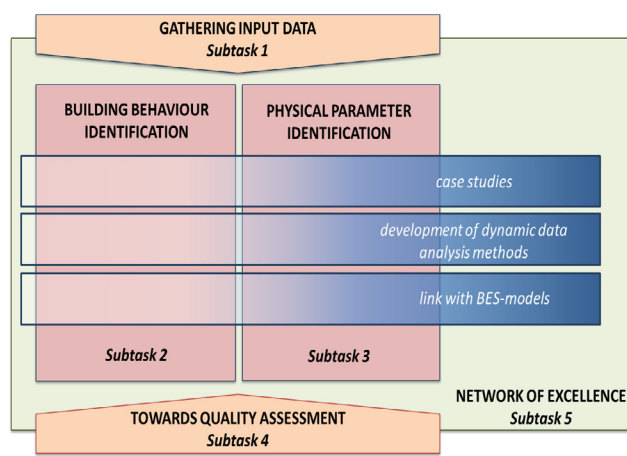


Building Energy Performance Assessment Based on In-situ Measurements

EBC ANNEX 71

Better prediction, characterization and quality assurance of actual building energy performance are essential to realise the anticipated world wide energy reductions in buildings and community systems. Quantifying the actual performance of buildings can only be effectively realised by optimized in-situ measurements combined with dynamic data analysis techniques. This project has advanced the development of in-use monitoring for buildings to obtain reliable quality checks of routine building construction practice to guarantee that designed performance is obtained on site.

The project beneficiaries were the building research community and associated specialists (for example energy providers), engineering consultancies and building designers, the construction industry interested in high performance systems, and policy and decision makers involved in developing standards and building performance evaluation



Schematic overview of the project scope.
Source: EBC Annex 71

PROJECT OBJECTIVES

- 1 supporting the development of replicable characterisation and quality assurance methodologies embedded in a statistical and building physical framework to characterise and assess the actual energy performance of buildings;
- 2 disaggregating the building energy use to its three main sources: building fabric, systems and users.

ACHIEVEMENTS

The project focused on residential buildings, both at the level of individual dwellings, as well as at the community level. At the building level, methodologies to assess and characterise occupied buildings, controlled with the buildings' own services were explored. Compared to the previous assessment methods, this means that the intrusive, dedicated tests are left behind in favour of assessment methods based on on-board monitoring systems. At the aggregated level (interpreted as a cluster of individual dwellings, whether an apartment building, a small neighbourhood or a district) the project developed procedures to assess large – but often rather crude – data sets that allows the identification of opportunities at the stock level. At both levels the development of characterisation methods were explored, as well as of quality assurance methods.

INTERNATIONAL ENERGY AGENCY

The International Energy Agency (IEA) was established as an autonomous body within the Organisation for Economic Co-operation and Development (OECD) in 1974, with the purpose of strengthening co-operation in the vital area of energy policy. As one element of this programme, member countries take part in various energy research, development and demonstration activities. The Energy in Buildings and Communities Programme has co-ordinated various research projects associated with energy prediction, monitoring and energy efficiency measures in both new and existing buildings. The results have provided much valuable information about the state of the art of building analysis and have led to further IEA co-ordinated research.

EBC VISION

By 2030, near-zero primary energy use and carbon dioxide emissions solutions have been adopted in new buildings and communities, and a wide range of reliable technical solutions have been made available for the existing building stock.

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.

The following reports have been published as the official project deliverables:

- Description and Results of the Validation of Building Energy Simulation Programs
- Challenges and General Framework
- Building Behaviour Identification
- Physical Parameter Identification
- Project Summary Report

Project duration

Completed (2016 - 2021)

Operating Agent

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