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# ~~Towards Nearly Zero Energy Buildings: On Uses of Energy in Buildings: Extracting influencing~~ ~~Factors of Occupant Behaviour by Means of a Questionnaire Survey~~

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## Abstract

In order to reduce the energy consumption in buildings ~~and to reach the Nearly Zero Energy Building (NZEB) target~~, more and more energy efficient technologies for the building-HVAC system have been developed. Several studies showed that occupant behaviour has a much larger influence on the energy performance of a building than the thermal process within the building façade. This underlines the need to investigate the influence of occupant behaviour on building performance.

This paper presents the results of a questionnaire survey related to occupant behaviour and preferences in residential buildings. Multivariate regression analyses are conducted to outline main patterns and correlations between energy use, building characteristics and occupant behaviour. Results show a strong relationship between occupants' actions and characteristics of the built environment – in particular the construction year of the building. Furthermore, occupants have a notable impact on building performance: the chosen set point temperature and the total hours of heating system utilization, which both increase with the age of the building, lead to an increase of the fuel consumption. In conclusion, occupant behavior is affected by the characteristics of the building, which requires additional studies to increase our understanding of occupant behavioral patterns in existing and modern (e.g. NZE) buildings.

*Keywords:* Occupant behaviour; Energy saving; Data collection; Questionnaire survey; Multivariate regression analysis.

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## 1. Introduction

~~The European Directive on Energy Performance of Building (EPBD, 2010) [1] has defined the standard NZEB (Nearly Zero Energy Buildings) as an important target to be achieved by buildings newly constructed from 2020 onwards.~~

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