about the partnering initiatives related to raw materials:

- EIS: Innovative exploration concepts and data analysis tools to find new sources of critical raw materials for the EU's economy.
- ION4RAW: proposing a new mineral processing technology recovering critical raw materials from primary sources.
- CIRAN: exploring the aspects of Critical Raw Materials extraction in environmentally protected areas.
- BIORECOVER: a sustainable biotechnology-based process for the selective extraction of Critical Raw Materials.
- LGI: a European sustainable innovation consultancy delivering Innovation Strategy, Financing, Management & Communication services for public & private innovators.
- LEAP-RE: establishing a long-term joint research and innovation partnership between the European Union and African Union.
- SCRREEN: developing an EU-level Expert Network to support decision-making on raw materials and their value chains.
- AFRICAMAVAL: developing a EU-Africa partnership ensuring a responsible sourcing of Critical Raw Materials for the European industry.

¹ Extracted from AGEMERA post on X (former Twitter) on 31 October 2023: https://twitter.com/agemera_eu/status/1719245735441408148.

- PROMETIA: Mineral processing and extractive metallurgy for mining and recycling innovation association.

Each project produced a dedicated web banner (Figure 2) that was published on social media in agreed dates, one per project, and all involved projects were asked to share each other's publication. This approach intended to expand the outreach capacity of the involved projects, reaching a wider audience and strengthening their level of engagement and visibility on social media, providing strongly support to the communication & dissemination work package (WP6) at large.



Figure 2: CRM-geothermal web banner that was shared on social media by the partnering initiatives during the Raw Materials Week 2023.

4.1.5 Engagement with Aquatech

On December 17, 2025, the CRM-geothermal partners from LPRC had an online meeting (Figure 3) with a representative from Aquatech (Chicago, US). Aquatech was also invited to the Market Deployment task's focus group session. Due to the low TRL proposed by CRM-geothermal, Aquatech was not able to provide any strategic input at this session. However, the discussions highlighted a shared interest in future collaboration opportunities between CRM-geothermal and Aquatech, as well as raising awareness of CRM-geothermal research beyond Europe, contributing to a globally relevant project network.

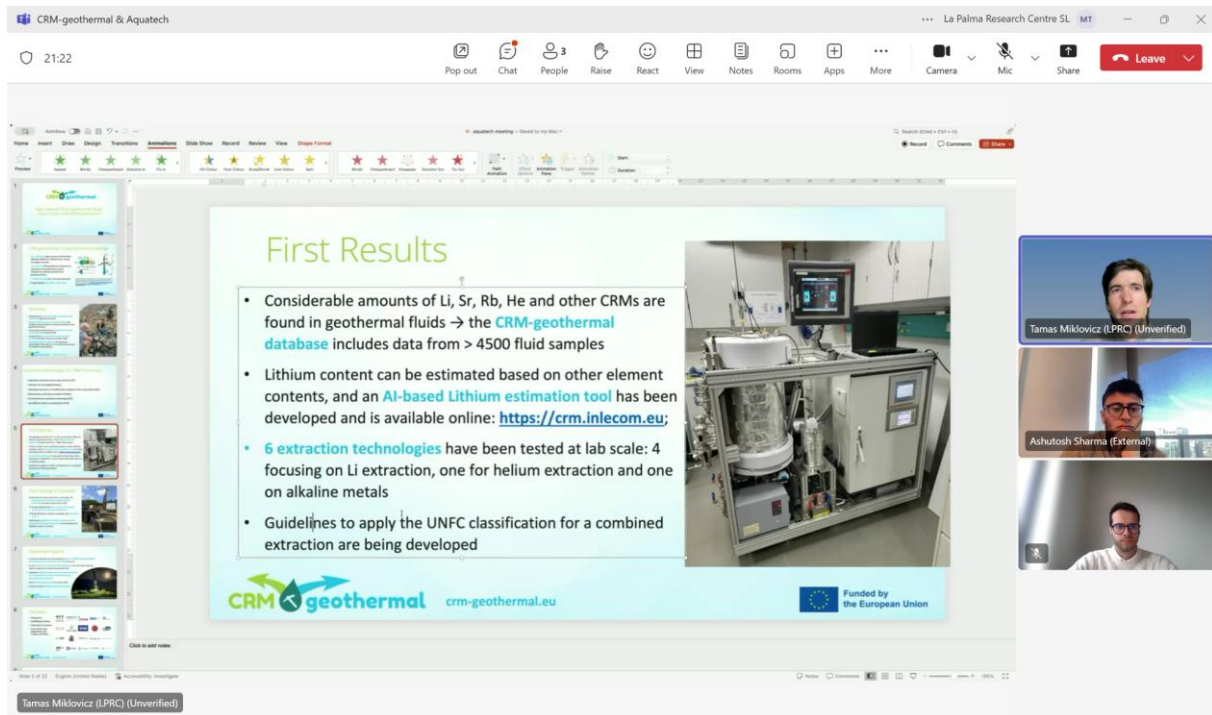


Figure 3. LPRC meeting with Aquatech.

4.1.6 CRIRSCO/UNFC Workshop: Reporting Schemes in the Co-Extraction of Heat and CRMs from Geothermal Fluids, University of Miskolc

On 8 May 2024, CRM-geothermal partners INTRAW and the University of Miskolc (UNIM) co-organised a workshop at the University of Miskolc, Hungary, on the application of CRIRSCO and UNFC reporting schemes to the combined extraction of critical raw materials and energy from geothermal fluids (Figure 4). The event took place in the afternoon in a hybrid format, allowing both in-person and online participation.

The workshop was attended by external experts from the industry, and allowed a productive environment for networking and exchanging on reporting standards for dual use. This was key input for the WP4 and for Task 2.7 Resource calculation (UNIM, INTRAW). The workshop was held as a satellite event of the Miskolc Forum Green and Smart symposium and networking event on 9 May, which included parallel sessions on CRM State of Play and Sustainable Cement and Concrete, followed by a Greennovation partnership and networking forum for industry and academia.



Figure 4. Eberhard Falk talking about the implications of resource assessment by UNFC and CRIRSCO for the combined extraction of heat and minerals.

4.1.7 Symposium on Direct Lithium-Extraction (DLE)

The CRM-geothermal project was represented at the DLE Symposium by researchers of the University of Padova, a project partner. The event was hosted between 17 and 18 October 2024 by Karlsruhe Institute of Technology (KIT). This symposium covered the latest advancements and innovative technologies in the field of direct lithium extraction (DLE), fostering collaboration and knowledge exchange to drive forward this critical sector. Topical Overview of the symposium:

- Liquid / solid Li extraction technologies
- Membrane & precipitation technologies
- Conversion to battery
- Electrochem. Li extraction & Desalination Technologies
- Concentration & Purification of Li-brines

From CRM-geothermal, Prof. Enrico Negro delivered a presentation entitled: “Cation binding - a tool for studying efficiency and selectivity of ion-extraction by ionomers”, which is part of the University of Padova’s research topic in the project.

4.1.8 RESPECT Event – “Critical Raw Materials Act: Dream or Reality?”

On 10 December 2024, CRM-geothermal representatives from LPRC attended the event “Critical Raw Materials Act: Dream or Reality? Perspectives from the RESPECT project”, hosted by RESPECT (member of Cluster Hub) in Brussels. The event allowed for in-person networking and learning about the latest CRMA implementation from the EC DG GROW and CINEA. This is relevant for the project on the governance and exploitation of European CRM resources.

4.1.9 START project clustering workshop on "Supporting the Critical Raw Materials Act: Research Projects in the European Union".

The Project Coordinator, Katrin Kieling was invited and presented (Figure 5) the CRM-geothermal project at the START clustering workshop² titled "Supporting the Critical Raw Materials Act: Research Projects in the European Union". It was a satellite event of the Raw Materials Week 2024 and was opened by M. Cacanowski, EU Project Officer for Raw Materials at HaDEA. It brought together eight EU-funded projects working on critical raw material extraction, processing, or recycling: START, GSEU, FutuRaM, CRM-geothermal, CIRAN, SUPREEMO, REESOURCE, and REPTiS. The project presentations were followed by roundtable discussion, audience questions and finally a networking session. It was a great opportunity for CRM-geothermal to grow its network from other EU funded projects.

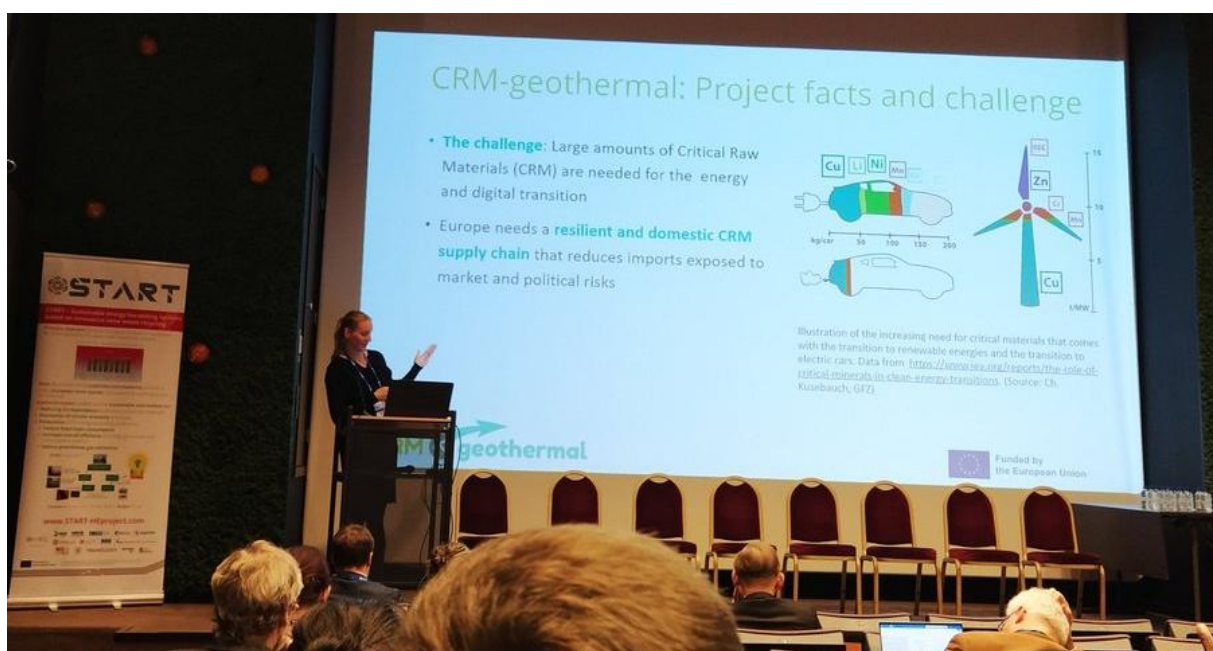


Figure 5. Project Coordinator Katrin Kieling presenting CRM-geothermal at the START project clustering workshop.

4.1.10 Showcasing CRM-geothermal at PDAC 2025

Project Partner, Vitor Correia from INTRAW, represented CRM-geothermal at the Prospectors & Developers Associations of Canada (PDAC) in the EU Booth (Figure 6). The project's innovative research supporting a sustainable extraction of critical raw materials (CRMs) from geothermal fluids was presented. This event contributed to visibility of the project to professionals, investors, and policy makers beyond the European community.

² Event website: <https://www.start-heproject.com/clustering-rm-workshop/> [Accessed: April 2026]



Figure 6. Vitor Correia presenting CRM-geothermal at the PDAC in the EU booth

4.1.11 Participation in CEEGS Clustering Workshop: Multi-use geothermal applications

In 2025, CRM-geothermal and CEEGS projects had multiple joint actions as part of their commitments to building cross-sectoral collaboration and knowledge exchange with related Horizon Europe projects. CRM-geothermal participated in the CEEGS Clustering Workshop (Figure 7), held online on 1 April 2025. The event was hosted by the CEEGS project and focused on exploring the combined use of geothermal energy with other technologies, such as energy storage, industrial heat use, or raw material extraction. The project was represented by Project Coordinator Katrin Kielsing, who delivered a presentation introducing the project's scope, goals, and key results. The presentation highlighted the novel approach to co-producing critical raw materials and geothermal energy from the same resource, with ongoing pilot-scale developments in Cornwall (UK) and field studies in East Africa.

The clustering workshop offered valuable synergies between CRM-geothermal and other participating projects:

- CEEGS, which develops CO₂-based underground thermal storage systems;
- GeoSmart, focused on optimising geothermal plant flexibility and hybrid operations; and
- LEAP-RE, with its Geothermal Village project supporting off-grid geothermal solutions in Africa.

The project presentations were followed by a discussion facilitated by EFG, covering future collaboration ideas, joint publications, public engagement strategies, further strengthening the cluster network and knowledge exchange with other multi-use geothermal projects. The video recordings of the presentations are available on CEEGS YouTube channel.



Figure 7. Project Coordinator Katrin Kieling presenting CRM-geothermal at the CEEGS clustering workshop.

4.1.12 GOLDSCHMIDT 2025 International Geochemistry Conference

CRM-geothermal researchers from GFZ Helmholtz Centre for Geosciences, Constructor University, and ETH Zurich presented a series of scientific contributions at the Goldschmidt 2025 Conference, held 6–11 July 2025 in Prague, Czech Republic. The event was thoroughly promoted on social media with social media cards, videos recorded in La Palma General Assembly (Figure 8), inviting conference attendees for networking with CRM-geothermal researchers at the conference.

The project presentations were the following:

- Poster #253 'Tracing Critical Raw Materials: Using Geothermal Fluids as Subsurface Probes to identify Platinum Group Element (PGE) Distributions' by Jessica Stammeier (GFZ Helmholtz Centre for Geosciences),
- Presentation 'Assessment of co-production of Geothermal Energy and Critical Raw Materials in the East African Rift' by Franziska Wilke (GFZ Helmholtz Centre for Geosciences):
- Presentation 'Rare Earth Elements in alkaline geothermal fluids from Iceland and the East African Rift, Kenya: A data quality and anomaly assessment via the λ polynomial modelling approach' by Lukas Klose,
- Poster #305 'Extraction of Critical Raw Materials from Geothermal Precipitates from Reykjanes, Iceland' by Lea M. Krohn (ETH Zurich),
- Presentation 'Lithium content in deep geothermal fluids of the North German Basin and its mobility in different geological formations' by Simona Regenspurg (GFZ Helmholtz Centre for Geosciences).



Figure 8. social media cards and video content promoting the CRM-geothermal attendance at Goldschmidt 2025, and inviting attendees to contact project partners.

4.1.13 'Invisible Mining in Action' Bootcamp at Vulcan Energy Resources facilities

On 8 September 2025, an innovation bootcamp titled 'Invisible Mining in Action' was organised at Vulcan Energy Resources' sites in Insheim and Landau, Germany as part of the CRM-geothermal project (Figure 9). It was co-organised by Vulcan Energy Resources, the European Federation of Geologists, GFZ Helmholtz Centre for Geosciences, and INTRAW. The event brought together policy makers, operators, and mining professionals allowing direct engagement, contributing to the project's clustering objectives of increasing visibility and exploitation of results.

4.1.14 Project Conference 'Navigating the Energy Transition' at the European Parliament

CRM-geothermal organised an in-person project conference at the European Parliament in Brussels, in partnership with MEPs and key policy stakeholders (Figure 9). Hosted under the title 'Navigating the Energy Transition: Research Breakthroughs from CRM-geothermal'³, the event examined how combined extraction of critical raw materials from geothermal fluids can contribute to Europe's critical mineral security and clean energy goals under the Critical Raw Materials Act (CRMA). The conference attracted participants from research, industry, and policy communities, and was formally welcomed by MEP Nicolás González Casares (S&D). The panel discussion, moderated by Pavlos Tyrologou from EFG, featured Christine Banken (European Commission DG Energy), Mark Harris (Cornish Lithium Plc), Simona Regenspurg (GFZ Helmholtz Centre for Geosciences), Kestutis Kupsys (European Economic and Social Committee (2020-25), consumer rights activist) and Emily Ritchey (Transport & Environment, T&E).

This event represented one of the highest-profile networking and dissemination activities of the project. The event was especially valuable connecting research results directly with EU legislative and policy processes.

³ CRM-geothermal project website: <https://crm-geothermal.eu/2025/12/04/spotlight-on-innovation-crm-geothermal-research-presented-at-the-european-parliament/> [Accessed: April 2026]



Figure 9. Panellists at the European Parliament event, organised by CRM-geothermal project

4.1.15 CEEGS clustering event in Lisbon

On 24 September 2025, CRM-geothermal participated an other CEEGS clustering workshop, held in hybrid format at ISCTE – University Institute of Lisbon, alongside the CEEGS project's General Assembly. The session, titled 'From Pilots to Commercial Reality: The Challenges for Large Scale Energy Storage', brought together the following EU-funded projects: CEEGS, CRM-geothermal, PilotSTRATEGY, CaLby2030, and ConsensusUS. CRM-geothermal was represented by Pavlos Tyrologou (EFG/CERTH), who delivered a lightning snapshot presentation on the project. After each project was presented briefly, the workshop moderator, Marko Komac (EFG), guided the participants through multiple interactive and collaborative exercises, including a Synergy Matrix, Action Canvas, and Funding Radar. These were valuable in identifying project complementarities, explore future funding opportunities, and outline concrete actions for inter-project collaboration, even after the project ends.

4.1.16 Joint CRM-geothermal & CEEGS webinar on social acceptance

Building on the productive collaboration established during the first CEEGS Clustering Workshop, CRM-geothermal and the CEEGS project co-organised a public joint webinar on social acceptance and community engagement in innovative geothermal and energy storage technologies. The event was moderated by Pavlos Tyrologou (EFG) and featured the following speakers:

- Paul Mitchell (minerals engineer and ESG specialist);
- Jane Charman – Geothermal Engineering Ltd (GEL)
- Dr. Katrin Kielsing – CRM-geothermal Project Manager (GFZ Potsdam)
- Dr. Ana Delicado – Institute of Social Sciences, University of Lisbon
- Prof. Ricardo Chacartegui – University of Seville / CEEGS Coordinator

- Dr. Ana Prades – CIEMAT / CISOT-CIEMAT

This was another fruitful collaboration between the two projects, working on shared research topics such as effective community engagement around emerging technologies that supports the energy transition.

4.1.17 CRM-geothermal Final Conference at GeoTHERM 2026, Offenburg

The final conference of the CRM-geothermal project took place on 25 February 2026 in Offenburg, Germany, as an official side event of GeoTHERM⁴ (10). The final conference gathered more than 50 researchers and industry representatives to reflect on the project's results. Even though the event consisted of primarily presentations, the attendees were invited to ask questions after the presentations, and directly engage with project partners during the breaks, making it a valuable event for networking and clustering.



Figure 10. CRM-geothermal final conference at GeoTHERM

After the final conference, the project actively participated at GeoTHERM as well, the leading European trade fair and conference for geothermal energy. The project shared a booth with EFG, allowing the visitors and exhibitors to interact with partners. In addition to booth presence, the project coordinator Katrin Kieling (both GFZ) delivered a presentation (Figure 11) within the main scientific programme of GeoTHERM in the Deep Geothermal session. The final conference served as a key platform for networking with industrial actors active in the geothermal space.

⁴ CRM-geothermal project website: <https://crm-geothermal.eu/2026/03/10/advancing-critical-raw-material-co-production-from-geothermal-fluids-crm-geothermal-final-conference-at-geotherm/> [Accessed: April 2026]



Figure 11. CRM-geothermal by Katrin Kielsing at GeoTherm, Geep Geothermal section"

4.2 MATERIALS FOR BATTERIES" CLUSTER HUB

CRM-geothermal was invited by the LiCORNE project (licorne-project.eu/), which was one of the potential clustering candidates identified in section 3, to participate in the 'Materials for batteries Cluster Hub' (Figure 12). The Cluster Hub represents a collaborative community united by a common goal: advancing the expertise needed to promote a sustainable and circular approach to producing raw materials for the European battery sector. The initiative was founded in 2022, and it counts with 25 projects (Figure 13) from the Horizon Europe programme until April 2026.



Figure 12. Cluster Hub logo.

The CRM-geothermal project joined the Cluster Hub in February 2023, and participated in several clustering activities with the partnering projects. These activities are described in the following subchapters.

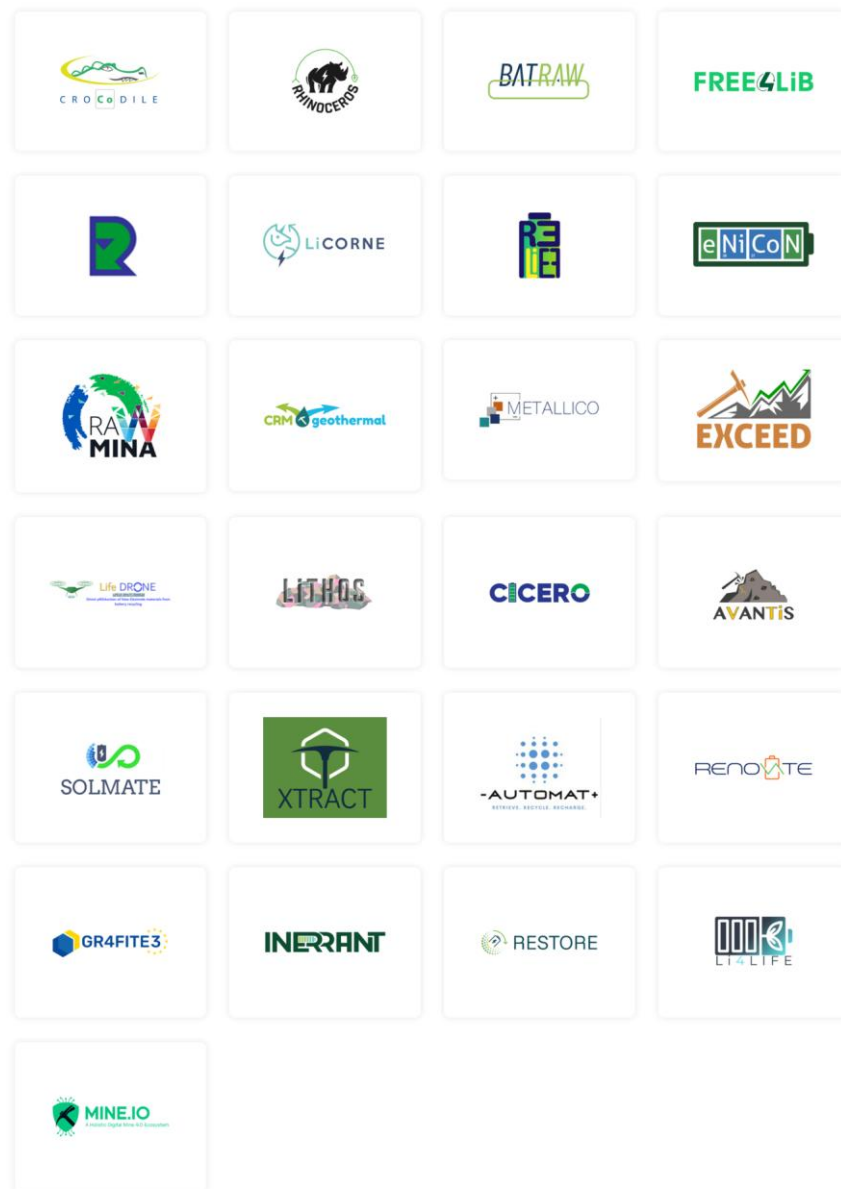


Figure 13. Cluster Hub projects (30, April, 2026).

4.2.1 Bimonthly meetings with Cluster Hub members:

The Cluster Hub members have been conducting virtual meetings every two months to discuss the past and upcoming activities, as well as to take any decisions regarding new candidates and potential joint events to be organised by the projects. The first meeting that CRM-geothermal participated was held in March 2023 (Figure 14).



Figure 14. CRM-geothermal attending the Cluster Hub meeting on 15 March 2023.

4.2.2 Presentation about CRM-geothermal at Plenary Meetings from other projects:

The above-mentioned discussions conducted during the bimonthly meetings resulted in the invitation of CRM-geothermal project to be introduced at the Plenary Meetings of two other Cluster Hub members: LiCORNE (Figure 15) and RAWMINA (Figure 16), both held in October 2023. In these opportunities, the CRM-geothermal Project Manager Katrin Kielsing had a dedicated slot to deliver a presentation about the project, remotely, followed by a brief Q&A session with their respective consortia. This kind of activity is aimed to foster engagement and exchange of information between the projects, which is a common objective to all Cluster Hub members.

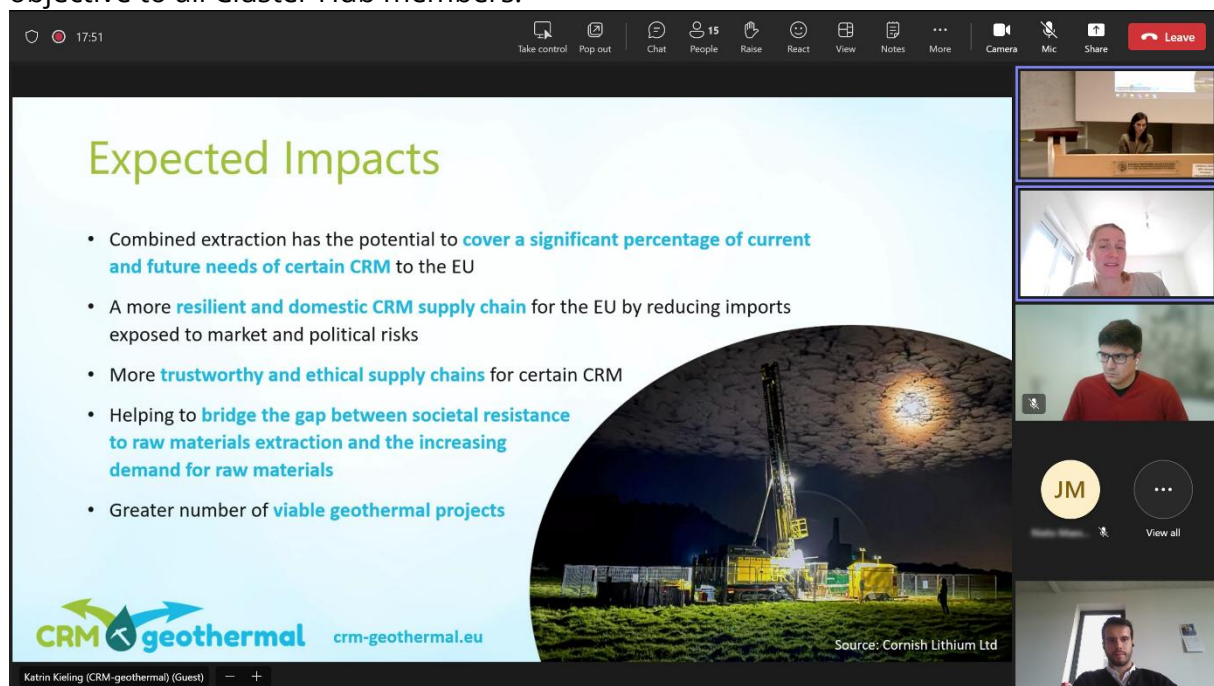


Figure 15. Presentation of CRM-geothermal at LiCORNE Consortium Meeting.

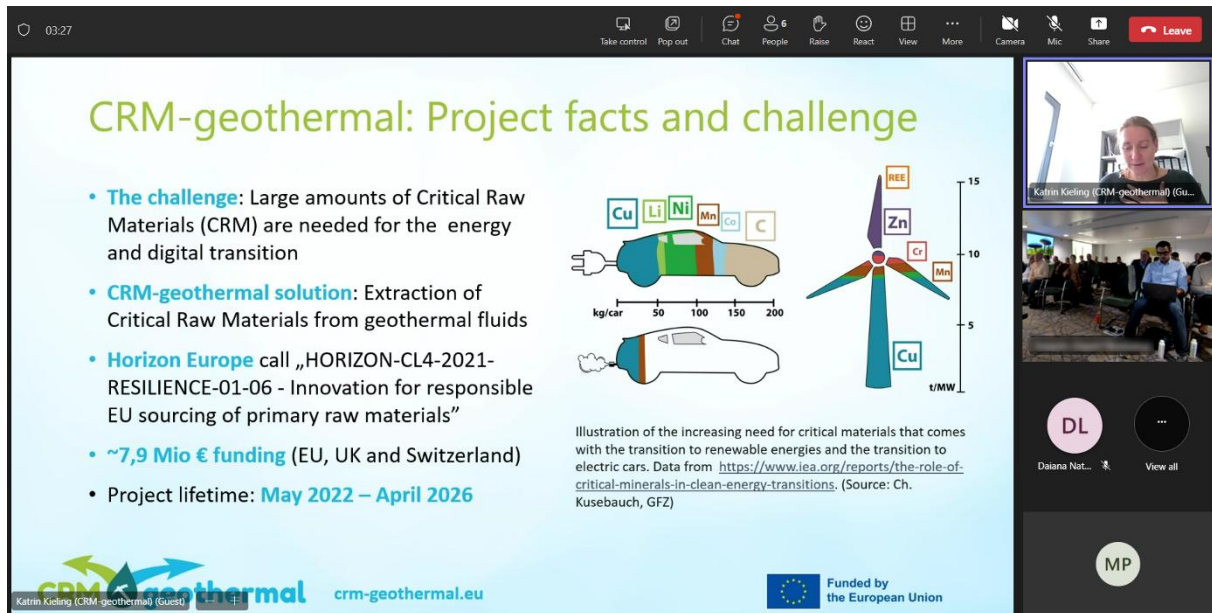


Figure 16. Presentation of CRM-geothermal at RAWMINA Consortium Meeting.

4.2.3 Participation at the annual Cluster Hub workshop:

The 2023 edition of the annual Cluster Hub workshop was held during the Raw Materials Week, as a satellite event. In this opportunity, representatives of all members of the Cluster Hub gathered physically in Brussels to engage and discuss common topics and challenges that the projects have been encountering (Figure 17).



Figure 17: Members of the Cluster Hub at the annual workshop, held in Brussels, in November 2024.

CRM-geothermal actively participated in the event, in which the Project Manager Katrin Kieling delivered a presentation about CRM-geothermal (Figure 18), followed by a

research-focused presentation concerning the combined extraction of critical raw materials and energy from geothermal fluids.



Figure 17. K. Kieling presenting CRM-geothermal at the annual Cluster Hub workshop.

The last session of the agenda consisted of an interactive roundtable with representatives of the participating projects to discuss several topics, when Vitor Correia (INTRAW, CRM-geothermal partner) was invited to talk about social aspects of raw materials sourcing, emphasizing the challenges related to public perception and how to possibly overcome them (Figure 19).



Figure 18. Vitor Correia representing CRM-geothermal in the panel discussions at the annual Cluster Hub workshop.

4.2.4 RAWMINA and CRM-geothermal joint webinar:

As an outcome of the joint discussions and interaction between partners during the annual Cluster Hub workshop, the representatives of CRM-geothermal and RAWMINA proposed the organisation of follow up discussions on sustainable extraction technologies, which is a common topic between both initiatives (Figure 20). Utilising advanced techniques such as adsorption and other innovative separation methods, RAWMINA and CRM-geothermal are redefining possibilities in critical raw materials recovery from mine waste and geothermal fluids.

A preliminary exchange of emails, followed by an introductory virtual meeting between representatives of both projects, resulted in the idea of co-organising a joint public webinar to introduce the projects and conduct technical discussions on the ongoing research (Figure 21).

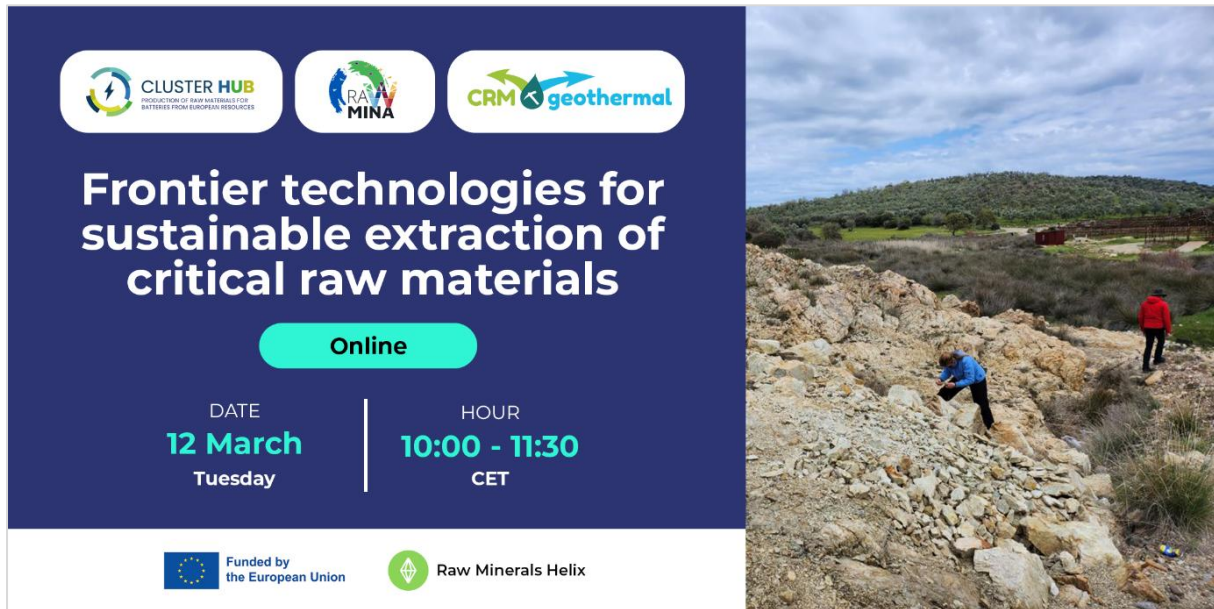


Figure 19. Web banner of the CRM-geothermal and RAWMINA webinar.

In addition, there was a dedicated slot to presenting the Cluster Hub itself, to raise awareness about the initiative and to invite potential projects to get in touch with the members to assess the possibility of participation in the clustering activities (Figure 21).



Figure 20. Presentation about the Cluster Hub at the CRM-geothermal and RAWMINA webinar.

The webinar was held in March 12th, with the attendance of 78 unique viewers who interacted with the speakers via Q&A sessions and polls that ran between presentations. The event was recorded, and the talks are available on the YouTube channel of CRM-geothermal:

<https://www.youtube.com/watch?v=5MzmYInuMEM&list=PL6Yl2PYNfyXoA4DQBjOLSdEB2-wdtiCFn&pp=iAQB>.

4.2.5 LITHOS Workshop – Responsible Mining and Processing of Energy-Transition Metals

In early September 2024, LPRC attended an in-person workshop organised by LITHOS, a partner project within the 'Materials for Batteries' Cluster Hub. The workshop titled "Responsible mining and processing of energy-transition metals: a socio-environmental assessment"⁵. The workshop had several high-level speakers from Boliden Mineral AB EC, DG GROW, GTK, IEEP, and gathered Cluster Hub projects, including ENICON, EXCEED, AVANTIS & CICERO. This event allowed for policy makers, NGOs, academia and industry to discuss responsible mining and processing in light of the much needed energy-transition metals. The discussion focused on social licence to operate (SLO) challenges, the EU Critical Raw Materials Act, and climate neutrality.

4.2.6 Co-organisation of the 2024 Cluster Hub workshop

On December 12, 2024, the third edition of the annual workshop for the Cluster Hub "Production of Raw Materials for Batteries from European Resources" took place in Brussels, co-organized by the EU-funded projects in the Cluster Hub (Figure 22). The event was held as a satellite event of the Raw Materials Week 2024 and allowed space for projects to share their latest developments, bottlenecks, and discuss potential collaboration opportunities in the battery sector.



Figure 21. Members of the "Materials for batteries Cluster Hub" in 2024.

Multiple CRM-geothermal partners attended in-person (LPRC, GFZ) and the project presentation was provided online by Saskia Bindschedler, a Professor at the University of Neuchâtel. The talk "Lithium biorecovery using microbial activity" presented the results from the project research until the end of 2024 (Figure 23).

⁵ Event website: <https://lithos-horizon.eu/eu-clustering-event-on-responsible-mining-in-europe-9-sep-2024/> [Accessed: April 2026]

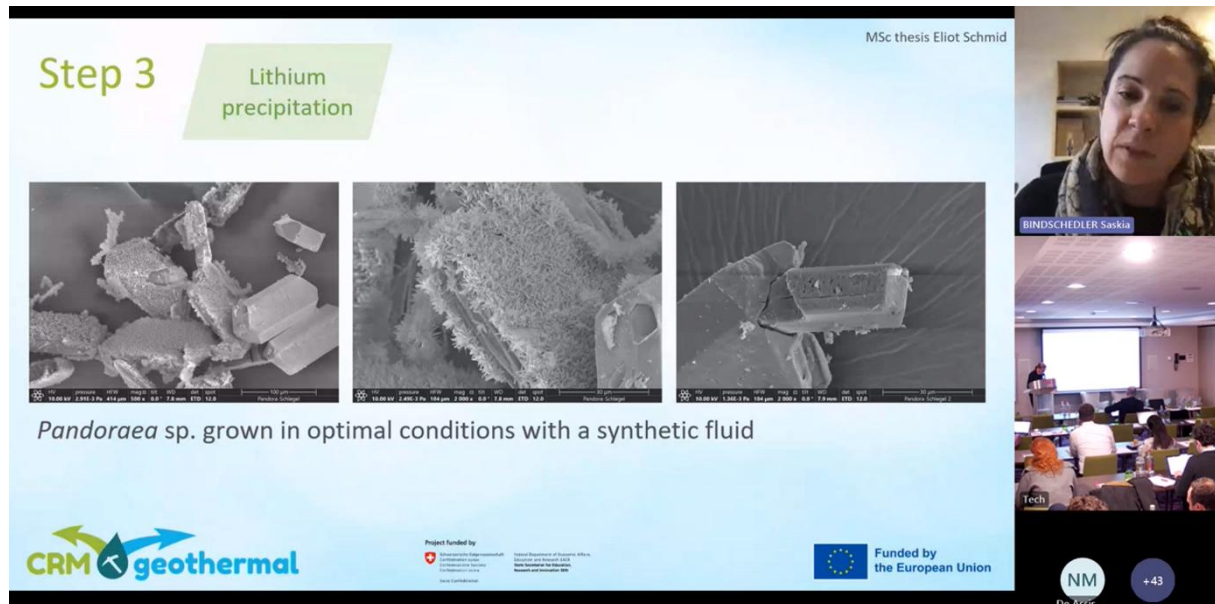


Figure 22. Saskia Bindschedler presenting at the 2024 annual Cluster Hub workshop.

4.2.7 Cluster Hub Annual workshop: Production of raw materials for batteries from European resources

In the following year, the annual workshop⁶ for the 'Materials for Batteries' Cluster Hub (Production of Raw Materials for Batteries from European Resources) was held on 20 November 2025 at NH Brussels Carrefour de l'Europe in Brussels, in hybrid format. The event brought together over 20 EU-funded projects and more than 120 organisations to share concrete results from across the battery raw materials value chain (Figure 24).



Figure 23. Social media card for the 2024 Annual Cluster Hub workshop.

⁶ Event website: <https://www.materialsforbatterieshub.eu/news/review-article-cluster-hub-annual-workshop/> [Accessed: April 2026]

CRM-geothermal was presented by INLECOM, Konstantinos Loupos, who talked about the value of AI in the exploration of lithium-rich geothermal fluids in session entitled “Innovations in extracting and processing battery materials with minimal environmental impact Technical presentations EU-funded projects”⁷. Knowledge sharing and networking remains to be one of the biggest benefits of the Cluster Hub’s Annual workshop.



Figure 24. Members of the "Materials for batteries Cluster Hub" in 2024.

5 ACHIEVEMENTS AND OUTCOMES

The clustering activities allowed CRM-geothermal to not only increase its outreach capacity and visibility towards stakeholders of the geothermal and raw materials sectors, but also to cooperate and create synergies with other Horizon Europe projects. The campaign to list and engage with clustering candidates resulted in the invitation and inclusion of CRM-geothermal in a structured cluster group, the Cluster Hub for production of raw materials for batteries from European resources. This opportunity allowed CRM-geothermal to directly engage and learn from the 25 participating projects in a structured format, with bimonthly progress meetings online and three annual Cluster Hub workshops in Brussels to discuss ideas for collaboration and share results.

From the partners’ network, CRM-geothermal also benefited from a joint social media campaign with other projects related to critical raw materials sourcing, which increases social media engagement and, consequently, enhances the visibility to the initiative, supporting the efforts of WP6 in general. The presentation of CRM-geothermal at the clustering event “European Union SuperCluster Lapland Geoconference” fostered dissemination about the project and provided the opportunity for the Project Coordinator to learn about other initiatives related to the raw materials sector and interact with their respective representatives, expanding the pool of clustering candidates for future joint activities.

The co-organisation and hosting of a webinar with the RAWMINA project was a valuable clustering opportunity with regards to the recovery of critical raw materials from

⁷ Clustering workshop Agenda: https://www.materialsforbatterieshub.eu/wp-content/uploads/2025/11/ClusterHub_Agenda_2025-Updated-V1.0.pdf [Accessed: April 2026]

geothermal brines and mine waste. In this event, the researchers from both teams exchanged information about methods and presented initial results to an audience of 78 participants, including researchers from other projects who manifested interest in also collaborating in future activities with the involved projects.

The clustering and networking activities directly allowed CRM-geothermal Partners to engage with industry actors. The Vulcan Energy Resources bootcamp, Aquatech meeting, PDAC 2025 attendance, GeoTHERM final conference and trade fair were all excellent opportunities to connect with industry representatives, investors, professionals, operators from the geothermal sector. Even though the TRL level for the project is low, valuable insights were shared and future collaboration opportunities were discussed between the partners and the industry actors. These exchanges directly support future implementation of research results from CRM-geothermal.

The project conference 'Navigating the Energy Transition: Research Breakthroughs from CRM-geothermal', hosted at the European Parliament in November 2025, allowed direct engagement with policy makers. The high-profile event was a great success to extend the project's reach and visibility among policy makers and connect the research results directly with the EU's legislative and policy processes.

Finally, the collaboration with CEEGS project enabled to work closely on shared technical and societal challenges such as multiuse of geothermal resources and social acceptance. The two clustering workshops (April 2025 online workshop, September 2025 Lisbon workshop) and the joint webinar (October 2025) were helpful to get to know other projects perspectives (LEAP-RE, GeoSmart, PilotSTRATEGY, CaLby2030, ConsensusUS), results and solutions to shared challenges.

6 CLUSTER NETWORK MAP

From the methodology and clustering activities outlined in the present report, the CRM-geothermal project is currently connected to a number of initiatives spanning from the sourcing of critical raw materials to the geothermal sector, both from the research and the social engagement perspectives. The resulting cluster network map in M48 is the following (Figure 26):

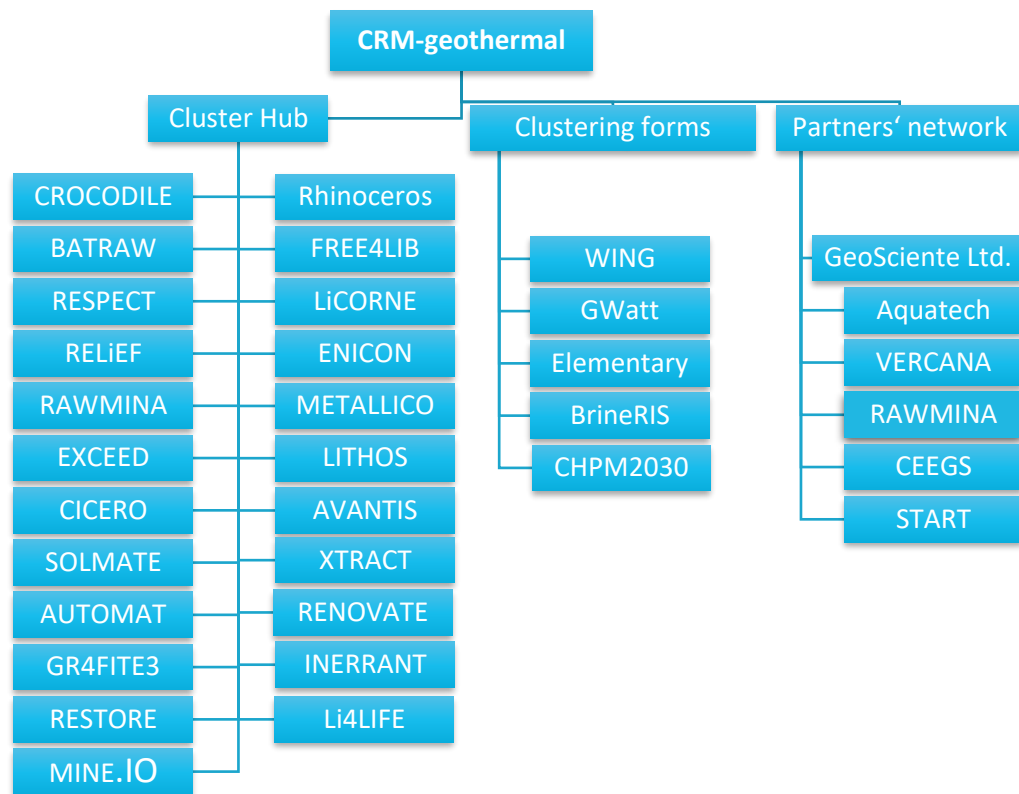


Figure 25. Cluster network map of CRM-geothermal until April 2026 (M48).

Throughout the clustering and networking efforts of CRM-geothermal, the project has connected to various network types:

- Formal multi-project Cluster Hub: The Materials for Batteries Cluster hub connected 25 EU funded projects via bimonthly meeting and annual clustering workshops in Brussels in 2023, 2024 and 2025.
- Bilateral project partnership with joint activities: CEEGS clustering events and webinars, RAWMINA joint webinar, consortium meeting presentations with LiCORNE and RAWMINA, and online meetings with WING and GeoScience Ltd.
- Thematic clustering events around specific topics: DLE Symposium at KIT, LITHOS workshop on responsible mining, START clustering workshop on CRMA, UNFC/CRIRSCO workshop on reporting schemes in the co-extraction of heat and CRMs from geothermal fluids, EU SuperCluster Lapland Geoconference.
- Policy and institutional engagement: CRM-geothermal project event at the European Parliament with MEP González Casares and DG Energy.

- Industry and commercial engagement: Vulcan Energy Resources bootcamp, Aquatech meeting, PDAC 2025 attendance, CRM-geothermal final conference at the GEOTHERM trade fair.

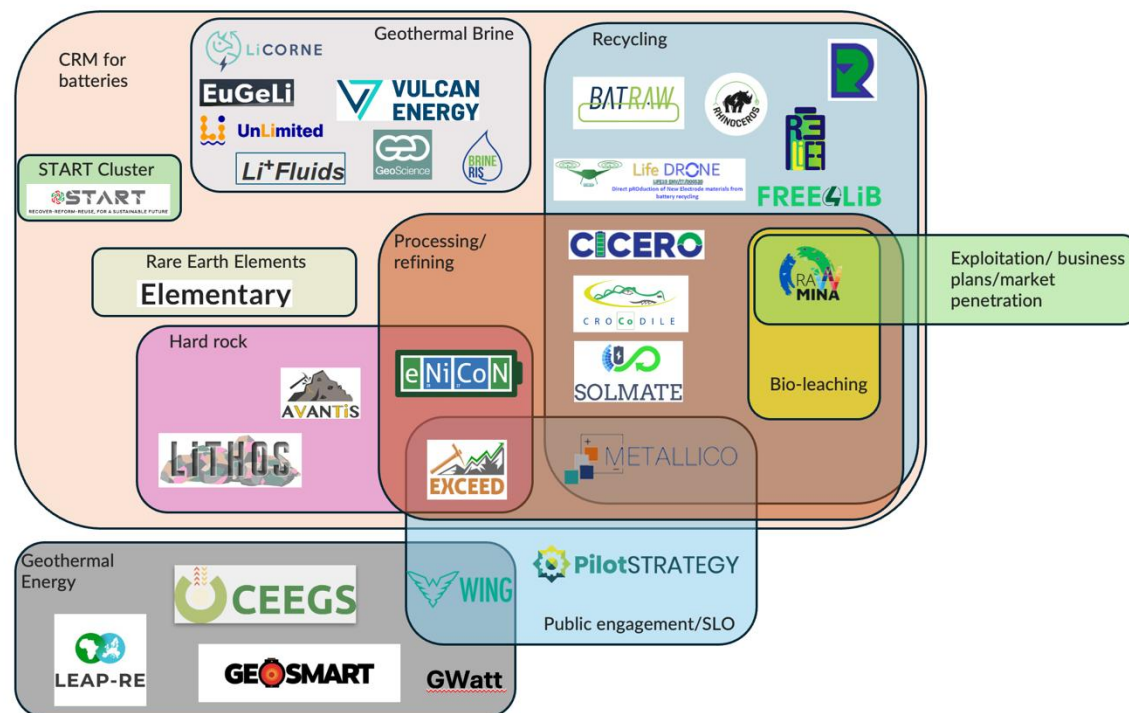


Figure 26. Thematic Cluster network map of CRM-geothermal until April 2026 (M48).

Besides working with different network types, CRM-geothermal also engaged across thematic clusters of shared challenges, synergies and joint efforts (Figure 27). The main thematic cluster was around CRM, especially for batteries, as the Cluster Hub was the driver for many of the activities. Throughout bimonthly meetings, three annual workshops, joint webinars with RAWMINA, and the START project's wider CRMA cluster (GSEU, FutuRaM, SUPREEMO, REESOURCE, REPTiS), the Cluster Hub provided a dynamic collaboration covering processing/refining, recycling, and Rare Earth Elements. Lithium extraction from geothermal brines was also a strong thematic cluster, connecting research projects with commercial operators (Vulcan Energy Resources, Cornish Lithium Plc) and was discussed at the DLE Symposium at KIT. The thematic cluster around multi-use of geothermal resources gathered projects like CEEGS, GeoSmart, and LEAP-RE, through multiple joint clustering workshops online and in-person, webinars, and joint social media activities. An overarching thematic cluster on responsible mining, processing and reporting was addressed during LITHOS workshop with ENICON, EXCEED, AVANTIS, CICERO, and the CRIRSCO/UNFC reporting workshop at the University of Miskolc. Last, but not least, social acceptance and public engagement were shared topics with many of the projects, and explicitly addressed with CEEGS webinars and the in-person CEEGS clustering workshop in Lisbon with ConsensusUS, PilotSTRATEGY and CaLby2030.

7 CONCLUSION

The efforts undertaken within Task 6.6 – Clustering of the CRM-geothermal project have led to promising results in establishing a robust network of projects and initiatives aligned with the main topics within CRM-geothermal project: sourcing critical raw materials and geothermal energy. Through proactive engagement and collaboration throughout the 48 Months, CRM-geothermal has been able to identify synergistic opportunities and actively participate in clustering initiatives such as the 'Materials for batteries Cluster Hub' with 25 EU funded projects as of April 2026, and bilateral partnership with CEEGS. This involvement has facilitated knowledge exchange and generated opportunities for joint activities and partnerships with other EU initiatives. This has been implemented through formal cluster structures and workshops, bilateral project collaborations, thematic clustering events, policy engagement and industry events.

The participation at the annual Cluster Hub workshop in 2023, 2024, and 2025, the joint webinars with RAWMINA and CEEGS, reflects the commitment of CRM-geothermal in fostering dialogue and cooperation within the research community. In addition, the structured social media campaign during the Raw Materials Week enhanced the project's visibility on social media. The CEEGS clustering workshop in Lisbon in September 2025 used dedicated exercises (Synergy Matrix, Action Canvas, and Funding Radar) to identify concrete actions for inter-project collaboration that can extend beyond project end, providing a basis for several of the established connections to continue under future funding instruments.

In the second half of the project, CRM-geothermal extended its network and reach towards the industry and policy makers, via the successful project conference 'Navigating the Energy Transition' at the European Parliament in November 2025, the 'Invisible Mining in Action' bootcamp at Vulcan Energy Resources facilities and the project's presence at the GeoTHERM trade fair in February, 2026. These events brought the project research outputs towards the industry, operators and the legislative community. As the project concludes in January 2027, the focus of the clustering work has shifted from expansion to consolidation and continuity.

Although the clustering task (T6.6) concludes with this deliverable (D6.7), as CRM-geothermal continues until January 2027, the partners remain open for further networking, engaging with new projects, particularly in geothermal energy.

Considering that the objective of clustering is to build connections with related communities, form research partnerships, boost project visibility, and enhance the utilization of results, the objectives connected to this deliverable have been achieved.