Chair of Renewable and Sustainable Energy Systems
TUM School of Engineering and Design
Technical University of Munich

Summer semester 2025

Project Lab Renewable and Sustainable Energy Systems

Notes on registration

If you are interested in participating in this project internship, please proceed as follows:

1. Select the topic relevant to you for the project internship in the topics listed below. Also consider which other topics would be suitable for you.
2. Get in touch with the supervisors of the topics of your choice and make an appointment for a short video call.

   Procedure of the video call:

   - First, the supervisors will give you a brief overview of their topic.
   - Afterwards you can speak with the supervisors for 3-5 minutes to get an impression of whether the topic is suitable for you.
3. If you would like to apply for one or more topics after the interview with the supervisor, please register for the corresponding groups in TUMonline by Thursday, April 24, 2025, at the latest and please make it clear how you prioritize the topics.
4. By Monday, April 28, 2025, at the latest, we will inform you whether and, if so, in which topic you can work on the project internship.

If you have questions concerning the organization of the lab course, please contact Dr. Kuhn (propens.ens@ed.tum.de).

If you have any questions about the content of the different topics, please contact the supervisor directly.

Please be sure to pay attention!

In order to participate in the project internship, it is essential that you

1. had a **short video-call with the supervisor** of the topic **AND**
2. register **in TUMonline for the course**.

If you do not meet one of the three requirements, you will not be included in the selection for participation.

Organizational matters

Weekly attendance times are mandatory for the project internship.

The language (German or English) depends on the composition of the group.

Topics

No.	Topic	Students	Brief description	Supervisor (email)	Time slots for meetings
1	**Digitalization framework planning for SEED Center Microgrids**	**4**	The SEED Center aims to **digitalize the SEED Living Labs** by installing measurement devices and linking them to an online dashboard that will be accessible to **researchers and academics** for research purposes. Each Living Lab is unique, with different sets of devices and measurements. The coursework will serve as the foundation for **potential on-site internships** at one of the SEED Living Labs, where students will deploy the measurements and make them available online. **Tasks:** • Conduct a literature review on the **digitalization of microgrids**. • Contact local **SEED Lab coordinators** and prepare **single-line diagrams (SLD)** for the labs. • Prepare a list of **available measurements** across different SEED Living Labs. • Develop a **digitalization framework** to be executed during **a potential internship.** • Compare the prices of different measurements available at the local market. The SEED Living Labs Digitalization Planning project study offers **four** positions for master's students at TUM. Students will work in a team and benefit from: • 6 ECTS credits • Future Possibility of an internship at one of the Living Labs (9 full-time weeks) **Requirements:** - Background in Electrical Engineering - Previous experience of working with hardware	Pant, Prashant	tbd

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2	**Enhancing Social Acceptance of Next-Generation Geothermal Technologies in Germany: from Skepticism to Support**	5	This project explores how to improve public perception of next-generation geothermal technologies, particularly hydraulic fracturing adapted for geothermal energy. While this innovation could significantly expand geothermal use in Germany, public skepticism remains a major challenge. **Tasks:** • Conduct a literature review on public acceptance of geothermal energy and fracking. • Survey public attitudes toward conventional and next-gen geothermal technologies. • Identify key concerns and develop effective communication strategies. • Create engaging content (videos, infographics, social media) to explain the technology. • Develop a framework to enhance public awareness and acceptance. The project offers 4/5 positions for master's students at TUM. Students will work in a team and benefit from: • **6 ECTS credits** • **Future possibility of writing a Master Thesis** focused on public engagement and science communication in geothermal **Requirements:** • Background or interest in Social Sciences (e.g., psychology, sociology, political science) • Strong communication skills and ability to simplify complex topics • Experience or interest in creative content creation (e.g., video production, graphic design, social media)	Sidorova, Anastasia	tbd

No.	Topic	Students	Brief description	Supervisor (email)	Time slots for meetings
3	**Optimal locations for DAC in Germany**	5	The aim of this project is to determine optimal locations for Direct Air Capture (DAC) in Germany, with a particular focus on the use of industrial waste heat as a heat source. Central factors such as the availability and use of renewable energies are taken into account, and the potential of DAC as a flexible load is examined and evaluated. The aim is to define ideal site conditions through a holistic view of technical and economic aspects. **Tasks:** • Description of relevant DAC technologies • Derivation of essential location criteria • Investigation of the potentials of industrial waste heat • Identify a metric to qualitatively describe locations in terms of DAC • Estimation of additional system functions of DAC as flexible load and their impact on site selection	Kuhn, Philipp	Tuesday, 13:00 – 16:00

No.	Topic	Students	Brief description	Supervisor (email)	Time slots for meetings
4	**Business Models for next generation electricity providers**	**4**	In the UK Octopus Energy has become the largest electricity provider over the past 10 years bypassing the incumbents by capitalizing on innovation and customer centricity. With profound changes on the supply as well of demand side of the market there is a window of opportunity to fundamentally change the competitive landscape. Changes in the regulatory framework (dynamic pricing for wholesale markets as well as dynamic grid fees) and higher cost efficiency for battery electric storage enable the creation of more tailored electricity plans for households and small businesses. On the demand side ongoing electrification due to PV systems, heat pumps and charge points for electric vehicles are increasingly making standard load profiles obsolete creating a market opportunity for electricity plans that integrate these specific requirements. **Requirements**: • When applying for this project you should be prepared to do extensive data collection, processing, and financial modelling. • Advanced Excel and programming skills (e.g. Python) are a plus, however, not a prerequisite. • Experience in the energy trading space is more than welcome. **Tasks**: • Creating load profiles for households with PV/battery/heat pump/charge point • Identifying optimization strategies for cost efficient purchase of electricity • Developing optimized electricity plans for select customer segments • Identifying opportunities for home energy management and use of battery electric storage.	Achter, Sven	Monday, 14:00 – 16:00