

Moeebius Technical overview

Jiri Rojicek



Modelling Optimization of Energy Efficiency in Buildings for Urban Sustainability

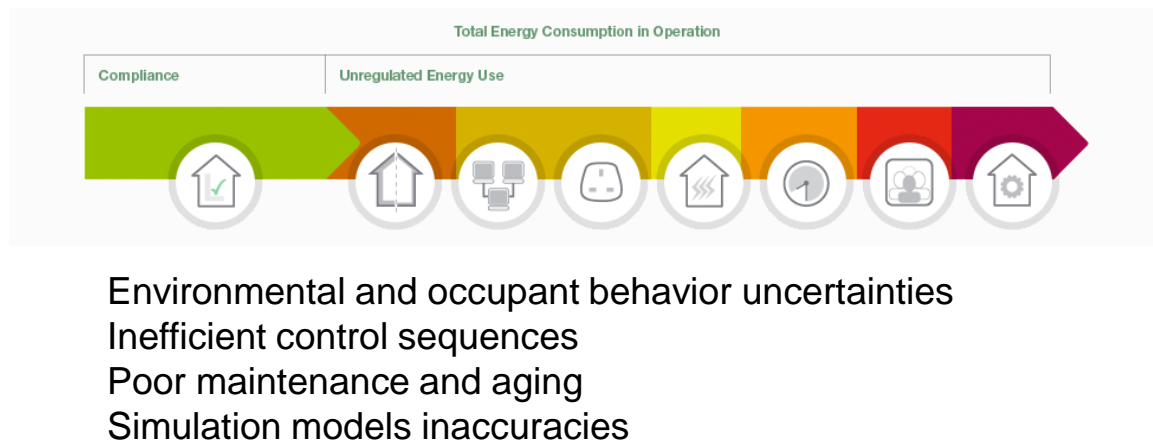
Project duration: November 2015 – February 2019

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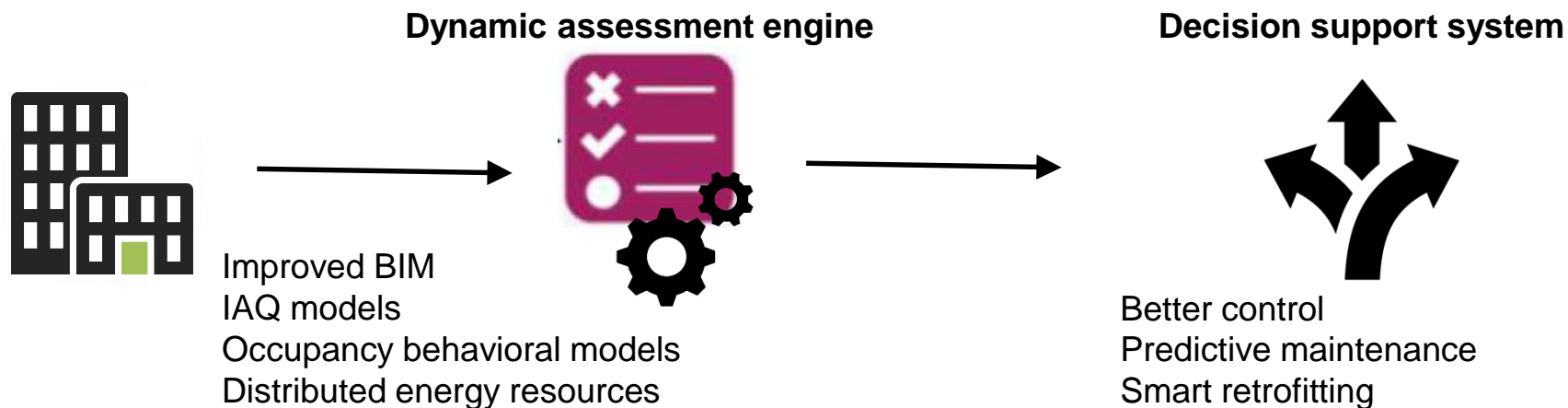


Moebius objectives

Identify and minimize the gap between expected and actual energy consumption



Moebius energy performance optimization framework



End-user and business requirements and energy performance assessment specifications

Overall requirements on Moebius framework

End user requirements

Users characterization
Users' expectations

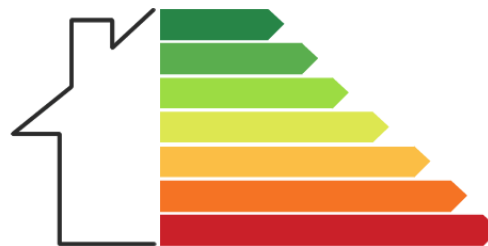


Business requirements

Relevant business scenarios
Relevant ESCO business model development
Value proposition for users

Energy performance assessment specifications

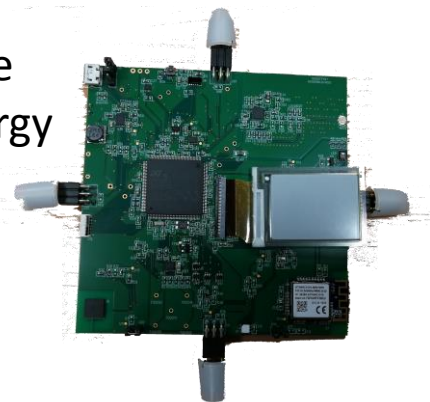
Key performance indicators
Measurement and verification
Target setting



Data acquisition and management

Wireless sensor network / BEMS integration

- NOD: a novel equipment capable to sense key variables required for HVAC performance optimization addressing some of the known pain points in building instrumentation like energy harvesting.
- NOD sensor directly connects to Moeebius framework



Moeebius middleware orchestrates all relevant Moeebius layers

- Service oriented middleware capable to orchestrate all relevant Moeebius layers.
- Open standards, open source, scalable, secure
- Provides endpoints consuming data collected at sites and making them available
- Enables to chain or combine actual services developed in Moeebius



Moeebius pipe

Simulation based dynamic assessment environment

Perform simulations utilizing models in order to understand and improve building comfort and energy performance.

- Improve user experience by context-aware user preferences
occupancy profiling to eliminate unnecessary building interaction with occupants
- Assessment of building level energy performance optimization
- Assessment of district level peak load management and energy performance optimization

Dynamic assessment engines

describe consequences of applied control strategies

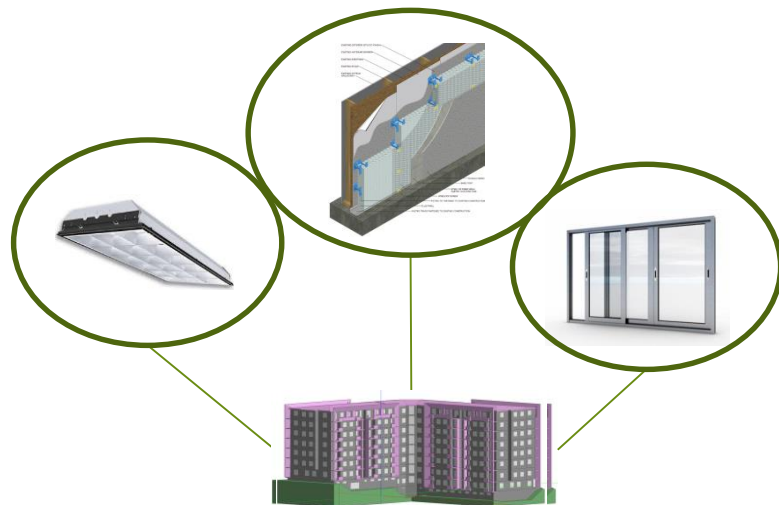
feed into **decision support system** (WP6) for optimization.

Moeebius quest

Decision support system for holistic energy performance optimization

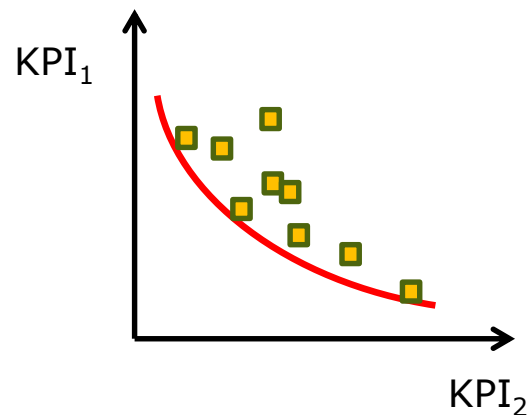
Retrofitting advisor

Suggest a cost effective retrofit considering maintenance cost and replacement ROI, as the part of lifecycle costs



Energy performance optimization

Suggest changes to control strategy and corrective actions to improve selected KPIs.



Moeebius quest

Pilot setup and validation

validation of the above concepts on real pilot

Living Lab

KUBIK: 3-story
experimental building



London, UK



Resi., Retail, Office
4 buildings
49625m²
9986MWh (el)
80MWh (ng)
4400 people

Mafra, POR



School, Office, Sport
5 buildings
8100m²
535MWh (el)
760MWh (ng)
800 people

Belgrade, SRB



School, Office,
Sport, Residential
48 buildings
434000m²
12400MWh (el)
11700 people



MOEEBIUS

MOEEBIUS Partners



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Moebius motivation

Significant gap between expected and actual energy consumption

The Telegraph

HOME | NEWS | SI

Science

Science

Energy scandal: efficiency claim huge bills for ho



Review

The building performance gap: Are modellers literate?

Salah Imam¹, David A Coley¹ and Ian Walker²

Abstract

One of the most discussed issues in the design community i

BUILDINGS SERVICES ENGINEERING
RESEARCH & TECHNOLOGY

Building Serv. Eng. Res. Technol.
2017, Vol. 38(3) 351–375
© The Chartered Institution of Building
Services Engineers 2017
DOI: 10.1177/014362416684641
journals.sagepub.com/home/bse
SAGE

The Hazards of 'Blame Throwing' About Building Performance

Rob Watson
Monday, October 19, 2009 - 12:01am



IBPSA - International Building Performance Simulation Association

6,996 members

Member



Mike Barker · Group Owner

① Consulting Building Services Engineer ② Renewable Energy Engineer

Report claims some building modellers 'not fit for purpose'

Every few years Energy Modelers come under the whip. Buildings are not performing as per the Energy Model !

Time to ask - do we deserve this criticism, and are our efforts perhaps STILL misunderstood by our industry peers ?

ABOUT THIS GROUP

Interested in Green Buildings ? - Apply for FREE IBPSA membership now at www.ibpsa.org !

This group covers the modeling / simulation of green building, low carbon or low energy construction, and net zero buildings.

For building scientists, architects &... Show more

Group rules



er Burning Question http://www.flickr.com/photos/team_716_pwns/302366778/

out "When LEED falls short," which linked me to a [blog](#) about the trials
iding owner with some of its LEED buildings not performing as expected.