NEW COMPONENT >EV CHARGING LOAD<
FOR URBAN ENERGY MODEL

PROJECT DESCRIPTION

Charging of electrical vehicles is one of the main factors that will alter the electricity demand profiles of urban areas in the near future. This important influence should be reflected within models for urban energy studies. UrbanEnergyPro is a python-based tool that is able to model electricity, space heating and domestic hot water loads for urban energy studies. A GIS-based gray-box approach is used for the estimation of heat demand and hot water consumption at the urban scale and it was recently extended by integrating a Residential Electricity Model (REM), written in MATLAB. In order to further integrate the electricity demand by the mobility sector a new component is to be developed.

The purpose of this project is to implement an adequate model to represent EV charging loads that fits the existing software architecture of UrbanEnergyPro to create a consistent python-based open-source urban energy modelling tool. This task includes deriving realistic schedules for EV charging based on data analysis of multiple data sources like available time-use-survey data, charging data and geodata. A quarter in Munich will be used as a case study to apply the developed tool.

Language: English or German
Number of students: 2 – 4

ACCOMPANYING LECTURE

Sustainable Mobility (EI80004)
WS 20/21, English (or SS 21, German)
3 SWS (4 ECTS) + 1 ECTS by additional course work (presentation or similar)
Contact: cristina.de-la-rua@tum.de
Alternative: Stadtenergiesysteme und moderne städtische Infrastruktur, WS 20/21, German!

REQUIREMENTS

- Experience in Python OOP
- Preferable: familiarity with MATLAB
- Preferable: experience using geodata

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