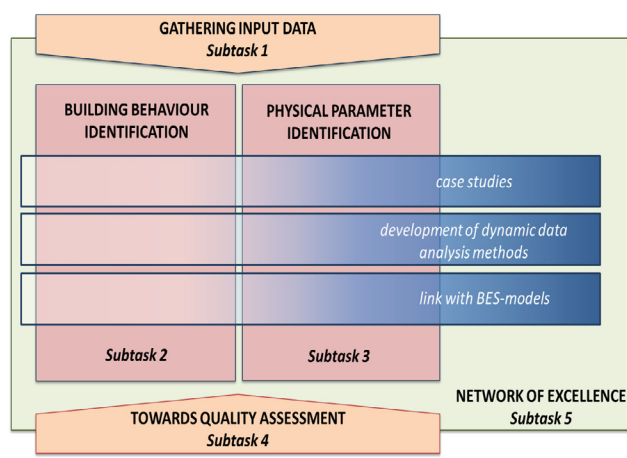


# Building Energy Performance Assessment Based on In-situ Measurements

## ANNEX 71

Better prediction, characterization and quality assurance of actual building energy performance is 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 is advancing 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 will focus 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 will be explored. Compared to the current assessment methods, this means that the intrusive, dedicated tests are left behind in favour



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

### PROJECT OBJECTIVES

- 1 support 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, and
- 2 disaggregate the building energy use to its three main sources: building fabric, systems and users.

of assessment methods based on on-board monitoring systems. At the aggregated level (to be interpreted as a cluster of individual dwellings, be it an apartment building, a small neighbourhood or a district) the aim is to develop procedures to assess large – but often rather crude – data sets that allow the identification of opportunities at the stock level. At both levels the development of characterisation methods will be explored, as well as of quality assurance methods.

The planned deliverables from this project are:

- dynamic data sets (at different scales: individual building and district levels) that can be used for developing dynamic data analysis procedures and for validation purposes
- a series of reports covering the following topics: reliability of input data for onsite building performance assessment, dynamic data analysis methods that can be used to disaggregate occupant influences / fabric

## 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.

and systems at the building level, case studies at the building level, data analysis methods applicable at the district level, case studies at the district level, guidelines (possibilities and limitations) to apply the methods in quality assessment procedures

- collaboration with Dynastee, the network of excellence on full scale testing and dynamic data analysis.

The project beneficiaries will be:

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

## Project duration

Ongoing (2016 - 2021)

## Operating Agent

Prof Staf Roels  
K.U.Leuven  
Department of Civil Engineering  
Building Physics Section  
Kasteelpark Arenberg 40  
B-3001 Leuven,  
BELGIUM  
+32 (0)16 321349  
staf.roels@bwk.kuleuven.be

## Participating countries

Austria, Belgium, Denmark, France, Germany,  
the Netherlands, Switzerland, Spain, UK

## Further information

[www.iea-ebc.org](http://www.iea-ebc.org)