


Event:
Date:
Place:

ENERGY in BUILDINGS 2018
Saturday November 3, 2018
Athens, Hellas



#	Atsonios Ioannis Mechanical Engineer, PhD	
Title:	Post-Doctoral Researcher at Lab. of Heterogeneous Mixtures and Combustion Systems, School of Mechanical Engineering, National Technical University of Athens, Greece	
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Presentation title:	Comparative Techno-Economic Assessment between Conventional insulation and VIP for the Renovation of a Building Envelope	
<p>The reduction of the global energy consumption is the driving force for the limitation of the energy demand in building sector. To meet this target, the upgrade of the building envelope thermal performance is the most effective way. In this context, the scientific community emphasizes on the development of new high-insulation materials. Such materials are the Vacuum Insulation Panels (VIPs) which are the most promising Super Insulating Materials with the lowest thermal conductivity, resulting an insulation capability 5 – 10 times better than the conventional insulation. The present study discusses the impact of VIPs on the energy and cost efficiency in the renovation of an old building located in cities with different climatic conditions and economic factors. A comparative assessment between VIPs and conventional insulants is carried out from the techno-economic point of view. Five renovation cases, regarding the use of VIP and EPS in different thicknesses, are evaluated in terms of the achieving energy saving and the financial viability for three different European cities: Athens, Geneva and Stockholm. As the building is historical, the insulation is located at the internal side of the walls. The economic analysis is performed for two scenarios: excluding and including the impact of the rent revenues caused by the reduction of the net floor area, due to the increase of wall thickness after the renovation. The comparative assessment of the renovation cases is performed by means of the calculation of the annual savings/operating costs and the time for the recovery of the initial installation cost. The energy analysis is based on the reduction of the energy demand for heating and cooling calculated by the EnergyPlus software, while the economic analysis is performed according to the common payback period method. The results show that the use of VIPs with the current prices can be profitable in cold climates and for areas with high rental prices.</p>		

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CV:

Ioannis Atsonios was born in Athens in 1990. He is a Post-Doctoral Researcher at Laboratory of Heterogeneous Mixtures and Combustion Systems at the School of Mechanical Engineering, National Technical University of Athens (NTUA). He received his PhD in 2018 from NTUA on energy efficiency of building envelopes. He graduated as Mechanical Engineer from NTUA in 2012 and obtained his Master of Science in Computational Mechanics from NTUA in 2014.

Since 2012, he has been working as a senior researcher at the laboratory of Heterogeneous Mixtures and Combustion Systems at the NTUA. He has joined at the research project "ELISSA" (Energy Efficient Lightweight – Sustainable – Safe – Construction).

He specializes in the experimental and computational methods for the energy assessment of the thermal performance of building envelopes. He has also participated in the experimental monitoring of several buildings with the purpose of assessing the thermal and hygrothermal performance of their building envelopes. Moreover, his research includes the experimental and numerical investigation of innovative insulation materials (Vacuum Insulation Panels). He has published several articles in international scientific journals and international conferences.