



**UNIVERSITÉ
DE GENÈVE**

HSLU Lucerne University
of Applied Sciences
and Arts

Two vacancies for Ph.D. student positions in the energy domain

There is one vacancy each at HSLU (Lucerne University of Applied Sciences and Arts) and University of Geneva for a

Ph.D. student on energy efficiency in industrial processes

The two Ph.D. students will collaborate in the context of a project funded by the Swiss National Science Foundation.

Project and job description:

Energy efficiency and renewables play key roles in the European Union's energy and climate policy, in Switzerland's Energy Strategy 2050 and in the energy plans prepared by Swiss cantons. Industry and buildings, and in particular their energy use related to heating and cooling, are among the largest sources of CO₂, e.g. causing half of all greenhouse gas emissions in Switzerland. These emissions need to be drastically reduced.

Against this background we are searching for two *Ph.D. students on energy efficiency in industrial processes*. One task will be to develop, test and apply a methodology for establishing spatially explicit industrial energy demand and CO₂ emissions and to explore approaches for using this information for future energy planning. In addition, to speed up the analytic phase, new optimisation approaches and models need to be developed, allowing to identify improved system configurations which make use of heat recovery (Pinch analysis), heat pumping, renewable energy and energy storage. Trade-offs between energy optimisation and costs need to be considered that are bound by constraints encountered in real systems. In-depth analysis of several key production processes of one or two industry sectors are foreseen.

Requirements:

The position offers unique opportunities to the successful candidates to further develop a wide range of analytic and modelling skills, presentation and reporting skills and networking in cutting-edge R&D areas that are essential for the energy transition, nationally and internationally. Candidates should have a Master's degree respectively in physics, engineering or environmental sciences and they must be able to combine thorough technical understanding with economic assessment and broader aspects of the energy transition. Experience with programming (e.g. Python) for simulation and/or optimisation is expected. Knowledge in the areas of systems analysis, process integration/pinch analysis and GIS are clear advantages. Very good knowledge of English is a necessity and good knowledge of French and/or German is desired.

Institutions:

In **Geneva**, the successful applicant will become member of the Department F.-A. Forel for Environmental and Aquatic Sciences, Faculty of Sciences and she/he will be housed by the interfaculty Institute for Environmental Sciences (ISE, <http://www.unige.ch/environnement>) that is active in cross-disciplinary research in the domains of energy, climate change, surface waters, urban ecology and other sustainability domains. The institute represents an enthusiastic, dynamic and international working environment. It offers an interdisciplinary Master's program in Environmental Sciences (MUSE) with a track on Energy to which the successful candidates will contribute.

In **Lucerne**, the successful applicant will become a member of the Institute of Mechanical Engineering and Energy Technology, and she/he will be housed by the Competence Center of Thermal Energy Systems and Process Engineering (<http://www.hslu.ch/tevt>). The Competence Center is involved in applied research and development and has an extensive amount of experience in process integration and pinch analysis and has become a leader in this field. In cooperation with the Swiss Federal Office of Energy, our group operates the SFOE Process Integration/Pinch Analysis center to provide industrial companies and engineering firms support in the practical application of pinch analysis through training courses, coaching, and consulting as well as the PinCH software development, maintenance, and user support.

Conditions of employment:

We offer an initial 1-year appointment with planned further extension by at least three further years. The salary will be in accordance with the regulations at the respective university.

Interested applicants are kindly requested to send their application at the earliest convenience. The application package should include a letter describing the applicant's motivation and competences next to an up-to-date CV with publication list, overview of teaching activities and transcripts (course load and grades) as well as the professional experience. The announcement remains valid until a qualified candidate will have been found. Applications should be sent by email to job-efficiency@unige.ch.