



ENERGY IN TIME WORKSHOP



European Research Conference: Buildings
Europäische Forschungskonferenz: Gebäude

EiT Integrated Solution for Building Control



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World Sustainable Energy Days
1 - 3 March 2017, Wels/Austria

Factors in Energy Consumption

- Buildings energy demand and consumption is influenced by internal and external factors:
 - Design
 - Construction materials
 - Climate
 - Users behaviour
- These factors are considered at the building **design** and **planning** stage
- During daily operation those factors can **change**



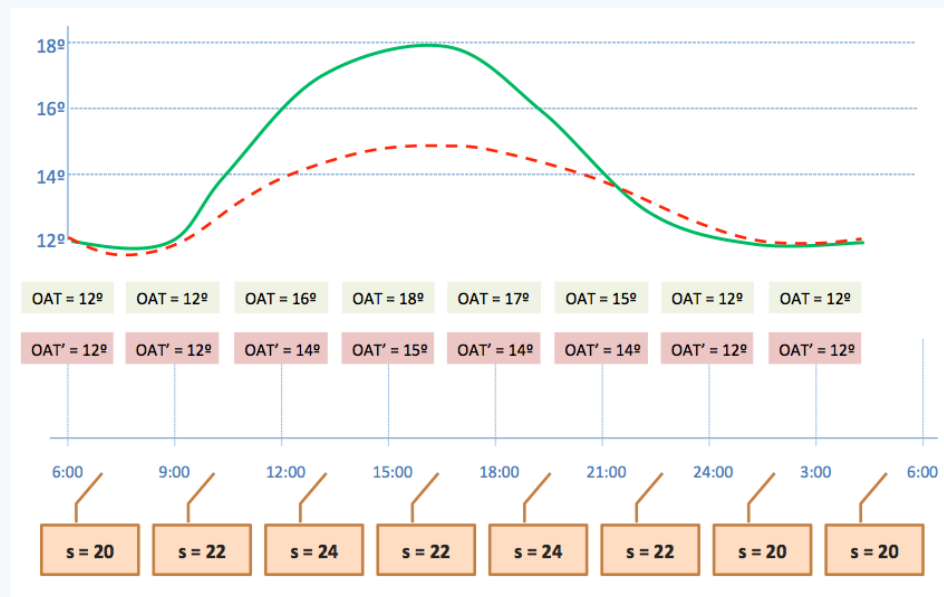
An Integrated Solution

- Energy simulations and calculations done at the design stage will often differ from the actual energy performance of the building
- Change in internal and external factors can be represented by a **model** of the building
- Taking into account the state of the model it is possible to create more accurate **operational plans**
- Changes in the variables used to create operational plans can be **detected** to take corrective actions
 - Deviations from the conditions used by the plan
 - Malfunctions or errors in building equipment



Operational Plan

- An operational plan consists in a set of instructions (or setpoints) to be executed by the BEMS in a given future time period
- A good operational plan can aid to save energy
- The operational plan needs to know the building internal and external conditions



Building Simulations

- **Virtual** operating models of the buildings allows for tightly calibrated building conditions at any point in time, enabling a realistic representation and simulation
- Models are **updated** with information obtained from the building monitoring
- Other kind of information can be loaded in the models
 - Weather forecasts
 - Building occupancy
- Based on the model state an **optimal operational plan** is generated



Changes Detection

Divergences in the conditions from which a operational plan was created can be detected

- **Model On-Demand Control**

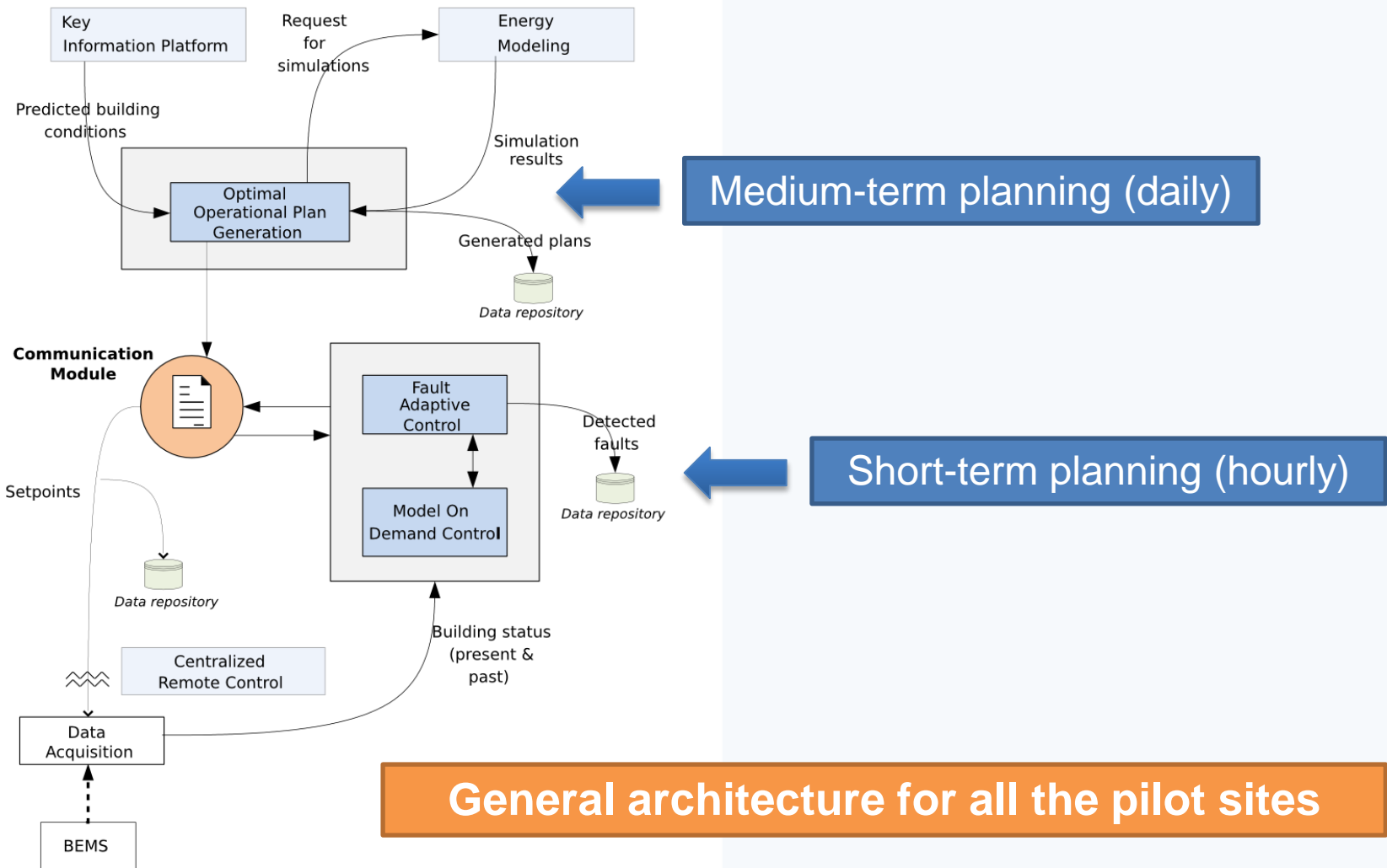
- Adjusts the optimal operational plans deviations due to changes external/internal data compared to the forecasted data used.

- **Fault Adaptive Control**

- Detects and treats deviations between operational plans and real operation due to changes in equipment performance



Integrated Solution for Building Control



Data Analysis

- Building data is stored during the operation of the building and can be analyzed
 - Decision support method for building analysis
 - Data Mining for improving building operation





Thank you!

www.energyintime.eu

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