# Module Card

**Module Number**: REAP-M-Mod-202  
**Module Name**: Urban Energy Flows  
**Type (C/CE/E)**: C  
**Semester (proposed)**: 2.  
**Module Coordinator**: Prof. Dr. Wolfgang Dickhaut

<table>
<thead>
<tr>
<th>Subject Area</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Fundamentals and Methods</td>
<td>1 semester</td>
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<tr>
<th>CP (according to ECTS)</th>
<th>Contact Hours/Week (SWS)</th>
<th>Self-study</th>
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<tr>
<td>5 CP (= 150 h workload)</td>
<td>3 (= 31.5 h contact time)</td>
<td>118.5 h</td>
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## Objectives and Contents

### Objective of Qualification (competencies)
- Knowledge of simple calculation approaches for energy needs and demands in complex urban systems.
- Knowledge of dynamics and interdependencies of energy demand and supply sides in urban contexts.
- Understanding of a city as a system (system dynamics) and the role of energy as the driving force (motor) of it, its energy models and balances.
- Ability to construct energy balances for different fields of energy use (heating, electrical power, transport) and to access magnitudes of energy end uses.

### Contents

- Basics on energy demand and supply (forms of energy, conversions, efficiency etc, balancing, visualization etc) and the interdependencies between different energy systems/ grids.
- Introduction into energy flows in cities (areas of energy use (domestic, industrial, public) providing data on energy qualities and quantities.
- Energy use and demand due to (thermal) comfort needs (heating, cooling ventilation) in residential and non-residential buildings.
- Energy demand of public services and due to mobility needs.
- Using renewable energies in an urban environment (techniques and contributions).
- Modelling and visualisation of urban energy flows.
- Methods to define priorities in urban energy saving strategies (strategic planning targets).

## Exam(s)

### Precondition of Examination
regular participation, successful completion of student report and oral presentation

### Type of Examination
<table>
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<th>Duration of Examination (if written or oral exam)</th>
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| Term paper (S), comprising report (R)         |
| Composition of Module Mark                   |

### Exam grade

## Additional Information

### Previous Knowledge / Conditions for Participation (in form and content)
Awareness of energy needs in Cities and of urban and architectural planning and building procedures (Content)

### Applicability of Module
The successful completion of this module is required for the attendance of the module REAP-M-Mod-204 Project II.

## Frequency of Offering
Summerterm