Modeling of user type specific load profiles for the residential energy consumption on a well monitored Building based on a lifestyle oriented approach

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Abstract

Despite of diverse efforts of policy and optimisation of individual technologies, the environment effects of residential energy consumption are large and continue to grow. In addition to individual technological and regional framework, it is especially user behaviour that affects energy consumption significantly.

Residential consumption of electricity is influenced by many of variables and shows big variance between households, even with the same number, age and work status of its occupants in the same building types. Understanding these differences is important for forecasting energy consumption and developing new technologies, policy concepts and sustainable programs.

In sociology it is assumed that it is possible to describe and explain social differences with features of social inequality. In this case, research into social stratification in modern societies has shown that the complexity of social activities cannot be explained satisfactorily by sociodemographic variables alone. Attitudinal and value variables have been introduced in order to explain and understand individual behaviour in more depth and to segment the population into meaningful groups. Single indicators such as income, wealth, education, ethnic origins, gender, age, household type are not sufficient, therefore this research refers to the differences of lifestyle groups.

This Paper connects the lifestyle approach with real time-data on energy consumption in the household. Therefore, a model that provides diverse lifestyle aspects based on their hourly energy consumption will be created.

This is only the first step towards system wide and spatial model within the PhD program URBEM, entitled "Urban Energy and Mobility Systems", which has been instituted by Wiener Stadtwerke Holding AG and the Vienna University of Technology. The aim is to research and to develop an interactive environment for analysing scenarios towards a sustainable, secure, affordable and liveable city by the example of the City of Vienna in a holistic and interdisciplinary approach. (http://urbem.tuwien.ac.at).