

Summer semester 2026

# Seminar on Renewable and Sustainable Energy Systems

Prof. Dr. Thomas Hamacher

## Registration

The number of participants for the seminar is limited. **If you are interested in participating in the seminar, please send an e-mail to the stated supervisor of the topic that interests you.** The e-mail should contain the following details: name, surname, matriculation number, and e-mail. **You will get a confirmation or rejection email from the supervisor within 2-3 days. This will depend on the number of students interested in the topic.** In case of a positive answer, you will then be automatically registered for the corresponding Moodle course. Topics will be assigned in between **April 1<sup>st</sup> and April 9<sup>th</sup>, 2026.**

## Objectives

After completion of the module, the students are expected to process independently a topic in the field of renewable and sustainable energy systems in a scientific way, to present the results in front of a professional audience and to discuss them with the audience afterwards.

## Components of the module exam

- Presentation of the results (15 minutes) followed by discussion (5 minutes) (40%)  
- **as in-person meetings for presenting students!**

### Dates of presentations:

**May 20, May 27, June 10, June 17, June 24, and July 1<sup>st</sup>**  
**from 10.15 am to 11.45 am**

Place: ZEI in Garching, meeting room: 2002@5414

- Written research paper in IEEE style (5 pages) (60%); obligatory submission by **July 13, 2026, 8:00 am.**

## Dates

Timeslots: **10:15 am to 11:45 am**

In general, all meetings will be in-person meetings; however, participating via [Teams](#) is possible. Only exception: The presenting students must be present at ZEI!

Date	Topic	Participants
Apr. 15	Kick-off	All
<b>Tue., Apr. 21</b>	Meeting with supervisor (online; date shifted due to	Students with Food & Energy topics

	shifted FVV students' meeting)	
Apr. 29	Meeting with supervisor (date shifted)	Students with Food & Energy topics
May 6	How to do the presentation	All
May 13	How to write the paper	All
May 20	Presentations	All
May 27	Presentations	All
Jun. 10	Presentations	All
Jun. 17	Presentations	All
Jun. 24	Presentations	All
Jul. 01	Presentations	All

Meetings for the students with other topics than Food & Energy topics are defined by the respective supervisor.

### Coordination and general topics

Dr. Sarah Weik

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Only to be contacted for organizational questions. Please apply for the seminar directly to the supervisor of the topic(s) you are interested in!

### List of topics

Topic	Supervisor
Development of nuclear power plants with respect to technological improvements and safety concerns	Julia Gawlick ( <a href="mailto:j.gawlick@tum.de">j.gawlick@tum.de</a> )
Comparison of National Heating Strategies	Jessica Heck ( <a href="mailto:jessica.heck@tum.de">jessica.heck@tum.de</a> )
Electrification of the Heating Sector and Its Impact on the Electricity System	Jessica Heck ( <a href="mailto:jessica.heck@tum.de">jessica.heck@tum.de</a> )
The Heat Transition in Germany: Political, Legal and Economic Framework	Jessica Heck ( <a href="mailto:jessica.heck@tum.de">jessica.heck@tum.de</a> )
Food & Energy: The Link between Energy and Food Crisis - How Fertilizer Production Depends on Natural Gas	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: The Process and Energy Demand of Milk Pasteurization	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: Milk Powder Production - Analyzing the Energy Demand of Spray Drying	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: The Cold Chain – How Much Energy Do We Need to Refrigerate Our Food?	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: The Energy Demand of Supermarkets	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )

Topic	Supervisor
Food & Energy: Production and Energy Demand of Oat Milk	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: The Energy Demand of Cheese Production	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Food & Energy: The Energy Demand of Canteens	Sarah Weik ( <a href="mailto:sarah.weik@tum.de">sarah.weik@tum.de</a> )
Implementation study of different Dynamic Line Ratings (DLR) estimation methods	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Implementation study of different Dynamic Thermal Ratings (DTR) estimation methods for Power Transformers	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Optimal sensor placement for Dynamic Line Ratings (DLR) estimators using Fischer Information Matrix	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Development of Flexibility Class Labels for Houses and SMEs at the Distribution grid level.	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Analyzing the Impact of Extreme Climate Events on German Power Systems	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Energiewende in Retrospect: Comparing Energy Transition Projections (2000–2020) with Realized Outcomes	Prashant Pant ( <a href="mailto:prashant.pant@tum.de">prashant.pant@tum.de</a> )
Modeling, Analysis and Reliability Assessment of LCL Filters in Grid-Connected Inverters	Anirudh Katoch ( <a href="mailto:anirudh.katoch@tum.de">anirudh.katoch@tum.de</a> )
System-Level Reliability Modeling of Grid-Connected Inverters Based on Component-Level Lifetime Estimation	Anirudh Katoch ( <a href="mailto:anirudh.katoch@tum.de">anirudh.katoch@tum.de</a> )
Reliability Assessment of Cooling Systems in Power Electronic Converters	Anirudh Katoch ( <a href="mailto:anirudh.katoch@tum.de">anirudh.katoch@tum.de</a> )
Modeling, Analysis and Reliability Assessment of Gate Driver Units for Grid-Connected Inverters	Anirudh Katoch ( <a href="mailto:anirudh.katoch@tum.de">anirudh.katoch@tum.de</a> )
Identification of the Most Critical Power Electronic Components in Modern Power Grids: A Review	Anirudh Katoch ( <a href="mailto:anirudh.katoch@tum.de">anirudh.katoch@tum.de</a> )
A review of deep learning methods for the simulation and optimization of deep geothermal energy systems	Moke Rao ( <a href="mailto:moke.rao@tum.de">moke.rao@tum.de</a> )
Empirical Benchmarking of Optimization Methods for Equivalent Impedance Tuning in Dynamic Network Reduction using PowerFactory and Python	Hafiz Muhammad Faisal ( <a href="mailto:hm.faisal@tum.de">hm.faisal@tum.de</a> )