

GEB NEWSLETTER

Issue 4: June 2023

About GEB:

The GEB Project is supported by the Erasmus + Programme Key Action 2, Capacity Building in Higher Education, CBHE, to help reduce the lack of skilled engineers in geothermal engineering in Egypt, to unlock the potential of this clean and sustainable energy resource.

GEB Activities February 2023 to June 2023:

Different activities including seminars, webinars, and meetings have been accomplished during this period. Besides, several planned future trainings are designed to equip the Egyptian staff from the Egyptian partners with the skills and expertise needed to dive into the world of Geothermal Engineering. Each training is focused on an aspect that each university is renowned for, to all work together and nourishes this multi-disciplinary field of Geothermal Engineering giving it a chance to grow in Egypt.

Public Seminar on “GEB project and geothermal energy applications” – Feb 2023

Tuesday, 28 February witnessed the first GEB project public seminar "GEB Project and Geothermal Energy Applications" at Faculty of Engineering- Cairo university. The opening speech has been delivered by the Dean of Faculty of Engineering-Cairo University, Prof. Hossam El-Din Ahmed Abd EL-Fattah, presenting the project importance to Renewable Energy in Egypt and the objectives. Dr. Mohamed Mohy Elkarmoty (the project coordinator) presented the project status, the implemented activities, and the next steps. Moreover a number of sessions were delivered to discuss the utilization of geothermal energy applications delivered by the European partners: Prof. Manuel Chicote (University of Valladolid), Prof. Francesco Tinti (university of

Bologna) and Prof. Tomislav Kurevija (University of Zagreb). The Egyptian Partners from GANOPE team participated also in the seminar by delivering to the attendees Egypt 2030 vision and the governmental efforts to the utilization of geothermal energy. It is worth mentioning that professors, students, engineers and geologists from different universities, renewable energy, petroleum companies and authorities have attended this seminar.

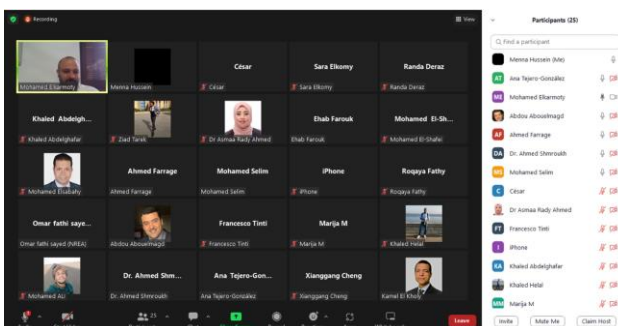


"GEB project and geothermal energy application" Seminar at Faculty of Engineering Club- Cairo University, 28 Feb 2023.

Geothermal Energy Capacity Building in Egypt

Public Webinar on the design of geothermal pilot plant for cooling at Cairo University - June 2023

The project partners have organized a public webinar on Thursday, 22 June on zoom platform under the title “The design of geothermal pilot plant for cooling at Cairo University” to present the construction of the first pilot plant at Faculty of Engineering- Cairo University, the educational pilot plant is one of the project’s outcomes which will be built to help in the teaching activities of the diploma., The opening speech has been delivered by Dr. Mohamed Mohy Elkarmoty "the project coordinator "presented the project status, the implemented activities, and the next steps, followed by Eng. Khaled Abdel-ghafar who delivered all the pilot plant implemented and on-going activities, moreover an open discussion among all the Egyptian and European partners have taken place to respond for any questions regarding the pilot plant specifically and the project generally.



“The design of geothermal pilot plant for cooling at Cairo University” Public Webinar, 22 June 2023.

Develop postgraduate program” Diploma” in Geothermal energy.

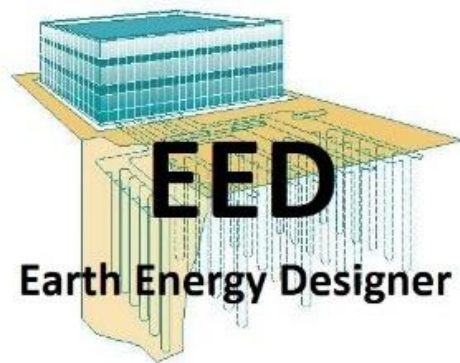
Development of the post graduate program in geothermal energy engineering is the main mile stone of the project. During the past duration, GEB partners constructed a solid structure of the diploma. Cairo University team submitted a request for the recognition of the new diploma, the request was accepted by Cairo University and approved by the supreme council of universities, Moreover, the upcoming duration should be for the preparation of the students enrollment since the project partners are expecting to start the first semester of the program in the next October 2023.

Educational Pilot Plant Activities Implementation

The educational geothermal pilot plant for cooling at Faculty of Engineering- Cairo University considered as one of the most important outcome of GEB Project, since it’s the first geothermal pilot plant in Egypt, which shall be used in both, the practical training of the diploma graduates and the dissemination of practical knowledge to local enterprises. The construction of the pilot plant requires specific equipment and software such as Water level meter and Thermost, which have been decided by the consortium. The water level meter, Thermal Conductivity Apparatus and many other equipment were required to measure the ground parameters at Faculty of Engineering- Cairo University before the start of the pilot plant design implementation, some of these equipment and software were purchased thanks to the project fund. A 40 meter depth borehole was drilled at the pilot plant purposed location at Faculty of Engineering- Cairo University to collect samples which have been used to determine ground parameters: Ground thermal conductivity, hydraulic conductivity, ground water table and ground temperature. Another purpose for the borehole was to get the location lithology as well for more understanding of the ground parameters. The European team, in cooperation with the Egyptian team could accordingly design the pilot system. The most worth mentioning is that

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there is a call for tender in progress to select a company to implement the pilot plant construction activities.



The pilot plant commercial design software (EED)

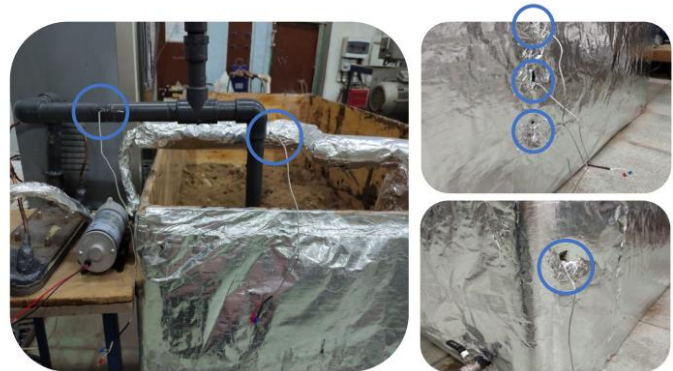


Exploration borehole at Faculty of Engineering- Cairo University

A graduation project thesis at Ain Shams University on a full lab-scale ground-source heat pump

The Ain Shams University's Energy Technology and Climate Change Laboratory hosted a graduation project for the year 2022: 2023 as a step for capacity building and preparing the graduate engineers for the utilization of geothermal energy in Egypt. The project objective was to study the potential of implementing sustainable air conditioning and cooling systems in Egypt using shallow geothermal energy technically, economically, and environmentally. During the project, different scenarios for providing the cooling loads by ground source heat pump had been studied either for one room or a floor at different

locations in Egypt. The modeling of the ground source heat exchanger was simulated using COMSOL software and a life cycle assessment was conducted using SimaPro software to examine the environmental impact of such a project. A prototype was held to simulate the actual exchange in the ground source heat pump and then the results were compared with the modeling. The results showed the environmental advantages of using a ground source heat pump in comparison with the traditional air-to-air heat pumps, the economic advantages appeared only on large-scale heat pumps.



Sensors placed at various points on the graduation project's prototype



Graduation project's prototype from different angles

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Advertising GEB

The project members have been keen on advertising the project to attract potential students, and to attract partners from the industry that are willing to adopt this technology and apply it commercially. This has been through the regular posts on the Facebook page (<https://www.facebook.com/gebproject>) that aim to increase people's knowledge and interest in Geothermal Energy and its potential as a clean and sustainable source of energy. Additionally, the participating institutions have mentioned the project and its potential on their respective websites, links to these websites can be found on the project website (<https://www.geb-project.info/pages/Partners>). The tools being developed for the project, such as the pilot plant and the lab-scale model, will also be a powerful tool in showing the potential stakeholders the power of Geothermal Energy.

Disclaimer

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