Rethinking Buildings: Opportunities and Challenges

ABSTRACT

Buildings consume about 40% of U.S. primary energy. As energy supply and demand for buildings become much more dynamic, due to renewable energy generation, electric vehicles charging, energy storage charging and discharging, as well as response to real-time pricing, the traditional energy efficiency has to integrate technologies to enable demand flexibility to optimize energy use. Meanwhile, the more frequent extreme weather events require the design and operation of buildings to be climate resilient. This talk introduces related research conducted at LBNL and discuss opportunities and challenges to make buildings energy efficient, demand flexible, and climate resilient leveraging unanimous sensing, big data, machine learning, and computing.

BIOGRAPHY

Dr. Tianzhen Hong is a senior scientist and deputy head of the Building Technologies Department of the Lawrence Berkeley National Laboratory. He leads the Urban Systems Group and a team with research on data, methods, computing, occupant behavior, and policy for design and operation of low energy buildings and districts. One of his software toolkits, CBES, won the 2019 R&D 100 Award. He is an IBPSA Fellow and ASHRAE Fellow. He has co-authored more than 150 journal articles. He received a bachelor of engineering and doctorate in HVACR, and a bachelor of science in applied mathematics from Tsinghua University, China.