EBC

Energy in Buildings and Communities Programme

Factsheet

Data-Driven Smart Buildings

EBC ANNEX 81

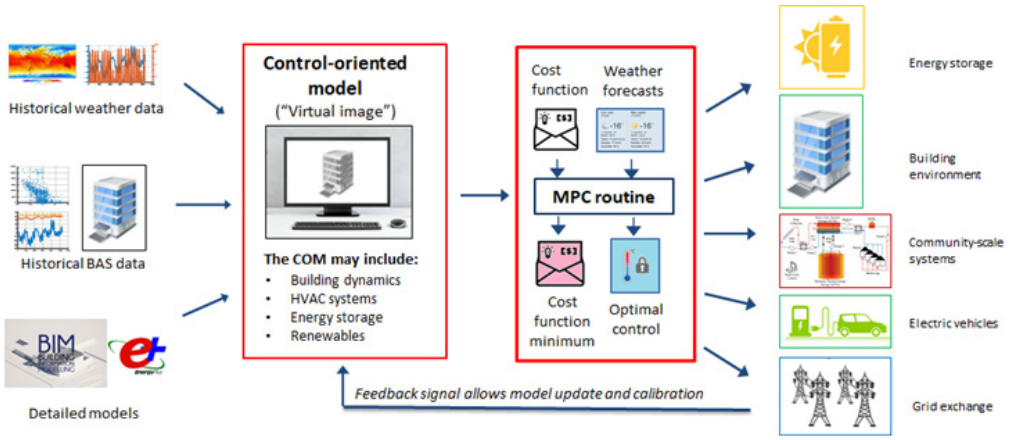
This project has imagined a future world empowered by access to discoverable, reliable, ubiquitous real-time data from buildings, such that digital solutions can rapidly scale and where energy efficiency knowledge can be widely encapsulated and disseminated within highly accessible software 'Applications'. Applications, in this context, are conceived as easy-to-configure and instantiate software microservices, built on top of a common software infrastructure that facilitates data access under well-defined application program interfaces (APIs), deployed on edge-computing devices or the cloud. Such Applications are somewhat analogous to the 'Apps' we use on personal mobile devices.

ACHIEVEMENTS

By embracing modern IT approaches, the management and operation of building services can be simplified to overcome energy efficiency skills barriers and reduce reliance on manual interventions. Inside this vision, the project outcomes help to harness the emerging

PROJECT OBJECTIVES

1. provide the knowledge, standards, protocols and procedures for low-cost high-quality data capture, sharing and utilization in buildings
2. develop a Building Emulator platform that enables testing, development and assessment of the impact of alternative building HVAC control strategies in a digital environment
3. develop building energy efficiency software Applications that can be used and ideally commercialized for reducing energy use in buildings
4. drive adoption of results through case studies, business model innovation and results dissemination



Conceptual representation of Model-based Predictive Control (MPC).
Source: EBC Annex 81

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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.

digital technology revolution to both reduce energy use in buildings, and to enable buildings to participate as distributed energy resources in support of increased use of variable renewable electricity sources. It has achieved this through developments in 'Software as a Service' innovation and intelligent data-driven building automation. The deliverables from this project are:

- a report on suggested functional requirements for data platforms that can be used to help to advance data sharing;
- an online repository of exemplar data sets for building analytics research;
- data-driven control-oriented building models suitable for model predictive control in building scenarios;
- a software repository, that catalogues and describes relevant data-driven software implementations;
- a proposal for governments to lead by example in the use of data-driven smart building solutions in their own buildings;
- competitions for incentivizing innovators to develop data-driven 'applications'.

Project duration

Completed (2019 - 2025)

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Further information

www.iea-ebc.org

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