Occupant behaviour is a key issue for building design optimization, energy diagnosis, performance evaluation, and building energy simulation. It contributes significantly to building energy use. Before this project, general understanding of occupant behaviour was quite limited both in terms of building systems design and energy retrofit, leading to inappropriate over-simplifications. Existing studies on occupant behaviour, mainly from the perspective of sociology, lacked in-depth quantitative analysis. Although there are many groups worldwide studying occupant behaviour, often in isolation, the behaviour models created so far have often been inconsistent, with a lack of consensus about common terminology, good experimental design and modelling methodologies.

Due to the complexity and the great diversity in behaviour often encountered, it is prerequisite for researchers to work together to define and simulate occupant behaviour in a consistent and common way. International cooperation is particularly important for both knowledge discovery and data sharing.

**PROJECT OBJECTIVES**

1. identify quantitative descriptions and classifications of occupant behaviour,
2. develop effective calculation methodologies of occupant behaviour,
3. implement occupant behaviour models with building energy simulation tools, and
4. demonstrate the occupant behaviour models in design, evaluation and operation and optimization by case studies.

**Definition and Simulation of Occupant Behavior in Buildings**

EBC ANNEX 66

Occupant behaviour influences building systems by movement or actions and further determines the building indoor environment and energy use. Both the indoor environment and energy use in turn affect occupant behaviour through psychological, physiological and economic factors together with several external factors like comfort and culture.
The target of the project was to set up a standard occupant behaviour definition platform, establish a quantitative simulation methodology to model behaviour in buildings, and understand the influence of behaviour on building energy use and the indoor environment.

How to quantitatively describe the influence of occupant behaviour on building performance and how to analyze and evaluate the impact of occupant behaviour in buildings are fundamental scientific questions. Answering these questions was the main focus of this project.

**ACHIEVEMENTS**

The outcomes from this project are:
- a standard definition and simulation methodology for occupant presence and movement models,
- a standard description of occupant action behaviour simulation, a systematic measurement approach, and a modelling and validation methodology in residential and commercial buildings,
- an occupant behaviour XML schema, a software module that can be integrated within building energy modelling programs, a software developers guide, and sample computer codes to demonstrate the use of the schema and module,
- case studies and a behavioural guide that are useful to architects, engineers, building operators, and designers of controls systems.

**EBC MISSION**

To accelerate the transformation of the built environment towards more energy efficient and sustainable buildings and communities, by the development and dissemination of knowledge and technologies through international collaborative research and innovation.