

The **Energy Politics Group (EPG)** within the *Department of Humanities, Social, and Political Sciences* of **ETH Zurich** investigates questions related to the **governance of technological change in the energy sector**. We are currently offering a

## Master's thesis: Classifying patents with ML for clean energy innovation policy

### Research field and tasks

In 2015, almost 200 countries committed to drastically reducing their CO<sub>2</sub> emissions under the Paris Agreement. Achieving this goal requires increased innovation in **clean energy technologies**. However, technologies can differ widely in terms of their drivers of innovation, underlying learning mechanisms, and hence, the **public policy** measures needed to support them (e.g. R&D subsidies, demonstration projects, deployment policies). Policy makers need to understand how these technologies differ to decide which instruments of innovation and industrial policy are the most effective to promote a technology. At EPG we support policy makers in designing such “technology-smart” policies. While existing studies have often relied on experts to characterize technologies, there is the need to develop more quantitative approaches to support innovation policy in a consistent, replicable and scalable way. One such promising data-driven approach is based on text processing of **patent data** with **machine learning** to characterize clean energy technologies in terms of their determinants of innovation.

EPG offers a master's thesis that aims to analyze patents with methods from natural language processing and machine learning. The student's task will comprise, amongst others:

- Reviewing the relevant literature.
- Developing a classifier to discriminate patent data based on patent texts.
- Developing a clustering algorithm to identify technology characteristics from patent texts.

### Requirements

We are looking for an excellent student with experience and interest in applied machine learning and text analysis. Fluency in English and experience with statistical analysis are required. Strong communication and project management skills, knowledge of Python or R, and an interest in technological innovation and energy policy are an asset. We are open in terms of disciplinary background and master program. Applications from non-ETH students are also welcome.

### Conditions

The master's student will work in close collaboration with Dr. Lynn Kaack and Dr. Abhishek Malhotra, two post-doctoral researchers at EPG, as well as Prof. Tobias Schmidt. The student will have the opportunity to become an integral part of the EPG research team and contribute to EPG's research agenda. The duration of the thesis is 6 months. Ideally, the start would be fall of 2019.

### Your application

Your application documents should include a short letter of motivation that includes a description of the relevant experience (max. one page), a CV, and transcript of records (with grades). Please send your complete documents by e-mail to:

Lynn Kaack (lynn.kaack@gess.ethz.ch).

At [www.epg.ethz.ch](http://www.epg.ethz.ch) you can find more information about the group. The review of applications will start immediately after publication of this ad and will continue until the position is filled.