

Efficient Building DESIGN

MATERIAL & HVAC EQUIPMENT TECHNOLOGIES

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3:00–4:00 pm (Beirut time)



OVERVIEW OF SMART ENERGY SYSTEMS FOR THE BUILT ENVIRONMENT

by

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Moncef Krarti, Professor and Coordinator, Building Systems Program, Civil, Environmental, and Architectural Engineering Department at the University of Colorado. He is also the director for the Building Energy Smart Technologies (BEST) center that fosters research collaborations between industry representatives and university researchers to advance the knowledge in smart buildings, cities, and grids. He is the co-founder and the editor of Journal of Engineering for Sustainable Buildings and Cities (JESBC). Prof. Krarti has a vast experience in designing, testing, and assessing innovative energy efficiency and renewable energy technologies applied to buildings. Prof. Krarti has published over 300 technical journals and handbook chapters in various fields related to energy efficiency, distribution generation, and demand side management for the built environment. Moreover, he has published several books on building energy efficient systems. Due to his dedication to disseminate knowledge, Prof. Krarti is a Fellow member to the American Society for Mechanical Engineers (ASME), the largest international professional society. Prof. Krarti has an extensive experience in promoting building energy technologies and policies overseas, including the establishment of energy research centers, the development of building energy codes, and the delivery of energy training programs in several countries.

| Abstract

The presentation overviews new concepts and specific technologies suitable to design and operate buildings to be adaptive to the outdoor environment as well as response to the electrical grid. Concepts of grid-interactive efficient buildings are introduced with several examples of technologies suitable for designing, retrofitting, and operating the built environment to be energy efficient, resilient, and sustainable. In particular, the energy performance of a wide range of smart and automated controlled technologies are presented including dynamic building envelope, electrified heating and cooling equipment, on-site power generation systems, and smart controls. The applications of these smart technologies to individual buildings, communities, and urban centers are outlined throughout the presentation with some guidelines on their energy and non-energy benefits for various climates and countries.

