

Do we know what can we do to save energy and maintain comfortable temperature throughout the year in our home? Do we take time to learn that? Do we practice what we know? Do we know how adjusting heating to our needs and lifestyle can influence the energy consumption? Does switching from *traditional* to *low-energy* house change our routines, like airing the house. Why? What do we care most for in regulating climate in our homes: ease of use, full control or just peace of mind? Does it matter that we seek to improve our homes to achieve thermal comfort at lowest possible cost?

In this project we want to develop tools to help us answer such questions. We want to find out if there is a link between how much an inhabitant is involved into controlling indoor climate and the achieved results and his/her level of satisfaction with the results. We want to be able to tell if the higher involvement results in higher thermal comfort and lower energy use or not.

To do that we will divide our research into four stages: literature study, research conducted in occupied houses, computer modelling and finally verifying our conclusions from previous stages. We will use various methods to help us grasp all the complexities influencing user engagement in real life, or monitor temperature and energy use. One of the first challenges will be finding out what exactly to look at to describe and classify user involvement in maintaining a comfortable temperature. We will look at previous studies into how user behaviour and practices influence energy consumption in buildings. Then we will develop tools to study user involvement in micro climate regulation in 10 low energy houses. Measurements of indoor and outdoor temperature and energy consumption will be collected for a period of one year. Computer modelling of three houses will allow us to progress from observed user engagement scenarios to testing alternative levels of inhabitants' involvement. Knowing which elements of user engagement were crucial for user satisfaction with temperature and energy consumption will allow us to test the findings with a wider group.

Understanding what drives the inhabitants into taking or not taking actions influencing indoor climate and energy use is the aim of many research projects around the world. Social scientists and engineers cooperate to find the answers. What we know so far is that the current energy use models based solely on the building itself can lead to ten-fold mismatch between the expected and real energy use. This project aims to bring user engagement into the equation - a factor missing from previous research - in hope of explaining some of the performance gap looming in the current energy use models.