Title:

Behavioral patterns of individual energy use in public buildings

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 500-700 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Problem: Targets of the European Union prescribe nearly-zero energy by the end of 2018 for all new buildings used and owned by public authorities. Although sophisticated energy efficient construction and technology is available, energy-related behavior of the building users often counteracts efficiency efforts. Lack of energy saving technologies in older buildings further exacerbates the detrimental influence of user behavior. Thus, public authorities need to build general awareness for energy efficiency among building users; need to improve the congruence between existing technologies (e.g., heating/cooling) and the users who put these technologies into practice (e.g., window-opening); and need to identify effective approaches how to engage building users in everyday energy saving.

Research gap: Energy-related behavior in public buildings encompasses a multitude of activities users undertake in their workplace or when accessing public services within the building. Previous research singled out specific aspects, such as window opening/closing or turning off appliances at the workplace. However, there is a lack of extensive research how specific behaviors interact with and predetermine each other, giving rise to patterns of energy-related behavior. Presumably, these patterns connect to the users' role in the building (e.g., teacher, student, office worker, visitor) and socio-demographic characteristics.

Research goal: Thus, our research goal is to identify profiles for both, users (socio-demographic attributes) and their behavior (frequency of different energy-related behaviors). To this end, we conduct empirical research in five case study buildings, owned by public authorities: one university (located in Turkey), one high school, two office buildings and one social housing building (all of them located in Spain).

Method: In addition to a deep literature review we conduct explorative qualitative interviews with building managers as well as selected staff and visitors of the case study buildings in order to outline prevalent behavioral patterns and motivational drivers for building users.

Results: Based on analyzed literature and interviews we will generate energy behavior typologies of users of public buildings.

Outlook: The qualitative results found the basis for a further quantitative investigation which will be conducted in October/November 2015. We will survey the socio-demographic characteristics as well as the frequency of energy-related behaviors of users in the buildings. Through statistical analysis we aim to identify about ten archetypes that cover the majority of public building users considering user characteristics and energy-related behavior with underlying motivational drivers. Furthermore, our results will be used as inputs for the development of a serious game that will be played by the case study buildings' users aiming to motivate them towards energy efficient behaviors in public buildings.

Conclusions: Although there are already some intervention strategies in place (e.g. information to raise awareness, feedback through monitoring systems), our identification of archetypes leads to substantive points of reference for each investigated target group to create concrete intervention strategies stimulating behavioral changes towards energy efficiency in public buildings.