

Event:

ENERGY in BUILDINGS 2025


Date:

Saturday, November 15, 2025

Place:

Athens, Greece



#	Constantinos A. Balaras, PhD Dr Mechanical Engineer, EUR ING FASHRAE	
Title:	Research Director, Institute for Environmental Research & Sustainable Development, National Observatory of Athens, Greece	
email:	costas@noa.gr	•
Presentation title:	Climate Impacts on the Energy Performance of Hellenic Buildings	
<p>A National Research Network for Climate Change and its Effects (CLIMPACT) among numerous academic and research entities in Greece and Cyprus is addressing a multitude of issues related to climate change and the associated climate risks, natural disasters, as well as social and economic impacts. This work focuses on assessing the impacts of climate change on the energy performance of Hellenic residential buildings. Two representative concentration pathways (RCP) are used to project future greenhouse gas concentrations as different climate change scenarios which are used to generate the necessary input climatic data for 62 Hellenic locations in the four national climate zones. The methodology utilizes the national TABULA building typology for residential buildings with a semi-steady-state calculation methodology for assessing their energy performance. The paper provides an overview of the generated climatic data that can be used to more realistically estimate future heating and cooling loads, quantify the energy use intensities of different Hellenic building typologies and future energy demand, consumption and emissions for the existing building stock, renovation scenarios and nearly zero energy buildings. The results reveal that there are small differences in the total energy demand among the historical and future climate projections for the two RCP emission scenarios with increasing cooling and decreasing heating demand. Technological advances and switching from high pollutant fossil fuels to heat pumps and green electricity generation make up for some of the impacts from the ambient temperature variations, especially for cooling.</p>		
Short CV:	<p>Dr. Balaras is a Mechanical Engineer. Research Director with the Group Energy Conservation at the Institute for Environmental Research & Sustainable Development -NOA, Athens, Greece. He has over 35 years of experience in research, development and demonstration in the areas of energy conservation, sustainability and resilience assessments of the built environment, and energy audits. He is an ASHRAE Fellow and currently serves as a voting member on ASHRAE Standard 240P Evaluating Greenhouse Gas (GHG) and Carbon Emissions in Building Design, Construction and Operation, TC 6.7 Solar Energy & Other Renewables, and as a NVM of SSPC 189.1 Design of High Performance, Green Buildings.</p>	

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Dr. Balaras is a Research Director with the Group Energy Conservation at the Institute for Environmental Research & Sustainable Development, NOA, Athens, Greece. He has over 35 years of experience in R&DD in the areas of energy conservation, high performing buildings and decarbonization, thermal and solar building applications, climate resilience and sustainability assessments, and energy audits. He holds a PhD and MSc in Mechanical Engineering from Georgia Institute of Technology and a BSc in Mechanical Engineering from Michigan Technological University. He is a registered EUR ING and Chartered Mechanical Engineer, member of the Technical Chamber of Greece, Fellow ASME, Fellow ASHRAE. Dr. Balaras has over 350 scientific articles published in international journals, books and conference proceedings. Past ASHRAE service: Society Vice President (2011-13), past DRC Region XIV (2017-20), past DAL (2007-10). Recipient of several ASHRAE Awards including DSA, ESA, John F. James International Award, and Andrew T. Boggs Service Award.

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