TECHNISCHE UNIVERSITÄT WIEN

Energy Economics Group

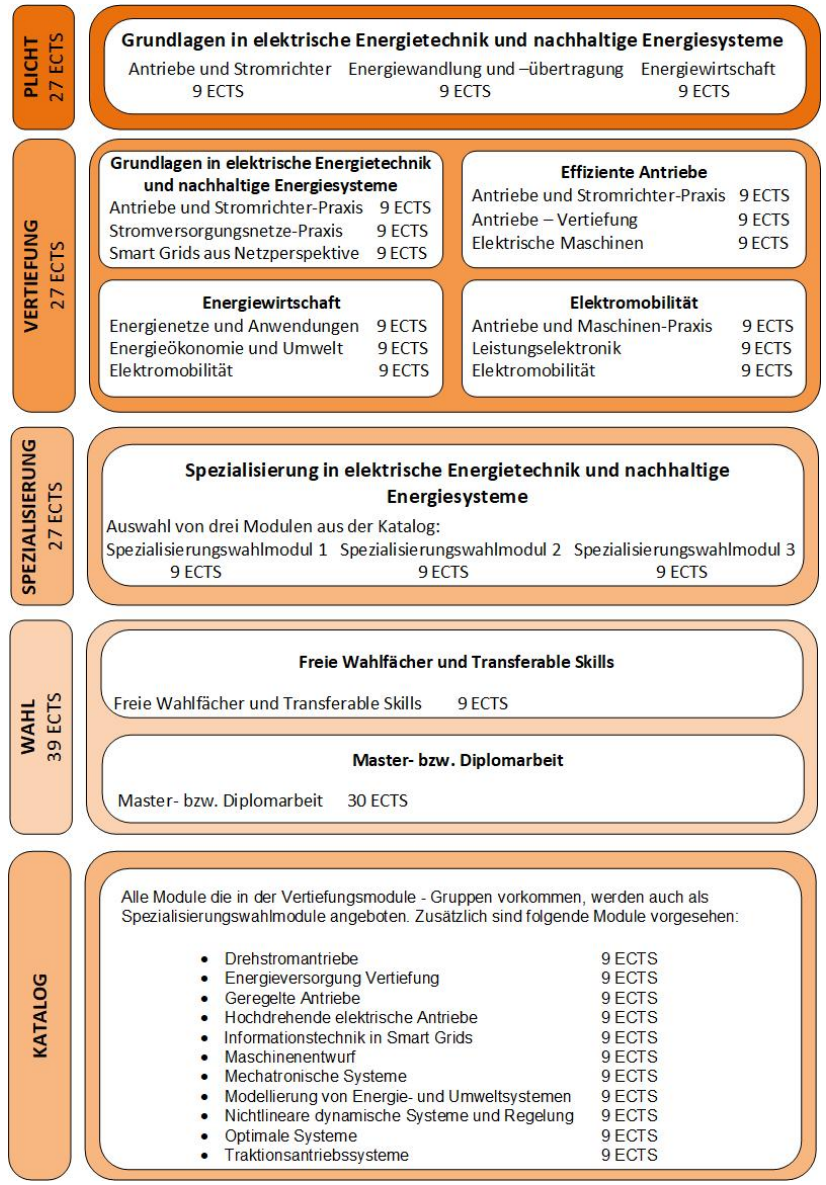
Übersicht - Lehrveranstaltungen der Energy Economics Group (EEG)

Auer, Ajanovic, Zwickl-Bernhard, Golab, Loschan, Kranzl, Radosits, Haas, et al.
EEG / TU Wien, https://eeg.tuwien.ac.at

Vorbesprechung SS25

03.03.2025

Elektrische Energietechnik und nachhaltige Energiesysteme



Alle 3 Pflichtmodule (je 9 ECTS)	27 ECTS
Wahl einer der 4 Vertiefungspflicht-modulgruppen (je 27 ECTS), bestehend aus je 3 Modulen mit 9 ECTS	27 ECTS
Wahl von 3 Spezialisierungsmodulen (je 9 ECTS) aus Katalog bzw. auch nicht bereits belegte Module aus Vertiefungsmodulgruppen	27 ECTS
Freie Wählfächer & Transferable Skills	9 ECTS
Master- bzw. Diplomarbeit	30 ECTS

Summe: 120 ECTS

Studienkennzahl: 066 503

EEG-relevante Module/LVA im Master an ETIT-Fakultät

Pflichtmodul „Energiewirtschaft“

373.010 VU Energieökonomie (4,5 ECTS)*UIW
373.011 VU Energiemodelle und Analysen (4,5 ECTS)

Vertiefungspflichtmodulgruppe „Energiewirtschaft“

Energienetze und Anwendungen

370.080 VU Ökonomie der Energienetze (4,5 ECTS)
370.043 VU Selected Topics in Energy Economics and Environment (4,5 ECTS)

Energieökonomie und Umwelt

370.082 VU Energy Systems and Climate Change (3,0 ECTS)*UIW
370.081 VU Renewable Energy System Economics (3,0 ECTS)
370.076 VU Umweltschutz in der Energiewirtschaft (3,0 ECTS)

Elektromobilität

370.055 VO Energy Economics in Transport (3,0 ECTS)

Spezialisierungsmodul/Katalog „Modellierung von Energie- und Umweltsystemen“

370.062 VU Open Source Energy System Modeling (3,0 ECTS)
370.077 VU Elektrizitäts- und Wasserwirtschaft (3,0 ECTS)

Freie Wahlfächer & Transferable Skills (siehe auch unter „Elective Courses“: https://eeg.tuwien.ac.at/lectures)

357.683 VO Wirtschaftl./ökolog. Optimierung des Heizens (3,0 ECTS)
370.063 VU Winter/Summer School on Economic and Environmental Aspects of Energy Systems (6,0 ECTS)
370.101 VU Winter/Summer School on Energy Transition (6,0 ECTS)
370.100 VU Advanced Energy System Optimization (3,0 ECTS)
370.098 SE Introduction to Scientific Work and Publishing (4,5 ECTS)
370.051 VO Regulierung und Markt in der Energiewirtschaft (3,0 ECTS)

Diplom-/Masterarbeiten

Direkt-Link: https://owncloud.tuwien.ac.at/index.php/s/4sds9dgqd16sQCF
Über EEG-Website: https://eeg.tuwien.ac.at

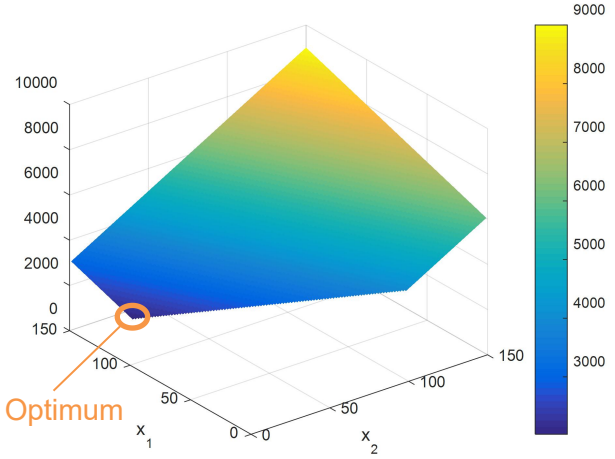
Wintersemester
Sommersemester
Winter & Sommersemester

*UIW Pflicht-LVA im Bachelor Umweltingenieurwesen

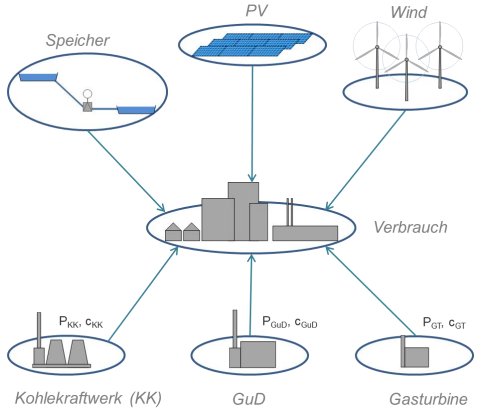
VU Energiemodelle und Analysen (373.011 / 4,5 ECTS)
Golab, Zwickl-Bernhard, Auer

Inhalt

- Überblick zu Modelltypen, Zielfunktionen und Lösungsansätzen
- Einführung in die Ökonometrie, Ökonometrische Nachfragemodelle
- Angewandte Statistik, Anwendungsbeispielen
- Lineare und gemischt-ganzzhalige Optimierung, Anwendungsbeispiele
- Dualität, Anwendungsbeispiele
- Implementierung von Optimierungsproblemen in Python
- Nichtlineare und Dynamische Optimierung, Anwendungsbeispiele



Ort:	EI 2 Pichelmayer HS
Zeit:	Montag, 10.00-13.00
Beginn:	Montag, 03.03.2025, nach EEG-LVA-Vorbesprechung
Prüfungsmodus:	4 Homeworks (Programmierübungen, Rechenbeispiele) in Gruppen (40%) + 2 schriftliche Teilprüfungen (60%) in Mitte (05.05.2025) & Ende des Semesters (23.06.2025)
	Homeworks während des Semesters und schriftliche Prüfungen sind jeweils positiv abzuschließen!
Rückfragen:	Antonia Golab, golab@eeg.tuwien.ac.at
Details/Unterlagen:	TISS/TUWEL



VU Energy Systems and Climate Change (370.082 / 3,0 ECTS)
Ajanovic, Haas, Radosits

Content

- History of global warming and climate change
- Energy and carbon chains, energy systems and CO2 emissions
- CO2 factors of energy sources and energy carriers
- Modelling carbon emissions and comparison of online models
- Carbon footprint and the impact of human behaviour
- Technologies (incl. costs) contribution to CO2 reductions
- Energy policies for CO2 reductions; Scenarios (CO2, energy, temperature)

Venue: EI 3 Sahulka HS

Time: Monday, 13:00-16:00 (in blocks)

Start: Monday, 10.03.2025

Examination mode: Group works during the semester (3 group exercises (10% each) + presentation in group (20% each): 50% in total
Written exam (end of semester): 50% in total
Both, work in groups during the semester and written exam must be completed positively!

Contact person: Frank Radosits, radosits@eeg.tuwien.ac.at

Details/Documents: TISS/TUWEL

VU Renewable Energy System Economics (370.081 / 3,0 ECTS)
Kranzl, Resch

Content

- Introduction – energy/climate challenge and basics of economic technology assessments (Block 1)
- Renewable energy technologies for electricity generation – potentials and costs (Block 2)
- The role of energy policy - support schemes for renewable energy technologies/systems (Block 3)
- Renewable energy technologies for heating and cooling (Block 4)
- Biomass – a key option within all energy sectors (Block 5)
- Visions and perspectives of renewable energy systems on a global, European and nation scale (Block 6)

Venue:	EI 2 Pichelmayer HS
Time:	Tuesday, 15:00-18:00
Days/Blocks:	01.04.2025, 29.04.2025, 13.05.2025, 20.05.2025, 27.05.2025, 03.06.2025, 17.06.2025 (exam) or 01.07.2025 (exam)
Examination mode:	2 written homeworks (50%) + oral exam (50%) **Both, homeworks during the semester and oral exam must be completed positively!**
Contact person:	Lukas Kranzl, kranzl@eeg.tuwien.ac.at
Details/Documents:	TISS/TUWEL

VU Umweltschutz in der Energiewirtschaft (370.076 / 3,0 ECTS)
Huber

Inhalt

- Lokale, regionale und globale Schadstoffemissionen und Ursachen energiebezogener Umweltprobleme
- Grundlagen der Umweltökonomie, externe Effekte und umweltpolitische Lenkungsinstrumente
- Umweltpolitik in perfekten und imperfekten Märkten
- Grundlagen der Treibhausproblematik, Auswirkungen der Klimaveränderung und Gegenstrategien
- Internationale Klimapolitik (Kernpunkte internationaler Vereinbarungen)
- Europäische Klimapolitik (EU-Emissionshandelssystem, Green Deal, …)
- Ausblick

Ort:	EI 3A Hörsaal
Zeit:	Freitag, 13:15-16:30
Termine/Blöcke:	07.03.2025, 14.03.2025, 21.03.2025, 11.04.2025, 25.04.2025, Ersatztermin: 16.05.2025 (Prüfung geplant) Allfällige weitere Ersatztermine: 23.05.2025, 06.06.2025
Prüfungsmodus:	Mitarbeit + schriftliche Prüfung (Termin wird gemeinsam mit Studierenden festgelegt)
Rückfragen:	Claus Huber, claus.huber@axpo.com
Details/Unterlagen:	TISS/TUWEL

Internationale Klimapolitik & Gefangenen-Dilemma

A | B	Vorgaben nicht umsetzen	Vorgaben umsetzen
Vorgaben nicht umsetzen	3 , 3	1 , 4
Vorgaben umsetzen	4 , 1	2 , 2

VU Open Source Energy System Modeling (370.062 / 3,0 ECTS) Huppmann

Content

- Principles of open-source and collaborative scientific programming for energy modelling
- Introduction of several open-source frameworks for modelling the energy system and assessing the transition to renewable sources in the context of climate change mitigation and sustainable development
- Discussing the role of quantitative, model-based pathways in international and national climate mitigation policy, in particular the reports by the Intergovernmental Panel on Climate Change (IPCC)
- Review of the role of numerical modelling of human and earth systems for policy-makers in the context of the IPCC reports and other global outlooks
- Developing a national-scale energy system model using the open-source MESSAGE*ix* Integrated Assessment Modeling Framework

Venue:	EI 3A Hörsaal
Time:	Tuesday, 14:00 -17:00
Days/Blocks:	04.03.2025, 11.03.2025, 18.03.2025, 25.03.2025, 01.04.2025, 08.04.2025 (substitute date)
Examination mode:	Homework assignments + written exam (29.04.2025)
Contact person:	Daniel Huppmann, huppmann@iiasa.ac.at

VU Advanced Energy System Optimization (370.100 / 3,0 ECTS), Zwickl-Bernhard

Content

- Linear and mixed-integer optimization (1st unit)
- Stochastic optimization and robustness of the solution – Modeling under uncertainty (2nd unit)
- Game theory in the energy industry (3rd unit)
- Complex optimization problems and their decomposition: “Benders decomposition theory” (4th unit)

Venue:	EI 3A Hörsaal
Time:	Tuesday, 12:00 - 14:00
Days/Blocks:	06.05.2025 (1st unit) 13.05.2025 (2nd unit) 20.05.2025 (3rd unit) 03.06.2025 (4th unit) 10.06.2025 (oral exam) 17.06.2025 (oral exam)

Examination mode: Homework assignments (4 x 15%) + oral exam (40%)

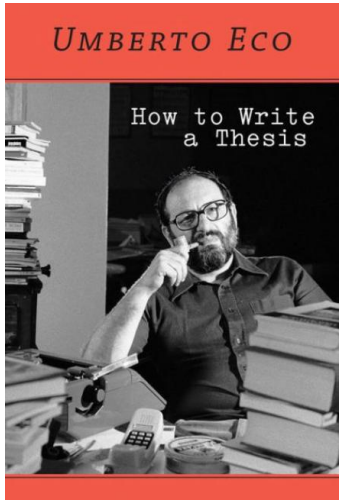
Contact person: Sebastian Zwickl-Bernhard, zwickl@eeg.tuwien.ac.at

SE Introduction to Scientific Work and Publishing (370.098 / 4,5 ECTS)
Auer, Zwickl-Bernhard, Golab

Content

- Introduction to correct scientific work and publishing (incl. plagiarism criteria)
- Structure, preparation & presentation of scientific works (conference/journal papers, Master/PhD thesis)
- Selection of a topic in energy/environmental system analysis & critical appraisal of peer-reviewed literature
- Add your own contribution & results to this topic (review, simple analysis, empirical evaluation, sensitivities)
- Preparation of a written conference paper (homework) and presentation in a typical conference atmosphere/setting (15 min. presentation & 15 min. discussion; the seminar is held in consecutive blocks)
- Note, the chosen topic can also be used for a thorough literature review of a possible future Master Thesis

Venue:	EI 3A Hörsaal
Time:	Friday, 10:00 – 13:00
Days/Blocks:	21.03.2025, 28.03.2025, 16.05.2025 (Day 1: Presentation of paper), 23.05.2025 (Day 2: Presentation of paper) 23.05.2025 (Final deadline for conference paper submission)
Examination mode:	Submission of written conference paper (homework) on chosen topic + Oral presentation (15 min.) & discussion (15 min.) of the paper + Chairperson & lead discussant of other paper presentations
Details/Documents:	TISS/TUWEL
Contact person:	Hans Auer, auer@eeg.tuwien.ac.at

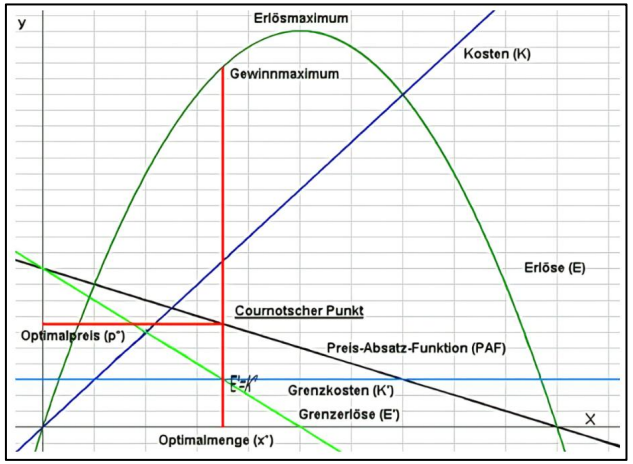


VO Regulierung und Markt in der Energiewirtschaft (370.051 / 3,0 ECTS)
Haas, Kettner-Marx

Inhalt

- Historische Entwicklungen
- Regulierungsarten
- Grundlagen der Mikroökonomie, Soziale Wohlfahrt, Monopole, Duopole, Wettbewerb
- Unbundling und Preisregulierung
- Analyse liberalisierter Märkte: Marktkopplung und Marktsplittung
- Randbedingungen für langfristigen Wettbewerb, Hedging und Stromhandel

Ort:	EI 5 Hochenegg HS
Zeit:	Mittwoch, 13:00-16:00
Termine/Blöcke:	12.03.2025; weitere Termine werden gemeinsam mit den Studierenden vereinbart
Anmeldung:	TISS
Prüfungsmodus:	schriftlich und mündlich



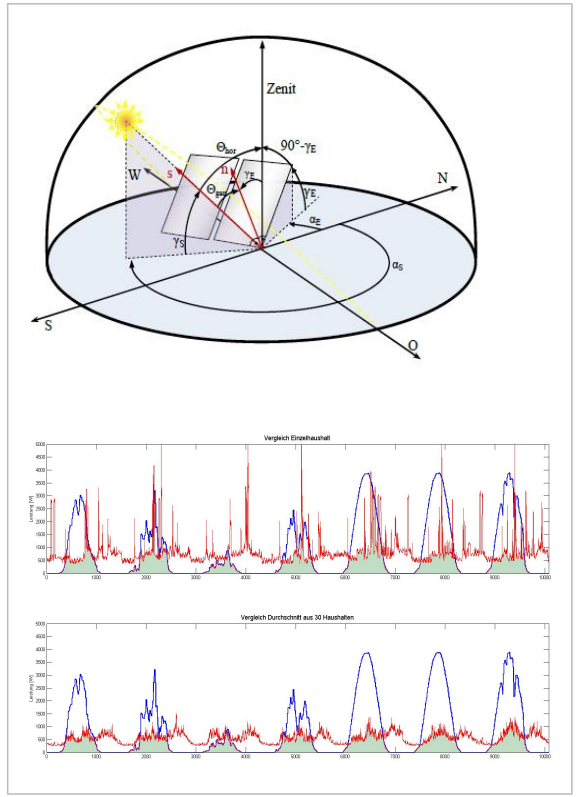
Rückfragen: Reinhard Haas, haas@eeg.tuwien.ac.at

VU Fachvertiefung Energiesysteme (370.007 / 5,0 ECTS)
Loschan, Auer

Gemeinsame LVA mit dem Forschungsbereich Energiesysteme und Netze (Prof. Klöckl)

Inhalt: 1. Teil (Energiewirtschaft)

- Modellierung von PV-Stromerzeugung
- Einführung in Python + Jupyter Notebook
- Wirtschaftlichkeitsberechnung von PV-Anlagen (Haushalts-, Freiflächenanlagen)
- Statistische Analyse von Erzeugungsdaten und Strompreisen



Ort: Raum CF0426

Beginn: Einführung in Teil 1 & Teil 2, 26.03.2025, 14:00 Uhr (!)

Termine (Teil 1): Mittwoch, 14:00-18:00
26.03.2025, 02.04.2025, 09.04.2025, Studienreise Juni 2025

Prüfungsmodus: Gruppenarbeiten mit Simulationsbeispielen, Erstellung eines Abschlussberichts, Präsentation der Ergebnisse auf einer Studienreise im Juni 2025 (Anwesenheitspflicht)

Teilnehmer_innen Beschränkung: maximal 21 (bedingt durch Studienreise)

Rückfragen (Inhalt Teil 1): Christoph Loschan, loschan@eeg.tuwien.ac.at

Rückfragen (allgemein): Hans Auer, auer@eeg.tuwien.ac.at

VU Winter/Summer School on Economic and Environmental Aspects of Energy Systems (370.063 / 6,0 ECTS), Ajanovic, Radosits, Haas





One week in Prague
01.02. – 07.02.2025
One week in Vienna
11.05. – 16.05.2025

6 ECTS

Contact:

Frank Radosits, radosits@eeg.tuwien.ac.at
Amela Ajanovic, ajanovic@eeg.tuwien.ac.at

INTERDISCIPLINARY WINTER AND SUMMER SCHOOL
ON ENERGY SYSTEMS IN CZECHIA AND AUSTRIA

Information
10 Austrian and 10 Czech students get the opportunity to participate in this bilateral exchange programme: the course language is English. The programme covers various aspects of Energy Systems and consists of lectures, discussions, interactive parts and excursions in the Czech Republic as well as in Austria. For successful graduation of the school students will get 6 ECTS Points. Therefore it's necessary to participate in both parts of the school and write a seminar paper in CZ-AT pairs. The programme adresses Bachelor and Master students.

VU Winter/Summer School on Energy Transition (370.101 / 6,0 ECTS)
Auer, Zwickl-Bernhard, Golab

During the year, several opportunities arise to participate in thematic schools (winter, spring, summer, autumn) where EEG staff members are involved in the organisation and/or as lecturers. 2024 the following schools take/took place (selection). Partly the same or similar are also expected in 2025. Therefore, the list below will be continuously renewed and extended whenever a new school is announced in the upcoming summer/winter term 2025/2026…

Loyola Autumn Research School – Research/Modeling with impact on policy and regulation
(organized by FSR/Italy)
Format: 18-20 September 2024, Florence/Italy
Contact: Hans Auer, auer@eeg.tuwien.ac.at

InfraTrain 2024 Autumn School – Economics, Modelling, Policies for Affordable & Renewable Energy
(organized by WIP TU-Berlin/Germany)
Format: 21-25 October 2024, Berlin/Germany
Contact: Hans Auer, auer@eeg.tuwien.ac.at

NordNET PhD Autumn School – Modeling Energy System Integration and Sustainable Transport
(organized by CSEI/Denmark)
Format: 21-25 October 2024, Copenhagen/Denmark
Contact: Hans Auer, auer@eeg.tuwien.ac.at

Winter School – Advanced Stochastic Optimization
(organized by NTNU/Norway)
Format: 2-6 December 2024, Trondheim/Norway
Contact: Hans Auer, auer@eeg.tuwien.ac.at

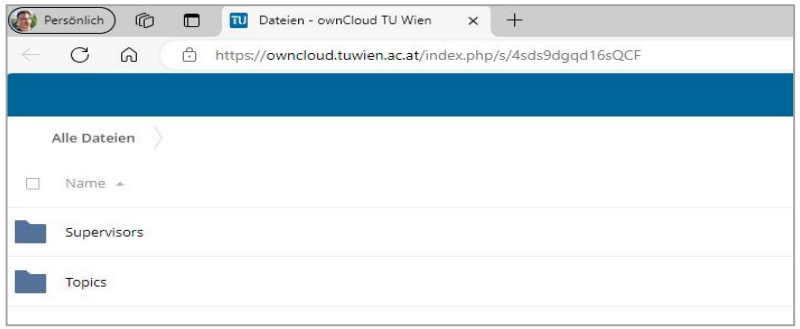
Winter School – Planning under uncertainty in energy markets
(organized by NTNU/Norway)
Format: 6-11 April 2025, Kvitfjell/Norway
Contact: Hans Auer, auer@eeg.tuwien.ac.at

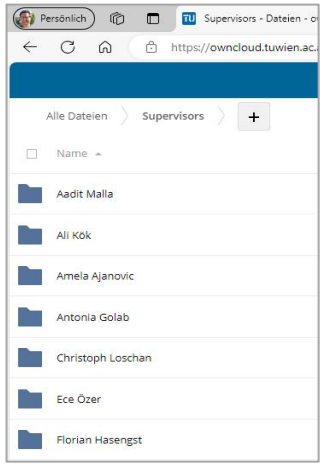
Summer School - NorRen 2025 PhD Summer School on Renewable Energy
(organized by University Oslo/Norway)
Format: 17-22 August 2025, Bergen/Norway
Contact: Hans Auer, auer@eeg.tuwien.ac.at

Diplom-/Masterarbeiten

Direkt-Link: https://owncloud.tuwien.ac.at/index.php/s/4sds9dgqd16sQCF

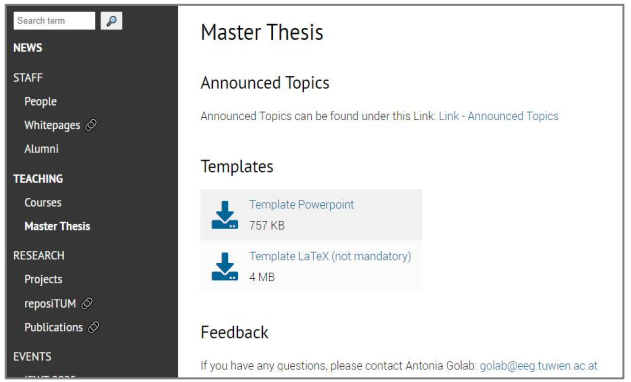
Über EEG-Website: https://eeg.tuwien.ac.at





Thematic field	*Supervisor*
Carbon management	Frank Radosits Marcus Otti Sebastian Zwickl-Bernhard
E-fuels and bio-fuels production and economy	Frank Radosits Amela Ajanovic
Electro-mobility (transport sector decarbonization)	Antonia Golab Amela Ajanovic
Electricity market modeling	Christoph Loschan
Energy communities	Helen Fischer
Energy demand Demand response in Buildings	Ece Özer Philipp Mascherbauer Reda El Makroum
District Heating and cooling networks	Ali Kök Aadit Malla Nirav Patel Sebastian Zwickl-Bernhard
Global climate change impacts on energy systems	Florian Hasengst
Industry sector and its energy transition	Marcus Otti
Raw material markets in energy system models	Sebastian Zwickl-Bernhard Helen Fischer
Diploma thesis in cooperation with companies	Hans Auer

Supervisors



Contact persons for answering content-related questions: Antonia Golab (golab@eeg.tuwien.ac.at) & Sebastian Zwickl-Bernhard (zwickl@eeg.tuwien.ac.at)

Fragen

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