Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe

Technical review report for project Mintell4EU

This report is part of a project that has received funding by the European Union's Horizon 2020 research and innovation programme under grant agreement number 731166.

INTRODUCTION

Technical review report is part of GeoERA's Monitoring and evaluation process for co-funded projects (*hereinafter: project*). The aim of a technical review is to assess the work carried out under the project over a certain period and provide recommendations. Such technical review evaluates the project reports and deliverables, the proper use of resources, the management of the project and the expected impact.

Technical review report consists of four sections, each representing one level of monitoring and/or evaluation of the project:

Level	Monitor / Reviewer	Input	Aim
1 – Monitoring of progress indicators	Monitoring and reporting officer (GeoZS)	MPPR* FPPR**	Monitoring of the effectiveness of implementation of selected projects with respect to finance, time and administration.
2 – Scientific review	Reviewers (GeoZS)	Submitted deliverables MPPR FPPR	Quality review of the deliverables and review of achieving scientific and professional goals.
3 – Review of the theme progress	Theme coordinators	MPPR FPPR	Review of achieving theme objectives.
4 – GeoERA Progress evaluation	Stakeholder Council member(s)	Sections 1 and 2 of this report Review meetings	Overall project progress and general recommendations.

*MPPR = Midterm Project Progress Report (see PI doc no 2)
**FPPR = Final Project Progress Report (see PI doc no 2)

Monitoring and evaluation process:

M0 = End of reporting period
M1 = Submitted (Final) Project progress Report (MPPR / FPPR)
M2 = 1 – Monitoring & 2 – Evaluation
M3 = 3 – Evaluation of the theme progress
M3 = (Final) Review Meeting & 4 – Progress evaluation

Each project will be reviewed twice: for first project period M1-M18 – Technical review report, and second project period M19-M36 – Final review report.
Technical review report is based on Horizon 2020 templates but adopted to GeoERA needs. Technical reviews of projects shall be carried out on a confidential basis.

GENERAL INFORMATION

ERA-NET Cofund Grant Agreement:	731166
ERA-NET Cofund acronym:	GeoERA
Call identifier:	H2020-LCE-2016-2017/H2020-LCE-2016-ERA
Project full title:	Mineral Intelligence for Europe
Project acronym:	Mintell4EU
Project reference number:	GeoE.171.016
Project topic:	Raw Materials
Project specific topic:	RM1–Improving and sustaining the Raw Materials Knowledge Base by periodically delivering a Minerals Yearbook and Inventory Information System
Lead partner:	GEUS Geological Survey of Denmark and Greenland
Project website:	http://geoera.eu/projects/mintell4eu/

☒ Technical review report
☐ Final review report

Period covered	01/07/2018 – 31/12/2019
Review meeting date	11.03.2020

Contributor:	Role:	Approved on:
Barbara Simić	Monitoring and reporting officer	13.03.2020
Maja Ilić	Monitoring and reporting officer	16.03.2020
Tina Zajc Benda	Scientific reviewer	16.03.2020
Jasna Šinigoj	Scientific reviewer	13.03.2020
Matija Krivic	Scientific reviewer	13.03.2020
Antje Wittenberg	Theme coordinator	17.03.2020
Thomas Crafford	Stakeholder Council member	NA
Harikrishnan Tulsidas	Stakeholder Council member	22.04.2020

1 LEVEL 1 – MONITORING OF PROGRESS INDICATORS

In this section the project is monitored "remotely" on the basis of the respective reports. This part is filled in by Monitoring and reporting officer with aim to monitor the effectiveness of implementation of the selected projects with respect to finance, time and administration, based on submited MPPR and FPPR.

	Yes	Partially (comment needed)	No
PROJECT MANAGEMENT			
Has the MPPR / FPPR report been submitted on time?	☒		☐
Have there been any changes in project partnership?	☐		☒
Has the project management been performed as required?	☒		☐
Has the collaboration between partners been effective?	☒		☐
Do you identify evidence of underperforming partners, lack of commitment or change of interest of any partners?	☐ (see comment)		☒
DELIVERABLES and MILESTONES			
Have the planned deliverables for the period been submitted on time according to timeline in Project Agreement?	☐	See comment no.1	☒
Have the planned deliverables for the period been completed (from MPPR / FPPR, sheet 4)	☒		☐
Have any changes to deliverables occurred (type/ dissemination level)? (from MPPR / FPPR, sheet 4 and 5)	☒	See comment no.2	☐
Have planned milestones been achieved for the reporting period? (from MPPR / FPPR, sheet 4)	☒		☐
Have the project partnership identify any difficulties achieving any of the deliverables / milestones?	☐		☒
DEVIATIONS (from MPPR / FPPR, sheet 5)			
Has the project partnership identify any deviations that will not affect projects outputs?	☒		☐
Have any deviations occur on the project, with impact on project outputs?	☐		☒
In case of deviations, have the project adopted corrective measures?	☒		☐
DISSEMINATION, COMMUNICATION			
Has the project adopted its dissemination plan?	☒		☐

Have the planned dissemination activities been completed for the reporting period? (from MPPR / FPPR, sheet 6)	☒		☐
Have the partners' disseminated project results and information adequately?	☒		☐
Is the project following dissemination plan?	☒		☐
Is the project interacting in a satisfactory manner with other GeoERA projects?	☒		☐
Is the project interacting in a satisfactory manner with national/international bodies?	☒		☐

FINANCE			
To the best of your estimate, have the resources used been utilised for achieving the project? (according to MPPR / FPPR, sheet 9)	☒		☐
To the best of your estimate, have the resources used been in a manner consisted with the principle of economy, efficiency and effectiveness? *	☒		☐
Are there any major deviations in the budget consumptions from the financial plan? (zero consumption in M18; deviation from plan exceeding 20% in M36)	☐		☒
Are there any major deviations in the Person - Months consumptions from the plan? (zero consumption in M18; deviation from plan exceeding 20% in M36)	☐		☒
Are any budget modifications for the project needed? (from MPPR / FPPR, sheet 5)	☐		☒

***The principles of economy, efficiency and effectiveness** refers to the standard of "good housekeeping" in spending public money effectively. Economy can be understood as minimising the costs of resources used for an activity (input), having regard to the appropriate quality and can be linked to efficiency, which is the relationship between the outputs and the resources used to produce them. Effectiveness is concerned with measuring the extent to which the objectives have been achieved and the relationship between the intended impact and the actual impact of an activity. Cost effectiveness means the relationship between project costs and outcomes, expressed as costs per unit of outcome achieved.

Comments (highlighting the project progress) / deviations / recommendations:

Comment no.1: In the first reporting period 10 deliverables were due:
7 deliverables were submitted in time
1 deliverables were submitted with eligible delay (amendment 1)
2 deliverables are currently in delay.
Comment no.2: Change to deliverable:
D3.1: postponed from M12 → M15
The changes have no impact on the project outputs.

The Mintell4EU project supports the overall aim of GeoERA – to integrate European GSOs' information and knowledge on subsurface energy, water and raw material resources to contribute to sustainable use and management of the subsurface. The

project is building its results on existing achievements of completed projects, funded by the EC through different programmes, thus capitalizing the results. Project builds on two finalized projects ORAMA and Minerals4EU.

In the first reporting period the project followed its project plan with minor deviation in one deliverable and two, that are slightly delayed.
The communication, dissemination and exploitation plan has been adopted and some indicators given. The project reported its reach ~1.700 only through publications, events and meetings, which is about the average compared to other GeoERA projects. Overall financial consumption at the end of first reporting period is 36 %, which is a bit low. According to the project plan, the majority of activities will be done in the second reporting period, consequently the financial consumption will increase.

Project management structure is well defined and efficient. No challenges in achieving project outcomes are recognized, the project lead provides good support to partners with implementation of project activities.

Recommendation to project are:

- Keep track of the communication and dissemination activities and try to count or estimate the people reached with these activities. The same is applicable for the meetings and online media.

Overall assessment of the project:

☐ 5 - **Overachiever** (the project has achieved all objectives and goals for the period and has even exceeded expectations)

☒ 4 - **Excellent progress** (the project has fully achieved its objectives and goals for the period)

☐ 3 - **Good progress** (the project has achieved most of its objectives and goals for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has achieved some of its objectives; however corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule)

Summary of dissemination activities (detailed activities are annexed to this report):

Activity	Target audience	Number of people reached
Publications	General public	>1.000
Events	EU institution	>25
Events	Policy makers	/
Events	Scientific community	270
Events	General public	>150
Meetings	Scientific community	>255
		~1.700

Are the dissemination activities adequate? (link to GeoERA WP5)

☐ 5 - **Overachieved** (the projects dissemination activities have exceeded expectations)

☐ 4 - **Excellent** (the projects dissemination activities have fully achieved its expectations)

☒ 3 - **Good** (the projects dissemination activities are adequate; however, some additional activities are needed)

☐ 2 - **Acceptable** (the projects dissemination activities need corrective actions; additional activities are needed)

☐ 1 - **Unsatisfactory** (the project has failed to disseminate)

Cummulative financial statement:

	Person months	Total eligible costs	Reimbursement rate	GeoERA contribution	In-kind contribution
Plan	468,65	2.859.161	29,7%	849.171	2.009.990
1st period consumption	207,74	1.015.809	29,7%	301.695	714.114
2nd period consumption					

2 LEVEL 2 – SCIENTIFIC REVIEW

In this section the project is reviewed ”remotely” on the basis of the respective reports. This part is filled in by reviewer with aim to review the quality of the deliverables and review of achieving scientific and professional goals. Scientific review is based on submitted deliverables and reported Impact statement in MPPR/FPPR.

Impact statement (from MPPR / FPPR, sheet 8):

The overall expected impact of Mintell4EU is that it will provide a comprehensive mineral resource data platform for European primary and secondary mineral resources, including a user-friendly portal. This will provide easy accessible and vital information for stakeholders and policy makers, for planning, investments etc. At this stage, more (and further harmonized) data is already added to the database and being available across Europe (e.g. new data Balkan countries and a German State) enabling better estimates of raw materials potential in Europe and this will be further extended during the remaining part of the project. At the end of the project there will also be a better integration of the e-Minerals Yearbook in the EGDI platform making it easier and more user-friendly to access the data. Information about mineral resources will also be available for the RMIS-system thereby enabling users to find this information and combine it with other topics in RMIS. Finally, the pilots testing UNFC as a classification principle for a broad range of materials will in the longer run provide stakeholders with a more standardised and homogenised data set. Mintell4EU seeks to extend the impacts through cooperation with other projects to achieve higher interoperability and data coherence. All these enhancements are still under development and the real impact will be visible (measurable) only towards the end of the project.

Expected impact (from Project Agreement):

A comprehensive mineral resource data platform for the European primary and secondary mineral resources, including a user-friendly portal, will provide vital information to governmental and private stakeholders, for planning and investment purposes. This proposal addresses a system, provided by the GeoERA Information Platform, aimed to provide data in a seamless way, using fully parametrizable applications for download and thus facilitating their use/integration in client in-house applications.

Evaluation of deliverables

Deliverables list status			
No.	Title	Status (Approve/ Reject)	Comments
D1.1	Data management Plan		See below
This deliverable provides a first version of the Mintell4EU Data Management Plan. It is structured according to the guidelines of the Overall GEOERA Data Management following Horizon 2020 FAIR Data and Management Plan. It is very well written, but it needs to be updated (QA procedure, data licensing, code lists maintenance).			
D 1.2	Project Management plan/Inception report		See below
This deliverable describes details in the implementation of Mintell4EU based on Inception Workshop held on November 6th at GeoZS in Ljubljana. It describes strategic focus, work plan for Minerals inventory, coordination needed with other projects, technical aspects, UNFC and EGDI. Synergy with other GeoERA mineral resource projects (FRAME, MINDeSEA, EuroLithos) is very important and the recommendations of the ORAMA project should be taken into account.			
D1.3	Management Reports		In delay
D1.4	Communication and Dissemination Plan		
This deliverable describes how Mintell4EU will communicate and disseminate (C+D) its results. Goals of the C+D activities are defined, the main target groups identified and C+D activities are tailor for the different target groups. The timetable of communication activities is missing.			
D3.1	Minerals Inventory Report		
This deliverable describes how Mintell4EU started with the process of refining the Minerals Inventory. Data gaps in spatial coverage were identified, the quality control application was established, and harvesting quality assurance is described.			
D3.2	Technical guidelines		
This deliverable describes and summaries existing technical guidelines and will be updated at the end of the project to be in line with all the modifications yet to come.			
D5.1	Comparative analysis of KDPs resources versus RMIS 2.0 needs		
This deliverable examines the different KDPs recently developed and how the RMIS could benefit of these data, information and services. The attempt to summarize the recommendations regarding the transfer of part(s) of data and information, aggregated data and knowledge stored in KDPs to the RMIS 2.0. was made.			
D 5.2	Recommendations for integration of results into GeoERA Information Platform		

This deliverable describes how results from the Mintell4EU project will be integrated with the EGDI. Recommendations are provided in relation to the integration of the Minerals Inventory and e-Minerals Yearbook and the functionality that should be included in the EGDI Portal are identified.			
D5.3.1	Specification of steps needed to integration the e-Minerals Yearbook in the Minerals4EU database		
This deliverable describes the steps to be undertaken to integrate the e-Minerals Yearbook (e-MYB) into the Minerals4EU database (EGDI database) and assesses the possibilities and technical solutions related to setting up harvesting systems and automation routines. It is based on ORAMA recommendations.			
D5.7.1	Description of how data and information from the project are integrated into the Information Platform and guidelines for future maintenance		In delay

Has the quality as a whole been achieved according the objectives? Has the project as a whole been making satisfactory progress?

☐ 5 - **Overachiever** (the project has achieved all objectives and goals for the period and has even exceeded expectations)

☒ 4 - **Excellent progress** (the project has fully achieved its objectives and goals for the period)

☐ 3 - **Good progress** (the project has achieved most of its objectives and goals for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has achieved some of its objectives; however corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule)

Comments (highlighting the project progress) / deviations / recommendations:

The overall aim of Mintell4EU is to improve the European knowledge base on raw materials by updating the electronic Minerals Yearbook, by extending the spatial coverage and quality of data currently in the Minerals Inventory and by increasing the degree of harmonisation, communication and interaction between existing data platforms. Activities to update the electronic minerals yearbook are ongoing and so far, production data for 2014 to 2017 and trade date for 2014 to 2016 have been added and can be found online. Data coverage has been extended with the addition of data from the Balkan countries and one German state and a quality control application was developed. To increase the degree of harmonization, communication and interaction

between existing data platforms a number of API applications aimed at the RMIS are under consideration. Also, the applicability of the UNFC classification system is being tested through a large number of pilot studies on different commodity types.

Mintell4EU is building on ORAMA recommendations and in cooperation with the FRAME, EuroLithos, MINDeSEA and several other EIT RM projects. Reviewer suggests to taking into account or cluster also with several EIT RawMaterials projects, also compiling data on different primary and secondary MR in Europe.

Reviewer suggests that the recommendations of the ORAMA project should be taken into account as much as possible. For the next period, the project should also find a sustainable solution and governance plan for code list management. It is also not clear how the data will be licensed to permit the widest re-use possible.

The project consists of 27 partners and is organised in 5 Work Packages. The reviewer recognises the complexity.

3 LEVEL 3 – REVIEW OF THE THEME PROGRESS

In this section the project is reviewed ”remotely” on the basis of the respective reports. This part is filled in by Theme coordinator with aim to review the achieved scientific goals in accordance with theme objectives, on the basis of Sheet 3 in MPPR / FPPR – Project contribution to GeoERA project.

Project contribution to GeoERA project (from MPPR / FPPR, sheet 3):

The Mintell4EU project supports the overall aim of GeoERA – to integrate European GSOs’ information and knowledge on subsurface energy, water and raw material resources to contribute to sustainable use and management of the subsurface. Mintell4EU works to improve the European Union Raw Materials Knowledge Base (EURMKB) by updating the electronic Minerals Yearbook, by extending the spatial coverage and by improving data quality in the Mineral4EU database. Therefore, the scope described for projects under the GeoERA Programme Specific Research Topic “RM1 - IMPROVING AND SUSTAINING THE RAW MATERIALS KNOWLEDGE BASE BY PERIODICALLY DELIVERING A MINERALS YEARBOOK AND INVENTORY INFORMATION SYSTEM” is to a high degree being tackled by Mintell4EU. With the status of the deliverables on the electronic Minerals Yearbook, the inclusion of the project RESEERVE findings and the technical solutions regarding data quality check these goals are already achieved to a high degree.
Not only will the electronic minerals yearbook be updated, the data will also be transferred to the Minerals4EU database to allow automation and sustainability. This will enable appropriate and streamlined interfaces towards end users e.g. through EGDI and RMIS. In addition, the geographic recording of raw material data in the mineral inventory is expanded to include Balkan countries and a German state. The data quality and harmonization are addressed via education, workshops and the development of quality assurance tools. Harvesting systems to ensure correct data acquisition is already in place. Finally, Mintell4EU will implement recommendations from the ORAMA project including testing the use of UNFC on European mineral resource data. This should also check the applicability of the classification system with regard to improved data harmonization and ultimately a Europe-wide harmonized mineral inventory that needs to be provided. This can be used to derive decision indicators that are supported in the decision-making process and the schedule for project implementation.

Theme objectives:

Optimal use and management of the subsurface is GeoERAs main objective addressed by 1) *a more integrated and efficient management* and 2) *more responsible and publicly accepted, exploitation and use of the subsurface*.

Mintell4EU contributes to the GeoERA objectives on:

- *interoperable and transnational data and information services on the distribution of raw material resources in Europe and harmonized methods to assess those* -> pan GeoERA Theme requirements have been addresses on regular basis including strong bonds with all GeoERA Raw Material Projects, and GIP-P as well as it builds up on former Horizon2020 projects (i.e. ORAMA, SCRREEN) and EIT Raw Materials projects (RESERVE)
- *a geological knowledge base, existing of objective and seamless data, information and expertise to service European, national and regional policy makers, industry and other stakeholders and facilitate them in policy and decision making processes* has been put forward through e.g.: Raw Materials Week 2018, 2019; PDAC 2019, 2020; and by internal workshops assisting less mature partners concerning the data harmonisation and data harvesting process.

Mintell4EU was designed responding to specific request by the European Commission for a Minerals Intelligence and related special products (European Mineral Yearbook and Minerals Inventory) to serve the needs identified (i.e. the security and sustainability of mineral raw materials supply from EU domestic sources and the management of competing uses of the European surface and subsurface). While MintellEU is building on existing data and providing guidance for further harmonisation and interoperability of data it adds to the impact FAIR data can have for the society. With new players / data providers, the quality check tool, the strong links to the other Raw Materials projects and the MREG significant improvement on the data quality and geographic coverage has been made.

Therefore, Mintell4EU serves the GeoERA theme objectives as well as the overall GeoERA objectives.

Has the project as a whole achieved the objectives and expected impact of the theme?

☐ 5 - **Overachiever** (the project has achieved greater impact on project theme and/or other themes than expected)

☐ 4 - **Excellent progress** (the project has fully achieved its objectives and goals towards the theme as expected)

☒ 3 - **Good progress** (the project has achieved most of its impact towards the theme for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has minor impact; corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule and/or has no impact on the theme; corrective actions are required)

Comments / deviations / recommendations:

Mintell4EU is the interface project between other GeoERA Raw Materials project and GIP-P. The well described guidelines, the specific data workshops and the provided deliverables so far help the community to ensure mutual understanding and performance. Hence, it also adds on improved implementation of the INSPIRE directive.
The IT expertise cumulated under Mintell4EU is a benefit to the other projects – in particular their GIP-P liaison WP while they benefit from new findings and expertise provided by the other project. Mintell4EU is a real network and communication project serving the needs expressed by the European Commission and interfaces directly to the EU-RMIS.
Deliverable5.1 is an important step for that task. However, it remains unclear, how the interaction with JRC on RMIS is ensured.
The workshops and guidelines in particular for newcomers are crucial for the success of GeoERA Raw Materials. Data quality and data plausibility check is a continuously task also beyond the lifetime of the project.

4 LEVEL 4 – GEOERA PROGRESS EVALUATION

In this section the project is reviewed on the Review meetings, where projects present their overall progress and achievements. This section relates to particular project, broader impact of GeoERA as a whole on policies will be covered at the Final Review meeting with questionnaire and interview with Evaluator.

Based on technical review summaries provided by Sections 1 – 3 of this report, and project presentation on the (Final) Review meeting:

Has the project as a whole been making satisfactory progress according to your own understanding and expectations of the GeoERA project?

☐ 5 - **Overachiever** (the project has exceeded expectations)

☒ 4 - **Excellent progress** (as expected)

☐ 3 - **Good progress** (minor recommendations given below)

☐ 2 - **Acceptable progress** (below expectations; minor corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed; corrective actions are required)

Overall comments for the project (overall recommendations, modifications, corrective actions, or re-tuning the objectives to optimize the impact or keep up with the State of the Art, re-focusing, or a simple praise)

The Mintell4EU project seeks to integrate European geological information and knowledge raw material resources to contribute to its sustainable use and management. The project is building on the results of several projects funded by the EC. The project aims to provide interoperable and transnational data and information services on raw material resources in Europe and harmonized methods to assess these resources. Besides, the project will contribute to the geological knowledge base with objective and seamless data, information and expertise to service European, national and regional policymakers, industry and other stakeholders to support them in policy and decision making. The project coordinates with ORAMA and RESEERVE projects to improve spatial coverage and data quality of the European minerals inventory.

Comments and suggestions on the Work Packages are as below:

Management, communication, dissemination, and sustainability: The project team has done excellent work in coordinating the project. It is recommended that social media posting based on other WP achievements, primarily focussed on sustainable development initiatives may be attempted.

Update to Electronic European Minerals Yearbook: Production data and trade data updates from 2014 to 2017 were completed. The data from 20 Resources, reserves and exploration data updates 17 to 2019 will be completed in the remaining phase of the project. Resources, reserves and exploration data updates for 2019 will also be completed later. The project team has done an excellent job in keeping the updates on time. The project team is suggested to share details of challenges in data compilation if any, especially related to the use of different standards and units of measurements with the whole team. This information will be of great interest to WP 4 on UNFC pilot. The team is also suggested to share there progress with WP 1 communications team to publish significant insights on the latest data through a blog and social media posts. The team is congratulated for their hard work.

Minerals Inventory: The team did an excellent job in extending the spatial coverage with data from Western Balkan countries in cooperation with the RESEERVE project, and with data from Freiburg, Germany. New or modified data from existing data providers were accessed. This task also focuses on historical mine sites with a touristic component and the possibility for presenting some of the mines in a 'Coffee table book' is being investigated. It is recommended that the team may collaborate with GeoConnect3D and share this data with them, to integrate with their Geomanifestions initiative.

UNFC pilot: The United Nations Framework Classification of Resources (UNFC) provides a universal standard for classification of mineral resources. The case studies have been started. A guideline on how to perform UNFC has been prepared and will be distributed together with examples of relevant UNFC cases and templates and guidelines from the ORAMA project. It is recommended the team may also enlarge the scope to secondary resources from mine tailings and wastes to attract more case studies. The guidance materials available on the UNECE website (https://www.unece.org/energy/se/reserves.html) may be consulted, or the Expert Group on Resource Management Technical Advisory Group (reserves.energy@un.org) be consulted for assistance with the case studies. The team is complimented for the progress they have made.

Improvement of KDPs' applications and interaction with the RMIS and the GeoERA Information Platform: A report that describes how KDPs can and should deliver information to the RMIS, and include an examination of how the RMIS can utilise data on primary and secondary raw materials was prepared. The needs of the RMIS are considered in terms of the pre-computed views for the electronic mineral yearbook (e-MYB) and ProSUM e-stat module. The report also describes how the RMIS could carry out thematic searches within non-structured knowledge. The report recommends that dedicated APIs are developed to provide a link between the different platforms and the RMIS. Recommendations for integration of result into the GeoERA Information Platform was completed. Specification of steps needed for the integration of the e-Minerals Yearbook in the Minerals4EU database was finalised.

The team is also recommended to have a look at WP 4 on UNFC case studies and how the data integration and harmonization could be achieved seamlessly. The team is acknowledged for its excellent work.

In summary, the project is progressing very well, and all team members are congratulated for their efforts. Given the COVID-19 situation, the team is also suggested to have a special report on the critical materials essential for health care, such as drugs, equipment, PEEs and laboratory supplies. The team is suggested to publish the achievements in reputed journals and conferences.

Stakeholder Mr Thomas Crafford participated at the review meeting and provided recommendations for the projects. Due to personal reasons, he wishes not to participate further in the GeoERA monitoring and evaluation process. The “date of approval” of this document is therefore NA.

Annex 1: Review meeting list of participants

Name	Role	Organisation
Tessa Witteman	GeoERA coordinator	Netherlands Organisation for Applied Scientific Research
Barbara Simić	Monitoring and Reporting Officer	Geological Survey of Slovenia
Jasna Šinigoj	Scientific Reviewer	Geological Survey of Slovenia
Tina Zajc Benda	Scientific Reviewer	Geological Survey of Slovenia
Antje Wittenberg	Raw Materials Theme Coordinator	Federal Institute for Geosciences and Natural Resources, Germany
Tom Crafford	GeoERA Stakeholder council member	US Geological Survey
Harikrishnan Tulsidas	GeoERA Stakeholder council member	UN Economic Commission for Europe
David Whitehead	Project manager	Geological Survey of Denmark and Greenland
Lisbeth Flindt Jørgensen	Project member	Geological Survey of Denmark and Greenland
Mikael Pedersen	Project member	Geological Survey of Denmark and Greenland
Jørgen Tulstrup	Project member	Geological Survey of Denmark and Greenland
Teresa J. Brown	Project member	British Geological Survey
Špela Kumelj	Project member	Geological Survey of Slovenia
Kari Aslaksen Aasly	Project member	Geological Survey of Norway
Ulrich Clain	Project member	French Geological Survey
Marc Urvois	Project member	French Geological Survey

Annex 2: Communication and dissemination activities

Please select activity	Subcategory	Date	Target audience	Number of people reached	Short name of project participant	Author(s)	What	Where	Link (if applicable)
EVENTS	CONFERENCE (tele-conference)	2-4 July 2018	GENERAL PUBLIC	>150	All project partners	Špela Kumelj, Lisbeth Flindt Jørgensen	Poster	GeoERA Kick-off Meeting	
EVENTS	MEETINGS	7-8 Nov. 2018	SCIENTIFIC COMMUNITY	>30	GeoZS	Špela Kumelj	Presentation	ORAMA 2nd Project Progress Meeting	
EVENTS	CONFERENCE (tele-conference)	16 Nov. 2018	POLICY MAKERS		NGU	Kari Aslaksen Aasly	Presentation	Raw Materials Week 2018	
EVENTS	CONFERENCE (tele-conference)	12 Nov. 2018	POLICY MAKERS		GeoZS	Jasna Sinigoj	Poster	Raw Materials Week 2018	
EVENTS	WORKSHOP	19 Feb. 2019	EU INSTITUTION	>25	GeoZS	Špela Kumelj	Presentation	RESEERVE workshop	
EVENTS	WORKSHOP	13 June 2019	SCIENTIFIC COMMUNITY		NGU	Henrik Schiellerup	Presentation	ORAMA & JRC RMIS Joint Workshop	
EVENTS	CONFERENCE (tele-conference)	23-25 Sept. 2019	SCIENTIFIC COMMUNITY	>100	BGR	Antje Wittemberg	Poster	GeoMünster conference	
EVENTS	SEMINAR	15 Nov. 2019	SCIENTIFIC COMMUNITY	>90	GeoZS	Špela Kumelj	Presentation	5th Slovenian INSPIRE day	
EVENTS	CONFERENCE (tele-conference)	22 Nov. 2019	POLICY MAKERS		BGR	Antje Wittemberg	Presentation	Raw Materials Week 2019	
EVENTS	CONFERENCE (tele-conference)	22 Nov. 2019	SCIENTIFIC COMMUNITY	>50	GEUS	Jørgen Tulstrup	Presentation	ORAMA event at Raw Materials Week 2019	
PUBLICATIONS	NON-SCIENTIFIC PUBLICATION	28 Sept. 2018	GENERAL PUBLIC	>500	GeoZS	Špela Kumelj, Jasna Sinigoj	Article (in Slovenian only)	Revija MINERAL	https://www.mineral-revija.si/1875/Geoloska-sluzba-za-Evropo-%28GeoERA%29
PUBLICATIONS	NON-SCIENTIFIC PUBLICATION	Oct. 2018	GENERAL PUBLIC	>500	GeoZS	Špela Kumelj, Jasna Sinigoj	Article (in Slovenian only)	Mineral Resources in Slovenia	https://www.mineral-revija.si/1875/Geoloska-sluzba-za-Evropo-%28GeoERA%30

Annex 2: Communication and dissemination activities

PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	Nov. 2019	GENERAL PUBLIC		All project partners	GEUS	Flyer	Raw Materals Week 2019	https://geoera.eu/projects/mintell4eu7/
MEETINGS	Internal project meeting	4 July 2018	SCIENTIFIC COMMUNITY	>30	All project partners	GEUS	Kick-off meeting/Project Assembly no. 1	GeoERA Kick-off Meeting	https://intranet2.geoera.eu/
MEETINGS	Internal project meeting	6-7 Nov. 2018	SCIENTIFIC COMMUNITY	10	All project partners	GEUS, GeoZS, NGU, BRGM	Inception workshop	GeoZS, Ljubljana, Slovenia	https://intranet2.geoera.eu/
MEETINGS	Meeting with international body	27-28 Nov. 2018	SCIENTIFIC COMMUNITY	>30	GEUS	Lisbeth Flindt Jørgensen	Presentation, discussions	MREG biannual meeting	-
MEETINGS	Meeting with international body	27-28 Nov. 2018	SCIENTIFIC COMMUNITY	>30	NGU	Henrik Schiellerup	Presentation, discussions	MREG biannual meeting	-
MEETINGS	Meeting with international body	14-15 May 2019	SCIENTIFIC COMMUNITY	>30	GEUS	Lisbeth Flindt Jørgensen	Presentation, discussions	MREG biannual meeting	-
MEETINGS	Meeting with international body	4-5 Nov. 2019	SCIENTIFIC COMMUNITY	>30	GEUS	Jørgen Tulstrup	Presentation, discussions	MREG biannual meeting	-
MEETINGS	Meeting with other GeoERA projects	17-18 Sep. 2019	SCIENTIFIC COMMUNITY	>30	GEUS & GeoZS	Lisbeth Flindt Jørgensen, Frands Schjøth, Špela Kumelj	Presentation, discussions	FRAME Workshop	
MEETINGS	Internal project meeting	16 Oct. 2019	SCIENTIFIC COMMUNITY	35	All project partners	GEUS	Project Assembly no. 2	GEUS, Copenhagen, Denmark	https://intranet2.geoera.eu/
MEETINGS	Internal project meeting	Every month	SCIENTIFIC COMMUNITY	>30	All project partners	GEUS	15 Project Board meetings	Webex meetings	https://intranet2.geoera.eu/