

Grant Agreement no. 776473

**CROCODILE PROJECT**

**First of a kind commercial Compact system for the efficient Recovery Of CObalt Designed with novel Integrated LEading technologies**



**D10.5 Centre of excellence workshops for recovery of CRMs**

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Contributor(s)	All Partners
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**List of abbreviations and definitions**

<b>Abbreviation</b>	<b>Definition</b>
CRM	Critical Raw Materials
EIA	Environmental Impact Assessment
EIP	European Innovation Partnership
EIT	European Institute of Innovation and Technology
NGO	Non-Governmental Organisation
SDG	Sustainable Development Goals
SDLO	Sustainable Development License to Operate
SLO	Social Licence to Operate
UN	United Nations



### Executive summary

The report D10.5 provides centre of excellence for events that are organised and held in the period M1-M18 of the CROCODILE project. Clustering events are organised in order to gather similar projects, partners, technologies and solutions, all following European policy in order to exchange ideas, experiences and summarize activities based on good solutions.

The EU H2020 CROCODILE project develops an innovative metallurgical system, based on advanced pyro-, hydro-, bio-, iono- and electrometallurgy technologies for the recovery of cobalt and the production of cobalt metal and upstream products, using a wide variety of secondary and primary European resources that will serve as feedstocks of cobalt metal. The business concept and model of mobile plant is based on profit sharing principle between company with feedstock rich in cobalt and the CROCODILE consortium.

Since CROCODILE project envisages the development of innovative systems and will develop a first kind commercial mobile system for the cobalt metal recovery, i.e. provide active engagement of local and international groups, one of project's objectives is to cluster similar projects that might put together the same targets and, in such way, connect interested parties through communication, dissemination and exploitation activities. This synergy should represent a cross section of common topics, identifying similar targets, solving possible same barriers and exchange potential solution. This deliverable gives an overview of clustering events that were organised previously, since 2018.

Eventually, up to M18 of CROCODILE, several clustering events were organised:

- Innovation forum was held in Athens, October 2018 [\[1\]](#);
- Raw Material Week 2018 SESSION III: R&D&I ON CRM IN EUROPE in November 2018 [\[2\]](#);
- Specific symposium organized as part of the CARE INNOVATION event organised by CROCODILE Partner ISL, November 2018 in Vienna, (described in D10.1) [\[3\]](#);
- Ensuring the SLO concept is adaptive and resilient: Organized by the MIREU project, in collaboration with the H2020 projects, CROCODILE, NEMO and TARANTULA, in Brussels, June 2019 [\[4\]](#);
- Public Acceptance and Social Impact of Mining and Minerals Recycling”, organized as satellite event during the Raw Material Week 2019, in November 2019 in Brussels [\[5\]](#);

Moreover, apart from these clustering events, two webinars were co-organised:

- The lessons learned on the June workshop on SLO + presentation of the mineral resource governance report of the UNEP IRP, held in June 2019 (Information available on the website [\[6\]](#))
- September: ‘the Secrets of SLO’: discussing the SLO approach of the SecREEs project and comparing it to the analysis of Thomson and Boutlier (2011), held in September 2019 (Information available on the website [\[7\]](#), [\[8\]](#)).

All mentioned events offered an exclusive opportunity to a variety of recent updates about the latest EU activities in the fields of Raw Material recycling, critical metals recoveries and technologies, circular economy, sustainability and social acceptance through steps of communication and dissemination activities. One of the best advantages was the opportunity to meet and discuss with stakeholders and the audience to participate actively in debates and networking.



## 1. INTRODUCTION

One of the most important objectives of EU Raw material strategy is to keep the European industry competitive and with low carbon technology and circular economy, to help the industry to implement the newest and best available technologies with digitalized, innovative and sustainable approach, to enforce domestic production and EU industrial value chains, to improve the recovery of raw materials, as well as to improve partnerships between the EU, Member States and regions which will eventually attract young generation and develop relevant skills.

The criteria for determination and identification of clustering projects has been described in D10.1 and were done based on 3 layers (D10.1).

- 1<sup>st</sup> layer – Projects specifically linked to the cobalt (Co) value chain (sourcing/processing/end-use)  
This category comprises projects with a direct link to the cobalt supply chain, its processing and key market segments of Co-rich products.
- 2<sup>nd</sup> layer – Projects showcasing advances in metallurgy/recycling of valuable raw materials  
Projects featuring enabling technologies for (metallurgical) (pre)processing and refining of Co and other valuable metals, such as REEs, Li, In, etc.
- 3<sup>rd</sup> layer – Projects linked thematically to Critical Raw Materials  
Projects linked to not only Cob but other CRM of relevance that can also be of interest to the partners and the technologies considered within CROCODILE to further expand the potential of this project into other applications.

A total list of **39 projects were selected** out of a list of 510 pre-identified ones (i.e. 352 H2020 funded projects, 85 LIFE funded projects and 73 EIT funded projects, where **27 projects funded by H2020** under different sub-programs (i.e. Innovation Actions, Research and Innovation Actions, Coordination and Cooperation, European Training Networks, etc), **2 projects funded by the LIFE** program and **10 projects funded through the EIT Raw Materials organisation**).

Some of the most relevant projects that were recognized as interesting projects for clustering with CROCODILE are: SCREEN, MIREU, NEMO, PLATIRUS, TARANTULA, METGROW plus, INFAC, etc (detailed list of clustering projects is given in D10.1).

D10.3 of CROCODILE project offers detailed explanation of the events organized in previous period, and here is given only in general, while the most recent event (“Public Acceptance and Social Impact of Mining and Minerals Recycling” is described here.

## 2. Summary of the clustering event “THE INNOVATION FORUM H2020” with conclusions

Description of the clustering event is given in D10.1 and D10.3, while here is a brief summary of outcomes.

The forum bonded research institutes, academia, business companies and SMEs fostering examples of innovative solutions that should lead to overall improvement and innovations in European projects.

Through sessions, the forum presented variety of European projects, business-oriented workshop, technical workshop, and business applications session, sharing the most successful cases [\[1\]](#).

Topics that were discussed were related with clustering interactive tool, projects’ objectives and activities, business applications, LCA methodologies.



Projects participating the clustering event: SCALE, METGROW, MIREU, REMOVAL, PLATIRUS, CHROMIC, NEMO, REMAGHIC, ENSUREAL, ALUMINA, PLATIRUS, CROCODILE. The outcomes of the forum were the possibility to exchange experiences and ideas related to European projects' realization. The main conclusion of the forum was the related to high importance of clustering activities, since numerous HORIZON 2020 projects have similar objectives (and/or methodologies), therefore the newest conclusions of one project might be applied in projects that were starting later on.

### 3. **Summary of the clustering event: RAW MATERIAL WEEK 2018, SESSION III: R&D&I ON CRM IN EUROPE with conclusions**

The Raw Material Week 2018 was organized to gather together the newest information related to Critical Raw Material, enable clustering between projects with similar challenges during the session III, [\[2\]](#).

The clustering event *Session III: R&D&I on CRM in Europe – Co-chaired by Mr. Stéphane Bourg, Screen Coordinator and Mr. Gian Andrea Blengini, DG JRC, EC* aimed to accomplish responses to challenges and discuss solutions of possible extraction, reuse or recycle raw materials in order to improve supply security for the downstream industries (described in D10.1 and D10.3). Thus, Horizon 2020 Raw Material Information and Brokerage Event were organized. Topics that were presented were related to the latest news Raw Material, worldwide and actual state in European Union, projects with the objective of recovery of raw materials, policy technologies, European databases, demand, international cooperation, framework and regulation.

Projects participating the clustering event: SCREEN, NEMO, DEMETER, REE4EU, SCALE, as well as CROCODILE.

The conclusions were made regarding the newest technologies and research outcomes that are result of each project's consortium [\[9\]](#). During the event, each project was presented: recent results, coming activities and issues that are being solved by each consortium. Thus, the audience could use the opportunity to apply recommendations and to avoid similar issues, eventually.

### 4. **Summary of the clustering event: 3rd SLO Stakeholder Workshop “Ensuring SLO is adaptive and resilient” with conclusions**

During June 2019, the 3<sup>rd</sup> SLO Stakeholder Workshop was held in Brussels, *Ensuring SLO is Adaptive and Resilient* in Saxony Liaison Office (described in D10.3). The two-day Workshop that was held on 5-6<sup>th</sup> June and the most important topics that were discussed within 4 sessions. Topics that were discussed were related to policies and SLO strategies, social outcome of changes in mining industry, SLO in global context [\[4\]](#).

Projects participating the clustering event: CROCODILE, NEMO and TARANTULA.

The conclusions were mostly regarding strategies and methodologies of Social License to Operate, where high-level multi-stakeholders participated in the debate and raised topics such as top-down and bottom-up strategies.



## 5. Summary of the clustering event: (“Public Acceptance and Social Impact of Mining and Minerals Recycling”)

The most recent clustering event “Public Acceptance and Social Impact of Mining and Mineral Recycling in Europe” (KUL) was organized on 22<sup>nd</sup> November 2019 as satellite event at the Raw Materials Week (Brussels) [\[5\]](#).

The [satellite event](#) was under the organisation of clustering activities related to the EU H2020 projects NEMO, CROCODILE and TARANTULA, in collaboration with the SecREETs, INFAC and CHROMIC project.

A panel was created among highly diverse background panellists and public raised as topics related to the public acceptance of mining and recycling in EU. The participants were coming from academia, industry, government civil society, NGOs, local citizens, academia, international institutions with the aim to suggest policy recommendations from the EU Commission.

Since low carbon economy requires a large amount of critical raw materials (rare-earth neodymium and dysprosium, as well as lithium and cobalt) and primary mining should support this transition because recovery is not efficient sufficiently, while lack of social acceptance hinders development and implementation of any mining activity. Eventually, the reputation of mining is often confronted with a negative reputation in society. The most common methodology applied NIMBISm (not in my back yard) and it was discussed.

After the welcoming introduction given by Piet Wostyn from KU Leuven and Veronique WOULE-EBONGUE (EC – EASME), that explained activities of EASME (apart from mining sector, renewable energy, tourism and forestry, as well). She has emphasised the existence of raw material (RM) initiative that was adopted in 2008 and mitigation measures that are suggested by [EIP on RM EU partnership](#). The three pillars of the EIP were mentioned and here is described more:

1. **RMIS databases that offers social and environmental information** (Raw materials research and innovation coordination, Technologies for primary and secondary raw materials production, Substitution of raw materials, Improving Europe’s raw material and waste management framework conditions, Knowledge, skills and raw materials flows).
2. **Horizon 2020 calls along**
3. **International cooperation** (including communication, dissemination and local community).

Each of 6 speakers presented one key recommendation for the European Commission to consider when dealing with public acceptance and social impact of mining and minerals recycling. After conclusions, a fruitful panel debate created good environment that allowed further alignment of mentioned recommendations.

The programme covered 6 perspectives on social acceptance:

- Prof. **Paul Ekins** (UNEP – IRP): Gearing Extractive Industries Towards Sustainable Development
- Mrs. **Riikka Aaltonen** (Ministry of Economic Affairs and Employment of Finland): Political, legal versus social license negotiation and facilitation
- Dr. **Cathryn MacCallum** (SRK): Industry perspective on inking social risk to social acceptance
- Mr. **Carlos Gutiérrez Álvarez** (neighbour from Tapia de Casariego, Asturias (Spain): Local experiences from Asturias, the case of Oro de Salave



- Mr. **Alberto Vazquez** (CATAPA): From SLO model to practice: pitfall and drivers for a transparent dialogue
- Dra. **Marieke Meesters** (WUR): Academic review of the literature on social acceptance and Social License to Operate (SLO)

Some of conclusions were that we would need to have governance frameworks, rules and laws that will support monitoring activities, as well as to cluster projects and experiences as much as possible. Also, **Professor Paul Ekins** suggested that EU should enter sustainable commodity agreements based on achievements on SDGs with the major countries to global. Moreover, **Riikka Aaltonen** from Ministry of Finland suggested that EU should take the lead to make one sustainable mechanism instead of numerous initiatives around the world. **Dr Cathryn MacCallum** concluded that we should consider more focus on the social context of EIA and to avoid transfer of responsibilities from national to local level and vice-versa.

**Carlos Gutiérrez Álvarez** commented that mining activities should be stopped, that people don't want to be bothered and that mining companies have the profit as ultimate objective, which is causing environmental damage and impact on human health, eventually. **Alberto Vazquez** said that, since mining in EU has a strong impact on environmental, cultural, social and political entities, it's recommended that we should have an open dialogue based on equality and involve more of stakeholder's suggestions. **Marieke Meesters** commented that there should be specific concern and raised the question who should give the Social Licence to Operate, precisely.

After the recommendations given by each speaker, the debate was triggered by NGOs that opened philosophical discussion – do we have to exploit at all and when is enough.

This broad cluster of EU H2020 project aimed to discuss different viewpoints on social acceptance from industry, governments, NGOs, local citizens, academia and international institutions.

Eventually, the finalisation of the panel was made through conclusions and networking.

## 6. CONCLUSION

Clustering events held for the first period of CROCODILE project offered an exclusive opportunity gather relevant stakeholders, speakers and participants that were discussing about a variety of important topics and EU activities in the field of Raw Material. Through these events, the participants had the possibility to exchange ideas, innovative technologies, knowledge about critical metal recoveries and technologies, circular economy and how to perform communication and dissemination activities and discuss about topics related with the social acceptance and social licence to operate.

Events are organized by Horizon 2020 projects and expert networks creating a perfect environment to foster experiences, knowledge and recommendations. So far, there has been 5 clustering events and 2 webinars organised related with CROCODILE.

Regarding social licence to operate, the general conclusion is that the extraction activities depend on the permission of the society in most of cases, therefore the communities are demanding more involvement in decision-making. Not entering to the philosophical question whether mining activities should be performed at all or not, one of the strongest conclusions was related to the EU policy: in a case of decision of continuing with the mining activities, a detailed policy and responsibilities should be defined.





## 7. ANNEX

Webpages:

1. <https://www.h2020innovationforum.com/h2020-innovation-forum-2018/>
2. [https://ec.europa.eu/growth/content/raw-materials-week-2018\\_en](https://ec.europa.eu/growth/content/raw-materials-week-2018_en)
3. <https://h2020-crocodile.eu/2018/09/28/circular-economy-raw-material-experts-meet-in-vienna/>
4. <https://h2020-crocodile.eu/2019/09/26/the-secrets-of-the-social-license-to-operate-slo/>
5. <http://prometia.eu/satellite-event-public-acceptance-and-social-impact-of-mining-and-minerals-recycling/>
6. <https://h2020-tarantula.eu/gearing-extractive-industries-towards-sustainable-development-webinar-report/>
7. <https://h2020-crocodile.eu/2019/09/26/the-secrets-of-the-social-license-to-operate-slo/>
8. <https://h2020-tarantula.eu/the-secrets-of-the-social-license-to-operate-slo/>
9. <https://h2020-crocodile.eu/2018/11/26/networking-on-crms-nemo-crocodile-and-demeter-present/>

