EIS
Exploration
Information
System

D.6.3 – Updated Version of the Communication, Exploitation, and Dissemination Plan

Document, Report

Version N°01

Lead Beneficiary: LGI

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Abbreviations and Acronyms

Acronym	Description
WP	• Work Package
CE&D	• Communication, Exploitation and Dissemination
IP	• Intellectual property
IPR	• Intellectual Property Rights

Summary

The primary aim of deliverable D6.3 - Updated Version of the Communication, Exploitation, and Dissemination Strategy & Plan is to provide an overview of the EIS project's approach to communication and dissemination and offering an evolved perspective on deliverable D6.1 – Initial Communication, Exploitation, and Dissemination Strategy & Plan.

Providing a review of the project's CE&D activities, this updated plan delves into the effectiveness of the strategies and tactics implemented, ensuring alignment with evolving requirements. The document continues to contextualize the EIS project, articulate communication objectives, target groups, key messages, and the metrics by which we gauge success. It also maintains a focus on resource allocation, tools, and channels used to engage our audience and disseminate project findings – adapting the efforts necessary to increase the visibility of the project and it describes the exploitation strategy and implementation that was done during this period.

Keywords

EIS, communication, dissemination, visual identity, poster, roll-up, website, LinkedIn, events, workshops, scientific publications, update, strategy.

1. Introduction

1.1 Purpose and scope

Communication and dissemination activities have become a top priority in European collaborative research projects funded under the EU's Horizon 2020 programme.

The core objective of this updated CE&D plan is to describe the communication and dissemination strategy employed by the Exploration Information System (EIS) project since its start – highlighting the intricacies over the past 20 months. This document identifies the communication objectives, target audiences, key messages, and specifies the tools and channels instrumental in connecting with the audience and disseminating project findings. Most importantly, this deliverable assesses the actions taken internally and externally of the project in terms of knowledge dissemination and public communication regarding EIS and their results.

1.2 Partner Contributions

LGI Sustainable Innovation (LGI) leads communication and dissemination activities for EIS. More specifically, LGI focuses on the global communication of the project and its results as well as the dissemination of results and progress to key stakeholders (policymakers, regulators, academia, NGOs, citizens, and end-users such as exploration companies and the mineral exploration industry).

As with D6.1, the CE&D strategy outlined in this deliverable serve as a blueprint for all project partners, ensuring a unified and coordinated approach. A summary of partner contributions to this strategy can be found in the table below.

Partner	Contribution
LGI	**Task 6.1: Public communication** • Communication, exploitation, and Dissemination plan • Visual Identity: logo, presentation, and document templates • Promotional Materials: flyer and roll-up • Digital tools: website, social media accounts and video • E-Newsletter and press releases **Task 6.2: General Public Awareness** • Awareness Campaign: 8 easy-to-understand visuals • Factsheets and infographics **Task 6.4: Exploitation Plan** • IP Diagnostic based on exploitable results • IP & Exploitation workshop (IP webinar and co-creation session) • Final exploitation workshop (M24)

LGI, GTK, Beak, LU, BRGM	Task 6.3: Dissemination of Project Results • Event and Publication Management Plan • Coordinating partners' participation in conferences and events to promote the project • Coordinating publications • Organising a Scientific Short Course (by BEAK and LU) • Organising the final Workshop
LGI, GTK	Task 6.5: Data and Knowledge Management • Describing the data management life cycle for all data
Other partners	All Tasks • Support to translating materials into key European languages • Contribution to communication and dissemination of content, and promotional materials when needed • Support to relay news and results produced in the EIS project • Support to produce the project video and campaigns

Table 1: Partners Contribution

1.3 Relation to other activities

The success of the overall communication, exploitation, and dissemination strategy depends on and is linked to, the work undertaken in other WPs. Communication and dissemination activities relies and will continue to rely on the work of all partners and their collaboration in providing WP6 with information on their activities and in sharing relevant information about the project to their own contacts and networks.

Within this collaborative framework, several tasks within WP5 hold particular relevance to WP6's objectives. The following tasks from WP5 will be particularly interrelated with the work of WP6:

- WP5 will work closely with WP6 in developing stakeholder engagement strategies such as business-to-business interactions, business policymakers, and business-to-citizens.
  - Task 5.2 Development and launching of public EIS Scope Engagement Forum (ESEF)
  - Task 5.3 EIS clustering events

Over the past months, WP6 has joined force with WP5 for its task 5.3: the "*EU SuperCluster Lapland Geoconference*" was a great source of information, content and provided interesting results for the projects communication channels. This event organised by EIS gathered over 120 experts.

2. Context & Objectives

The rapid deployment of clean energy technologies as part of the energy transition implies a significant increase in demand for minerals. Global demand by the automotive industry for raw materials is likely to continue and is predicted to grow 5 to 10 times to current demand, due to increasing request from the EV sector (IEA 2021). Mineral supply-chain disruptions would have long-range impacts on electrification, as well as on energy transition security and on achieving the decarbonization targets. The risk of running into bottlenecks in the raw material supply is increasing because the demand is growing faster than production capacity. When supporting the implementation of European Green Deal, EIS is addressing the twin goal of an increase in Europe's long-term self-sufficiency and resilience of raw materials and also achieving the stated decarbonization goals.

Today there is a broad consensus that delivering the European Green Deal would require vast quantities of mineral raw materials. In the transition to clean energy, raw materials criticality refers to and seeks for securing and sustaining the resource and supply potential of the new mineral commodities needed. This concerns specifically those enabling the implementation of batteries (e.g., lithium, cobalt, graphite) and permanent magnets (e.g., rare earth elements), which are the biggest factors driving the potential intensity of mineral demand.

Communication and dissemination activities have become a top priority in European collaborative research projects funded under the EU's Horizon 2020 programme.

Based on the needs of the project, the EIS project's main **communication and dissemination objectives** include the following:

- **Disseminate the results** of the EIS project to key stakeholders
- **Communicate on the activities and results** of the EIS project to target audiences
- **Provide an exploitation strategy** for the EIS technology to meet its market and have a sustainable model.

3. Communication & Dissemination Strategy

The overall EIS communication, exploitation, and dissemination strategy is based on a series of key messages tailored for specific audiences, an exploitation methodology, and a consistent project description. These have been implemented throughout the different channels and tools described in a dedicated section in this deliverable.

3.1 Target Audiences and Key messages

The EIS project aims to reach key target groups through its communication and dissemination strategy including academics, mining companies, industrial stakeholders and NGOs, civil society and others. Each communication action will be targeted at different levels: local, nationwide, European, and global. In the next version of the communication plan, these groups will be further refined into a more specific set of audiences.

A workshop was organised at the KOM (beginning of June in Finland) with the partners to define and prioritize target audiences by groups and to define a set of key messages for each target group.

An initial set of tailored messages for EIS has been developed to promote the project in the most effective way. Developed in the initial CE&D plan and detailed in the table below, the results and continuous analysis made throughout the project, allow to partially evaluate the impact of the messages on our target audiences.

Target audience	Key Messages
Mining Companies + Mineral Exploration consultants / Industrial Stakeholders (including battery and permanent magnet producers)	• EIS will facilitate mineral prospectivity analysis by offering a non-commercial open-source software package containing tools for all stages of prospectivity analysis. • The EIS toolbox will assist exploration teams in their decision-making throughout the various stages and across the different scales of an exploration project. • The EIS QGIS Wizard has a good potential of becoming widely used in prospectivity analysis by both the research institutes and the business sector around the globe. • EIS will enhance the probability of finding new sources of critical raw materials for the EU's economy, with a focus on the primary raw materials that are the most critical for EU industrial value chains and strategic sectors. • EIS contributes to facilitating domestic sourcing of raw materials in the EU, securing supply chains, and facilitating access to raw materials produced in compliance with ethical and environmental standards.
Policymakers	• EIS will contribute to increasing access to primary raw materials, in particular critical raw

	materials for EU industrial value chains and strategic sectors.
	• The EIS project enhances the probability of finding new sources of critical raw materials thus reinforcing Europe's economic independence from third countries.
	• EIS will contribute to more socially and environmentally acceptable discovery and production of critical raw materials.
	• EIS will contribute to enabling a successful transition to a climate-neutral and digitized economy and society.
	• The EIS QGIS Wizard has a good potential of becoming widely used in prospectivity around the globe, putting the EU at the forefront of mineral prospectivity analysis.
Local Governments, Investors / Funders	• The EIS project will contribute to good financial returns and long-term security of supply.
	• EIS recognizes the limited supply and the unlimited demand and will enhance the probability of bringing a solution to find new sources of critical raw materials.
Academic, scientific community and Geosicientists	• EIS will allow to explore and learn more about mineral systems and ore-forming processes and can also be used as a data exploration tool.
	• EIS will facilitate the process of mineral prospectivity for all stages of prospectivity analysis.
	• EIS offers a non-commercial open-source software package that will allow for contributions from numerous researchers globally.
	• The EIS QGIS Wizard has a good potential of becoming widely used in prospectivity analysis by research institutes around the globe.
Open-Source Community	• EIS offers a non-commercial open-source software package that will allow for contributions from numerous researchers globally.
	• The EIS QGIS Wizard has a good potential of becoming widely used in prospectivity analysis by research institutes around the globe.
General Public/NGOs/Civil Society	• Raw materials are necessary for a successful transition to a climate-neutral and digitized economy and society.
	• Strengthening the EU's autonomy and ethical sourcing of raw materials by developing socially and environmentally friendly means of discovery

- and production is critical for a sustainable economy.
- EIS will enhance the probability of finding new sources of critical raw materials, thus reinforcing Europe economic independence from third countries.
- EIS will participate in strengthening the EU's ethical sourcing of raw materials while contributing to reducing the footprint of mineral exploration.
- The data analysis techniques developed will guide more environmentally friendly exploration for critical minerals, limiting impacts on biodiversity and the environment.

Table 2: Key messages for each target audience

The general impact of our key messages is overall very positive as we can see from the engagement on our online communication tools – find more details on this in 8. Online Tools

3.2 Timeline

A timeline gathering all key communication and dissemination activities throughout the project has been created and will be continuously updated

Figure 1 : Updated version of the communication & Dissemination Timeline

4. Management

M1
Project logo
Templates
Social media
Press release 1

M3
D6.1 Initial CE&D plan

M4
Project website

M6
1st Awareness Campaign
Flyer, poster and roll-up
D6.2 Data Management Plan

M8
2nd Awareness Campaign
1st Exploitation Workshop

M11
3rd Awareness Campaign

M12
Newsletter 1
Press Release 2

M14
4th Awareness Campaign

M17
5th Awareness Campaign

M20
6th Awareness Campaign
D6.3 Updated CE&D plan

M23
7th Awareness Campaign

M24
8th Awareness Campaign
Newsletter 2
Final Exploitation Workshop

M33
Video Release

M34
Final event
Press release 3

M36
D6.4 Final version of the CE&D plan
Newsletter 3

In the above timeline, some of the awareness campaigns were delayed but a strategic plan on how and when the remaining campaigns will be launched is described in the Awareness Campaign section. The Press Release 2 got released in M19 instead of M12.

4.1 Content flow

To facilitate the flow of information, an efficient process has been established to allow all partners to collaborate on content creation and relay the information shared through EIS communication channels.

As to further develop the flow of information among the partners, and to actively get their participation in the development and creation of content for the project's communication channels, a meeting that occurs every 6 weeks has been set up. During these meetings focused on WP5 and WP6 activities, partners share their latest progress, achievements and activities, such as events they attended or will attend, as well as articles they published or plan to publish.

At the start of the project, LGI used a form linked to its email address contact@eis-he.eu to receive news, announcements, scientific papers, pictures or information from partners.
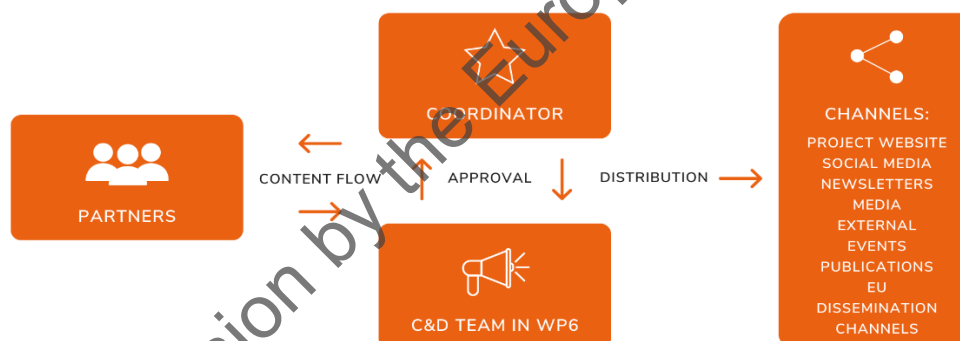
Figure 2. Communication Workflow

4.2 Role and responsibility of partners

To ease the flow of information and simplify the communication process between partners, an online form was created. Partners can fill out the form when they participate in an event, attend a conference related to the EIS project or publish an article about the project.

Figure 3. Screenshot of the reporting form

Partners were strongly encouraged to use this form frequently to provide communication and dissemination content to include in the project newsletters, website newsroom, and social media channels. This form will also be used to collect information for reporting periods.

As the project and the internal communication channels evolved, LGI replaced the reporting form with an event/publication planner (see Fig.6) which is more aligned to the project's partner preferences. This live document is shared at the WP5/WP6 meeting, as well as other meetings, and regularly per email.

Figure 4 – EIS event/publication planner

5. Communication channels and tools

5.1 Visual Identity

All the communication and dissemination tools described in this deliverable are consistent with the EIS project's brand identity, which aligns with the image that the project wishes to convey. This Communication, Exploitation, and Dissemination Plan has been developed and saved on Teams to provide partners guidelines on how to use the visual identity of the project, how to present the project, how to use social media, etc.

All materials, including scientific papers and publications produced by the project, will contain the mandatory EU emblem with appropriate prominence, together with the EU funding acknowledgment and required disclaimer (the disclaimer is included in the "EIS word deliverable template"). Moreover, it is important to note that the placement of the EU emblem should not give the impression that the beneficiary or third party is connected in any way to the EU institutions.

Figure 4. Example EU Emblem and Aknowledgement

Figure 5. Example EU acknowledgement placement

The partners have been informed that they can always find the full guidelines at the following link Operational guidelines for recipients of EU funding 📄 and Download the EU emblem and acknowledgement here.

5.1.1 EIS logo and usage

The main elements of a brand's visual identity consist of a logo, a colour palette, and a font. These three elements have been used to distinguish the project's identity from other projects or organisations at different events.

One of the first communications actions (Task 6.1) was to develop the project's visual identity. To ensure brand recognition, consistency and a strong project identity, several logo versions were designed, analysed before the kick-off meeting of the project. During the EIS kick-off meeting, the consortium voted for the logo that conveys the project in the simplest and clearest way possible.

The logo is a combination of a letter mark and abstract mark. The abstract part is colourful and clean but with a degree of complexity to highlight the different characteristic and disciplines involved in the Exploration Information System project. Whereas the letters are the initials of the full projects name, EIS (International Phonetic Alphabet: i: aɪ es) which is easy to remember. The combination of both marks creates an impactful logo that sets it apart from other brand identities while highlighting the aims of the project.

| Original logo | Full white logo |

Figure 6. EIS logo

Multiple versions have been provided to the consortium and can be found within the EIS logo toolkit. An example is a version of the logo without the full name. This logo version is provided in case when the full name on the original logo becomes unreadable. Other versions and how to use them have been described in CE&D plan (see D6.1 for more information on this).

When to use:

Example 1 - if the EIS logo is smaller than 3cm and the reader is at 1 meter away, use the small logo.

Example 2 - when the logo is placed on a small object, the full name is dropped to leave more space for its acronym "EIS".

Figure 7. Small logo

5.1.2 Selected Colours and font

Hex: #007BC4
RGB: 0, 123, 196

Hex: #EB6112
RGB: 235, 97, 18

Hex: #009640
RGB: 0, 150, 64

Hex: #A01F80
RGB: 160, 31, 128

Hex: #A29F9D
RGB: 162, 159, 157

Bahnschrift Bold
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Bahnschrift
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
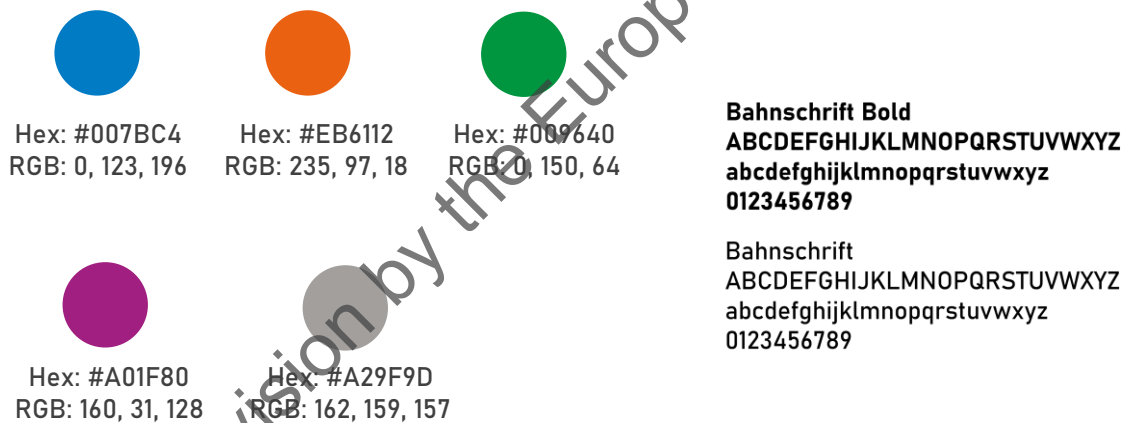
Figure 8. Official colour palette and font

The official EIS project colour palette and the official *Bahnschrift* font have been widely used in its online and offline communication materials. An example of this is the roll-up which be seen in 6.2 Other materials.

6. Deliverable Materials

6.1 Deliverable templates

A Word document and a PowerPoint template have been prepared and shared with all the members of the EIS consortium shortly after the start of the project. Consistent with the EIS visual identity and streamlined for ease of use, the template makes it easy for partners to take the visual identity in consideration while working alone or collaborating on deliverables.
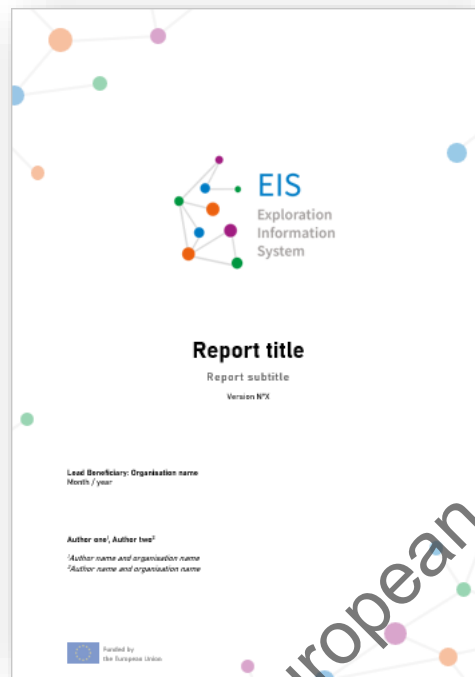
Figure 9. EIS Word document template

Figure 10. EIS PowerPoint template

Throughout the project, both templates have been updated with minor changes after partners send it requests. Some of these changes include: changing colours and font size, replacing partner logos after their rebranding, …

All templates are available on the internal collaboration Teams digital platform that is being used as one of the main communication channels among partners. A specific folder called deliverable templates is available on the general channel. On this same platform partners can

access the Communication Toolkit folder which contains several communication materials such as the EIS project's logo, partners' logos, and other materials that have been created since the start of the project, such as the two released press releases, the roll-up, project presentation PPT, the project flyer, SuperCluster event communication toolkit,…

6.2 Other materials

As the project progresses, more and more communication materials have been developed such as press releases, roll-ups, videos for events (such as a specific *What is EIS* video for PDAC 2023 video – reused on the [EIS website](#)) and other communication materials. As previously mentioned in this document, these materials have been made available to all consortium members on this project's internal communication platform Teams channel hosted by one of the consortium members.

Figure 11 - EIS Roll-up and flyer

As the project continues, more communication materials will be created depending on the demand from the consortium. All new materials will be put on the project's team channel.

7. Project description

A text describing the Exploration Information System has been drafted in three versions (extremely short, short and long) to ensure a comprehensive and consistent message about the project. The project descriptions can be used by all partners in materials dedicated to promoting, communicating and disseminating the results of EIS —such as flyers, PowerPoint presentations, and articles published by the partners—and to present the project at events or conferences.

Short description:

Exploration Information System (EIS) is a 36-months Horizon Europe project launched in May 2022. The EIS projects will play a supporting role in the implementation of the European Green Deal and Europe's long-term self-sufficiency of critical raw materials (CRM).

EIS will develop geomodels that will use spatial data analysis tools for mineral exploration which will reduce costs and time to find new sources for CRM. This new innovative method will enhance the probability of finding new sources of critical raw materials for the EU's economy – critical for an economy that is transitioning to achieve its decarbonization goals – as well as reducing the environmental footprint of mineral exploration and mining.

Long description:

Exploration Information System (EIS) is a 36-months Horizon Europe project launched in May 2022, and will play a supporting role in the implementation of the European Green Deal and increasing Europe's long-term self-sufficiency of critical raw materials (CRM).

EIS will develop new data analysis methods by applying artificial intelligence into mineral prospectivity mapping. Together with new geomodels, mineral systems modelling, machine learning and deep learning, these new methods will reduce the current high exploration costs and improve the accuracy of the targeting of the early phase exploration. This makes mineral exploration more responsible by increasing energy efficiency, minimizing the footprint of mineral exploration on nature, reusing already existing exploration data and increasing the needed CRM sources to achieve the decarbonization goals of the EU. EIS will also raise awareness of general public on the importance of critical raw materials to the EU's economy, welfare and their role in transitioning to a zero-carbon future.

The EIS consortium consists of 17 partners from leading research institutes (4), academia (5), service providers (4) and industry (4), located in six European Union member states (FI, FR, DE, ES, CZ, SE) and South Africa, as well as one associate member from Brazil. Overall, the project will benefit from a vast international collaboration network.

The extremely short description main purpose is for the communication platform that restricts text to 160 characters, like the social media Twitter, and should only be used in similar cases. This description does not fully appreciate the complexity and value of the project.

> **Extremely short description:**
>
> EIS will develop innovative exploration concepts & data analysis tools to find new sources of critical raw materials for the EU's economy.

8. Online tools

8.1 Website

The EIS public website was officially launched in June 2022: www.eis-he.eu. It has been continuously updated and it will continue to evolve with the lifecycle of the project, in line with the Exploration Information System Communication and Dissemination Plan.

At its start the website was a single landing page. Currently the website has a multitude of pages, sections, and articles. The number of visitors has been steadily increasing (see figure 13) and shows a positive result.
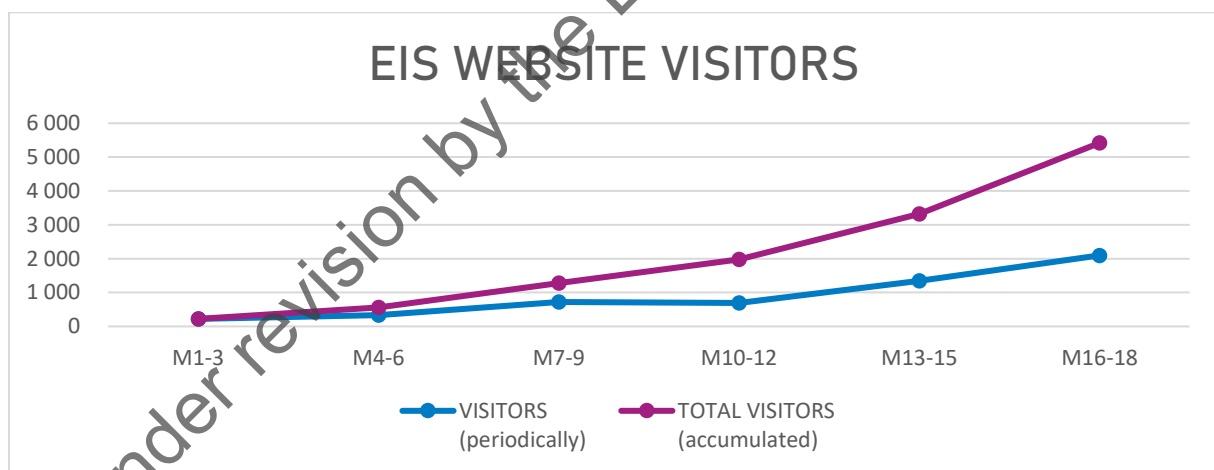
Figure 12 – EIS Website visitors[1]

This website is used as a main information entry point and delivery channel for results and progress achieved in EIS, the public website disseminates and informs stakeholders and the general public on the project's activities. Such as the project events (e.g. EU SuperCluster Lapland geoconfernce), publications, public deliverables and other activities of interest for the EIS community. The website also fosters participation and engagement among consortium

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[1] Unlike previous graphs, this data excludes connections to the website for maintenance/updates (from LGI) as well as internet bots.

members. In addition, any stakeholder can access it to gain information or to contact relevant partners.

To make useful and relevant information available to website visitors, it was decided that the website should address the needs and the questions that would most likely interest external stakeholders such as:

- what the project is about, why it exists, and why it matters
- how the project works, its objectives, and impacts
- what the project is delivering
- information about the project partners
- the latest news and events of the project

The EIS public website will contribute to achieving the following objectives in terms of public communication:

- widely promote and ensure the visibility of the EIS project
- disseminate the knowledge and results achieved in EIS
- inform and educate the target audience about the research generally carried out in the geomodelling and mine exploration field
- foster collaboration between researchers, industry and other stakeholders in the geomodelling and mine exploration industry
- collect and make available all possible relevant public reports and project results
- inform and educate the general public about EIS and its importance.

All of this information and objectives are pursued through the numerous pages of the website: Home Page, About Page, EIS Tool Page, Work Packages Page, Partner Page, Network Page, News Page (containing numerous articles about the project), Clustering Event Page (for the EU SuperCluster Lapland Geoconference) , Resources Page, …

As the communication and dissemination needs of the project evolve, so does the website. The latest addition is the Newsroom Page which functions as a single page containing all information (media contact, online presence) and files (Logo toolkit, project pictures, press releases) needed for the press to share the press releases from the EIS project.

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Figure 13 – The EIS Newsroom Page

With the recent progress on the EIS Wizard and Plugin, the EIS Tool page will be reworked to reflect the latest progress and updates. This, and a page to promote the Short Course at PDAC 2024, are currently the next changes on the website.

As for browser compatibility: the website is compatible with most common web browsers on all common operating systems. These include various versions of Internet Explorer, Firefox, Safari, Opera and Chrome. The layout of the website is also responsive: it adjusts the design display based on the screen size of the device it is viewed on, regardless of whether it is viewed on a desktop, tablet or mobile phone.

Figure 14 – Example of the Responsive Design –
EIS Tool page on Smartphone

The Initial Communication, Exploitation, and Dissemination Plan (D6.1) had been made available to the consortium before the launch of the website. This allowed partners to provide their opinion on the structure and its content (see chapter 8.2 in D6.1) before the full website got published. All feedback has been integrated before the website release. As mentioned above, the website continues to evolve depending on the needs of the project and on specific requests of the consortium members.

8.3 Social Media

Different social media channels, including Twitter (now X) and LinkedIn, have been used since the start of the project. They are used to communicate on the project and disseminate its results in an effective and impactful way.

At the start of the project we aimed to target and engage with the following audiences across our platforms:

- Industrial Stakeholders (Mining Companies / Mineral Exploration consultants / Battery and permanent magnet producers) and investors.

- Scientific and technologic audience: Geoscientists (in the fields of geoinformatics, economic geology, structural geology, mineral deposits expertise and future geoscientists such as trainees and students), the Open-Source Community (Python users, QGIS developers and users, FOSS4G community).

- Policymakers and the general public (to educate them on the importance of mining to achieve climate goals, as well as general benefits of an European mining industry – economic, ethic, resource independency).

Through the EIS_horizonEU LinkedIn account we can get a grasp of what audiences the project has managed to reach over the last year. This data aligns with what the EIS project initially aimed for (see figure 16 – LinkedIn demographic).
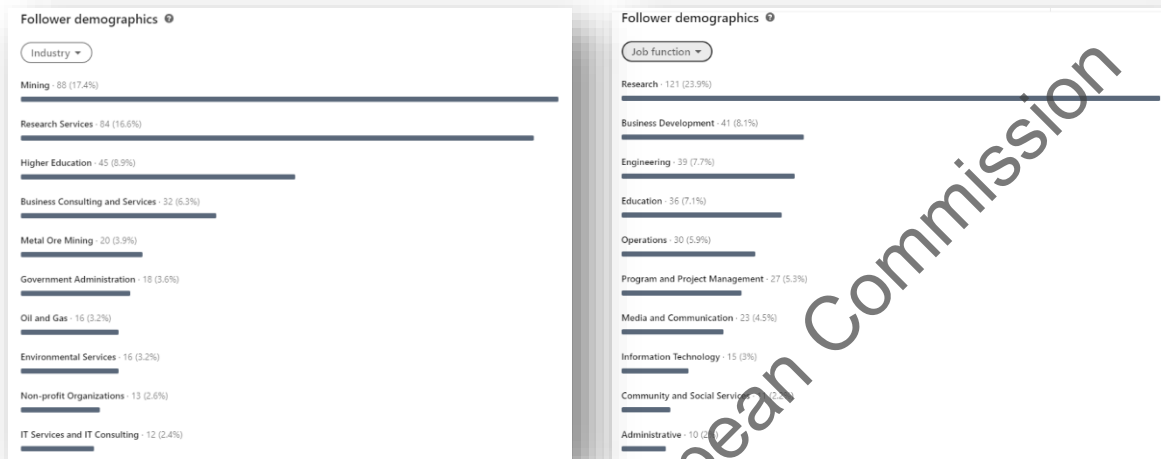
Figure 15 – LinkedIn demographic (Industry & Job Function)

In the CE&D plan (D6.1) an initial list of hashtags related to EIS had been developed to maximise the project's visibility on all channels. As the project's social media presence has been on a good trajectory, we can consider that these hashtags are proficient and thus will be used during the rest of the project.

General Hashtags	Specific Hashtags
#geology	#Geomodels #geoscience #geologist
#rawmaterials	#Mining #miningengineer #mineexploring #minerals
#miningexploration	#programming #opensource #QGIS #mapping #geospatial
#HorizonEurope	#sustainable #renewableenergy #cleantech #greenfuture

Table 3: table of #Hastags

The above indicated lists of audiences and hastags are non-exhaustive. Other audience might have been reached, and other hashtags related to the project and its activities have been used – such as event specific hashtags to promote our presence at these events.

8.3.1 Twitter

A Twitter (X) account was created at the start of the project under the handle @EIS_HorizonEU and the following URL https://twitter.com/EIS_HorizonEU

Twitter has been used as one of the main channels to build a project's online community and to disseminate the results. The three main objectives set for Twitter are to:

- build relationships and engage with target audiences

- disseminate knowledge on mine exploration technologies and geomodelling

- bring the EIS results closer to the general public, journalists and policymakers

The EIS Twitter account continuous to be managed daily. And the following actions are part of our current social media strategy:

- target at least one tweet/retweet on a bi-weekly basis

- reply to users who tweet or mention @EIS_HorizonEU

- follow and engage users who tweet content related to EIS activities

- track specific words, mentions and trending hashtags

Twitter will continue to serve as a channel for the distribution of news published on the website, of events that will be attended by EIS partners and of content generated by the project.

Although questions have been raised about the recent change on the social media platform, as the project has been relying on it well before this change occurred, and as the project has managed to build a small community on the platform (see *Table 5: Key Performance indicators*), the project will pursue the usage of the platform to share its progress and results.

8.3.2 LinkedIn

A LinkedIn page was created for EIS: https://www.linkedin.com/company/85314340/

The EIS LinkedIn account continuous to be managed daily. In terms of audience, the project aimed to specifically reach mining professionals, geoscience researchers and project stakeholders (consortium members, advisory board members and end user group members) through the LinkedIn social media account. As indicated on Figure 16, this has been quite

successful and the project will pursue to further increase its following among these target groups.

This achievement has been reached through the planned actions previously outlined in D6.1:

• publishing at least one post or share on a bi-weekly basis

• replying to users who mention @EIS_HorizonEU

• following and engaging users who post content related to EIS activities

• tracking specific words, mentions and trending hashtags

8.4 Newsletters

At least 3 electronic newsletters will be distributed over the course of the project, on an annual basis. The newsletters will inform the EIS community on the latest achievements of the project, progress, outcomes and relevant events, conferences and workshops. To develop interest in the newsletter, partners are encouraged to share all relevant information related to the project using a form accessible directly on the project's digital workplace as described in section 4.2 of this document.

Initially, the project's newsletter aimed to contain the following sections:
• An editorial written by the coordinator providing an overview of the previous year
• A feature on the results achieved
• A technical update from each work package leader on progress made
• A recap of the events attended and upcoming events of interest

However, due to the highly technical nature of the content, the editorial has been replaced by a short video explaining the main points of the project, and the technical update from each work package has been changed into a simplified bullet point list of progress and achievements. The first newsletter has been send to the EIS newsletter subscription list and is also available on the website in the newsletter section of the resources page.

Results and statistics will be drawn for each newsletter. As well as conclusions will be drawn and possible areas of improvement will be discussed to optimise future editions.

The first newsletter has been distributed in 2023.

A subscription pop-up box compliant with GDPR regulation has been added to the website to encourage visitors to subscribe to the newsletter in order to receive the latest project results and achievements.
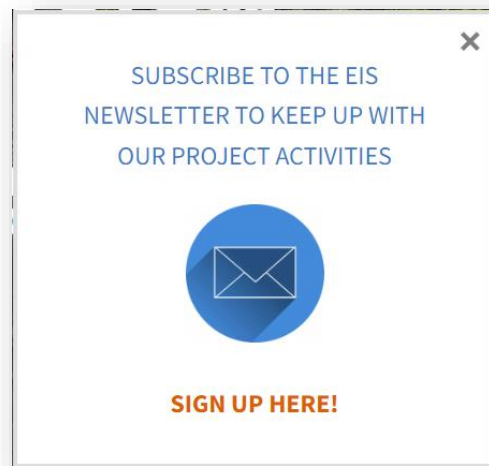
Figure 16 – Newsletter subscription pop-up box

8.5 Videos

A total of 1 video will be produced throughout the EIS project. The video produced will be an animated explainer video presenting the project, its objectives and expected impacts. The video will be online at M33.

The video will be featured on the project website and widely disseminated on EIS social media channels.

Although this video is not to be released soon, the subject has been brought up during meetings to align all future efforts on the writing and creating of the video.

8.6 Press releases

To ensure efficient communication and visibility in mainstream and specialised media in the field of minerals, raw materials, and exploration information system, press releases will be distributed. The first press release was shared in June 2022 announcing the project's kick-off meeting. It has been made publicly available on the project's social media platform and website landing page.

Figure 17. First press release

A second press release has been released after the successful results of the EU SuperCluster Lapland geoconference.


Figure 18 - SuperCluster Press release

Press releases will be shared whenever relevant depending on the achievements of the project. At least 3 press releases will be distributed during the project in support of the general public awareness campaign and the advertising of the EIS tool.

9. Awareness raising campaign

In order to reach out to the general public, a specific awareness raising activity will be developed. The purpose is to raise the awareness of a broader, less technical audience such as policymakers, NGOs and the general public, and informing and educating them on the importance of raw materials for the transition towards a green future.

An awareness campaign aimed at the general public, will popularise the issue by developing messages that are clear, straight-forward and close to raw materials concerns. The campaign will be based on **8 easy-to-understand and visually appealing elements, each delivered on a regular basis for one year (from M6 to M24).** Messages will be defined in collaboration with all partners which will provide recommendations, address challenges and identify areas of interest in which to raise awareness of where it is most relevant to engage with the general public.

The communication channels previously described in this document will be heavily mobilised to make the awareness campaign a success:

- **Media relations:** at least one press release will be shared at the launch of the general awareness campaign. LGI will ensure that the campaign is pushed in mainstream and specialised media (sectoral, environmental, professional press), such as newspapers, magazines, radio and/or television.

- **Social media**: the social media channels of the project (Twitter, LinkedIn) will be used to connect with the general public and create a two-way dialogue. Messages will be targeted according to audience profiles. As social media will be the main communication channel for the awareness campaign, a dedicated hashtag will be created.

    o Membership of relevant LinkedIn groups and the dedicated EIS LinkedIn page, will enable the project to contribute to discussions on the topic of raw materials, highlighting articles and events happening. This will enable the establishment of the EIS project as a credible, reliable voice in this area.

    o Twitter will be used to create a follower base firstly by following similar projects, organisations and thought leaders in the field and then by sharing relevant information from the EIS project and beyond to establish it as an interesting, thought-provoking commentary on this topic.

    o Online media and influencers: Social media influencers will be contacted to share the campaign messages with their online communities. Online general/science/technical magazines and relevant blogs with a general audience will be contacted and targeted to act as relays to promote the campaign and the key messages of the project. NGOs will also be contacted to act as communication relays.

    o Success metrics will be followed to adjust the campaign, if necessary, to deliver traction, make the biggest impact and encourage audiences to advocate for on the importance of raw materials for the transition towards a green future.

During this reporting period, three awareness campaigns were published on the website and social media:

- Awareness Campaign 1: The materials crucial to Europe's green transition. Available on LinkedIn and Twitter (X)
- Awareness Campaign 2: From dirty fossil fuels to clean technology. Available on LinkedIn and Twitter (X)
- Awareness Campaign 3: What Critical Raw Materials are in Green Technology. Available on LinkedIn and Twitter (X)

The main objective of these campaigns is to raise the awareness of a broader, less technical audience such as policymakers, NGOs, and the general public, and inform and educate them on the importance of raw materials for the transition towards a green future.

The remaining 5 campaigns will be launched starting February 2024. Extra time was needed to increase the project's awareness and increase the number of followers on social media– as this will generate more impact and visibility for the campaigns. We will design a tactical strategy and work one-on-one with the WPLs to define the campaign's key messages, content, and format according to the audience profiles. Partners will contribute to the dissemination of the campaign via their own communication channels.

10. Dissemination channels and content

10.1 Interactions and exchange with other related projects

EIS will aim to foster a close collaboration with relevant networks, clusters, and initiatives at European and national/regional levels to share information and exploit synergies and additional dissemination channels. Several networks, clusters, initiatives, and platforms at the European and national/regional level to establish close collaboration with EIS have been identified:

- **SEMACRET** - Sustainable exploration for orthomagmatic (critical) raw materials in the EU: Charting the road to the green energy transition (Horizon Europe)
- **AGEMERA** - Agile Exploration and Geo-modelling for European Critical Raw materials (Horizon Europe)
- **VECTOR** - Vectors to Accessible Critical Raw Material Resources in Sedimentary Basins (Horizon Europe)
- **GREENPEG** - New Exploration Tools for European Pegmatite Green-Tech Resources (H2020)
- **DroneSOM** - Drone Geophysics and Self-Organizing Maps (EIT RawMaterials)
- **GoldenEye** - Earth observation and Earth GNSS data acquisition and processing platform for safe, sustainable and cost-efficient mining operations (H2020)
- **MinExTarget** - Enhanced Use of Heavy Mineral Chemistry in Exploration Targeting (EIT RawMaterials)
- **EGT-TWINN** - Enhancing research capacity at the Geological Survey of Estonia to accelerate the country's transition to green energy (Horizon Europe)

Additionnaly, the SuperCluster event has created new synergies and has had an impact on the social media presence of the EIS project on LinkedIn and Twitter (X).

The full list of the project that participated at the event and were part of the spreading our communication efforts about the event are listed here: https://eis-he.eu/clustering-event/ (see bottom of the page).

10.2 Conferences and events

Presenting the EIS results at conferences and having a booth to disseminate the knowledge gained is key to maximising the project's impact. Attending conferences and events also creates the opportunity to engage closely with stakeholders.

The project consortium attended events that are relevant to the topic and through which target groups can be reached. The interest and readiness of the consortium will be evaluated when determining whether to present at key international events as well as how best to present (public intervention and/or hosting a booth). The most relevant events taking place over a 12-month cycle will be identified and event organisers will be contacted to ensure the project is properly represented.

An online form (described in section 4.2) has been created to track and monitor partner participation in international and national conferences.

The EIS project has identified several events of interest including the following:

- Fennoscadian Exploration and Mining (FEM) Conference 2023
- PDAC Annual Conference 2023, 2024 & 2025
- Raw Material Week 2022, 2023 & 2024
- ProExplo
- SME (Society for Mining, Metallurgy and Exploration) Annual Conference
- The Metallurgy and Materials Society (Metsoc) Conference of Metallurgists
- CONIMETM – International conference of metallurgy, materials and environment
- Society for Geology Applied to Mineral Deposits (SGA) Biennial Meetings
- Society Economic Geologist meetings
- FOSS4G (Free and Open-Source Software for Geospatial) annual conference

Event Type	Date	Title	Partners involved
Convention	24/05/2023	EU-LATAM dialogues on critical raw materials	CSIC, BRGM
Summit	15-17/5/2023	EIT Raw Materials Summit 2023	BEAK
Conference	2-6/6/2023	ECROFI-2023 – European Current	CU

		Research on Fluid and Melt Inclusions	
Meeting	28/8/2023–1/9/2023	SGA2023	GTK, SGU
Conference	26.08.2023 - 29.08-2023	SEG 2023	SGU
Colloquium	26/9/2023 – 29/9/2023	CAG29	BEAK, GTK, UFS
Cluster Event (organised by EIS)	30–31/10.2023	EU SUPERCLUSTER LAPLAND GEOCONFERENCE	GTK, BEAK, LTU
Conference	1–3/11/2023	FEM 2023 Conference	GTK, BEAK, LTU
Conference	13–16/11/2023	EU Raw Materials Week	GTK, BEAK, LGI
Conference		IAEG 50 Years of Irish, Galway.	SGU
Conference	June 2023	SEM (Spanish Society of Mineralogy) Madrid	SGU

Table 4 Events attended by partners

EIS will also hold a **final event** to present project findings and the EIS toolkit and QGIS wizard to key stakeholder groups, maximizing the project's impact. We will aim to organize the final event with all partners with a similar initiative or European project to increase the project's visibility and reach. Key aspects of the event will be accessible online so as to allow stakeholders who are unable to travel the ability to participate.

A **Scope Engagement Forum** will be organized by EIS to engage with a diverse set of relevant stakeholders: policy makers, regulators, academia, NGO's, citizens and end-users (exploration companies, industry). The end goal is to build a critical mass of interested stakeholders to stimulate stakeholder engagement and to enhance societal acceptance and uptake of new innovations. The event will combine dialogue sessions, awareness raising activities, demonstrations and workshops to understand the stakeholder needs (end-users and any related third party). The event is also the occasion to identify motivated stakeholders who could be involved throughout the rest of the project and after the project ends, in particular beta-testers who could take part in the test activities of WP4.
The event will span over one day and gather around 50 participants. It will also be the occasion de gather community of stakeholders around the project and project ambassadors who will contribute to the dissemination

The events are envisioned to be held physically but the partners will be ready to transform them into an online-only or hybrid version to ensure the safety and security of attendees.

10.3 European dissemination channels

All official channels established by EU institutions will be used to disseminate the project's results. The following official EU dissemination channels will be targeted:

Magazines	Research*eu results magazine	www.cordis.europa.eu/research-eu/home_fr.html
	Horizon – The EU Research and Innovation Magazine	https://horizon-magazine.eu/
Portals	CORDIS	www.cordis.europa.eu/home_fr.html
	Horizon 2020 newsroom	www.ec.europa.eu/programmes/horizon2020/en/newsroom

Table 5: EU dissemination channels

10.4 Scientific publications

Several scientific publications will be prepared by lead academic partners involved in the project. These publications will include the main findings of the project's deliverables and will primarily be presented in some of the conferences listed in section 10.2 of this document.

EIS will follow the Horizon 2020 open access policy by providing online access to scientific information that is free of charge to the end-user and that is reusable via platforms such as Zenodo, Open Science Repository and Open Research Europe. In the context of this project, scientific information refers to peer-reviewed scientific research articles, articles, conference papers and research data. The EIS project will combine different measures to foster open access to knowledge as much as possible.

Project partners will be encouraged to regularly share information about their scientific publications when related to textile recycling via the online form described in section 4.2. Summaries of these publications will be disseminated on the project website, through the annual newsletter and on all social media channels.

Some journals we will contact for the project:

- Mineralium Deposita
- Economic Geology

- Ore Geology Reviews
- Geology
- Journal of Applied
- Geochemistry
- Computers &
- Geosciences
- Precambrian Research

Publication Type	Date	Title	Partners involved
Research Report	November 2022	A preliminary approach to target generation for Bastnäs-type REE mineralisation in Bergslagen, Sweden Link	BEAK, GTK
GTK Open File Research Report 55/2023	October 2023	Vesa Nykänen, Nick Cook and Juha Kaija (editors). 2023. EU SuperCluster Lapland Geoconference – October 30–31, 2023, Hotel Santa Claus, Rovaniemi, Finland –– Abstracts Link	GTK, LGI, LTU, BEAK, GISPO, BRGM, SGU, UTU, CSIC

Table 6 Publications

10.5 Key performance indicators

Activity	Description	Target	M18
Public website	Main communication tool for promoting the EIS project. Interactive, dynamic, easily accessible online entry point to the project	5000 visits [M36]	5417 visitors
Comms toolkit	These will support communication and dissemination activities by promoting the EIS brand.	Roll-up and/or poster displayed at at least 6 events by the end of the project	
Press releases	3 press releases in support of the general public awareness campaign and the advertising of the EIS tool	50 views on the website and press release sent to at least 25 relevant journalists and/or influencers	2 press releases
E-newsletters	At least 3 e-newsletters to be sent to the EIS subscribers	At least 200 subscribers by the end of the project	77
Project videos	1 online video presenting the project, the tool developed and its benefits	A least 250 views [M36]	
Short courses	Consortium partners will deliver a hands-on presentation of the EIS toolkit and the QGIS wizard to professionals in the raw materials sector	2 conferences where the short course is presented (PDAC 2024 and FEM 2023)	Currently organizing Shortcoruse at PDAC 2024
Final event	Presentation of project results and promotion of the EIS toolkit and QGIS wizard.	Dissemination of project results, presentation of the EIS tool and toolbox, closer links with stakeholders	
External events	Consortium partners will actively promote the project, its objectives and results at relevant external events through oral and poster presentations.	9 events and conferences where partners have participated [M36]	11 events
Publications	Consortium partners will promote the project, its objectives and results by way of written publications, ensuring Open Access.	12 journal or conference publications [M36]	3 publications

Twitter	To build an online community in the fields of raw materials and sustainability, and to raise awareness	At least 250 followers [M36]	177
Linkedin	To build an online community of professionals in the raw materials sector and foster engagement with the project	At least 100 followers [M36]	325

Table 7: Key Performance indicators

11. Communication and Dissemination and conclusion

The Updated Communication and Dissemination Plan outlined in this document provides a detailed overview of the strategy and actions that has been implemented to promote EIS and its results in an efficient yet impactful way. A final plan will be updated based on the monitoring results collected on the communication and dissemination activities (D6.3) carried out after M20 of the project will be submitted at M36.

12. Exploitation Plan Objectives and Methodology

12.1 Objectives

As part of WP6, task 6.4 Exploitation Plan (EP) encompasses a comprehensive approach to all exploitation activities, aiming to boost the project's impact. The task's primary intention is to outline a well-defined Intellectual Property (IP) strategy and build an EP to ensure that the EIS research results such as the EIS toolkit and the EIS QGIS Wizard are successfully used and maximise the project's sustained impact after its completion.

Involving all partners, the purpose of this task is to find a common agreement on how to best use the project's results. The EP will provide recommendations for exploitation strategies in terms of commercial and non-commercial opportunities, Intellectual Property Rights (IPR), knowledge management and sustainable funding models options.

This task will enable project partners to identify the key EIS outcomes and results and accordingly, implement targeted IP & exploitation strategies. It involves identifying the end-users of the technology, understanding their specific needs and expectations, and analyse the market dynamic and issues related to the EIS technology, highlighting its unique advantages and value proposition in comparison with the current market of Geographical Information Systems (GIS) software and tools.

12.2 Methodology

12.2.1 Overview

This task will produce three reports throughout the project, as part of the Dissemination, Exploitation and Communication (DEC) plan:

- Initial Exploitation plan (D6.1, M3);
- Updated Exploitation plan (D6.3, M20);
- Final Exploitation plan (D6.4, M36)

The task follows a three-dimension methodology: IP diagnosis, Market Potential, and Implementation, as indicated in Figure 19.
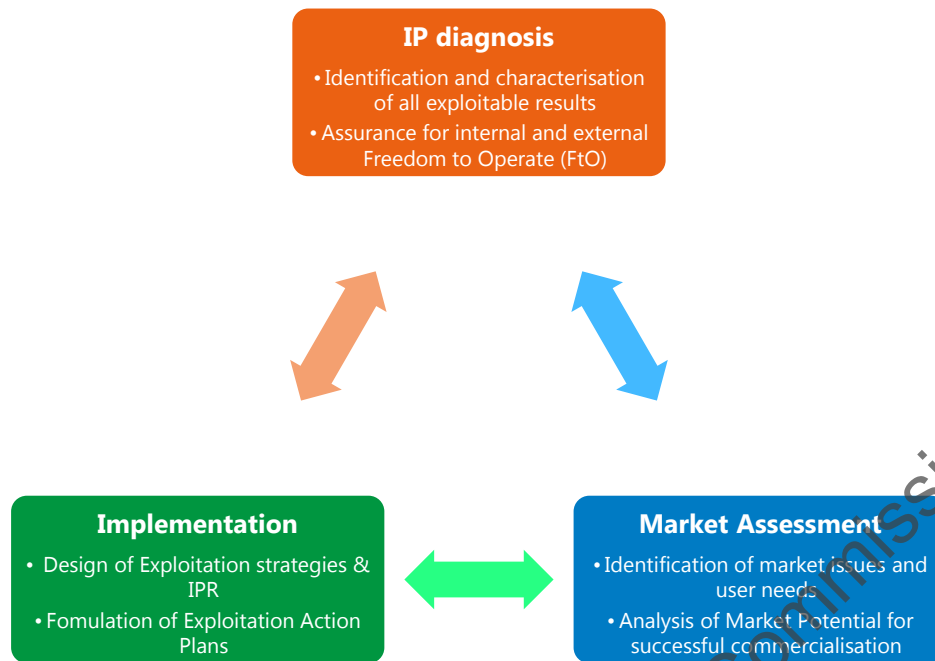
Figure 19. Parallel actions of the Exploitation Plan

IP diagnosis – Identification and characterisation of all exploitable results:

This phase initiates the IP and exploitation dialogue with the partners, informs them about key issues to consider, and allows for gathering the information required to set the basis of the project's results exploitation strategy. Background-IP, Foreground IP, organisation goals and barriers, Freedom-to-Operate, and ownership questions are raised with the partners. The outputs of the IP presentation and exploitation workshop feed into a collaborative IP repository and contribute to the drafting of the initial EP version and initial exploitation strategies. These are, of course, expected to evolve as the maturity of the project and its results increase.

Market Assessment for a successful uptake of the results:

Building on a market analysis, this stage is concentrated around the market uptake of the Key Exploitable Results (KER). It intends to strengthen the understanding of what could influence the success of the exploitation of the project results (users' needs and challenges, market players and existing offer).

Implementation – Exploitation strategies & IPR, Exploitation Action Plans:

Implementation consists of raising awareness on the importance of IP and facilitating discussions between partners, as well as preparing the plan for exploitation routes of the KER, such as licensing, further research, services offer or funding sources for an open-source result. A final workshop helps evaluate the TRL evolution for the results and elaborates the strategic planning roadmap. This results in the final Exploitation Plan (D6.4).

12.2.2 Results-Strategy-Beneficiary Methodology

The first co-creative exploitation workshop facilitated by LGI relies on the *Result-Strategy-Beneficiary (RSB)*, a methodology developed by LGI. This methodology, presented in figure 20,

is based on an adapted version of the 6-3-5 brainwriting method and includes individual and collective sessions.

The RSB methodology considers the existing IP partners bring to the project, their expected results, and identifies the potential beneficiaries to define the most adequate strategy for each pair of "result-beneficiary" association as well as the most adequate choice in terms of IPR. As part of the exploitation plan, the IP strategy ensures a common agreement on how the project results will be owned. IPR management will define the appropriate measures and methodologies for managing and protecting the IP. This will ensure that project results are compiled either into open access (dissemination) or protectable form (exploitation).
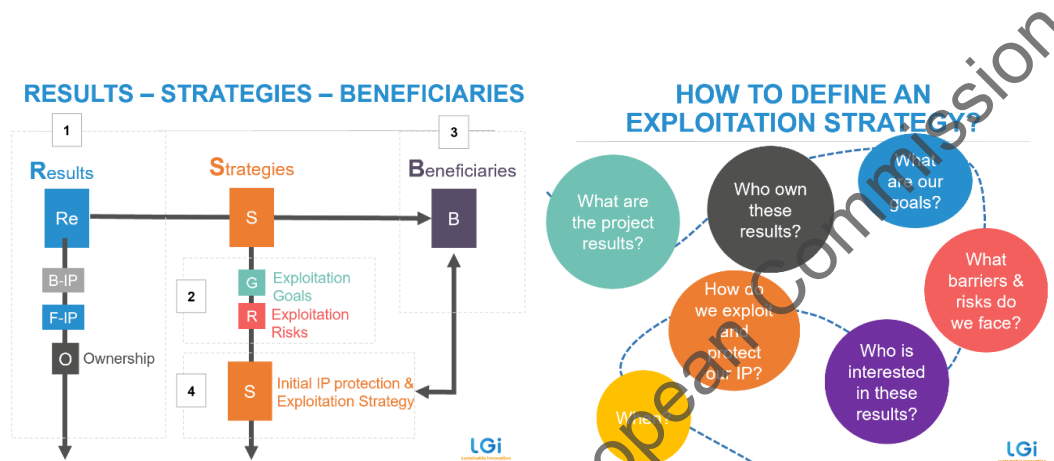
Figure 20. RSB methodology

The RSB methodology was adapted to the EIS project context, leading to the collection of information from the partners on the background and foreground IP, ownership, goals, risks and initial exploitation strategies thanks to workshops and bilateral discussions between LGI and each partner, taking into account that the expected Technology Readiness Level (TRL) of the produced EIS QGIS Wizard and related software sits at 5.

The outputs of the workshops and the discussions served to draft the updated exploitation plan and to start anticipating the potential barriers and drivers for the implementation. These outputs were also fed into an IP repository set up to centralize all IP related information.

12.2.3 Innovation Management

12.2.3.1 IP Repository & management

The IP repository is set up as a collaborative tool to collect and review all information related to IP and exploitation matters from the partners. The repository is shared with all partners together with a guidelines document providing key definitions, methodology and dates to facilitate the exploitation process throughout the project's lifetime.

All participants of the EIS project should be aware of the importance to protect their results and follow these guidelines:

- When planning a new publication or result: the lead partner should inform the Management Committee and other partners by email 30 days in advance and ensure that

there is no content conflict with other results and other dissemination activities planned by other partners.

- Before disseminating any result: the lead partner should check with other partners by email that it hasn't already been planned (for a publication, patent…).

- In case of claim, question or conflict about IP or dissemination of project results: Partners should get in touch with WP6 leader (LGI) and involve the coordinator (GTK).

12.2.3.2 Engagement of Partners

To ensure IP & Exploitation strategy is implemented, LGI liaises regularly with all EIS partners.

The first IP and Exploitation workshop was organised in December 2022 (M6) in Dresden, Germany during the first Progress Meeting and was attended by 34 participants. The workshop was constituted of one informative and one interactive session. The informative session consisted of an IP introduction during which the concepts of Exploitation & IP in the context of Horizon projects, were introduced. After establishing the necessary foundations needed for the collaborative workshop, the attendees were split into multiple groups and parallel sessions were run. Given the project's early stage at the time of the workshop, the primary objective was to facilitate a preliminary brainstorming session among partners. Focusing on key areas such as IP strategy and beneficiaries, the workshop provided a platform for innovative discussions.

Between the workshop (M6) and the submission of this updated exploitation plan (M18), LGI engaged in **11 bilateral discussions with the project partners**. Dubbed 'BEYOND EIS', these discussions were intended to extend the brainstorm on the exploitation of the project's results beyond its completion. These discussions aimed to create a platform for the partners, allowing them to contemplate the long-term implications and impacts of their work and the results produced in the EIS project. Partners were encouraged to validate their identified background IPs, explore strategies to leverage the project's outcomes, and express their aspirations regarding exploitation goals. These conversations also served as an opportunity for partners to identify potential risks and challenges anticipated post-project completion. The 'BEYOND EIS' discussions allowed partners to temporarily take a step back, envision the broader impact of their efforts, and strategise for the future, thereby maximising the project's influence and ensuring a comprehensive exploitation plan.

A second workshop was organised in October 2023 (M15) in Aracena, Spain during the third Progress Meeting and was attended by 36 participants. The partners focused in groups on two exploitation routes as a preparatory exercise for the follow-up of the task.

12.3 EIS Exploitation task roadmap
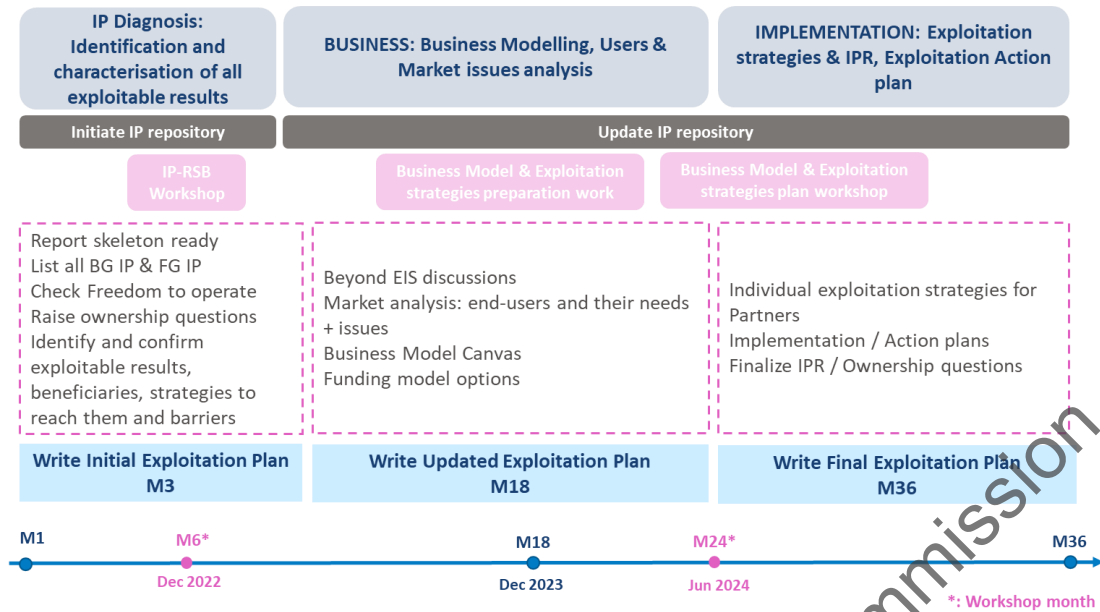
Figure 21. Roadmap of EIS exploitation task

13. Intellectual Property Diagnosis

13.1 Methodology

The IP strategy consists of three steps, as shown in Figure 22, among which two can be implemented during the project. The IP diagnostic gathers Background and Foreground IP. The IP protection phase has the objective for the partners to decide the strategy to implement to protect their IP. The IP enforcement could be looked at by partners after the end of the project.
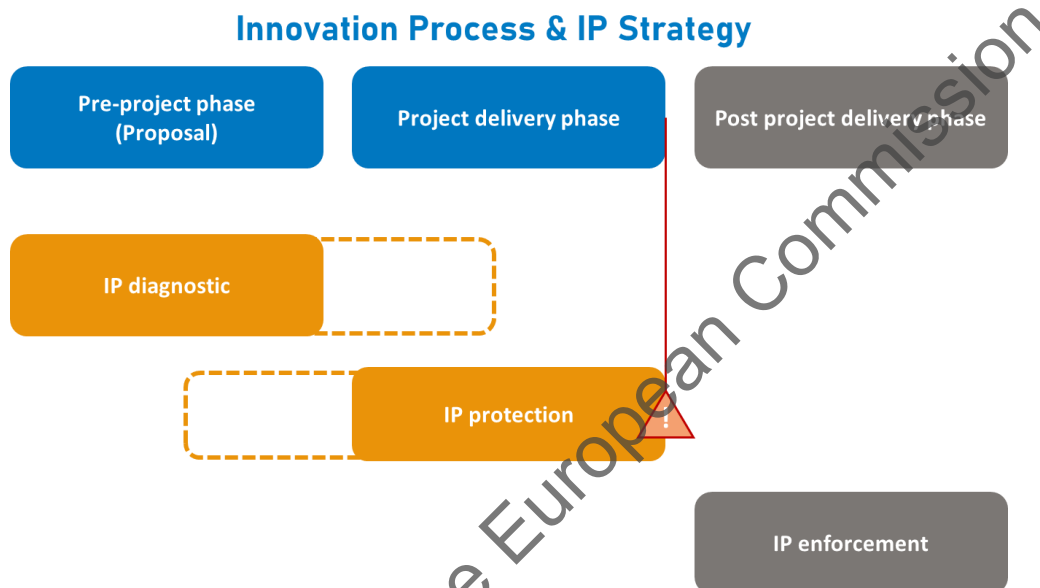
Figure 22. Innovation process and IP strategy steps

The three-step methodology in Figure 22 was presented to the consortium during the first workshop (M6) on IP exploitation organized by LGI. During the workshop, partners were presented with an introduction into what constitutes IP and the different legal rights that IP owners are entitled to. Participants were then invited to think about their work within EIS in this context, in order to verify that their work did not infringe upon the IP of others, and to raise awareness about the IP rights and ownership of each partner within the consortium.

In order to ensure that all partners in EIS are able to freely exploit the results of their work in the project and to comply with the obligations of the European Commission under Horizon Europe, careful attention has been paid to documenting and protecting project IP thanks to an IP repository.

The IP repository was created early in the project and documents all the IP brought and created within the project, as well as its owner, and exploitation and protection strategies. In total, 7 elements of background IP were identified, along with 7 elements of foreground IP developed during the project. The repository is a work-in-progress document, as the IPR strategies are still to be defined by the partners, while taking into account that most of the results are meant to be open source and open access.

The IP created and owned by project partners in EIS is in the "EIS IP repository" file accessible by all project partners and added to this report in annex.

13.2 Background IP and Data Management

Background IP is defined as IP, data, know-how or information that is supplied by a beneficiary (project partner) at the start of the project to be used in the scope of the project.

Table 8 summarises the Background IP brought by EIS partners and validated via the collaborative EIS IP repository. Information was initially taken from the Consortium Agreement (CA), then completed and refined with additional information shared during the first IP and exploitation workshop as well as during bilateral discussions initiated by LGI.

Table 8. Background Intellectual Property of the partners for the EIS project

Partner	Background IP type	Background IP Description from CA and exploitation workshop
GTK	Data	GTK Basic License data on the Project's Test sites
	Data	GTK Open CC Attribution International 4.0 Licence data on the Project's Test sites
BEAK	Software	advangeo® 2D Prediction including several source codes
BRGM	Predictive Method	Predictive method "Cell-based Association" (CBA)
	Predictive Method	Predictive method "DataBase querying" (DBQ)
KELIBER	Data	Geological, geochemical and structural geology data
COBRELC	Data	Salomé area exploration data

The EIS project encompasses multiple sites, with a crucial requirement to input data into WP2, WP3, and WP4. To fulfil this need, diverse datasets are incorporated into the project, comprising public data sourced from local and regional authorities within the studied zones, pre-existing data extracted from literature, and data from mines provided by partners associated with those mines. Additionally, new raw data is measured and collected from the sites to complement the data already available. The documentation of these datasets in the IP repository is important, as ownership and exploitation restrictions might apply. While public data remains exempt from such constraints, some information from authorities and mines may be sensitive, and are instead intended exclusively for producing results within the project.

For Finnish regions and sites in Finland for instance, GTK's regional datasets, openly accessible to the public, are used. GTK also acquired geological, geochemical and structural geology related data from KELIBER, some of which have restricted access. These datasets serve as input data for development, testing and scientific demonstration of the mineral systems modelling and the EIS tools and publications for this project. These datasets cannot be released externally or in public domain with the release of EIS-related software and applications.

Datasets, varying in size, areal extent, spatial resolution, and different computation parameters play a pivotal role in the EIS project as they are used for the development of mineral system models, for the testing of the EIS Toolkit and the developed EIS QGIS Plugins and Wizard, and for prospectivity analysis. Consequently, tracking and documentation of this data in the IP repository is important.

13.3 Freedom to Operate

Freedom to operate (FTO) grants the ability to proceed with actions, such as launching a new product or conducting specific research, without violating the intellectual property rights of others. In the context of a Horizon Europe project, ensuring freedom to operate is paramount, given that partners contribute their intellectual properties, such as methodologies, datasets and software licenses. It is crucial to have a clear understanding of the restrictions imposed by these intellectual properties.

The IP repository developed during the EIS project ensures internal freedom to operate, allowing partners to utilize each other's intellectual properties without infringement. As mentioned previously, this is especially pertinent for certain mines datasets provided by partners such as KELIBER and TALGA, which are not necessarily publicly available. These datasets can only be used within the project framework to produce the expected results and cannot be shared due to their restricted nature.

Given that the project is centred around an open source software, freedom to operate concerning the results generated becomes simpler. The project's core objective is to develop EIS codes that will be shared on GitHub as well as tools that will be integrated into the open source software QGIS.

13.4 Key IP Considerations and Guidelines

Access rights within EIS are determined by the Grant Agreement and Consortium Agreement. Figure 23 illustrates the conditions that appear in the Description of Action, in the Grant Agreement.

Before the EIS project	During and after the EIS project
If needed for the implementation of the project tasks, partners **MUST** grant each other access to their own background, if such background has been identified in the **Consortium Agreement**	If needed for the exploitation of the project's results, partners **MUST** grant each other access to their own background and results under **fair and reasonable conditions**
Conditions:	**Conditions:**
Royalty-free for the project	Royalty-free non-transferrable access rights for research purposes only
If needed by another partner to exploit their own results : Fair and reasonable conditions (to be agreed)	Access rights to background IPR and foreground developed in the project to be negotiated under fair and reasonable conditions
	➢ **To be rediscussed during and at the end of the project**

Figure 23. Key IP Guidelines

The Consortium Agreement states the following additions to the Grant Agreement :

"Until a joint ownership agreement has been entered into by the joint owners:

- each of the joint owners shall be entitled to use their jointly owned Results for non-commercial research activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s), and

- each of the joint owners shall be entitled to otherwise Exploit the jointly owned Results and to grant non-exclusive licenses to third parties (without any right to sub-license), if the other joint owners are given: at least 45 calendar days advance notice; and Fair and Reasonable compensation".

13.5 Open-Source License

Given that the IP developed through the project is primarily related to computer programming and accompanying written reports, copyright emerges as the primary legal protection relevant to the EIS project. Partners are entitled to copyright ownership on the intellectual work that they developed within this project. Despite this inherent legal right, in order to enact copyright ownership in practice, additional efforts have to be taken to protect the intellectual property of exploiting partners.

A dedicated focus has been directed toward determining the licensing strategy for the software tools developed through EIS, aiming to secure future use and additional services. As mentioned in the Design Report (Deliverable D3.1), the EIS toolkit and the EIS QGIS Plugin will be licensed under the European Union Public License (EUPL 1.2) open-source license. EUPL 1.2 is a copyleft license which is a type of open-source software license that ensures that the software and its derivatives remain free and open-source. In practice, any modifications to the EIS Toolkit must be published under the same licence. Attention would be paid to not violating the terms of any copyleft licenses, should a future development emerge.

The selection of this software licensing agreement terms matches the project's desire to embrace the open access policy of Horizon Europe, striving to ensure and maximise access and reach of the EIS tools while preserving the interests of all developing partners. Partners can continue using and diffusing their research developed through EIS. Moreover, provided that license conditions are complied with, EUPL does not restrict the use of the tools as a part of a commercial software. Notably, private sector partner BEAK are able to partly integrate the toolkit into their commercial software advangeo® 2D Prediction.

13.6 Commercial License

In the frame of EIS project, advangeo® 2D Prediction Software is freely available for consortium members during the project for application and usage, but only in the defined project test sites with the project data. After finalization of the project, the software will only be commercially available for consortium members.

14. Market Analysis

The EIS project is developing a software package for mineral prospectivity analysis within the exploration information system concept, seamlessly integrated into the open-source software QGIS. The market analysis gathers here a comprehensive examination of the current landscape of mineral prospectivity analysis software tools and package. Insights were gathered from the first exploitation workshop conducted and the bilateral discussions with the partners, complemented by literature review.

The primary objective of the market analysis is to identify the end-users of the EIS technology, understand their needs and expectations, and assess how the EIS product software answers these challenges. This examination extends to the analysis of the market dynamics associated with the EIS technology, exploring the current arrays of tools available for prospectivity analysis, seeking to understand how the EIS product software is positioned in relation to alternative solutions in addressing pertinent market issues.

14.1 Exploration Information System Concept

The EIS project centres around the exploration information system approach, aiming to facilitate the mineral exploration process. Mineral exploration is about searching for evidence of any mineralisation hosted in the surrounding rocks. It involves gathering geological data from various locations, progressing through sequential phases, and adopting more advanced techniques based on economic viability.

A fundamental aspect of successful mineral exploration is a profound understanding of mineral systems. Models of these mineral systems are usually developed to describe the processes and conditions leading to ore deposit formation, spanning various scales from regional to deposit levels. Geologists leverage this knowledge about the geological processes that create mineral deposits to guide their exploration efforts, often extrapolating mineral system models to unexplored regions.

In today's digital age, Geographic Information Systems (GIS) serve as a powerful tool in mineral exploration. GIS are frequently used to combine, analyse, and interpret diverse geoscience and mineral exploration data. The main goals are both to refine existing targets and discover new ones. It serves as a computer-based system managing geological, geophysical, and geochemical data, offering insights into Earth's processes.

Mineral prospectivity analysis integrates geological, geophysical, and geochemical data to identify high-potential areas for mineralisation. This process involves data collection, pre-processing, visualisation, and prospectivity modelling, to create a predictive model for the likelihood of discovering new mineral deposits based on the analysed data. This streamlined approach guides efficient exploration and investment decisions in the mining sector.

While GIS already proves pivotal in mineral exploration, recent decades have witnessed advancements in GIS-based methods, particularly Mineral Prospectivity Mapping (MPM), creating maps indicating mineral likelihood in specific areas. To enhance the effectiveness of MPM in exploration, the next crucial step is to better integrate the mineral system models with available data. This integration can be achieved through an Exploration Information System, capable of handling complex natural phenomena like mineral systems.

The Exploration Information System (EIS) approach is a holistic approach leveraging GIS, mineral system models, and prospectivity analysis, to streamline the exploration process. A pivotal element involves a repository of geological characteristics representing various mineral systems, facilitating the selection of pertinent geoscientific datasets for effective prospectivity analysis.

The EIS approach comprises components for data pre-processing, predictive modelling, and model validation. This approach converts data into information, information into knowledge, and knowledge into insights. It would then serve as a platform for turning insights about mineral systems into mappable criteria, ultimately aiding in the prediction of undiscovered mineral deposits.

By embracing a spatially predictive approach incorporating varying data scales pertinent to the specific mineral deposit being pursued, the EIS project aims to develop an open-source software package for mineral prospectivity analysis following this comprehensive Exploration Information System concept.

14.2 Market Issues

Mineral exploration currently relies on a diverse array of software packages. Key features of tools and software packages were identified through insightful interviews conducted with the project partners. Comprising mineral exploration companies, geological centres, researchers, and consultants, EIS partners regularly use software packages and tools in their daily mineral exploration work. Given their roles as potential users of the EIS QGIS Wizard, their perspectives and insights are particularly relevant.

A brief comparative study is presented through Table 9 below, comparing various tools and software packages across these four essential criteria:

- Functionality: Trade-off between flexibility and complexity inherent in each tool or package
- Compatibility: Challenges associated with data exchange and integration, crucial for seamless operations
- Choice: Balance between cost and benefit, often taken into consideration in the selection process
- Usability: Preference and experience, the user-friendliness of each tool or software package

Table 9. Comparative Overview of Mineral Exploration Tools and Software Packages

	Functionality (flexibility and complexity)	Compatibility (data exchange and integration)	Usability (preference and experience)	Choice (balance between cost and benefit)
QGIS	Open-source GIS software offering a balance between functionality and complexity. It provides a wide range of geospatial tools and plugins, making it flexible for various tasks in mineral exploration.	Support for various data formats and Compatibility with different file types, making data exchange and integration relatively straightforward.	Usability in QGIS can vary based on user experience and preference. It offers a user-friendly interface but may require some learning for beginners.	Cost-effective choice offering a balance between cost (free) and the benefits provided.
advangeo	Commercial software providing advanced functionality for mineral prospectivity analysis. It focuses on predicting mineral deposits and offers flexibility in analysing geospatial data.	advangeo focuses on compatibility with geological and geospatial data, making it suitable for integrating diverse data sources.	advangeo aims for user-friendliness in mineral prospectivity analysis, but it may require training for optimal use.	advangeo comes at a cost, but offers specialised benefits for mineral prospectivity analysis.
ArcGIS	Powerful commercial GIS software, offering extensive functionality and tools for mineral exploration, such as spatial analysis and 3D modelling.	ArcGIS has strong compatibility with industry-standard data formats and systems, simplifying data exchange and integration within the mining industry.	Preferred by many professionals with experience in GIS but with a steeper learning curve for beginners.	ArcGIS is a powerful choice but comes with a higher cost, making it suitable for organisations with the budget for advanced GIS.
Leapfrog	Specialised geological modelling tool known for its advanced functionality in 3D geological modelling. It is highly functional but may be complex and is mainly used for geological interpretation.	Compatible with various geological and mining data formats, ensuring seamless integration of geological information.	Known for its user-friendly 3D modelling interface, making it accessible for geological professionals.	A premium solution, offering significant benefits for geological modelling but at a higher cost.
Maptek Vulcan	Commercial software for mining and geological modelling, with a range of functionality, like resource modelling and mine planning, but is relatively complex.	Well-integrated with geological data formats and designed for compatibility with mining-specific datasets.	Designed for experienced geologists and mining professionals, so usability may vary based on expertise.	Comprehensive, high-cost choice for mining and geological modelling, suitable for well-funded mining companies.
ILWIS	ILWIS is known for its simplicity and ease of use, making it suitable for beginners. However, its functionality may be limited.	Generally compatible with common geospatial data formats, although its data integration capabilities may be more limited compared to some other tools.	Designed to be user-friendly, making it suitable for those new to geospatial software.	ILWIS is cost-effective and can be a choice for those looking for affordability without compromising basic geospatial functionality.

Choice: Balance between cost and benefit, often taken into consideration in the selection process

A number of commercial software options already provide selected machine-learning based tools for mineral prospectivity analysis, often relying on usage of commercial GIS software in parallel, too. However, their high cost renders them less accessible to a wide set of users, including junior exploration companies, universities, and research institutions.

Compatibility: Challenges associated with data exchange and integration, crucial for seamless operations

Conversely, non-commercial mineral prospectivity modelling software options are available, but these typically contain only a limited set of tools for executing specific prospectivity analysis tasks rather than a comprehensive collection of tools needed for performing a

complete prospectivity analysis. Consequently, performing prospectivity analysis often necessitate the use of multiple software packages simultaneously, leading to compatibility challenges due to differences in data formats when switching between these packages.

Functionality: Trade-off between flexibility and complexity inherent in each tool or package

No current open-source product offers a comprehensive selection of tools centralised in one place. The required tools for prospectivity analysis are fragmented in pieces across the research and software development community as various libraries and functions. Each research group, consultant, and mining company compiles and implements its own selection of tools for prospectivity modelling, resulting in a time-consuming and inefficient process lacking a centralised resource. This approach is also highly demanding as it requires expertise in diverse geoscientific data, data exploration, data processing, predictive modelling methods and software implementation.

Usability: Preference and experience, the user-friendliness of each tool or software package

Moreover, existing software packages often lack user-friendly graphical user interfaces (GUIs) and guidance. Prospectivity analysis is a complex procedure, and outlining where to start, or what to do next, is often challenging. A wizard-like structure would prove beneficial in guiding users through the essential steps of prospectivity analysis and identifying situations where additional processing steps are desirable.

Increasing the exploration productivity and getting the most out of the exploration data are crucial steps towards enabling a more efficient and more responsible mineral exploration. Currently, there is a lack of a product that is accessible, user-friendly, comprehensive, guided in the market capable of doing so. The EIS product software developed as part of the EIS project, addresses these market challenges by providing a solution meeting these criteria.

14.3 EIS Product Software

In the EIS project, partners are developing and integrating the EIS toolkit into the open GIS platform QGIS as a wizard. As described in deliverable D3.1, The "EIS QGIS Wizard" is a guided end-to-end implementation with a visual user interface following the exploration information system concept and will be guiding users through different steps of mineral prospectivity analysis and providing the possibility to organise data and track the processing workflow.

At the core of the EIS product software lies the mineral system library, which defines the essential parameters for mineral prospectivity analysis. The EIS project focuses on three mineral systems parameters related to critical raw materials:

- Cobalt bearing VMS system
- Lithium-tin-tantalum-tungsten bearing granite/pegmatite-related system
- Rare earths-cobalt bearing IOCG system

Models for each of the three mineral systems were developed using extensive data collected during the EIS project, including analysis of actual study sites and data shared by the project partners. These models are integrated into the EIS software, providing users with flexibility to choose a model based on their specific mineral system of interest. Users can then perform

tailored data pre-processing and analysis according to their unique data inputs and study regions.

As such, an integral aspect of the EIS software product involves integrating proxies for the three mineral system models developed to guide users in their choice of data for the mineral prospectivity analysis and in their data preprocessing. However, the mineral system library can also be omitted during the data preprocessing stage, allowing users to make their own informed choices based on the best of their knowledge.

This EIS product software presents several notable advantages over currently the available prospectivity modelling software and tools mentioned earlier. Additionally, there is potential for future improvements, including the possible inclusion of additional mineral systems in the library, improving the comprehensiveness of the EIS product.

Comprehensive collection of mineral prospectivity tools

The EIS QGIS Wizard will be designed and implemented to form a cohesive entity consisting of software tools for every stage of prospectivity analysis, from selecting and processing input data to data analysis, model generation and prospectivity mapping. The key functional software components encompass five parts aligned with distinct stages of prospectivity analysis: data preprocessing, data analysis, data integration and modelling, model testing, and visualization and reporting.

During the data pre-processing step, data is transformed to serve as proxies for critical mineral system parameters. The pre-processed data then becomes input for predictive modelling or other data analysis methods. In the final step of prospectivity analysis, model validation assesses the performance of both modelling and prospectivity mapping.

At each stage, users have access to various methods and tools, allowing them to tailor the process according to their specific needs. The wizard is designed to accommodate additional functions later on, further extending its comprehensiveness beyond the EIS project timeframe.

Open-source software

As the EIS QGIS Wizard is integrated into the open-source platform QGIS, it is an open-source solution, fostering collaboration and accessibility within the mineral exploration community. Building these components as modules in an open-source, community-based platform allows for contributions from developers globally, thereby enhancing the development and maintenance of the product. Given the widespread use of the free and versatile QGIS software globally, and the ongoing prospectivity mapping constantly carried out in various scales from continent scale to deposit scale, EIS QGIS Wizard has a significant potential of becoming widely adopted in prospectivity analysis by both research institutes and the business sector around the globe.

Compatibility

The EIS product software integrated into QGIS is designed to be compatible with common data formats used in mineral exploration, thereby enhancing data exchange and integration

capabilities. Notably, the EIS Wizard stands out for its compatibility with various software platforms, facilitating the integration of diverse data types. This adaptability positions the product as a serious choice for a wide spectrum of professionals who rely on a multitude of data sources.

User Friendliness and Guidance

A pivotal characteristic of the EIS tool is its user-friendly design, as user friendliness will be in a central role considering the use of the wizard as well as its installation in QGIS. The EIS QGIS Wizard prioritises ease of use, ensuring that both seasoned experts and newcomers can easily navigate its intuitive interface. Emphasis will be placed on creating informative documentation, including technical specification of the software as well as a thorough user manual. The clearly structured user interface will guide users through the prospectivity analysis process, providing support in the data selection and in the choice of appropriate preprocessing routines and parameters for generating relevant variables for modelling.

Through these advantages, the EIS QGIS Wizard developed in the EIS project places itself as a transformative approach to mineral exploration, making it open-source, comprehensive, and user-friendly, and addresses some of the major market issues related to the EIS technology.

14.4 End-Users Needs and EIS solution

The EIS tools developed in this project have a broad range of end users, primarily catering to the mineral exploration industry, including mining companies, junior mining companies, and service providers. Additionally, the tool can be used by the researchers and students within universities and research institutes. The goal of this product is to support exploration teams in decision-making across various stages and scales of exploration projects. Besides, geoscientists can also leverage the product to analyse and quantify the spatial association between mineral deposits and geoscience data derived from surveys during mineral exploration, fostering the understanding of mineral systems and ore-forming processes.

The beneficiaries of the tools developed in this project include both direct end-users of the EIS QGIS Wizard, interested in conducting prospectivity analysis, as well as other indirect beneficiaries, interested in the results of these analyses and the potential of the EIS product. Identified beneficiaries, confirmed with the partners during the first workshop in Dresden, include exploration companies, scientific community (researchers, universities, geologists, survey centres), land use managers/planners, investors, civil society, policy makers and governmental/local authorities.

The tables below provide insights into the specific needs and challenges of each category of identified beneficiaries, illustrating how the EIS tools provide a solution to these challenges.

Table 10. Exploration Companies

Exploration Companies	
Need or Challenge	**Added value of the EIS tools**
Enhancing geochemistry and geophysics exploration methods and model integration, as it directly impacts their ability to discover and characterise mineral deposits. Advanced exploration methods and modelling can enhance the efficiency and accuracy of exploration activities.	The EIS tools developed include new data analysis methods, such as artificial intelligence, machine learning and deep learning for mineral prospectivity mapping. These advanced methods can enhance the accuracy of exploration methods by integrating geological and geophysical data into models. The EIS QGIS Wizard contributes to improving exploration methods and the modelling of mineral deposits.
Improving systems to collect and predict ore-body and rock information. Exploration companies heavily rely on accurate data collection and predictive systems to make informed decisions about potential mining sites.	The new data analysis methods developed can lead to improved systems for collecting and predicting ore-body and rock information. By applying AI and machine learning, the EIS Wizard seeks to maximise the extraction of valuable insights from existing exploration data, which can aid in ore-body and rock characterisation, ultimately enhancing exploration efficiency and accuracy.
Streamlining the exploration companies' processes and reduce costs during exploration campaigns.	The EIS Wizard contributes to a more accurate targeting of exploration efforts, in turn leading to more efficient and cost-effective operations management in the later stages of mining projects.
Junior companies have limited resources and often struggle acquiring expensive commercially available GIS software.	As a non-commercial open-source software package, the EIS QGIS Wizard provides a free solution that will facilitate mineral prospectivity analysis among junior exploration companies.

Table 11. Scientific Communities

Scientific Communities (Universities, Students, Researchers, Geological Survey Centres)	
Need or Challenge	**Added value of the EIS tools**
Aligning education and training with the needs of the geology and mineral exploration field, and develop comprehensive educational programs that adopt up-to-date tools to ensure students receive relevant knowledge and skills for mineral exploration, and that enhance understanding and knowledge of concepts like mineral system modelling and prospectivity analysis.	The EIS QGIS Wizard can serve as an educational resource, equipping students with skills aligned with the needs of the mineral exploration field and the industry demands. By integrating courses on EIS tools in QGIS and engaging students in prospectivity analysis research and projects, universities can provide practical experience with advanced data analysis methods, including artificial intelligence and machine learning, preparing students for academic or industrial careers in the field of mineral exploration.
Universities often have limited funding for geological programs which can restrict the acquisition of expensive commercially available GIS software.	As an open-source software package, the EIS QGIS Wizard provides a free and accessible solution for geology students that allows them to explore and learn more about mineral systems and ore forming.
Engaging in and producing innovative research publications that contribute to the advancement of	The EIS QGIS Wizard will facilitate the process of mineral prospectivity for all stages of prospectivity

knowledge in the field of mineral exploration, mineral systems and prospectivity analysis.	analysis and will help produce publishable results and allow significant contributions from researchers.
Geological survey centres rely on advanced geological and geophysical methods and aim to continually improve their methods to better understand subsurface structures and identify potential mineral resources.	The advanced methods offered by the EIS QGIS Wizard can improve the quality and accuracy of geochemistry and geophysics exploration methods and contribute to a better understanding of subsurface structures, aiding in the identification of potential mineral resources.

Table 12. Political Bodies

Political Bodies (Policy Makers, Governments, Local Authorities, Landuse Planners)	
Need or Challenge	**Added value of the EIS tools**
Positioning the EU and its regions at the forefront of mineral prospectivity analysis and reinforcing Europe's economic independence from third countries in relation to critical raw materials.	The EIS QGIS Wizard has a the potential to become widely used in prospectivity globally and particularly in Europe, contributing to an increased access to primary raw materials and putting the EU and its regions at the forefront of mineral prospectivity analysis.
Optimising allocation of land for mineral exploration while ensuring environmental sustainability. Effective planning is crucial to balance the interests of mineral exploration companies and land users while minimizing conflicts and addressing shared concerns such as environmental impacts, and resource consumption.	The EIS QGIS Wizard promotes responsible mineral exploration practices. The methods developed improve the accuracy of the targeting of the early phase exploration, making mineral exploration more responsible in terms of energy efficiency and minimizing footprint. This opens the door for more effective planning from political bodies which is crucial for balancing resource development with environmental protection.
The multiple steps from prospectivity, exploration with the cost of drilling, to mining represent high stakes in terms of risks and investments while the sector could also be considered from an economic development perspective.	The EIS QGIS Wizard can reduce exploration costs. More cost-effective and efficient exploration methods can potentially lead to discussions about financial support or other support mechanisms for mineral exploration.

Table 13. Investors

Investors	
Need or Challenge	**Added value of the EIS tools**
Investors are often concerned about the financial risks of mineral exploration and mining projects limiting the availability and accessibility of financing to the sector.	The EIS tools and Wizard contributes to the improvement in accuracy of early-phase exploration targeting and to the efficient use of existing exploration data. Consequently, the costs of mineral exploration could be reduced. Attracting possibly more investments in the sector by demonstrating more efficient and lower-risk exploration methods.
Investors are interested in investment opportunities that strengthen the EU autonomy in relation to critical raw materials.	Through its three modelled mineral systems, the EIS QGIS Wizard is currently designed to focus on prospectivity mapping for critical raw materials within the EU. The enhanced identification of potential sources of critical raw materials within the EU can open the door for investment opportunities driven by the need to reduce reliance on imports and ensure secure supply of these materials within the EU.

Table 14. Civil Society

Civil Society	
Need or Challenge	**Added value of the EIS tools**
Citizens and NGOs often express concerns about the environmental impacts of mining and exploration, emphasizing the importance of mitigating these impacts and adopt instead responsible practices.	The work that can potentially be produced through the use of the EIS QGIS Wizard can contribute to a more socially and environmentally acceptable discovery and production of critical raw materials. By promoting responsible exploration practices and more efficient resource use, these efforts align with citizens' environmental and social concerns. This in turn, can pave the way towards greater acceptance of mining activities, laying the groundwork for building trust between civil society and the raw materials sector.

15. Exploitation Strategy

Horizon Europe Project results can be grouped into exploitable & non-exploitable results, the latter pertaining to the Dissemination portfolio of results. As Exploitation & Dissemination work hand in hand, it is important to identify these results early in the project to ensure what the objectives are for the various results and adapt the strategy and resulting path of actions to the desired outcomes. Within the exploitable results category, some results will be commercially exploitable and some non-commercially exploitable, and this will lead to a range of exploitation options, as illustrated in the Figure 24. Results types & exploitation options below.


Figure 24. Results types & exploitation options

15.1 Key Exploitation Results

The Grant Agreement outlines the main exploitable results as well as the envisioned routes for their exploitation, illustrating how partners intend to maximise their impact beyond the project.

However, as the information presented in the Grant Agreement originates from early project development discussions and despite depicting accurately the ideas and goals at that time, revisiting this again during the project enables a clearer focus on and confirmation of the key exploitable results for long term strategies. Accordingly, through the initial exploitation workshop as well as the bilateral discussions with all the EIS partners, a more comprehensive list of key exploitable results has been developed (see Table 15), closely aligning with the ideas articulated at the time of this report.

The first exploitation workshop, complemented by the in-depth bilateral discussions, allowed to collect valuable information about the expected project results and to gather ideas on how to make use of them. Table 15 below presents a depiction of the expected key exploitable project results and the intention of the partners for exploitation. It serves as an updated, more refined version of the exploitation results table presented in the Grant Agreement.

Table 15. Key Exploitable Results

Key Exploitable Results	Partners to exploit	Potential users	Routes for exploitation	IPR Strategy
EIS toolbox and developed codes	GTK, BEAK, GISPO	Junior exploration companies, geologists with coding knowledge	Future code improvements	Open-source software, python codes publicly available on GitHub
EIS QGIS Plugin and Wizard	GTK, BEAK, GISPO	Junior exploration companies, geologists, academic institutions	Training courses, online tutorials, consulting services Upscaling, maintenance and further development	Open-source software
Refined mineral system models	LTU, GTK, BRGM	Academic institutions, Junior exploration companies	Research extension to additional mineral systems	Open access publications
Prospectivity maps and data produced	GTK, BRGM, BEAK, SGU, UFS	Junior exploration companies, public authorities	Publication in journals	Open access publications
Toolkit integration into advangeo 2D Prediction	BEAK	Junior exploration companies	Development of consulting services	Commercial licensed software

These first routes for exploitation were explored at the occasion of the third Progress Meeting in Aracena, Spain in October 2023, where a second workshop was organised by LGI to enable partners to discuss two routes in particular:

-Further research on Mineral System models and,

-EIS QGIS Plugin and Wizard.

15.2 Initial Exploitation Strategies

Based on the insights gathered from the initial and second exploitation workshops as well as the bilateral discussions, a considerable amount of information was collected pertaining to the specific exploitation goals of the partners in regards to the results of the EIS project as well as the beneficiaries that will most likely use and benefit from this result. The efforts were also extended to the identification of potential risks and challenges that might surface in the future trajectory of these results in order to keep them in mind and mitigate them in our future exploitation strategy. These efforts have paved the way for the formulation of an initial exploitation route for each identified result.

15.2.1 EIS Toolbox and developed codes

One of the primary objective of the EIS project revolves around the development of the EIS toolkit, acting as a comprehensive Python library of independent functions relevant for mineral prospectivity analysis. These functions involve mainly predictive mapping and data integration via mathematical modelling, complemented by general data processing and analysis. The toolkit serves as a compilation of diverse functions that can be integrated into multiple software programs, most notably QGIS.

The potential audience of the toolkit consists of individuals proficient in coding, who can access the python library, enabling them to tailor and refine the tools to suit their specific needs. However, the average GIS software user is unlikely to directly engage with the toolkit or manipulate the python functions. Instead, the average user will most likely utilise the EIS QGIS Plugin and EIS QGIS Wizard embedded with the developed EIS tools directly through the QGIS interface.

In the scope of this project, the EIS toolkit will include numerous tools, functions and methods relevant to mineral prospectivity analysis. However, the list of pertinent tools and functions that can be implemented in the toolkit is long, and while a selection of tools is being implemented as part of the EIS project, time constraints may limit the comprehensive implementation of all identified functionalities and methods.

The EIS toolkit's EUPL 1.2 copyleft license allows any partner or external beneficiary to improve it and add new tools to it beyond the project timeframe. The developed codes will be published and hosted in the open-source platform GitHub, fostering a sense of community and inviting contributions from interested independent developers. This open-source approach allows ongoing refinement of the codes and the introduction of new versions. Developers can submit changes to the main codes to fix bugs or to provide code improvements.

The changes to the codebase over time might need to be managed. This allows tracking the evolution of the codes and ensuring that different versions of the code can be accessed and referred to if needed later on. Several partners, including GISPO, GTK and BEAK, have expressed interest in maintaining the EIS toolkit and contributing to future improvements. However, such endeavours necessitate adequate funding.

15.2.2 EIS QGIS Plugin and Wizard

The EIS toolkit will be integrated into the open-source GIS software QGIS as a plugin accompanied by a Wizard. The EIS QGIS Wizard is a user interface guiding through different steps of prospectivity analysis and providing the possibility to organise data and track the processing workflow. The EIS Processing Toolbox is the QGIS interface to the EIS Toolkit functions, and it can be used outside the EIS Wizard for building custom prospectivity analysis workflows in QGIS.

Several actions can be further explored to propel the accomplishments of the EIS project into the market. A Scientific Short Course is expected to be developed by BEAK once the EIS toolkit is ready. In the frame of the short course, participants will receive an in-depth introduction to both the EIS toolkit and the EIS QGIS Wizard. The short course will conclude with a practical exercise for all participants, guiding them through the modelling of one of the test site datasets as guided tutorial. Partners expressed eagerness to maximise the impact of the developed tools and their integration into QGIS through the creation of a comprehensive user manual, tutorial data, training courses and online tutorial videos. Consulting services from partners like BEAK and GTK can also be offered for users requiring assistance.

As potential users, the EIS partners will be testing the EIS toolkit and the EIS QGIS Wizard to ensure that at the end of the project the EIS tools created and integrated into the QGIS software can be ready to be deployed in the market. Despite rigorous testing during the project, the EIS tools and QGIS plugin might still encounter new bugs and malfunctions that

might be detected later on, necessitating maintenance and updates after the project. GTK showed interest in maintaining and updating the QGIS plugins, provided that ministerial budget funding could be available, but no decision has been made at the time of this report. Other partners, including GISPO, also showed interest.

Partners see potential in upscaling and further developing the tools and the EIS QGIS Wizard beyond the project's horizon. Exploring funding opportunities to elevate the tools to a higher Technology Readiness Level (TRL) as the expected TRL of the produced EIS QGIS Wizard and related software sits at 5. Partners aim to engage with organisations and relevant stakeholders interested in advancing mineral exploration, exploring potential financing for a follow-up project to enhance the comprehensiveness of the EIS toolkit and its integration into QGIS. Future improvement routes include the possibility of adapting the EIS QGIS Wizard to operate effectively with 3D input data, leveraging current advances in the 3D GIS space.

As a non-commercial open-source software package, the EIS QGIS Wizard will need a sustainable funding model to be developed. This will be accomplished in a dedicated final exploitation workshop on M24. This workshop will use an adapted version of the Osterwalder's Business Model Canvas methodology to establish a viable exploitation model for the EIS in which specific strategies will be drawn for hosting, distributing, and maintaining the EIS toolbox and EIS QGIS Wizard.

15.2.3 Refined mineral system models

Study sites were selected for the EIS project research to analyse the essential components of three distinct mineral systems:

- Cobalt bearing VMS system
- Lithium-tin-tantalum-tungsten bearing granite/pegmatite-related system
- Rare earths-cobalt bearing IOCG system

Essential components including geological, geophysical, geochemical characteristics will be gathered, forming the foundation for the development of these mineral system models in the framework of WP2. By developing these models, proxies are defined and expressed as mappable variables used in prospectivity analysis as explanatory variables in WP3.

From an academic standpoint, these models can captivate interest from universities that would be eager to incorporate practical examples of mineral system models into their teaching curricula. Likewise, research centres can be interested in the models and can publish publications that can, in turn, play a role in promoting the EIS toolkit and mineral system models among the exploration companies.

While the focus of the EIS project is currently on three specific mineral systems, partners are aware of other mineral topologies that might be of interest at the EU level and for which models can be developed. The future expansion of the EIS QGIS Plugin and Wizard by encompassing additional mineral systems to strengthen the EIS capabilities in QGIS is foreseen as an exploitation route with strong potential. Other mineral systems of interest include:

- Cu – multiple types – high
- Sediment-hosted Cu
- REE in alkaline intrusions
- REE in iron-oxide apatite
- Intrusion hosted Ni-Cu-PGE system

15.2.4 Toolkit integration into advangeo 2D Prediction

The advangeo 2D Prediction software is a commercial modelling and prediction software developed by BEAK for analysing and modelling spatial data with artificial intelligence within the ArcGIS environment.

In parallel to the integration of the EIS toolkit into QGIS, the aim of BEAK is to integrate part of the EIS toolkit developments into the advangeo 2D Prediction software, then to perform prospectivity analysis with their own software.

Currently, advangeo 2D Prediction is constrained to use tools exclusive to Esri, necessitating clients to invest in both ArcGIS Desktop and advangeo 2D Prediction software. An exciting prospect for BEAK lies within their ability to extend their services for QGIS users thanks to the developed EIS tools. As QGIS is a free open-source software, users will only need to invest in advangeo 2D Prediction to benefit from BEAK's services, enhancing accessibility and affordability for a broader user base.

Beyond the scope of the project, there is keen interest in the potential for further tool development and providing ongoing support to their client.

15.2.5 Prospectivity maps and data produced

As part of WP4, GTK, BRGM, SGU, UFS, GOLDENPET and BEAK will respectively be using EIS QGIS tools to independently conduct prospectivity analysis and produce prospectivity maps and values, showing possible location of mineral deposits and giving scores of potential presence of minerals in the test sites.

As new prospectivity data and maps will be created, it is interesting to explore the utilisation of these results. Finnish prospectivity data created by GTK might be stored in GTK's database as GTK has a visualisation service in place on their website which they can use to present the prospectivity maps produced.

15.2.6 Publications

As numerous partners in the EIS project come from academic backgrounds, including universities and research centres, there is a substantial interest in publishing the results produced in the project. These publications play an important role in presenting the generated outcomes and promoting the EIS toolkit and mineral system models within the exploration sector. This can lead to increased engagement from exploration companies that may be prompted to reach out, seeking access to the produced data and the toolkit, or expressing interest in discussions about further development, upscaling and potential funding opportunities for new projects.

16. Exploitation Plan Conclusion

During the first phase of the exploitation analysis of EIS results, LGI gathered partners to list and discuss generated results. Exploitation goals, risks, strategies and beneficiaries were brainstormed. A first version of the IP repository was built to list all partners IPs and strategies.

These initial exploitation routes and ideas will be key components in the development of a comprehensive final version of the exploitation plan by M36 and will lay the groundwork for a more exhaustive and refined exploration plan. Through this plan, the aim will be to ensure that the exploitation of these key results is not just a theoretical concept but practical, actionable strategies that maximize their impact and benefits for all beneficiaries identified.

While the EIS tools developed will be integrated in the open-source software QGIS, the exploitation of the project's results is still possible, and even necessary, to thrive towards the sustainability of the results produced. Maintenance, improvement and further development of the results are all part of a forward looking approach, needing a well-defined plan encompassing of ownership and funding.

In the second phase of the exploitation analysis, LGI will be looking into finalising the IP repository, formalising the exploitation plan and developing a sustainable funding model for the EIS results in which specific strategies will be drawn for hosting, distributing, and maintaining the EIS Toolbox and EIS QGIS Plugin. This will be accomplished in a dedicated final exploitation workshop on M24.

The market study will also be refined thanks to further activities, such as the EIS Scope Engagement Forum, which is expected to take place in November 2024 (M28) and will gather different categories of stakeholders around the CRM ACT objectives and impact, the EU mining regions, the mineral prospectivity potential and the ESG aspect of exploration activities.

A final version of the Exploitation Plan (M36) will be delivered by the end of the project (M36), outlining the main conclusions and the finalised exploitation strategies.

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