

<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>Enhancement of the energy-related tools for the lifecycle use of eeBIM</b></p>	<p><b>Deliverable Number:</b>  <b>D 6.1 (public)</b></p>
<p><b>WORK PLAN:</b>          The <b>objective</b> of the Deliverable 6.1 "Enhancement of the energy-related tools for the lifecycle use of eeBIM " is to describe the work performed in the task T6.1 to provide energy-related tools and web services for the intelligent lifecycle management of public use facilities that are capable to resolve operating problems by the enhancement of the energy analysis simulation tool to perform CO<sub>2</sub> emission calculations.</p>	<p><b>Deliverable Main Authors:</b>          Tuomas Laine, Granlund          Francisco Forns-Samsó, Granlund          Antti Karola, Granlund</p> <p><b>Co-Authors:</b>          Marie-Christine Geißler, BAM          Friedrich Jonas, Obermeyer</p>
<p><b>EXECUTIVE SUMMARY:</b>          The Deliverable D6.1 presents the enhancement of the energy analysis simulation tool RIUSKA to perform CO<sub>2</sub> emission calculations. In addition, this deliverable describes the methods and procedures utilized, and it provides a comprehensive report of the results of the CO<sub>2</sub> emission calculations for different test scenarios.</p> <p>The work in <b>task T6.1</b> "Enhancement of the energy-related tools for the lifecycle use of eeBIM" of WP6 was performed both as prototype software implementation and this deliverable 6.1, which reports the results of that work and is structured in <b>three chapters</b>.</p> <p>The <b>Chapter 1</b> describes CO<sub>2</sub> emission calculation principles.</p> <p>The <b>Chapter 2</b> focuses on the functionalities of the CO<sub>2</sub> emission calculation tool.</p> <p>The <b>Chapter 3</b> utilizes a demo project of 3 floor office building in IFC format for the piloting of the CO<sub>2</sub> emission calculations and presents the results for the different test scenarios.</p>	<p><b>Deliverable Partners:</b></p>   



**BUILDING ENERGY CONSUMPTION  
PURCHASED ENERGY - CO2 EMISSIONS**

**Demo project**

Document No.	
Project No.	
Date	Created/checked by
Latest revision	
Created	28.11.2011 Marie

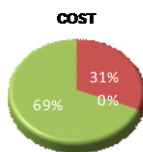
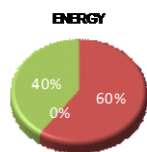
**BASIC INFORMATION:**

Geometry model area: 670,1 m<sup>2</sup>  
 Geometry model volume: 1.808,6 m<sup>3</sup>

Description of the simulation:  
 Case 2

**ANNUAL PURCHASED ENERGY NEED**

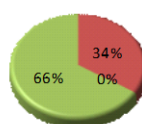
	MWh	kWh/m <sup>2</sup>	kWh/m <sup>3</sup>	Energy price EUR/MWh	Energy price EUR	Basic charge EUR	Total EUR
Heating energy	57,5	85,9	31,8	65,00	3.739,47	150,00	3.889,47
Cooling energy	0,0	0,0	0,0	0,00	0,00	0,00	0,00
Electric energy	38,9	58,0	21,5	220,00	8.551,42	50,00	8.601,42
<b>Total</b>	<b>96,4</b>	<b>143,9</b>	<b>53,3</b>	<b>285,00</b>	<b>12.290,89</b>	<b>200,00</b>	<b>12.490,89</b>



**CO2 EMISSIONS**

Primary energy Type	Purchased energy MWh	CO2 emissions kg/MWh	CO2 emissions ton CO2
Heating energy	57,5	219,0	12,6
Cooling energy	0,0	0,0	0,0
Electric energy	38,9	633,0	24,6
<b>Total</b>	<b>96,4</b>		<b>37,2</b>

**CO2 EMISSIONS**



Primary energy Type	Name	Purchased energy MWh	CO2 emissions kg/MWh	CO2 emissions ton CO2
District heating	District heating	57,5	219,0	12,6
District cooling		0,0	0,0	0,0
Electricity	Electricity	38,9	633,0	24,6
Renewable		0,0	0,0	0,0
Fossil		0,0	0,0	0,0
<b>Total</b>		<b>96,4</b>		<b>37,2</b>

FIGURE: Example of CO<sub>2</sub> emission calculation report from the developed prototype enhancement of RIUSKA energy analysis tool

The prototype software tool testing by using a demo project of 3 floor office building includes 3 different scenarios with different energy sources:

**Scenario 1** – district heating for heating and hot water and electricity for cooling, air-conditioning, lighting and equipment

**Scenario 2** – fossil energy for heating and hot water and electricity for cooling, air-conditioning, lighting and equipment

**Scenario 3** – ground heat with heat pump for heating and hot water and electricity for cooling, air-conditioning, lighting and equipment

The Deliverable D6.1 contains also as an appendix "User guide for prototype CO<sub>2</sub> emission calculation"

**TAGS:**

Energy-efficient building management, eeBIM, CO<sub>2</sub> emission calculation, energy analysis, public-private-partnership (PPP) projects, life-cycle, IFC

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

**COPYRIGHTS:**

The D 6.1 report is © HESMOS Consortium 2011. Its duplication is restricted to personal use within the consortium.

Financially supported by



and the project partners.