

Master Thesis Brief Description

Thesis Title	Optimization of economic and environmental benefits of buildings restoration
Programme of Studies	MSc in Engineering Management
Course	MEM 590 Master Thesis
Area of Study	Facilities Management
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Students Reg. Number	750
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Supervisory Committee	Dr. Marios Fyrrillas, Assoc. Professor, Mechanical Engineering Department Dr. Petros Christou, Ass. Professor, Civil Engineering Department
Semester	Spring Semester 2013
Short Description	<p>The scope of this study was to examine the optimization of economic and environmental benefits of building restoration. In terms of this study a literature review regarding results of previous research projects, statistics and tools (databases, software, etc.) applied for the estimation of the environmental load of renovation processes was performed. The review resulted to a guideline for best renovation practices in the building sector. Energy-efficient optimization of the building envelope included doors and windows, as well as insulation of the exterior walls and basement, roof, roof-space and floor slab. Thermal bridges, in particular around windows and in entrance areas, were to be avoided as far as possible. Savings could be made in the building's HVAC (heating, ventilation, air conditioning and refrigeration) through efficient heat generation and distribution, a large proportion of passive solar energy utilization and sophisticated ventilation technology. Changes in consumer behaviour played also a key role in this context because the active ventilation systems required (in passive houses in particular) render many old and particularly inefficient practices superfluous, for example, tilting windows to ventilate a room. Knowledge gained from and technologies used in the construction of energy-efficient buildings (for example, passive new builds) were also be applied to the renovation of building stock, including the optimisation of heating technology to ensure low wastage, ventilation measures and the avoidance of thermal bridges.</p>