EBC

Energy in Buildings and Communities Programme

Factsheet

Energy Flexible Buildings

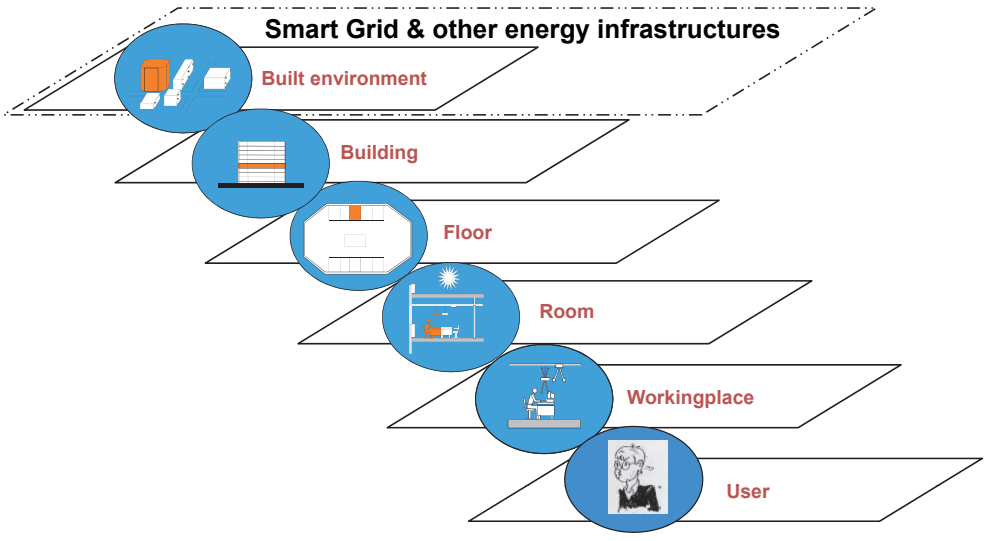
ANNEX 67

Energy flexibility in buildings will play an important role in facilitating energy systems based entirely on renewable energy sources. Flexibility is necessary to control the energy consumption to match the actual energy generation from various energy sources such as solar and wind power. However, there is lack of comprehensive knowledge about how much energy flexibility different building types and their usage may be able to offer to the future energy systems.

The aim of this project is to demonstrate how energy flexibility in buildings can provide generating capacity for energy grids, and to identify critical aspects and possible solutions to manage such flexibility. This knowledge is important in order to incorporate energy flexibility of buildings into future smart energy systems and to better accommodate renewable sources in energy systems. It is also important when developing the business case for using building energy flexibility within future systems to potentially reduce costly upgrades of energy distribution grids.

PROJECT OBJECTIVES

1. development of common terminology, a definition of 'energy flexibility in buildings' and a classification method,
2. investigation of user comfort, motivation and acceptance associated with the introduction of energy flexibility in buildings,
3. investigation of the energy flexibility potential in different buildings and contexts, and development of design guidelines, control strategies and algorithms,
4. investigation of the aggregated energy flexibility of buildings and the potential effect on energy grids,
5. demonstration of energy flexibility through experimental and field studies.



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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.

The planned deliverables from this project are:

- the principles of and a standard definition for energy flexible buildings,
- control strategies for maximizing energy flexibility while maintaining thermal comfort,
- documented business cases benefitting from the use of building energy flexibility in future energy systems,
- descriptions of and results from tests in laboratory and full scale test facilities, and
- demonstration and user perspectives.

The project beneficiaries will be:

- the building research community and associated specialists,
- district system / network operators, transmission system operators and aggregators (who would aggregate energy flexibility of multiple buildings and offer this as a package on the open market),
- architects and designers, engineers and consultants in building physics, energy, HVAC and sustainable construction,
- building component, HVAC system, ICT developers and manufacturers, and
- policy makers, decision makers and experts involved in shaping future energy systems.

Project duration

Ongoing (2014 - 2019)

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