ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

SusTec

Proposal for Master Thesis

"The role of energy cooperatives in the diffusion of district-level multi-energy systems"

Switzerland aims to reduce its greenhouse gas emissions by 50% relative to 1990 levels by 2030. More than one third of the Swiss energy consumption and greenhouse gas emission comes from heating, ventilation, and lighting in buildings. To reach these climate targets, Switzerland thus needs to improve the use of renewable energy sources in and energy efficiency of buildings. Individual technologies (e.g., heat pumps, geothermal heat storage, solar) provide one important element to realizing these changes. Equally important is the intelligent integration of multiple technologies into, so-called, multi-energy systems (MES). MES are considered more efficient, reliable, and resilient than both individual technologies and conventional energy systems. Also, by drawing on local energy sources, MES may facilitate integrating renewable energy and accelerate the decentralization of the Swiss energy system.

Yet, if MES are to exert their full potential, they need to be widely implemented in Switzerland. Energy cooperatives constitute an important accelerator for establishing district-level multi-energy systems. Energy cooperatives are organizations owned and managed by their members who also consume the generated energy and use provided energy services. During the last three decades, the number of energy cooperatives in Switzerland has doubled to nearly 300. Most Swiss energy cooperatives cover the entire value chain (generation, transmission, distribution) and already begin to integrate multiple renewable energy sources (e.g., solar, wind). Thus, energy cooperatives with modern MES have a great potential to reduce the energy consumption in Switzerland.

To improve our understanding of the role energy cooperatives in the Swiss energy transition, ETH Zurich's Group for Sustainability and Technology (SusTec) is offering a Master Thesis that will address the following research question: *What is the role of Swiss energy cooperatives in facilitating the diffusion of district-level multi-energy systems?* The student's tasks will comprise among others:

- Develop an overview of energy cooperatives and their regulatory environment in Switzerland
- Evaluate the technological configuration of the MESs' of Swiss energy cooperatives
- Assess the potential of cooperatives to serve as a platform for other services (e.g., mobility)
- Derive implications for energy cooperatives and policy makers in the energy sector

This project is embedded in the Swiss Competence Centre for Energy Research (SCCER) on Future Energy Efficient Buildings and Districts (FEEB&D), ensuring access to key industry experts and firms in the building sector. The Master student will be an integral part of the SusTec research team and will work in close collaboration with a postdoctoral researcher. The analyses of the thesis are intended to result in an academic publication. Through his or her research, the student will have the opportunity to influence firm strategies and policy making in a field of large societal importance.

We are looking for an excellent student with strong German and English skills who is interested in energy-related topics, highly motivated, and able to work independently. Strong communication and project management skills as well as experience in data analysis are an asset. Ideally, the applicant has a background in energy science, management, innovation studies, or engineering.

Start date:	October 2017 (negotiable)
Duration:	6 months
Location:	Zurich

Your application: Please send your CV, a short letter of motivation (max. one page), and transcripts of records (with grades) by email to **Johannes Meuer** (jmeuer@ethz.ch). Applications from non-ETH students are welcome. We look forward to receiving your application!