



Highly Innovative building control
Tools Tackling the energy
performance GAP

Cross-collaboration workshop
« Energy Performance GAP »





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HIT2GAP project in short

www.hit2gap.eu



Start: 01/09/2015



Eu contribution:
6,675 M€



Partners (5 RTO, 5 Universities,
4 IND, 7 SME, 1 GOV)

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Project Summary – Key Objectives

Address challenges in EeB 7 - 2015 – H2020 (New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings)

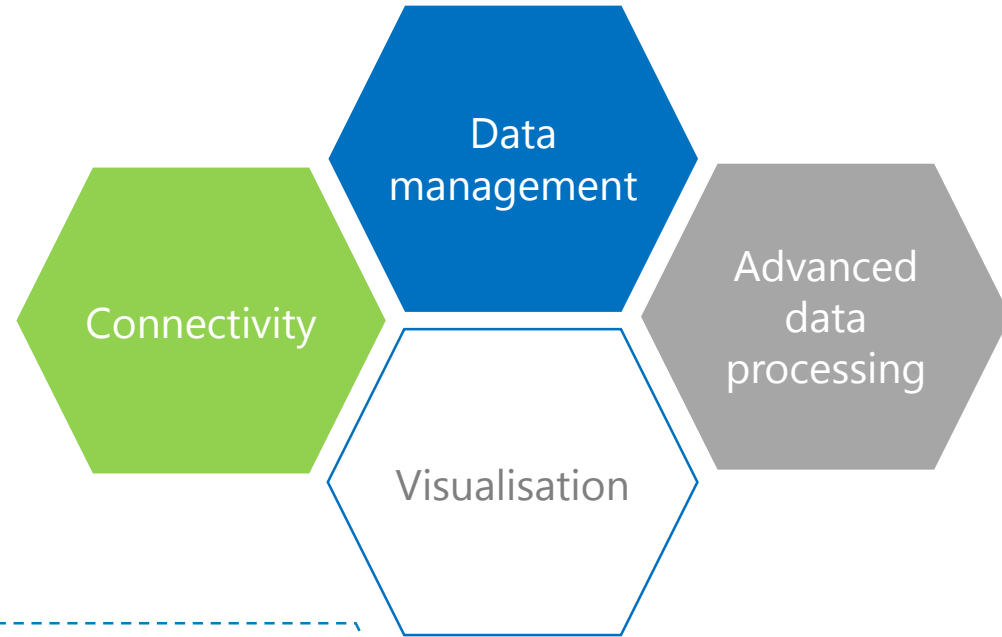
- Reduce the energy performance gap between predicted and real building performances, focusing on the operational phase of buildings.
- Propose a new paradigm for the development of energy management platforms in buildings, integrating existing expertise and resources: open approach for A NEW GENERATION OF BMS SOLUTIONS with plug and play analytics tools and modular services using a win-win strategy.
- Significant reduction of the energy performance gap using enhanced data treatment modules for monitoring real-time building operation and occupancy data and real-time meteorological and building performance data that are used to continuously calibrate the models to more accurately represent the real energy behaviour.



- **Data platform** – collection and storage of data
- **Modelling** – e.g. energy predictions, users' behaviour modelling
- **Modules** – data mining, EnMS and visualisation



Project Summary - Current status

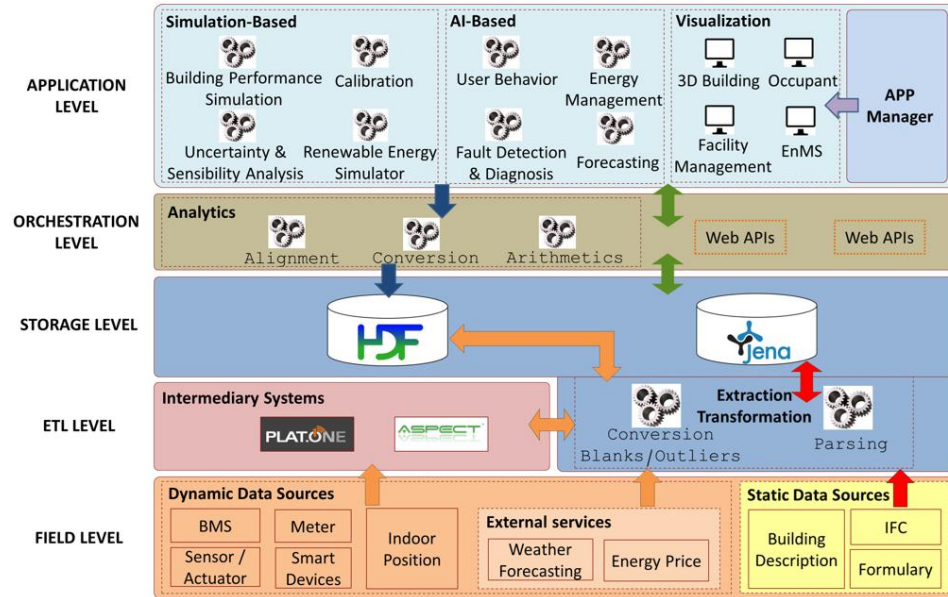


Building Performance Simulation services
(Model-Supported Control, Building Performance Simulator-ESP-r, Gap Reasoner, REnSIM)

Fault Detection and diagnosis modules

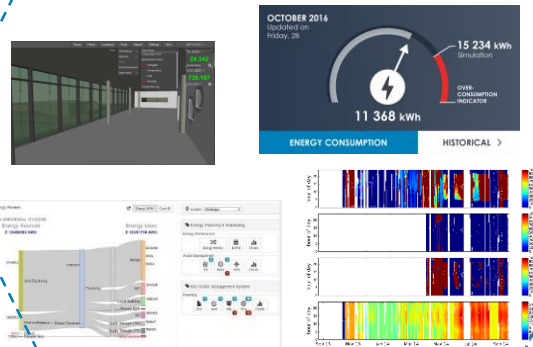
User Behaviour modelling

Energy Management module



Open, modular and evolutive Data platform (data structuration, pre-processing, consolidation and alerts, forecasting, webservices)

Display modules



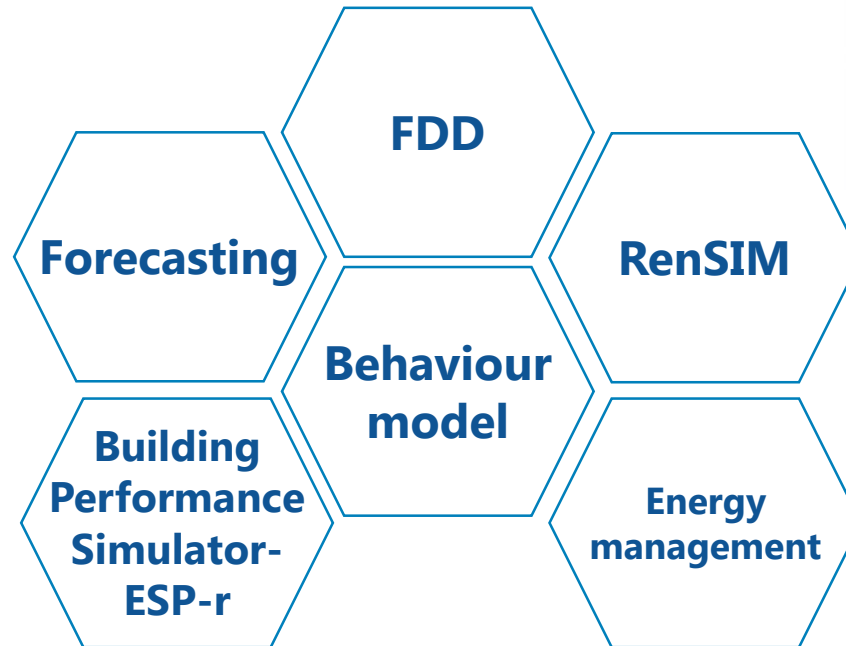
Demonstration on going



Current deployment

Challenger building

- Implemented modules
- Expected benefits
 - Early and automatic detection of faults and action management
 - Identification of the location and cause of inappropriate indoor environmental conditions
 - Better prediction of consumption and production to better master EPC
 - Anticipation or justification of overconsumptions
 - Reduction of energy consumptions by creating awareness
 - Identification of PV system performance degradation.
 - Occupants engagement in contributing in the improvement of energy performance



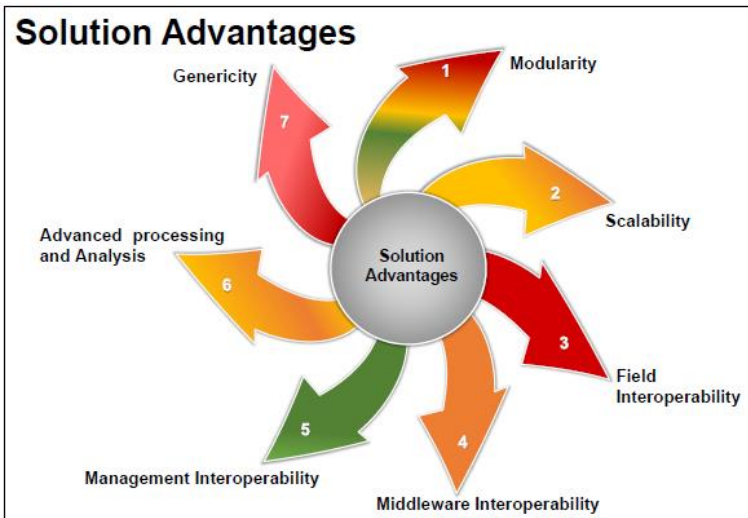
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Key Innovations

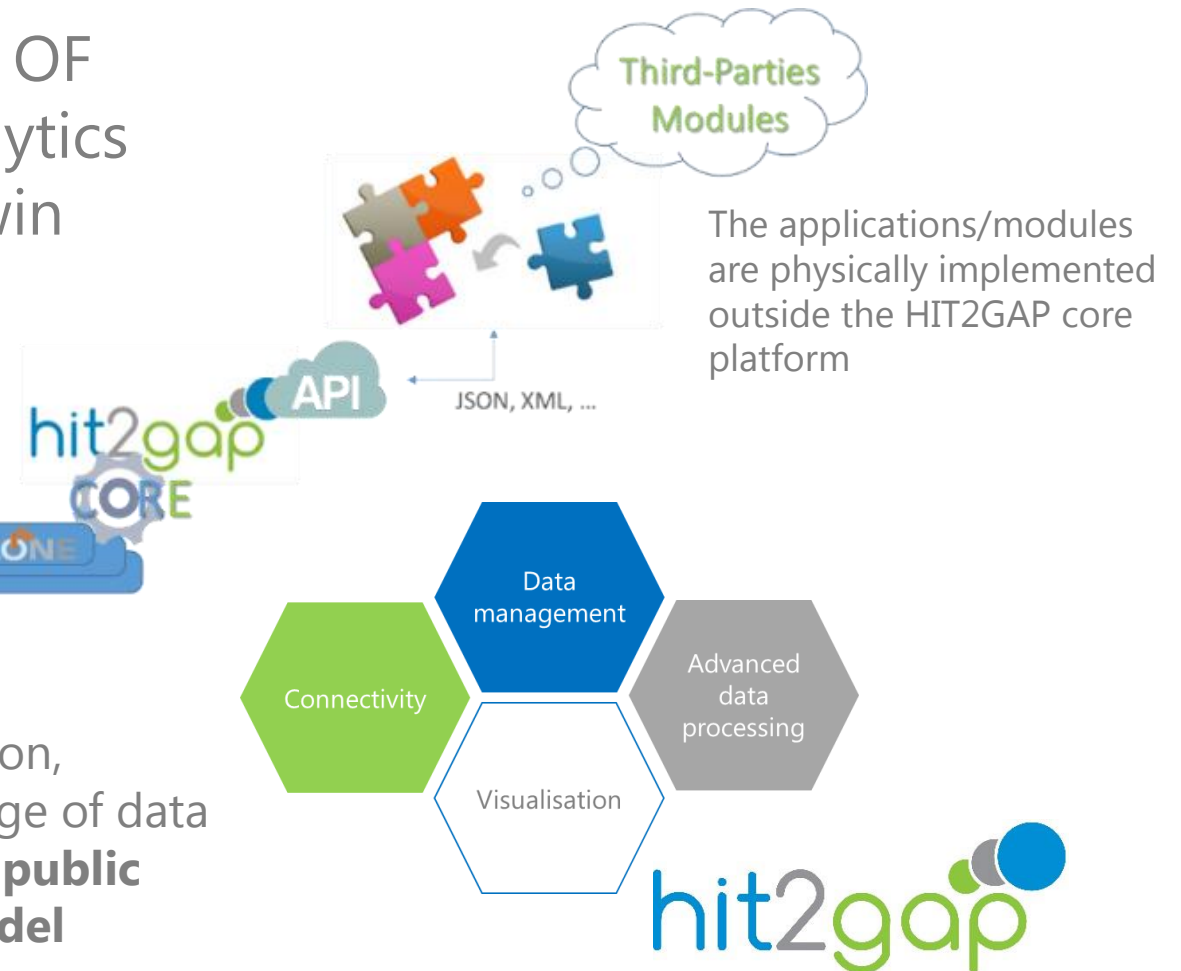
TRL4→TRL7

Data management – big data

Open approach for A NEW GENERATION OF BMS SOLUTIONS with plug and play analytics tools and modular services using a win-win strategy.



Platform for collection, storage and exchange of data via a **common and public ontology/data model**

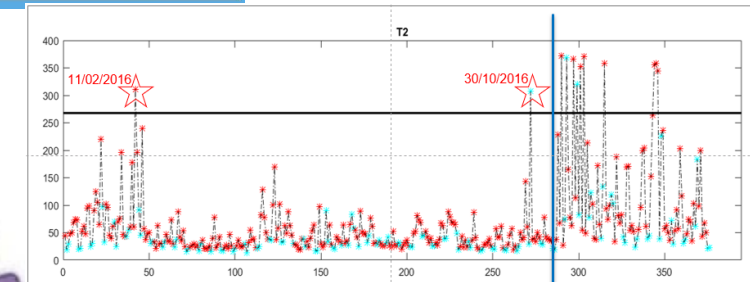


Key Innovations

TRL3/4→TRL6/7

Building Performance Optimisation and Gap reduction

- Integrate a new level of intelligence into current BMS product offerings for tertiary buildings
- Ability to reach important (>30%) savings using **DATA ANALYTICS** (machine learning, data mining): **Fault Detection & Diagnosis**, **Forecasting**, Usage patterns/**Occupants behaviour modelling**)
- **SIMULATION MODELS** used during the building **OPERATIONAL PHASE** (continuously calibrated models with real time data)



Key Innovations

TRL3→TRL6

Role of the citizen

- Increased awareness through modular information display
- Building occupants are active participants in BM module (**questionnaire** feeding the BM module on **perceived comfort**)
- **User behaviour models** combined with building information to generate a dynamic, adaptable and holistic recommendation and decision support system
- New sensing technologies (wearable sensors)



QUESTIONNAIRE

hit2gap Questionnaire for User Behaviour for Challenger Use Case

Instructions
Please answer the following questions.

General information

1- Gender (*)

☐ Male
☐ Female

2- Age (*)

☐ 18-24
☐ 25-34
☐ 35-44
☐ 45-54
☐ 55-64
☐ 65+

3- Efficiency Awareness (*)
At which level, do you consider your energy efficiency awareness?

☐ Very low
☐ Low
☐ Medium
☐ High
☐ Very high

4- Activities related to energy efficiency
Did you attend any of the following activities about energy efficiency?

☐ Course
☐ Seminar
☐ Conference



Key Innovations

Business models and market opportunity

- Integrate and format the solutions developed into market-oriented services
- Propose a new generation of services based on AI and data mining techniques
- Ideal access to the building data for modules/services developers and providers
- Open source platform made available to a community of developers who may extend and improve the core functionalities of the platform

