

Module Name	Energy Efficiency, Energy Management, and Energy Economics
Module Number	Eul-RES-E-EnEff
Responsible Lecturer	Dr. rer. nat. Peter Stange peter.stange@tu-dresden.de
Qualification Objectives	Students master methodological approaches for determining energy demands and evaluating the energy efficiency of energy-relevant products and energy systems. They possess detailed knowledge of the organization and technical implementation of energy and load management measures and are capable of applying selected methods of data-based modeling and mathematical optimization in the context of energy and load management. Students are familiar with the theoretical foundations of risk management in the energy sector and are acquainted with electricity market design.
Contents	The module covers fundamental and advanced elements of organizational and technical energy and load management. This includes efficient energy use through the analysis of demand structures, load forecasting, energy storage, and the optimal operation of facilities, as well as the analysis of dependencies between temporal load requirements and various influencing factors. The module addresses methods of mathematical modeling for forecasting and optimization problems and their solutions. Furthermore, the application of specialized software for operational management and design optimization of facilities is emphasized. The module also includes selected and current topics in energy economics, such as risk quantification and risk management or electricity market design for secure, cost-effective, and environmentally friendly electricity supply with high shares of renewable energy.
Teaching and Learning Forms	4 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Introduction to Analysis and Algebra as well as Heat Transfer are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 paragraph 3 of the Study Regulations (SO) and § 33 paragraph 3 of the Examination Regulations (PO) in the main study phase of the diploma program in Renewable Energy Systems.
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a portfolio with a duration of 10 hours on energy efficiency and energy management and a written exam on energy economics lasting 90 minutes. Bonus points for the written exam can be earned by completing optimization tasks with a workload of 20 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance. The module grade is calculated from the grades of the examination components, with the portfolio weighted sevenfold and the written exam weighted threefold.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.