

SAGES Innovation Programme

Job Title: HyNTS FutureGrid Policy Placement

Organisation: National Grid Gas Plc.

Duration: 3-6 months, part-time (flexible to fit around academic commitments)

Start date: April/May 2023 (tbc)

Remuneration: University of Edinburgh Grade 06

Travel costs: supported by SAGES (receipted travel and necessary overnight stays)

Hydrogen pipeline transport by repurposing natural gas transmission networks, an independent review of technology and policy

Summary

SAGES are offering a unique opportunity for a short-term policy placement in the HyNTS FutureGrid collaboration led by National Grid. The HyNTS FutureGrid is a £10M research collaboration which aims to understand how transmission assets in the UK could be used to transport hydrogen in the future to heat homes and deliver green energy to industry. The project will utilize published work and instrumented experiments at a new full-size engineered pipeline test facility in the established Spadeadam test site. This is led by National Grid with project partners, DNV GL, HSE, Northern Gas Networks (NGN), Fluxys and Universities of Durham and Edinburgh. Given the UK's commitments to Net Zero by 2050 and its ambitions regarding decarbonisation, hydrogen is an increasingly relevant technology. There are potential hazards associated with the repurposing of existing NTS infrastructure to carry hydrogen. A central aim of this placement is to work with the National Grid team to understand the hardware, operational, ownership, and regulatory changes required to repurpose and operate present day high pressure natural gas transmission pipes to carry hydrogen blends and pure hydrogen. The placement could, for example, transfer learning from existing and previous projects such as, ORCA HUB and SGN H100, around certification requirements. Ownership of gases, blended gases, hardware, service quality, liability, and grid storage of hydrogen all need to be tested against UK policy and regulations, as well as compared to EU connections through the wider hydrogen spine networks of import/export. Monitoring of pipeline and equipment performance could be based on a system of continuous low cost monitoring and surveillance. To ensure that potential hazards are recognised and processes managed to mitigate against them this work could draw upon state-of-the-art thinking in environmental risk and regulation where Edinburgh has already translated laboratory investigations by consultants into practical operational and safety criteria, and has examined the fit of hydrogen systems to the present Gas Act regulatory framework. The project will produce a series of short reports to identify available pathways enabling a transition from natural gas to hydrogen, and to identify technical or policy and regulation barriers which can be tackled using this Spadeadam facility.

Job Description

Since around 2018, in partnership with Scottish Gas Networks (SGN), Edinburgh has been undertaking a substantial review of NIA funded research into the ability of the gas network system to carry hydrogen. Delivery of the H100 NIA Academic Review project, funded through the NIA the Ofgem Network Innovation Allowance (NIA), has allowed SGN to explore options to convert from carrying methane, to carrying hydrogen. This work required assessments of every large and small component of the gas network system.

Previously SGN has commissioned a number of external consultants to examine and test critical aspects of their delivery system. SGN wanted to make sure these reports provided a credible evidence base before embarking on expensive pilot tests. Under the H100 project Edinburgh reviewed the various hydrogen reports and subjected each to scrutiny which evaluated and critiqued claims to academic verification/validation. Where appropriate, publications were submitted to peer reviewed academic journals and trade journals.

We now have a funded placement opportunity for 3 to 6 months to undertake a literature reviews to link H100 activities with FutureGrid/H21 (and other hydrogen pilots) to identify knowledge gaps, prevent duplication and develop crucial interfaces. The work would likely consist of a series of short literature review across the UK gas transmission and distribution industries and include information from international studies.

HyNTS FutureGrid

The FutureGrid hydrogen research facility at Spadeadam is a (first of its kind) offline hydrogen research facility to explore how gas transmission networks could be used to transport hydrogen in the future. Edinburgh is consortium partner with access to the Spadeadam facility. Although still in development phase, we expect experimental information to be flowing from mid-2023, so Q1 and Q2 of 2023 presents a good time for some valuable underpinning academic research in support of its development and to shape the scope for Phase 2 of FutureGrid, which will include deblanding, applications and operational use.

Aims and Outputs

The policy placement researcher will work with Drs Lars Schewe and Stuart Haszeldine at The University of Edinburgh. Schewe has expertise in the mathematical modelling and optimization of gas pipeline networks; Haszeldine was involved in the SGN H100 project to introduce 100% hydrogen to residential homes. Both have relevant expertise and experience and are supported by more than 20 hydrogen energy researchers and academics at the University of Edinburgh. The output will be a literature reviews of information collated from the FutureGrid project, combined with reports and publications from Spadeadam and elsewhere relevant to the repurposing of existing NTS infrastructure. We will ~~and~~ translate these findings through our established partnerships with different gas distribution companies in different parts of the UK. During the placement we can extend our links across to H100 in Fife and other small hydrogen pilots around the UK. This work will help identify common problems and seek to transfer solutions between operators to inform a regulation pathway for decarbonising, including the transportation and storage of hydrogen on shore and near shore.

Person specifications

We are looking for an Early Career Researcher or SAGES Graduate student:

- Either working towards, or has recently completed, a PhD
- Knowledge and/or experience of working in a multi and/or interdisciplinary research environment
- Social, Geoscience, or engineering knowledge of the energy Transition in the UK, and ability to apply that to Hydrogen
- Skills and capabilities at, and commitment to, interacting with a range of experts and stakeholders from public and private sectors as well as civil society
- Strong motivation in application of RD&D to effect change in government and regulatory policy
- Good problem-solving skills, including creative responses to potential barriers.
- Strong communications skills (written and verbal)
- Independent worker who can plan their own workload and is confident in their ability to deliver a well written document.
- The position will be based in Edinburgh, with some travel to Spadeadam, and to National Grid in Glasgow or Warwick. Hybrid working is normal – so that some F2F meetings in Edinburgh will be expected

How to apply

To apply, please provide a one page cover letter detailing why you are the right person for this Policy Internship as well as a CV (2 pages maximum) to Kristin Hopfe at the Edinburgh Climate Change Institute, email < Kristin.Hopfe@ed.ac.uk >. Please include one professional referee that you are happy for us to contact, should you be successful, who must also be able to confirm your availability within your current commitments.

Deadline for applications is **Tuesday 4 April, 2023 13.00hrs.**

By applying you are confirming that you are available for an interview on **27th April, 2023.**