DELIVERABLE 3.6

Assessment of GEE Network Mapping Tool

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1. Introduction

With the focus of strengthening the international competitiveness, cooperation ability and joint business bidding activity of the Geo-Energy Europe (GEE) meta-cluster members, a cooperation database was developed in order to codify the skills, markets and relationship which exist between the meta-cluster SMEs.

This database platform named Geo-CoLab is a collaboration network mapping and analysis tool with the aim of keeping up-to-date the clusters and member SMEs general data and partnerships information on a permanent basis in the most practical and effective manner. The platform allows GEE meta-cluster members to identify partners, build capacity, initiate collaborations among GEE internal and external members, which would subserve strengthening the Europe-based geo-energy network, and would help to spread information world-wide with a continuously expanding set of necessary and important data of partnerships, global projects and external connections in the geothermal energy sector.

The primary goals of the developed platform are the following:

- Raising awareness about Geo-Energy Europe metacluster member activities;
- Supporting access to international markets by providing information on closed/on-going/planned project activities and results, especially towards European SMEs not yet involved global commerce and/or industry;
- Promoting the products and services of member SMEs, and increasing the visibility of GEE SMEs members and external partnerships, projects.

The Geo-CoLab Skills and Collaboration Network Mapping Tool was developed by CAPES, and was firstly and brielfly introduced to the consortium during the project meeting on November 25th 2021; after being tested was successfully launched to the GEE meta-cluster and its members during a webinar that took place on March 10th 2022.

The main results and statistics of the period between March 2022 and November 2022 were presented during the final GEE2 Meeting, organized and hosted by JESDER, in Turkey, Izmir, between 17/11–18/11/2022.

2. Provision of information

Ensuring that the Geo-CoLab network mapping tool was user-friendly and its software was appropriately handled by the meta-cluster members was two of the objectives taken into consideration by CAPES, the partner responsible for its creation, presentation and demonstrationof how to use the network mapping tool and to encourage SMEs members to use it and further develop the database by providing continuous relevant input.

Access credentials were given to the clusters, via cluster managers, and the tool itself was introduced between March – October 2022 following the timeline below.

	Target	Participation	Event	Dates
1. Internal	GEE partners and member SMEs	Cluster members, and SMEs, approx. 100 attendees	Training sessions (online events)	Chile – 08/03/2022 Canada – 04/05/2022 Kenya – 24/06/2022 Costa Rica – 07/10/2022
	GEE members, personal events	Approx. 30 attendees in total (consortium partners)	GEE meetings (Ireland, Turkey) (physical events)	Dublin – 20/10/2021 Izmir – 17/11/2022
2. External (International Target Markets)	Geothermal opportunities in EU countries as well as 3rd countries	Approx. 35 attendees in total (consortium partners, SMEs, and other participants)	Market visits (physical events)	Chile – 04/04–07/04/2022 Canada – 13/06–15/06/2022 Kenya – 12/07–17/07/2022

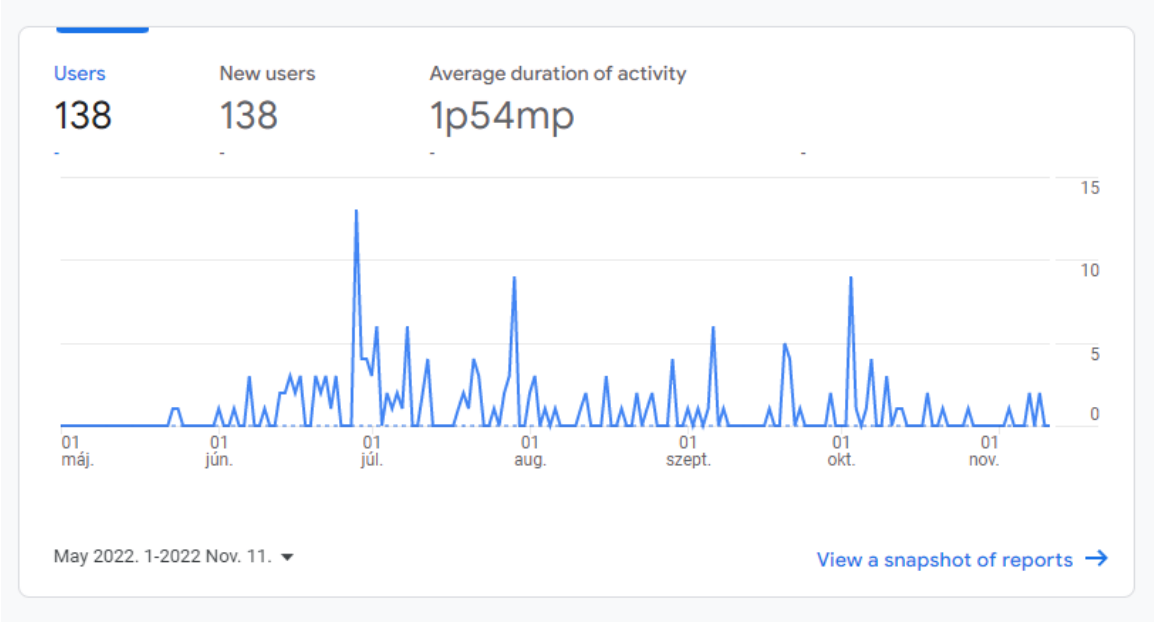
3. User Data Statistics

a) Map of demographic distribution of users after the launching of the platform (03/2022)
the data is based on IP addresses, representing location information (country/users).

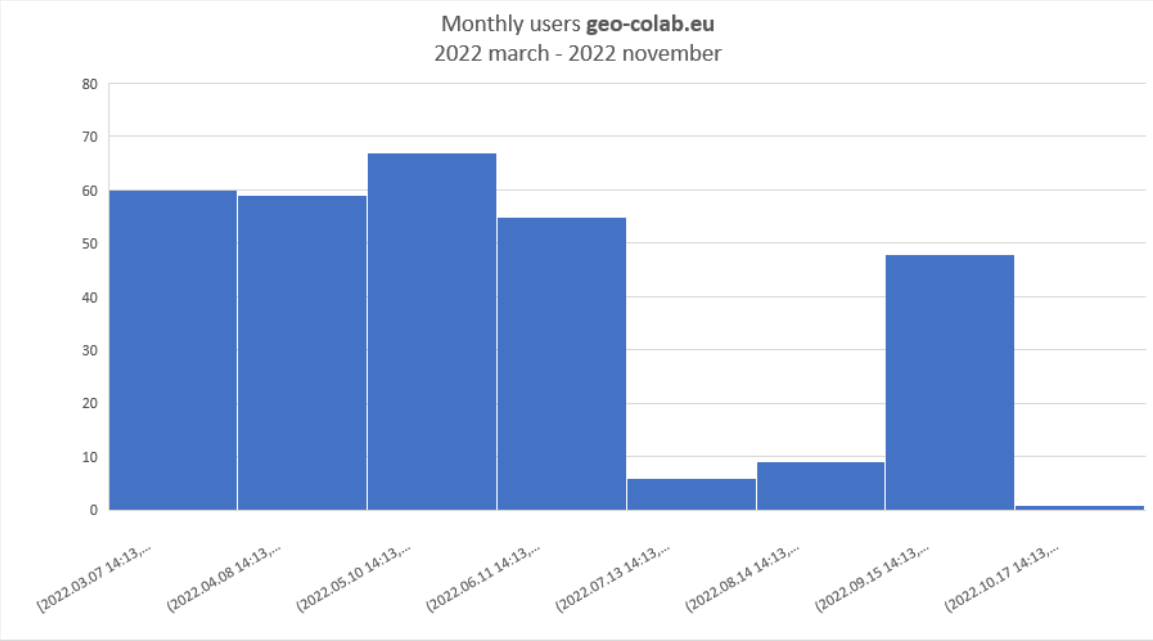
ORSZÁG	FELHASZNÁLÓK
United States	42
France	20
Turkey	13
Croatia	12
Italy	10
China	7
Netherlands	7

b) User log-in data from statistical background analytics performed between March2022 and November 2022)

Data according to Google Analytics statistics, namely user activity since May 2022:

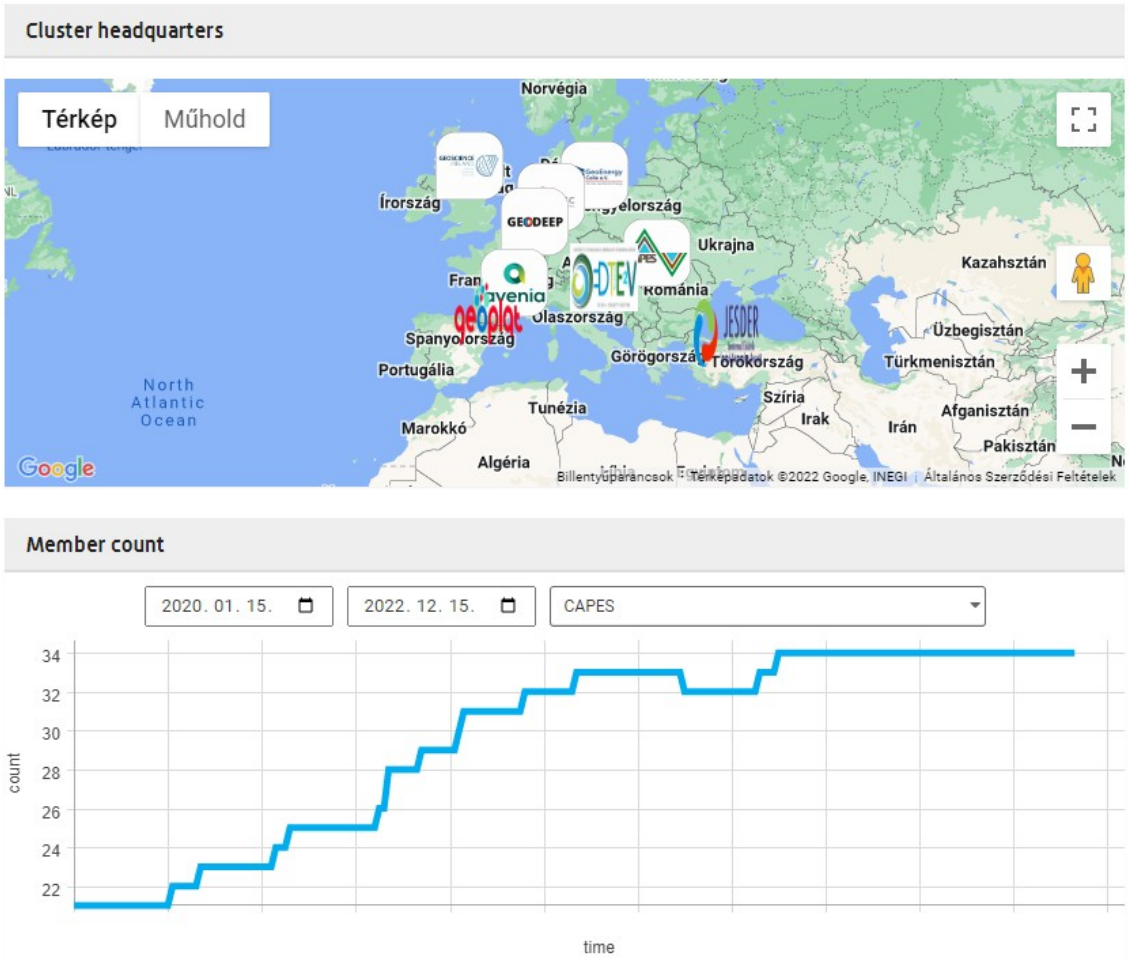


Obtained non-Google based statistics; the site opened under the new domain at the beginning of March 2022, the next graphic shows all the users who have entered and used the Geo-CoLab tool since then up to October 2022, in a monthly breakdown.



c) Geo-CoLab Statistics based on manual data input

In the case of CAPES cluster, the image below shows the updated increase of member SMEs for the last 3-year period. In the case of the rest consortium clusters, it is not possible to measure the increase due to missing data.



4. General Statistics

a) Changes in the meta-cluster between March 2022 and November 2022.
Overall evolution of GEE meta-cluster member & project data is shown in the table below.

General data	Change between 03/2022 – 11/2022 (%)
Total GEE members	**+2,19**
Total out of GEE companies	0
Total cooperations within GEE	-0,52*
Total cooperations out of GEE	-1,47*
Total projects	**+1,59**
Total projects participants	**+0,95**

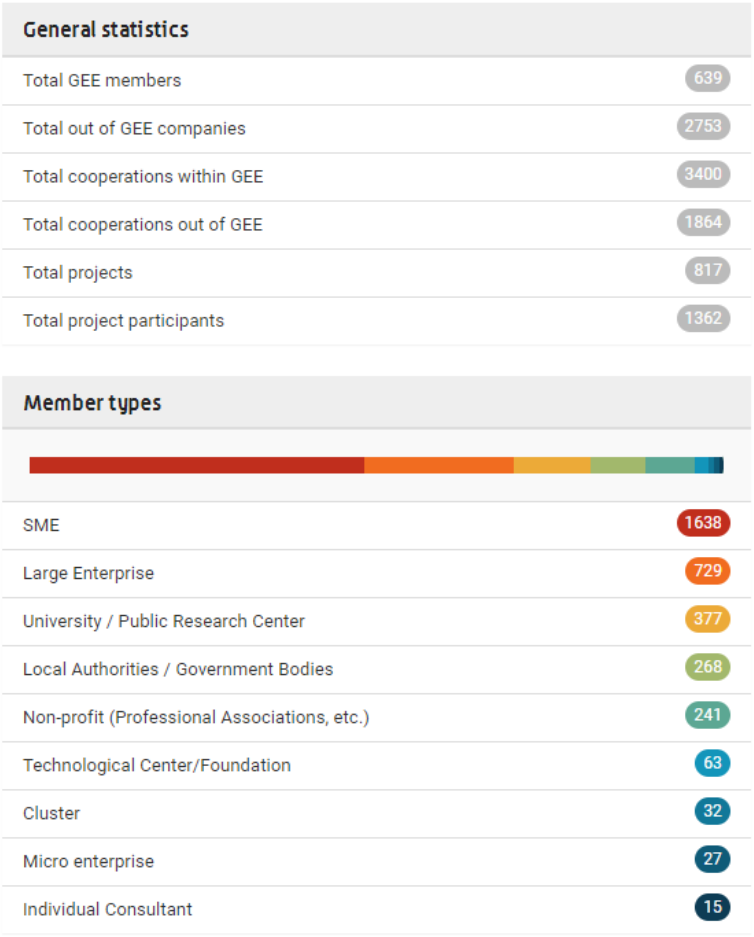
*Data probably a false negative; result based on data correction.

Overall evolution of members per type is shown in the table below.

Member types	Change between 03/2022 – 11/2022 (%)
SME	**+0,24**
Large Enterprise	**+1,23**
University/Public Research Center	0
Local Authorities / Government Bodies	0
Non-profit	0
Technological Center / Foundation	0
Cluster	0
Micro Enterprise	0
Individual Consultant	0

b) Quantification of GEE members based on the currently available data

The image below shows all the meta-clusters members per type of organisation as well as the overall picture of the meta-cluster composition.



General statistics	
Total GEE members	639
Total out of GEE companies	2753
Total cooperations within GEE	3400
Total cooperations out of GEE	1864
Total projects	817
Total project participants	1362

Member types	
SME	1638
Large Enterprise	729
University / Public Research Center	377
Local Authorities / Government Bodies	268
Non-profit (Professional Associations, etc.)	241
Technological Center/Foundation	63
Cluster	32
Micro enterprise	27
Individual Consultant	15

5. Business Results

The Geo-CoLab platform gave the GEE meta-cluster members the opportunity to plan the market visits to the four target countries (Canada, Chile, Costa Rica, and Kenya) in advance by searching for and contacting partners in the database. As a result, it was possible to contact in advance and meet with partners during the market visits, thanks to which several collaborations are under preparation and negotiation even after the oficial end of the project, e.g. agreements being negotiated after the Chilean market visit.

The Chilean market visit took place in the beginning of April 2022 in Santiago del Chile, where an introduction to the GEE2 project and meta-cluster and B2B meetings for the participants were organized by representatives from **CEGA** (Univ. Chile) and the **Geothermal Council of Chile** in collaboration with **GEODEEP** and **GeoScience Ireland**; it was considered a successful event on all sides and a steeping stone for future business agreements.

The representative of the **Chilean Ministry of Energy** responsible for geothermal affairs also took part in the opening round table discussion of the market visit. At the meeting, GEE was represented by the operational director of **Steam** (online), the owner and managing director of **GEOCHEM Ltd.** and president of **CAPES**, the consultant and part owner of **GTN**, the representative of **Geolith**, the representative of **GEOTER**, the president of **Halfway**, the vice-president and the cluster manager of **GEODEEP**, and the cluster manager of **COSVIG**. From Chile took part in the meeting: the representing of **CEGA**, the representing **ENEL**, and the representing **Transmark**.

The discussions and presentations were focused on the current utilization of Chile's geothermal potential and the possibility of connecting it to GEE2 project; also the topic of the role played by geothermal energy in lithium extraction was approached. The participants visited the **CEGA Laboratory**. In addition, there were several parallel business meetings with local representatives and representatives from the GEE clusters .

Similar to the experienced during the organisation of the Chilean market visit, the platform was also helpful when connecting local partners and institutes during the other international market visits.

On July 2022 took place the Kenyan market visit in parallel with the Kenya Geothermal Congress organized by KenGen and CDG, in Nairobi. On one hand, the conference aimed to show and promote the Kenyan market and its players, on other hand, it helped to place the GEE2 project and the meta-cluster among the services that can be offered in the fields of geothermal. The GEE2 project sponsored a booth at the conference where the clusters and their companies could present their services during the cluster's exhibition with posters and presentation materials. The booth was visited by **the Principal Secretary from the Ministry of Energy** and **the Principal Secretary from the Ministry of Petroleum and Mines.**

Other GEE meta-cluster members that attended the program: the representative of **Enertime**, the technical director of **IdroGeo**, a geothermal expert, the cluster manager of **Geosicence Ireland**, the cluster manager of **COSVIG**, the **Steam**'s Geoscience Manager, Steam's COO, and the vice-president of the **GEODEEP** cluster.

Intensive correspondence between the representatives with future agreements on the horizon has been discussed ever since.

In the case of Canada and Costa Rica, the Geo-CoLab platform was not used to search for potential contacts and start a previous networking work. In the case of Canada, deep geothermal energy exploration and use is still in its first stages and there are none to few companies focused on this area of geothermal energy. Regarding Costa Rica, the monopoly of the exploration of the

geothermal resources is with a state company, although the interest from the meta-cluster SMEs was high regarding this target country market, the possibility of negotiating and implementing business agreements is lower when compared with the other target countries.

Based on the defined filter categories of the Geo-CoLab tool, early defined by the consortium, the most searched and used data according to the system statistics can be divided in two diferent sections: (a) available capacity based on scope of activity, and (b) available capacity based on the position in the value chain. The tables below summarise the numbers in both sections.

a) Available capacity based on scope of activity

Scope of Activity	Availability (member/total)
Deep Geothermal	346/639
Shallow Geothermal	274/639
Deep and Shallow Geothermal	24/639
Upstream O&G	199/639
Geological Storage	143/639
Civil Engineering & Mining	154/639
Hydrogeology	139/639
Raw Material	11/639
Education & Training	9/639
Geothermal Research	4/639
Petroleum Research	3/639
R & D	25/639
Radioactive Waste Repository	4/639

b) Available capacity based on position in value chain

Position in Value Chain	Availability (member/total)
Research, Training & Education	127/639
Project Developer / Operator	117/639
Geoscience	113/639
Drilling	73/639
EPC	44/639
Production, Maintenance, Optimization	36/639
HSE	16/639
Manufacturing (Surface)	23/639
Manufacturing (Surface Installations)	43/639
Cross-sectional Services	108/639
Financing, Investment & Insurance	6/639
Power/District Heating Supplier	40/639
Power/Heat User/Client	4/639
Authority	9/639

6. Lessons Learned & Conclusions

The main focus and objective of the Geo-CoLab platform was achieved, its creation, implementation, presentation to the consortium and the meta-cluster members, and its use not only but mostly before the market visits to the target countries are indicators of such. After the GEE2 project has ended, the mapping and analyses of represented advanced skills in GEE meta-cluster will assist the competitive edge of the cluster members as well as enlarging it with members in the geothermal field.

During the second year of the project, the Geo-CoLab platform proved to be beneficial to the metacluster, namely by improving the efficiency of the internal capacity building through consolidated knowledge of the advanced skills, the joint business activity in national and international markets, and SMEs competitiveness.

The visibility gained by being in such a platform will assist SMEs in finding appropriate partner companies for more comprehensive business offers and also to become subcontractors for larger or global companies represented among the GEE members and acting on GEE's focused markets.

A future deep analyses of the collaboration network is needed to reveal areas where the GEE meta-cluster should make efforts to achieve sustainable competitiveness on focused international markets. The analyses will also assist in inviting new, potential partner clusters to GEE.

The creation of the Geo-CoLab and its use throughout the second year of the project allowed to increase and almost achieve the targeted key performance indicators defined in the Grant Agreement, namely the number of cooperation and business agreements, the number of SMEs that have directly or indirectly benefited from the project and the cluster benefits in terms of networking.