

Faculty of Science and Engineering

Profile report: Geo Energy

Level: Associate or Full Professor (“UHD”, “Hoogleraar 2”)

FTE: 1.0

1. Scientific Discipline

Earth Sciences, focusing on energy carriers and materials.

2. Vacancy

The position is opened by the Board of the Faculty (ref. xxx) and will be embedded within the Energy and Sustainability Research Institute Groningen (ESRIG) of the Faculty of Science and Engineering (FSE) of the University of Groningen (RUG). The position falls within the framework of ‘Career Paths in Science 4’ (‘Bèta’s in Banen 4’). Please see link for [criteria and conditions](#).

3. Selection Committee

Prof. H.A.J. Meijer

Dr. E.J. Stamhuis

Ms. Prof. M.A. van den Broek

Ms. Prof. A.G.J. Buma

dr.ir. E.W. Meijles (tbc)

Prof. J.D. Jansen

N.N.

Ms. A.M. van der Woude

Director of ESRIG and professor Isotope Research (chair)

Programme director of the master Energy and Environmental Sciences and associate professor at OE, base unit of ESRIG

Associate professor at IVEM, base unit of ESRIG

Chair of Ocean Ecosystems, base unit of ESRIG

Faculty of Spatial Sciences

Faculty of Civil Engineering and Geosciences TU Delft

Student Energy and Environmental Sciences

HR advisor

4. Research Area

Keyword for the area of research is "Energy Transition": the road that inevitably has to be taken in the coming decades from the present era of fossil fuels into a future of renewable energy.

The research themes of the present Geo-Energy group are aimed at optimizing the exploration and production of fossil fuels and the search for new, renewable energy sources. This GE research is primarily focused on the Netherlands with its declining gas reserves and its “induced seismicity” (earthquake) problems associated with gas extraction. In the specific case of the tremors in the Groningen gasfield, a dedicated GE study subject is formed by the analysis of the effect of shallow soil composition on ground accelerations. This links directly to the activities in the region related to strengthening of building constructions.

Safe subsurface storage of CO₂ (CCS) is important in the transition towards renewable energy. The investigation of long-term post-injection behaviour of reservoir and seal lithologies is location-specific and essential to be able to warrant the absence of leakage. In this context long-term lab experiments have been carried out with interaction between rock samples and supercritical CO₂. The development of new energy-sources in the subsurface such as geothermal energy, heat/cold storage and in addition electrolysis at fresh/salt water transitions offers the opportunity to provide our country with sustainable energy. Yet, the core topic for research is whether such applications can be scaled up to levels which are economically attractive.

A new avenue to be explored, on a global scale, is the proliferation of mineral components which are a necessity for the transition towards new energy sources and storage facilities. Examples in this context are lithium for batteries or neodymium for magnets in windturbines. In cross fertilization with new metallurgical purification techniques, geological knowledge is key in determining provenance, reserve estimates and technical/economic recovery of these resources.

Finally, geoscientific research focuses on how we can meet the challenges around sustainable exploitation of the subsurface with simultaneous and multiple forms of energy extraction and storage in a densely populated country like the Netherlands.

5. Embedding: ESRIG (Geo Energy)

Energy and sustainability are two of the key focus areas of the Groningen University. Within the Faculty of Science and Engineering the Energy and Sustainability Research Institute Groningen (ESRIG) research institute covers the Energy and Sustainability themes. This growing institute comprises of 5 groups (“base units”) with a total of over 100 staff. These groups are, next to Geo-Energy, Ocean Ecosystems (oceanic carbon cycle, biomimetics), Centre for Isotope Research (atmospheric greenhouse gases, radiocarbon), Energy Conversion (both fuel cells and combustion studies in flames), and the combination IVEM-Science and Society Group (energy transition, analysis and modelling of energy and resource systems and the relation between science and society). With the other groups, Geo Energy plays an important role in the master program Energy and Environmental Sciences. This master within the Faculty of Science and Engineering is the only master program within the university that clearly addresses two of the key foci of the university (“Energy” and “Sustainable Society”).

6. Local and (inter)national position

Geo Energy has a strong track record in co-operation with groups from other faculties, such as energy law, energy economics, engineering and social psychology. This is borne from the fact that subsurface activities, though not new in the Netherlands and Western Europe, are under increasing scrutiny from the general public and are subject to new legal regulations, economic criteria and technological challenges. For the latter, cooperation with other, engineering-oriented groups within the Faculty is expected.

In 2012 the Energy Academy Europe, now the New Energy Coalition (NEC) was launched in Groningen. In this organisation the UG collaborates with the Hanzehogeschool Groningen (University of Applied Sciences, offering professional education), provincial and municipal authorities and energy companies to establish a firm base for high-level interdisciplinary energy education and research. NEC has developed into a knowledge and network organization, driving innovation and education by bringing together knowledge, policy and entrepreneurship.

Because of the overlap in aims and research themes, collaboration with the NEC will lead to mutual benefits. Knowledge of the subsurface is essential in many projects governed by NEC, in both research and teaching activities. In turn, the NEC provides a high-profile environment with significant international visibility. Its partnerships with businesses, governments and NGOs form a valuable interface and enable innovative forms of collaborations for knowledge production and circulation.

At the national level, Geo Energy at the UG is a member of AardNed, the recently founded collaboration network on research and education of all earth science groups from the Dutch universities and three other organisations. Collaboration in this network is key to success. Participation, through a successful grant, in the long-term research programme DeepNL by the Dutch Research Council NWO) is of high importance. DeepNL will address the scientific questions concerning subsidence, induced seismicity and the integrity of the subterranean system.

7. Expected contribution to Research

The candidate is expected to have a broad overview over the earth scientific field and associated methodologies, and will focus on the energy aspects of long term sustainability. Such an approach enables thorough and constructive analyses of existing and proposed energy sources, including

- developing approaches for safe and economic development of subsurface resources

- analysing the dynamics of energy and material (mineral) resources
- describing economic and social feasibility of geo energy solutions
- staying abreast of earth science innovations in the field of energy

The candidate should focus on local, national and international collaboration. Alignment of the programme with the other research groups in ESRIG, other institutes of the faculty (most prominently the Engineering and Technology Institute ENTEG), other faculties of the RUG, and the New Energy Coalition will thus be key to growth and international reputation. The programme should mainly be based on extramural funding.

Whether the existing research lines of the present group (CCS, induced seismicity, geothermal energy, all focussed on the region) will be continued, or other research lines (for example scarcity of minerals world-wide) are chosen is up to the candidate, as long as the research is internationally competitive and addresses the energy transition within its societal context, using fundamental geological principles.

The candidate's efforts will lead to world class, original contributions for these lines of research, and preferably also have societal impact ("outreach").

8. Expected contributions to teaching

Teaching is a very important part of the candidate's tasks. The candidate will lecture in the teaching programmes within the faculty (Bachelor- and Master levels), and contribute to Ph.D. student educational programs. The candidate will contribute to a series of bachelor programmes with substantial energy-related elements, most of all the course "geo-energy" for the "energy and environment" track in the Physics Bachelor's degree programme. In the Master Phase, the candidate will be mainly involved in the Energy and Environmental Science Master's degree programme (which is largely supported by ESRIG staff). This includes the supervision of master students during their final research.

Other roles can be in the intra-university minor programme Future Planet Innovation, and/or in the university-wide minor programme "Energy". Depending on the background and interests of the candidate, contributions to one of the disciplines in the faculty is also possible.

The successful candidate will supervise Ph.D. students and act as Ph.D. advisor ("promotor").

Furthermore, within the NEC framework, the candidate will contribute to courses and to the development of NEC programmes.

9. Expected contributions to the organisation

Next to leading the research group, the candidate is expected to have an active interest and to provide a positive contribution to the management and organizational tasks of the institute. At the level of the Faculty of Science and Engineering, the candidate will contribute to the organization of the faculty, for example by participating in working groups and committees, in the fields of teaching, research and management. The candidate will participate in relevant national and international organizations. Furthermore, a prominent role is foreseen in connection with the university-wide "Energy" theme, and, last but not least, in the NEC.

Associate or Full professor in Geo Energy (1.0 fte)

Organisation

The University of Groningen is a research university with a global outlook, deeply rooted in Groningen, City of Talent. Quality has been our top priority for over four hundred years, and with success: the University is currently in or around the top 100 on several influential ranking lists.

The Faculty of Science and Engineering (FSE) is the largest faculty within the University. We offer first-rate education and research in a wide range of science and engineering disciplines, from classical disciplines such as mathematics, physics and mechanical engineering, to interdisciplinary fields such as artificial intelligence and energy and environmental sciences. Our community has an open and informal character with students and staff from around the world.

The position we offer will be embedded in the Energy and Sustainability Research Institute Groningen (ESRIG). This growing institute comprises of 5 groups (“base units”) with a total of over 100 staff. Research in the institute varies from experimental laboratory and field studies to model studies and research into the interaction between scientific knowledge and society. Key words are Energy Systems, “circular resource” systems and Carbon Cycle and Climate.

Job description

We are looking for an associate or full professor in Geo Energy in the Energy and Sustainability Research Institute Groningen (ESRIG). The candidate will chair the Geo Energy (GE) group within ESRIG. The research of the GE group is primarily focused on the Netherlands with its declining gas reserves, its “induced seismicity” (earthquake) problems associated with gas extraction, and increasing population and energy needs.

Research subjects include (the interplay between) safe subsurface storage of CO₂ (CCS) and induced seismicity problems, geothermal energy exploitation and other avenues of new energy sources. All of these national/regional subjects must be studied in close view of both economical and social feasibility. Furthermore, the focus is on how sustainable exploitation of the subsurface with simultaneous and multiple forms of energy extraction and storage in a densely populated country like the Netherlands must be organised.

On a global scale, a new avenue to be explored is the proliferation of mineral components which are a necessity for the transition towards new energy sources and storage facilities. Here a close interaction is possible with LCA and “circular economy” specialists elsewhere in ESRIG.

As Associate/Full Professor you will:

- develop a strong research group that contributes to the profile of your research institute
- supervise PhD students and post-docs
- acquire substantial research funds from external sources
- promote the societal relevance of your research
- teach in and contribute to the development of the degree programme Energy and Environmental Sciences Master
- contribute to the organization of the faculty, for example by participating in working groups and committees, in the fields of teaching, research and management

Nominally 40% of your time is for research, 40% for teaching activities and 20% for organizational tasks.

When hired, you will be expected to submit a proposal for the “DeepNL” program of the Dutch Research Council (NWO).

Qualifications

We encourage you to apply if you have:

- a PhD degree in earth sciences
- at least two years of academic experience outside of the Netherlands, preferably in a different country than where you received your PhD, and an extensive international network

- excellent research qualities, as shown by a publication record in international peer-reviewed journals and proceedings of renowned conferences
- independently supervised PhD students
- proven leadership qualities and demonstrable organizational competences
- received substantial research grants from external sources
- a good track record in teaching and in curriculum development
- experience and affinity for working in an interdisciplinary setting
- demonstrable organizational competences
- cross-cultural sensitivity
- good command of spoken and written English

And you are:

- a clearly visible expert in your field
- an inspiring leader who stimulates his or her group members to get the best out of themselves
- a team player with good communication skills
- able to highlight the societal relevance of your research
- in possession of or willing to obtain a University Teaching Qualification (Dutch: BKO) within three years
- able to speak the Dutch language or motivated to learn it within five years

Depending on your experience, you can be offered either a position on the level of Associate or Full Professor. You may indicate in your application what to your opinion the desired/expected level is.

Conditions of employment:

We offer you a full-time tenured position as either Associate Professor or Full Professor and:

- a salary, dependent on qualifications and work experience, from XXX up to a maximum of XXX gross per month (scale 13 or 14 CAO Dutch Universities) for a full-time position as Associate professor, or from XXX up to a maximum of XXX gross per month (scale yy or zz CAO Dutch Universities) for a full-time position as Full professor
- holiday allowance and end-of-year bonus of respectively 8% and 8.3% of your yearly salary;
- a pension scheme
- maternity and parental leave
- the possibility to work part-time (0,9fte or 0,8fte)
- a mentor program and a broad range of opportunities for personal development
- dual career support for partners of new faculty members moving to Groningen

Consider our website for more information about the working conditions at the University of Groningen:
<https://www.rug.nl/about-us/work-with-us/that-is-why/>

As Associate Professor, you will enroll in our faculty's tenure track system *Career Paths in Science*. This means that you will be assessed for promotion to the position of Full Professor after 4-7 years. This moment may be extended with at most one year in case of a life event (*e.g.* prolonged illness or maternity leave). Please consider *Career Paths in Science* for a complete description of our tenure track system as well as the criteria for promotion:

<https://www.rug.nl/fse/organization/vacatures/vacatures/career-paths-in-science-edition-4>

Application

We invite you to submit a complete application including:

- a cover letter in which you describe your motivation and qualifications for the position
- a curriculum vitae, including a list of your publications
- a list of five self-selected 'best papers'
- a statement of your teaching goals and experience
- a description of your scientific interest and plans

- a list with names of references

Please send your application by clicking on "Apply" below the advertisement on the website of the university. The deadline for applications for this position is 9am CET on [date].

The selection interviews will take place [in the week of/on] [date (xx-Month-Year)].

The University of Groningen is an equal opportunity employer and we value diversity at our organization. We do not discriminate on the basis of ethnicity, religion, national origin, gender, sexual orientation, age, marital status or disability status. Our selection procedure follows the guidelines of the NVP Recruitment Code and the European Code of Conduct for recruitment of researchers from the European Commission.

Information

For information about the position you can contact:

- Prof. H.A.J. (Harro) Meijer, h.a.j.meijer@rug.nl

(telephone secretariat: +31503634760)

Please do not use these e-mail address(es) for applications.

Additional information

- Profile report in which the position is described in more detail: [link]
- More information about the research institute: <https://www.rug.nl/research/esrig/>
- More information about the employment conditions of the University of Groningen: <https://www.rug.nl/about-us/work-with-us/that-is-why/>
- Career Paths in Science: <https://www.rug.nl/fse/organization/vacatures/vacatures/career-paths-in-science-edition-4>
- [add additional sources if you want]