

<p><b>PROJECT:</b>  <b>ICT Platform for Holistic Energy Efficiency Simulation and Lifecycle Management Of Public Use Facilities</b></p>	
<p><b>DELIVERABLE TITLE:</b>  <b>Gap Analysis, Use Case Scenarios and Requirements Specification</b></p>	<p><b>Deliverable Number:</b>  <b>D 1.1</b>          (Confidential, only for members of the consortium (including the Commission Services))</p>
<p><b>WORK PLAN:</b>          The <b>objective</b> of Work Package 1 of HESMOS is to analyse the requirements of ICT-related information, energy modelling, interoperability needs and simulation methods, starting from energy view objectives and proceeding to activity models of the different users (architects, building services engineers, facilities managers, operators, owners, public authorities). Based on identified user scenarios, the work package has to study the effects of design, operation and refurbishment on energy consumption, comfort as well as costs and identify the simulation needs.</p>	<p><b>Deliverable Main Authors:</b></p> <p>Bastian Bort, BAM AG          Marie Geissler, BAM AG          Romy Guruz, TU Dresden</p> <p><b>Co-Authors:</b>          Wilfred van Woudenberg, Ken Baumgärtel, Jens Kaiser, Burkhard Hensel, Raimund Zellner, Tuomas Laine, Friedrich Jonas, Thomas Liebich, Peter Katranuschkov</p>
<p><b>EXECUTIVE SUMMARY:</b>          In current practice, the complexity of buildings and surrounding exterior spaces on macro, medium and micro level, especially in the case of public use facilities such as shopping malls, university and school complexes etc., the variety of climatic scenarios and activity profiles and the exploited possibilities for ICT-based feedback and control of energy performance have led to highly sophisticated and specialised tools distributed among disciplines and lifecycle phases. Due to that, considerable gaps exist in the information flows and model interoperability between building automation data, FM data and BIM data.</p> <p>Based on identified user scenarios the different requirements concerning modelling, simulation and monitoring functionality, information needs and user interaction with the HESMOS platform were collected, analysed and categorised under various workflow aspects.</p> <p><b>This deliverable covers the overall work performed in WP1</b> within the following three tasks:</p> <ul style="list-style-type: none"> <li>• T1.1 Gap Analysis</li> <li>• T1.2 Use Case Scenarios</li> <li>• T1.3 Requirements Specification.</li> </ul> <p><b>The deliverable report is structured into three parts:</b></p>	<p><b>Deliverable Partners:</b></p>     

In the **first part**, the current life-cycle PPP process (i.e. the "AS-IS" Process) was examined to discover existing gaps and areas of improvement in energy analysis and related decisions. At first, the actors in the process were identified and allocated in accordance with their roles and responsibilities. After that, the issues related to energy analysis through simulation and sensor-based monitoring, as well as calculations regarding the balancing of overall energy consumption and operational costs were studied. The gathered knowledge was used to create the HESMOS "TO-BE" process aimed at improvement of energy performance. This "TO-BE" process encompassing the full life-cycle was further on partitioned in four relevant use case scenarios (design, commissioning, operation, and refurbishment) that are not directly inter-connected but coherently integrated via common models and data.

In the **second part**, the developed use cases are described and documented, including process diagrams in BPMN notation and descriptions of the activities, main decision points (gateways) and data objects. As basis, the IDM method (ISO 29481) was used. Data exchange requirements were specified and documented in specifically created for that purpose tabular form, to prepare for further formal description and development of an energy efficiency BIM model (eeBIM) and dedicated BIM-based model views.

In the **third part**, HESMOS requirements are specified, synthesizing the results of the preceding tasks in the following five groups: (1) Functional requirements, (2) Modelling requirements, (3) Simulation requirements, (4) Operational (implementation) requirements, and (5) User Interface (GUI) requirements.

A comprehensive appendix in three parts comprising a list of used acronyms and abbreviations, the developed detailed BPMN process diagrams and the developed exchange requirements in tabular form concludes the report.

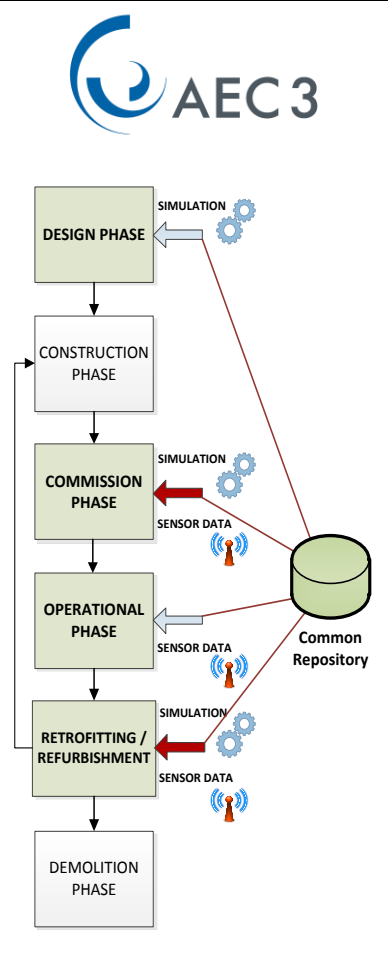


FIGURE: Simplified view of the identified TO-BE process, emphasising the broad consideration of lifecycle energy-relevant modelling aspects

**TAGS:**

Energy-efficient building management, Requirements gathering, Process and model integration, public-private-partnership (PPP) projects, life-cycle, IDM,BIM

HESMOS is a 36 month project that started in September 2010 and comprises a Consortium of one university and five industry partners.

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Financially supported by



and the project partners.