

ETM 519 Energy System Transition

Spring 2022

Course Instructor: Dr Değer Saygın

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Course Schedule: Please see below for dates (between 19:00-21:45 in the weekdays and 09:00-11:45 on weekends). All courses are online via Zoom unless otherwise stated

Course description, objectives & outcomes

Course description: The course will focus on the global trends in transformation of the energy system with renewable energy, energy efficiency, widespread electrification (including green hydrogen) and digitalisation/ICT in realising the seventh energy goal of the Sustainable Development Goals by 2030 and the net-zero emissions targets aligned with the Paris Climate Agreement by this mid-century. The course will provide insights from country experiences in energy transition, the current trends in the case of Turkey and will elaborate on how the transformation of Turkey's energy system can be accelerated. Attention will be paid to the technology, economic and policy aspects.

Course objectives and learning outcomes: The main objective of this course is to provide students with the latest knowledge on the current global and country energy transition trends and teach carrying out basic energy analysis research to estimate the potential, cost and benefits as well as answer key policy questions related to accelerating the transition of the energy system. Students who successfully complete this course can use the learnings in continuation of their carriers at the private and public sectors as well as in research organisations and in the civil society.

Keywords: Energy transition. Renewable energy. Energy efficiency. Electrification. Green hydrogen. Energy policy. Climate policy. Net-zero emission, decarbonisation and climate change mitigation. Costs, benefits and investments. Stranded assets. Global, country and Turkey experiences. System integration of renewables. Innovation.

Suitable background of the students: knowledge of natural sciences and basic background on economics and/or energy and climate policy principles

Course Policies, Assignments, and Grading

Course grading will be based on active participation in course discussions (35%) and a small exam at the last lecture of the course (65%). All announcements will be made through SUCourse+, students are responsible from following the announcements. Questions can be asked via email to the instructor.

Tentative schedule

- Lecture 1 (04/04): Global trends in energy transition and drivers
- Lecture 2 (08/04): Investments and stranded assets in the global energy transition
- Lecture 3 (09/04): Technology needs for energy transition
- Lecture 4 (11/04): Energy transition in Turkey: clean energy policies and power system transformation
- Lecture 5 (18/04): Innovation and R&D needs for system integration of renewables
- Lecture 6 (21/04): Costs of the global energy transition
- Lecture 7 (22/04): Social and economic benefits of energy transition

Powerpoint slides will be used during the courses prepared by the instructor. They will be made available latest 2 days before the class on SUCourse+.