GERAD
GROUPE D'ÉTUDES ET DE RECHERCHE
EN ANALYSE DES DÉCISIONS

Postdoc Offer 2023

The role of hydrogen in a net-zero emission energy future

Context

Canada has committed to achieve net-zero greenhouse gas emissions by 2050. Such a transition from the current situation will have important impacts on its economy and its energy sectors. This project ambitions to assess the contribution of hydrogen (H_2) in this transition.

Project Description

The project will mainly consist in modeling H_2 production and consumption pathways in two different models: AD-MERGE [1], a world integrated assessment model, and ETEM-YUL [2], a bottom-up energy model developed for the Greater Montreal region. The modeling work within AD-MERGE will be part of the H2CliP project funded by the National Research Council of Canada (NRC), in collaboration with Artelys, ESMIA, NRC, Siemens, and Uni. Stuttgart. The modeling work within ETEM-YUL will be part of a project funded by Environment and Climate Change Canada, in collaboration with Uni. Waterloo and Ontario Tech.

The successful applicant will: i) support the development of AD-MERGE (coded in GAMS) and ETEM-YUL (coded in AMPL); ii) help supervise a team of 3 Ph.D. and 3 M.Sc. students; iii) conduct studies with these models to assess the potential deployment of H_2 in Canada and worldwide; iv) contribute to the dissemination of results through scientific publications and conferences.

Candidate background

PhD in applied mathematics / optimization, industrial engineering or quantitative economics.

Good knowledge of either integrated assessment modeling or bottom-up energy modeling. Knowledge of hydrogen energy systems. Excellent capabilities for rigorous data management and computer programming (ideally in AMPL and/or GAMS). Good writing and synthesis skills, in particular for scientific articles. Capabilities to manage a team of (Ph.D. and M.Sc.) students and interact with academic partners.

Administrative Details

1-year postdoctoral contract with GERAD-HEC Montréal through a gross 60-65 k$ grant (based on the applicant experience). This position can be renewed for an additional year. Workplace is GERAD-HEC (Montreal, Qc, Canada). The position is open for April 1, 2023, and will remain open until filled.

How to Apply

Applications including a letter of intent, CV, a sample of recent research (papers, preprints, etc.), and names and contacts of two references should be submitted electronically to Prof. Olivier Bahn (olivier.bahn@gerad.ca).

Bibliography

[1] Bahn, O., de Bruin, K.C., Fertel, C. (2019). "Will adaptation delay the transition to clean energy systems? An analysis with AD-MERGE", *The Energy Journal*, Vol. 40, pp. 207-233.

[2] Aliakbari Sani, S., Maroufmashat, A., Babonneau, F., Bahn, O., Delage, E., Haurie, A., Mousseau, N., Vaillancourt, K. (2022). "Energy transition pathways for deep decarbonization of the Greater Montreal region: An energy optimization framework", *Energies*, Vol. 15, Article 3760 (18 pp.).