

# ENERGY EFFICIENCY APPLICATIONS IN COMMERCIAL BUILDINGS IN THE UNITED STATES

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In the United States, buildings consume over 40% of the country's total energy consumption, and 90% of these buildings are either small-sized (<5,000 sqft) or medium-sized (5,000-50,000 sqft). Specifically, Heating, Ventilation, and Air-Conditioning (HVAC), lighting and plug loads account for almost 90% of all consumption in buildings. But these small and medium-sized buildings do not have building automation or energy efficiency applications. Under a contract from the US Department of Energy, Virginia Tech is developing a web-based Building Energy Management Open Source Software (BEMOSS) platform for optimizing electricity usage and implementing demand response (DR) in small- and medium-sized buildings. This can help accelerate development of market-ready products like embedded Building Energy Management (BEM) systems and device controllers for HVAC, lighting and plug loads. This presentation discusses the core concept of the BEMOSS platform, and shows how single board computers like the Raspberry Pi are being used to implement the software being developed.



Professor Saifur Rahman is the founding director of the Advanced Research Institute ([www.ari.vt.edu](http://www.ari.vt.edu)) at Virginia Tech where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment ([www.ceage.vt.edu](http://www.ceage.vt.edu)). He is a Fellow of the IEEE and an IEEE Millennium Medal winner. He is the founding editor-in-chief of the IEEE Electrification Magazine. He was the founding editor-in-chief of IEEE Transactions on Sustainable Energy. He has served as a vice president of the IEEE Power and Energy Society (PES) from 2009 to 2013 and currently serving as a member-at-large of the

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