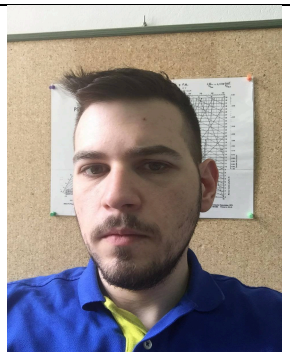
Event: **ENERGY in BUILDINGS 2016**
Date: Saturday November 12, 2016
Place: Athens, Hellas

#	**Evangelos Bellos** (Mechanical Engineer, PhD)	
Title:	National Technical University of Athens, Athens, Greece	
Presentation title:	**Solar assisted heat pump space heating systems in Athens - An energetic and financial analysis**	

In this study, the use of a solar assisted heat pump heating system is analyzed energetically and financially for the city of Athens, Greece. This system is compared with a conventional water source heat pump and the analysis is performed for various insulation thicknesses. TRNSYS is the simulation tool in order to analyze these heating technologies in dynamic conditions with realistic weather data. The examined building is a usual structure of 100m^2, with windows located in west, east and south directions. Its thermal transmittance has been analyzed parametrically by examining insulation layers from 2cm to 10cm, covering a great variety of possible building envelopes. According to the results, the solar assisted heat pump space heating system leads to lower electrical consumption with a reduction up to 50%. On the other hand, the conventional air source heat pump is the financially preferable solution with the present electricity cost. However, a sensitivity analysis proved that a possible increase in electricity price is able to make the solar assisted heat pumps to be more and more attractive solution.

CV:

I have graduated the School of Mechanical Engineering of NTUA in 2012 with grade 9.61/10. At this time, I am finishing my PhD studies in the Thermal Department of the same School. The title of my PhD is “Utilization and Optimization of solar systems in buildings”. As A PhD candidate, I have made many presentations in conferences (about 15) and I have published over 15 scientific papers, as well as I have written two book chapters. Some of my recent publications are listed below:

- E. Bellos, C. Tzivanidis, E. Zisopoulou, G. Mitsopoulos, K.A. Antonopoulos, An innovative Trombe wall as a passive heating system for a building in Athens—A comparison with the conventional Trombe wall and the insulated wall, Energy and Buildings 2016;133:754-769

- E. Bellos, E. Mathioulakis, C. Tzivanidis, V. Belessiotis, K.A. Antonopoulos, Experimental and numerical investigation of a linear Fresnel solar collector with flat plate receiver, Energy Conversion and Management 2016;130:44-59

- C. Tzivanidis, E. Bellos, G. Mitsopoulos, K.A. Antonopoulos, A. Delis, Energetic and financial evaluation of a solar assisted heat pump heating system with other usual heating systems in Athens, Applied Thermal Engineering 2016;106:87-97

Up to this time, I have received various scholarships for my performance as student and for my research in Phd.

My research field include the following categories: Energy in Buildings, Solar energy utilization, concentrating collectors, PTC, trigeneration systems, ORC, absorption chillers, solar cooling, solar assisted heat pumps, heat transfer.

The main software that I have used, are the following: Solidowks, Solidworks Flow Simulation, TRNSYS, eQuest, Energy Plus, EES, as well as Fortran and Matlab for programming.