EBC

Energy in Buildings and Communities Programme

Factsheet

Cost Effective Energy and CO_2 Emissions Optimization in Building Renovation

ANNEX 56

In recent years, various standards and regulations for energy consumption in buildings have emerged that specify greatly improved levels of energy efficiency in comparison with earlier requirements. However, these mainly focus on new buildings and do not respond effectively to the numerous technical, functional and economic constraints of the existing stock. It is common that requirements for existing buildings, which are generally targeted at energy efficiency measures, result in expensive processes and complex procedures, seldom accepted by occupants, owners or developers.

But, with an objective of mitigating climate change, renewable energy supply measures can sometimes be at least as cost effective as energy conservation and efficiency measures, if not more so.

Hence, it is important to investigate where the balance point lies between these two types of measures from a cost-benefit perspective. This involves determining how the best performance would be achieved with the least effort. Therefore, a new methodology for energy and carbon dioxide (CO_2) emissions optimized building renovation has been created as a basis for future

PROJECT OBJECTIVES

1. define a methodology for establishing cost optimized targets for energy consumption and CO_2 emissions in building renovation,
2. clarify the relationship between CO_2 emissions and energy targets and their eventual hierarchy,
3. determine cost effective combinations of energy efficiency and renewable energy supply measures,
4. highlight additional benefits achieved in the renovation process, and
5. develop tools to support decision makers in accordance with the developed methodology, select exemplary case studies to encourage decision makers to promote efficient and cost effective renovations.

Source: Nussmueller Architekten ZT GmbH

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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.

standards. This can be used by interested private entities and agencies for their renovation decisions, as well as by governmental agencies for the definition of regulations and their implementation.

ACHIEVEMENTS

- A new methodology for establishing cost optimized targets for energy consumption and CO_2 emissions in building renovation
- An investigation into cost-effective combinations of energy efficiency and renewable energy supply measures
- Documentation of additional benefits achieved in the renovation process
- Tools to support decision makers in accordance with the developed methodology
- Selected exemplary case studies to encourage decision makers to promote efficient and cost effective renovations

Project duration

Completed (2010 - 2017)

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