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| <b>Module Name</b>                                  | <b>Heat Supply</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Module Number</b>                                | Eul-RES-E-WVS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Responsible Lecturer</b>                         | Prof. Dr.-Ing. Clemens Felsmann<br>clemens.felsmann@tu-dresden.de                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Qualification Objectives</b>                     | Students are familiar with the structure and main components of central and decentralized district heating systems. They are capable of planning, constructing, and operating such systems. They are also familiar with methods for optimizing these systems. Furthermore, students understand the structure and functionality of systems for space heating and domestic hot water heating.                                                                                                                                                                                                                                                                                                                                        |
| <b>Contents</b>                                     | The module covers municipal and industrial district heating systems, technologies for heat generation, heat transfer within heating networks, and to the customer side, i.e., heating technology and domestic hot water heating. It also includes network design, pressure maintenance, safety requirements, control, and optimization of heating network operations, considering heat storage. Additional topics include requirements for decentralized heat feed-ins, multifunctionality, and the integration of renewable energy sources into heating networks, as well as central and decentralized combined heat, power, and cooling systems. Selected chapters of building energy technology are examined in greater detail. |
| <b>Teaching and Learning Forms</b>                  | 3 hours per week of lectures, 2 hours per week of exercises, 1 hour per week of practical lab courses, and self-study.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Prerequisites for Participation</b>              | The competencies to be acquired in the modules Heat Transfer, Thermodynamics of Processes, and Fundamentals of Power Machinery are required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usability</b>                                    | 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 Regenerative Energy Systems.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Prerequisites for the Award of Credit Points</b> | Credit points are awarded when the module examination is passed. The module examination consists of a written exam lasting 150 minutes and an ungraded portfolio with a workload of 20 hours. If fewer than ten students register for the examination, the written exam will be replaced by a non-public oral group examination lasting 30 minutes. This will be announced to the registered students at the end of the registration period in the usual manner. A bonus for the written exam is a written assignment with a workload of 20 hours.                                                                                                                                                                                 |
| <b>Credit Points and Grades</b>                     | 7 credit points can be earned through the module. If the portfolio is passed, the module grade corresponds to the grade of the written exam. Otherwise, the module grade is calculated according to § 15 paragraph 1 sentences 5 and 6 of the Examination Regulations as the weighted average of the grades of the individual examination components, with the written exam weighted three times and the portfolio weighted once.                                                                                                                                                                                                                                                                                                  |
| <b>Frequency of the Module</b>                      | The module is offered every winter semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Workload</b>                                     | The total workload is 210 hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Duration of the Module</b>                       | The module lasts one semester.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |