EBC

Energy in Buildings and Communities Programme

Factsheet

Energy Efficient Indoor Air Quality Management in Residential Buildings

EBC ANNEX 86

The energy performance of new and existing residential buildings needs to be radical-ly improved to meet ambitious climate change goals while maintaining a healthy, ac-ceptable and desirable indoor environment. While ventilation is the main strategy that is adopted for indoor air quality (IAQ management), other technologies influencing IAQ (e.g. air filtration) are available as well. However, there is no coherent assess-ment framework to rate and compare the performance of IAQ management strate-gies. This project will therefore focus on assessing the IAQ performance and identify-ing the optimal solutions for maximizing energy savings while guaranteeing a high level of indoor air quality in new, renovated and existing residential buildings.

The project will include the following tasks:

- Metrics and development of an IAQ management strategy rating method
- Source characterization and typical exposure in residential buildings
- Smart materials as an IAQ management strategy
- Ensuring performance of smart ventilation
- Energy savings and IAQ: improvements and validation through cloud data and internet of things (IoT) connected devices
- Dissemination, management and interaction

PROJECT OBJECTIVES

1. developing a consistent set of metrics to assess energy performance and indoor environmental quality of an indoor air quality management strategy
2. proposing an integrated rating method for the performance assessment and optimization of energy efficient strategies of managing the indoor air quality (IAQ) in new and existing residential buildings
3. gather existing scientific knowledge and data on pollution sources in buildings to provide new standardized input data for the rating method
4. improving the energy efficiency of the indoor air quality management strategies in operation and to improve their acceptability, control, installation quality and long-term reliability

EBC

Energy in Buildings and Communities Programme

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 project deliverables are planned:

- a literature list for energy efficient energy management
- an open database with source data for the rating of indoor air quality manage-ment strategies
- an overview report on methods and tools for the rating of indoor air quality management strategies
- a collection of case studies and demonstrations of energy efficient indoor air quality management strategies

The target audience includes:

- designers and practitioners;
- policy makers or regulatory bodies;
- manufacturers;
- residential construction sector, building owners and managers, and
- researchers and environmental health professionals.

Project duration

Ongoing (2020 - 2025)

Operating Agents

Dr Jelle Laverge
Assistant Professor
Ghent University
Department of Architecture & Urban Planning, Building Physics
Campus UFO T4, St-Pietersnieuwstraat 41
9000 Ghent
BELGIUM

Participating countries

Australia, Austria, Belgium, Brazil, Canada, P.R. China, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Türkiye, UK, USA

Further information

www.iea-ebc.org

Published by: EBC Executive Committee Support Services Unit