




<p>PROJECT: ICT Platform for Holistic Energy Efficiency Simulation and Lifecycle Management Of Public Use Facilities</p>	
<p>DELIVERABLE TITLE: HESMOS enhancements of energy simulation tools</p>	<p>Deliverable Number: D 5.2 (Restricted)</p>
<p>WORK PLAN: The objective of WP5 is to provide extended and specialist energy simulation functionality in the form of separate IT tools and/or web services so that to enhance the BIM-based kernel system to an energy simulation platform enabling third parties to contribute their expert knowledge in relevant design, refurbishment and retrofitting tasks for achievement of improved energy performance.</p>	<p>Deliverable Main Authors: John Grunewald, TU Dresden Jens Kaiser, TU Dresden Co-Authors: Marie-Christine Geißler, BAM Ken Baumgärtel, TU Dresden Peter Katranuschkov, TU Dresden</p>
<p>EXECUTIVE SUMMARY: A major goal of HESMOS is to integrate the use of simulation tools seamlessly into the design an operational process of buildings using a web-based framework organized as SOA. Important tasks in this regard are:</p> <ul style="list-style-type: none"> • Composition of the data which is necessary to run a simulation • Enhancement of available simulation tools for use inside a web-based SOA according to different levels of modelling and various use case scenarios. <p>Objective of work package WP5 is the extension of selected simulation tools into ‘Interoperable energy simulation tools’. The work package is structured into three tasks:</p> <ul style="list-style-type: none"> • T5.1 Interfaces to material and climate databases • T5.2 Enhancement of the energy simulation tools for use with energy-extended BIM (eeBIM) and ICT-based sub-systems • T5.3 User and service interfaces to the Integrated Virtual Energy Laboratory (IVEL) and its components <p>Deliverable D5.2 covers especially task T5.2 of the overall work performed in WP5 related to the enhancement of the HESMOS energy simulation tools for use with eeBIM and ICT-based building automation systems. The work done so far includes:</p> <ul style="list-style-type: none"> • The re-engineered energy simulation tools (building element, single space and building) enabling import/export and use of eeBIM data. • The necessary interoperability services for the integration of the simulation tools in the HEMOS IVEL including model management, filtering, access, transformation, processing and storage. • The services for post-processing and analysis of simulation results, providing also the developed energy-related key performance indicators (eKPI) to the IVEL. 	<p>Deliverable Partners:</p>  

Progress towards the work package objectives has been achieved in the form of a software prototype combining one of the simulation tools with a web-based GUI. This GUI gives the user the possibility to edit various data settings, perform a simulation run and visualize selected simulation results. All simulation tools are now available for use on both Microsoft and Linux based operating systems.

The main achievements of this phase of the R&D work are in:

- The clarification of the simulation, analysis and post-processing modules in the IVEL framework;
- The identified interaction and interoperability processes between the involved software modules and services;
- The transformation of the necessary data coming via the eeBIM into the data schema used by the simulation tools;
- The developed detailed specifications of eeTemplates and eKPIs described in this report.

Especially in use case one, early design, the definition and accessibility of the specified various kinds of eeTemplates provides an essential contribution to the integration of simulation tools as early as possible in the design phase. An overall concept covering the structure and content of such templates according to the special needs of the simulation tools was worked out for that purpose. This concept will be finalized and filled with content during the next project period (06/2012-03/2013).

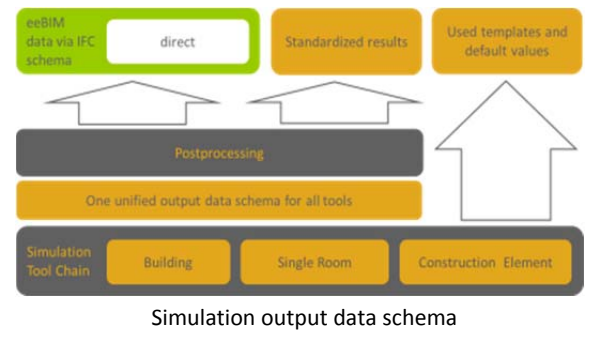
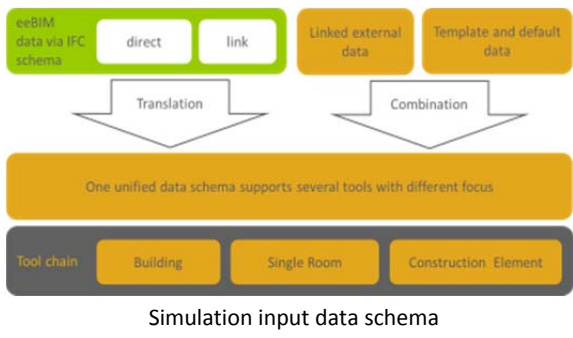
The description of the eKPIs as basis for the post-processing section of the IVEL framework and as primary instrument for fast and efficient decision making provides notable benefits and impacts with regard to exploitation. A further impact to the practical exploitation of the IVEL platform is the translation of IFC data into the data schema for the used simulation tools, including the IFC-conformant level one to level two space boundaries conversion.

Report structure

The deliverable report is structured into six parts. The first part provides a brief introduction regarding the performed work in the overall context of HESMOS. The second part explains the position, role and structuring of the services and tools in WP5 with regard to the HESMOS architecture. The third, fourth and fifth part are dedicated to the specifications related to the realisation of the pre-processing, simulation and post-processing modules. Finally, the sixth part draws overall conclusions and discusses the achieved results and their benefits and possible impacts.

Next steps

The next major working steps in WP5 comprise the finalization of the tool for the translation of data from the IFC schema, the provision of comprehensive content for the eeTemplates and the complete integration of all simulation tools in the IVEL framework in accordance with the developed overall concept and work plan.



TAGS:

Energy simulation, IVEL framework, Interoperability, eKPI, eeTemplates, energy-extended 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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