



GENIUS

DOCTORAL NETWORK ON
ENERGY GEOSTRUCTURES



Funded by
the European Union

Recruitment for 15 PhD Positions: GENIUS Doctoral Network on Energy Geostructures Integration: Buildings, Infrastructure and Underground Storage



genius-dn@ed.ac.uk

www.genius-dn.eu

[GENIUS - MSCA Doctoral Network: Overview | LinkedIn](#)



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Project Overview

GENIUS pioneers a comprehensive approach to address the biggest global challenge the energy sector is facing: the transition to renewable-based, energy-efficient heating and cooling systems. Space heating and cooling currently makes up the world's largest energy sector, accounting for approximately 50% of the final energy consumption. This figure is expected to grow rapidly over the coming decades due to economic and population growth, and inevitable increase in urbanisation. At the same time, the world is experiencing one of the most severe global energy crises in history, impacting the fossil fuels' availability and cost.

More than ever, there is an urgent need for innovative technologies to harvest renewable energy resources, to decrease our dependence on fossil fuels. Energy Geostructures (EGs) represent an effective means to meet the world request of less dependence on unsustainable resources by being designed as dual-purpose elements targeting geothermal heat exchange and structural support for buildings. Yet, their wider use has been hindered by the lack of (i) sustainable expertise pipeline in the field of energy geotechnology, (ii) technical knowledge regarding the integration of energy geostructures to buildings and infrastructure, (iii) scientific knowledge for the integration of energy geostructures with other underground structures. GENIUS will address all three challenges by developing advanced analysis and design tools for energy geostructures (WP-1) and by advancing practical and scientific knowledge for their integration with buildings, infrastructure and other energy resources (WP-2 and WP-3). Furthermore, the holistic approach of GENIUS will train the Doctoral Candidates to become pioneering experts in conceptualization, design and implementation of energy geostructure applications. Networking with their peers, industry and stakeholders will give them highly attractive skills for transforming their ideas to implementation.

Key Dates

Deadline for on-line applications:	30 November 2025
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Key Information

Eligibility

- Supported researchers **must not already in possession of a doctoral degree** at the date of the recruitment.
- Researchers who have successfully defended their doctoral thesis but **who have not yet formally been awarded the doctoral degree will not be considered eligible**.
- DC's **must be recruited and enrolled in a doctoral programme** leading to the award of a doctoral degree in at least one EU Member State or Horizon Europe Associated Country.
- Recruited **researchers can be of any nationality**.
- Recruited **researchers must comply with the mobility rule**:

They must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.



Compulsory national service, short stays such as holidays and time spent by the researcher as part of a procedure for obtaining refugee status under the Geneva Convention¹⁴⁰ are not taken into account.

English Language

Doctoral Candidate (DCs) must demonstrate that their ability to understand and express themselves in both written and spoken English is sufficiently high for them to derive the full benefit from the network training.

Exclusivity

The candidate must be working exclusively for the action.

Recruitment procedure

Recruitment will be carefully executed and monitored in accordance with the principles of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers and in the DN mobility rules. Following an open, transparent, merit-based, impartial and equitable recruitment procedure which are tailored to each DC offering.

The DC positions will be advertised until all positions are filled. All applications proceed through the central on-line recruitment site via the University of Edinburgh. Candidates apply electronically for one to a maximum of two positions and indicate their preference. All candidates must upload the following documentation:

- Degree Certificate(s) (and translations if not English)
- Transcript/interim transcript (and translation if not English)
- Syllabus/Course description (and translation if not English)
- Research Proposal (maximum 2 pages)
- CV
- English Language Certificate
- Reference contact information (references will only be contacted for shortlisted candidates)

During the application candidates must declare that they are eligible and meet the criteria mentioned under 'Eligibility' above.

To submit an application please follow this link: [GENIUS Doctoral Network PhD Application](#). Each application will be shortlisted by the relevant recruitment committee. The recruitment committees will bring together diverse expertise and competences, have an adequate gender balance, including members from different disciplines and including representatives from industry. All members are adequately trained.

Once shortlisted the selected candidates will be invited to an online interview with the relevant recruitment committee. The assessment will be done by the recruitment committee following a homogeneous assessment criteria based on each DC position.

All shortlisted, DC applicants will be notified regarding the success of their application. The selected DCs are to start their research as quickly as possible in line with the specific requirements of the hiring Institute's Human Resources department and in line with all provisions for VISA etc. All DCs must have started by 30 September 2026. Below you will see a full list of the 15 PhD positions that are open.



Applications are invited for 15 PhD positions (“Doctoral Candidates”, DCs) MSCA-DN 2024: GENIUS

Information relevant to all 15 PhD positions

Researcher Profile:	First Stage Researcher (R1)
Type of Contract:	Temporary Job
Status:	Full-time
Duration:	36 Months
Funding:	Horizon Europe (HORIZON) Marie Skłodowska-Curie Actions Doctoral Networks (MSCA-DN)
Marie Curie Grant Agreement Number:	101226708
Benefits:	Fully funded 3-year PhD position Tuition fees covered Travel and conference participation budget Access to state-of-the-art laboratories and computing facilities International and interdisciplinary research environment Secondment of 3 to 12 months to other network partners or associated partners
Is the Job related to staff position within a Research Infrastructure?	No

The Current PhD (DC) Positions

DC 1: Thermo-mechanical behaviour of EGs in challenging geological conditions.

Host Institution	University of Lille (France)
Main Supervisor	Hussein Mroueh (contact: hussein.mroueh@univ-lille.fr)
Aim	Investigate thermo-mechanical (TM) behaviour of EGs (like piles and EMPs) in challenging geological conditions such as quick clays and carbonates rocks (e.g., Chalk), for optimizing their design for production and storage.
Specific Objectives	(1) Conduct detailed geotechnical and thermal characterization of quick clays and chalk, Develop advanced numerical model. (2) Design and implement field and laboratory experiments for validation. (3) Assess the performance of EMPs in terms of efficiency, durability, and stability. (4) Develop practical design guidelines for the implementation of EGs in challenging geological conditions.



Secondment	- Norwegian University of Science and Technology (Norway) - AcessSQL Group (France) - Gustave Eiffel University (France)
Knowledge Skills and Experience	
Essential	- If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) - Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). - Must not be in possession of a doctoral degree on the recruitment date
Desirable	- The ideal candidate should possess a robust foundation in geotechnical engineering. Undergraduate/Master students in civil engineering / geotechnical and geological engineering / geothermal engineering are particularly welcome. Experience in numerical modelling (e.g. Finite Element Analysis Comsol, Plaxis, etc.) and foundation design is beneficial, but not mandatory for this position. - Other preferred requirements: - Proficiency in programming languages such as MATLAB, Python, or similar. - Ability to work both independently and collaboratively in a multidisciplinary research environment. - Physical and practical sense on experimental work, ability to follow an experimental setup and experimental program.

DC 2: Thermo-mechanical Analysis of EGs: Bridging the Gap in Soil-Structure Interface Behaviour.

Host Institution	University of Perugia (Italy)
Main Supervisor	Diana Salciarini (contact: diana.salciarini@unipg.it)
Aim	Develop and validate advanced constitutive models for the soil-structure interface behaviour in EGs, to understand their complex interactions under combined thermal and mechanical loads
Specific Objectives	(1) Design and implementation of accurate thermo-mechanical constitutive models for soil-structure interface. (2) Small scale laboratory tests to validate the developed models. (3) Employment of FEA software and high-performance computing for comprehensive numerical simulations.
Secondment	University Grenoble Alpes (France)
Knowledge Skills and Experience	
Essential	- If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) - Being able to provide proof of meeting the Mobility Rule (The candidate

	must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
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DC 3: Development of a numerical tool for geothermal performance of EGs.

Host Institution	University of Edinburgh (United Kingdom)
Main Supervisor	Melis Sutman (contact: melis.sutman@ed.ac.uk)
Aim	Operation of EGs leads to temperature variations and moisture migration within the neighbouring geological formations. This project aims to develop a numerical tool to model the long-term geothermal behaviour of EGs, considering these variations, to form a fundamental basis for WPs 2, 3.
Specific Objectives	(1) Conduct lab tests for the impact of environmental factor variations on thermal and hydraulic conductivity of geological formations. (2) Establish analytical models and calibrate by the laboratory test outcomes. (3) Develop a scaled-up model, using analytical models for material property assignment, for geothermal performance of EG.
Secondment	▪ University of Lille (France) ▪ TownRock Energy (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ Minimum entry qualification - an Honours degree at 2:1 or above (or International equivalent) in a relevant science or engineering discipline. ▪ An MSc/MEng degree or First class degree in any of the following: civil engineering, geotechnical engineering, engineering geology or any other closely related subjects. ▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ An MSc/MEng degree on shallow geothermal energy technologies or energy geostructures.

DC 4: Use of machine learning tools for estimating EGs performance.

Host Institution	University Grenoble Alpes (France)
Main Supervisor	Alice Di Donna (alice.di-donna@univ-grenoble-alpes.fr)
Aim	The aim of this project is to investigate the possibility to use machine learning techniques to predict the behaviour of EGs in terms of heat exchange and help in the optimisation of their functioning.



Specific Objectives	(1) Collect monitoring and numerical data on different EG types and different functioning scenarios (heating-cooling modes, different external and climatic conditions). (2) Define input and output parameters adapted for the evaluation of the heat exchange of EGs, and design a model based on artificial neural networks. Train models and check their performance on available data. (3) Use the models to predict the performance of EGs under different future scenarios (change in climatic conditions, temperature, activation modes, etc).
Secondment	▪ Politecnico di Torino (Italy) ▪ University of Lille (France)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ A good knowledge in design and basics of geotechnical engineering. ▪ A strong motivation for numerical modelling/analysis ▪ Appreciate coding and computational geomechanics

DC 5: Development of specific design tools or the design of EGs.

Host Institution	Politecnico di Torino (Italy)
Main Supervisor	Marco Barla (contact: marco.barla@polito.it)
Aim	Development of specific tools to support the designer of EGs by the implementation into a customized software that will provide a user-friendly interface and support for practitioners at the design analysis stage.
Specific Objectives	(1) Upgrading and generalisation of current preliminary design methods to account for more general conditions (geometry of the installation, thermo-hydro-geological and geothermal properties of the ground). (2) Implementation into a specifically developed software that allow the user for inputting all the needed parameters and obtaining a preliminary outcome of the EG installation (heat exchanged, sizing of the system, dimensioning of the heat pump). (3) Testing software against current design practice based on numerical modelling.
Secondment	▪ GeoSolving (Italy) ▪ University of Lille (France)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment

	(https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
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DC 6: Energy tunnels to reduce the costs of ventilation in tunnels.

Host Institution	University Grenoble Alpes (France)
Main Supervisor	Alice Di Donna (alice.di-donna@univ-grenoble-alpes.fr)
Aim	The objective of this project is to investigate the possibility to use energy tunnels to control the internal air temperature, thus limiting the ventilation costs. The solution is of interest for hot tunnels, such as deep mountain tunnels.
Specific Objectives	(1) Designing and installing an experimental site in which adapted energy segments will be implemented with monitoring system. Monitoring, analysing and interpreting the measurements obtained from the experimental site. (2) Developing a numerical model, to be validated against the monitoring data. (3) Cost-benefit analysis to assess competitiveness of the technology compared to standard ventilation systems
Secondment	▪ Politecnico di Torino (Italy) ▪ TELT: Tunnel Euralpin Lyon-Turin (France / Italy)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ A good knowledge in design and basics of geotechnical engineering. ▪ Proactive and motivated to take initiatives ▪ Good communications skills to interact with the engineering world for the installation of the experimental site

DC 7: Use of geothermal energy to prevent road icing and damage in cold climate areas.

Host Institution	Norwegian Institute of Science and Technology (NTNU)
Main Supervisor	Rao Martand Singh (contact: rao.m.singh@ntnu.no)



Aim	The main objective of this project is to investigate the possibility of using geothermal energy, coming from EGs close to the road, to limit or prevent icing and damage to roads.
Specific Objectives	(1) Identify different climatic areas relevant to the study and characterise weather conditions to be used as boundary and initial conditions in modelling. (2) Develop thermo-hydro-mechanical (THM) model considering the climatic conditions to investigate feasibility and efficiency of the EG technology. (3) Develop THM numerical model to investigate the road damage mitigation through the proposed EG based technology.
Secondment	▪ Norwegian Geotechnical Institute (Norway) ▪ University Grenoble Alpes (France)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in Norway for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date. ▪ Master's in Geotechnical Engineering with a grade of B or better in terms of NTNU's grading scale. ▪ Relevant experience in the field of thermo-hydro-mechanical (THM) behaviour of soils and/or Energy Geostructures (EGs).
Desirable	▪ Bachelor's in Civil Engineering with a grade of B or better in terms of NTNU's grading scale. ▪ Experience in analytical methods and numerical modelling. ▪ Proficiency in at least one programming language, e.g. C++, Python. ▪ Experience in geotechnical laboratory and field work. ▪ Highly motivated to do research. ▪ Challenges the status quo and takes new initiatives. ▪ Able to work with others in a team.

DC 8: Developing of EGs as retrofitting solution for existing buildings.

Host Institution	Norwegian Institute of Science and Technology (NTNU)
Main Supervisor	Rao Martand Singh (contact: rao.m.singh@ntnu.no)
Aim	The main objective is to investigate the conversion of micropile foundations into EGs to provide heating/cooling to existing buildings in dense urban areas.



Specific Objectives	(1) Reviewing the various existing micropiles solutions available in the market. (2) Numerical study of selected micropile products by employing heat exchangers. (3) Laboratory-scale trials to investigate the thermal efficiency and thermo- mechanical performance. (4) Field scale study of selected micropile designs under varying thermal and structural loads.
Secondment	▪ University of Lille (France) ▪ Keller (Norway)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in Norway for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date. ▪ Master's in Geotechnical Engineering with a grade of B or better in terms of NTNU's grading scale. ▪ Relevant experience in the field of thermo-hydro-mechanical (THM) behaviour of soils and/or Energy Geostructures (EGs).
Desirable	▪ Bachelor's in Civil Engineering with a grade of B or better in terms of NTNU's grading scale. ▪ Experience in geotechnical laboratory and field work. ▪ Experience in analytical methods and numerical modelling. ▪ Proficiency in at least one programming language, e.g. C++, Python ▪ Highly motivated to do research. ▪ Challenges the status quo and takes new initiatives. ▪ Able to work with others in a team.

DC – 9: Integration of low temperature thermal energy with district heating systems.

Host Institution	Politecnico di Torino (Italy)
Main Supervisor	Marco Barla (contact: marco.barla@polito.it)
Aim	The main objective is to investigate the integration of the heat produced by EGs into low temperature district heating systems.
Specific Objectives	(1) Assess the feasibility of integrating EGs with low temperature district heating system. (2) Analyse the potential of urban energy tunnels (and other EGs) for geothermal heat utilization urban areas. (3) Evaluate technological solutions for integration with existing building infrastructure. (4) Conduct feasibility studies for selected European cities.

Secondment	▪ IREN (Italy) ▪ University of Edinburgh (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date

DC 10: Geothermal extraction from flooded mine shafts for heating & cooling applications.

Host Institution	University of Derby (United Kingdom)
Main Supervisor	Christopher Sansom (contact: C.Sansom@derby.ac.uk)
Aim	The main objective is to evaluate the use of geothermally heated water in abandoned coal mines close to industrial or agricultural locations as a thermal store and as the base for water-source heat pumps.
Specific Objectives	(1) Identify mine shafts and industrial operations. (2) Identify the most appropriate AI technology to process the data Evaluation of thermal energy in flooded mines using appropriate modelling tools, based on location, water depth, water temperature and volumes. (3) Develop generic financial and feasibility criteria for future applications using an interactive database. (4) Develop a feasibility simulation model with parametric sensitivity analysis and risk assessment. Assess and validate the model on existing and future projects.
Secondment	▪ Bolsover District Council (United Kingdom) ▪ University of Edinburgh (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ An MSc/MEng degree on shallow geothermal energy technologies, energy geostructures, heat-pumps, heat networks, thermal modelling, intelligent data analytics, machine learning or AI, would be an advantage.

DC 11: Energy recovery from underground quarries during filling by geothermal energy storage.



Host Institution	University of Lille (France)
Main Supervisor	Hussein Mroueh (contact: hussein.mroueh@univ-lille.fr)
Aim	Numerous underground quarries have exploited the subsoil of Lille metropolitan area, mainly in the Chalk layer, at shallow depths, which threaten the stability of adjacent buildings and infrastructures. These cavities are generally filled by cement grout for stabilization depending on the urban needs. This PhD project aims to redefine the role of these underground spaces, transforming them into dual-purpose structures: safe and stabilised, but also serving as seasonal thermal energy storage (STES) systems. By combining geotechnical backfilling techniques with geothermal energy concepts, the project will explore how chalk quarries can be engineered to function as urban-scale heat reservoirs.
Specific Objectives	(1) Assess the thermal capacity of a backfilled cavity, using prototyping, physical and numerical modelling. (2) Perform short- and long-term risk analysis (backfill stability, environmental impact, influence of/on the water table). (3) Design the energy storage system, in particular the ground heat exchanger. (4) Instrument and monitor an in-situ installation in a cavity in terms of thermal exchange process.
Secondment	▪ Municipality of Lille (France) ▪ University of Edinburgh (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ The ideal candidate will hold a strong academic background in geotechnical, geological, and civil engineering, with prior training at MSc level (or equivalent). Candidates with expertise in geothermal engineering or related fields are also encouraged to apply. ▪ Other preferred requirements: • Familiarity with numerical modelling tools (e.g., Finite Element Analysis with COMSOL, Plaxis, or similar software). • Knowledge of programming languages such as MATLAB, Python, or equivalent. • Background or interest in foundation design, hydrogeology, or thermo-hydro-mechanical modelling. Ability to work independently while contributing effectively to a multidisciplinary, international research team.

DC 12: Agrifood business parks: geothermal integration with low carbon technologies.

Host Institution	University of Derby (United Kingdom)
Main Supervisor	Christopher Sansom (contact: C.Sansom@derby.ac.uk)
Aim	This project explores the potential for geothermal heating and cooling in an industrial agrifoods business park setting and its integration within a low-carbon heat and power network.
Specific Objectives	(1) Evaluation and characterization of the Case Study site. Enhancing geothermal exploration capabilities and scientific knowledge by developing comprehensive multidimensional geological and hydrogeological models. (2) Thermal analysis of the Case Study Agritech Park, heating and cooling demands. (3) Application of high temperature heat pumps, their utilization and integration with the site DHN. (4) Feasibility study of the integration of geothermal technologies within a low- carbon heat and power network on the Case Study site.
Secondment	▪ Smart Parc (United Kingdom) ▪ University of Edinburgh (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ An MSc/MEng degree on shallow geothermal energy technologies, energy geostructures & Integrated Technologies, heat-pumps, heat networks, thermal modelling, or heat grids/networks would be an advantage.

DC 13: Innovative Applications of EGs in Densely Urbanized Areas: study of their potentiality in Mitigating Subsurface Urban Heat Islands.

Host Institution	University of Perugia (Italy)
Main Supervisor	Diana Salciarini (contact: diana.salciarini@unipg.it)
Aim	The main objective is to examine the role of EGs in mitigating underground urban climate changes (Subsurface Urban Heat Islands – SUHI), enhancing the understanding and practical implementation of EGs for sustainable energy management and climate change mitigation.
Specific Objectives	(1) Development and validation of advanced numerical models to simulate the behaviour of EGs in various scales. (2) Integration of advanced constitutive models to describe the interactions between ground and EGs accurately. (3) Assessment the effectiveness of EGs in mitigating subsurface urban heat



	islands (SUHIs) and their potential for District Heating and Cooling networks.
Secondment	▪ GEOEG (Switzerland)
Knowledge Skills and Experience	
Essential	▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date

DC 14: Performance of EGs connected to small grids for industrial waste heat storage.

Host Institution	University of Edinburgh (United Kingdom)
Main Supervisor	Melis Sutman (melis.sutman@ed.ac.uk)
Aim	Heat demand and supply are usually not synchronised. Innovative technologies to store the heat are required to balance supply and demand over different timeframes and locations. This project aims to develop a numerical tool to model the performance of EGs connected to small grids for waste heat storage.
Specific Objectives	(1) Develop a TH model to analyse the geothermal performance of EGs for thermal energy storage. (2) Idealize the small grid operation (waste heat supply, demand and GSHP) and associate to the TH model. (3) Establish a database of waste heat potential from industrial sectors, demand from residential and commercial buildings. (4) Exploit the validated model to evaluate the thermal storage/supply potential of EGs connected to small grids.
Secondment	▪ British Geological Survey (United Kingdom) ▪ University of Derby (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ Minimum entry qualification - an Honours degree at 2:1 or above (or International equivalent) in a relevant science or engineering discipline. ▪ An MSc/MEng degree or First class degree in any of the following: civil engineering, geotechnical engineering, engineering geology or any other closely related subjects. ▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment



	(https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ An MSc/MEng degree on shallow geothermal energy technologies or energy geostructures.

DC 15: Bringing abandoned coal mines back to life for heat decarbonization

Host Institution	University of Edinburgh (United Kingdom)
Main Supervisor	Melis Sutman (melis.sutman@ed.ac.uk)
Aim	Massive underground voids imply substantial thermal storage potential. Appropriate management of waste heat injection and absorption through their repurposing can deliver an inexhaustible heat supply. This project aims to unlock the energy performance of abandoned mines during their re-use for heat storage and exchange purposes.
Specific Objectives	(1) Develop an exploratory thermo-hydro-geological (THG) model for abandoned coal mines. (2) Validate the model using existing datasets and case studies. (3) Perform long-term energy performance and optimization analysis using the validated model varying geological conditions, mine size, operation type, heat exchange level, waste heat supply/demand schedule.
Secondment	▪ British Geological Survey (United Kingdom) ▪ TownRock Energy (United Kingdom) ▪ University of Derby (United Kingdom)
Knowledge Skills and Experience	
Essential	▪ Minimum entry qualification - an Honours degree at 2:1 or above (or International equivalent) in a relevant science or engineering discipline. ▪ An MSc/MEng degree or First class degree in any of the following: civil engineering, geotechnical engineering, engineering geology or any other closely related subjects. ▪ If non-native speaker, being able to provide proof of English proficiency at the time of appointment (https://www.ed.ac.uk/studying/international/english) ▪ Being able to provide proof of meeting the Mobility Rule (The candidate must not have resided or carried out their main activity—work, studies, etc.—in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date). ▪ Must not be in possession of a doctoral degree on the recruitment date
Desirable	▪ An MSc/MEng degree on shallow geothermal energy technologies or mine water geothermal energy

Contact

For further information, please either contact the main supervisor listed above or email our central email: genius-dn@ed.ac.uk

Disclaimer



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