Building Technologies Research and Integration Center

Science Research Seminar Series

Making a Global Impact via Building Energy Efficiency and Low-Global Warming Potential Refrigerants

featuring

Dr. Som Shrestha

Building Envelope Systems Research Group

Monday, March 7, 2016
10:00 a.m.–11:00 a.m.
Building 4500N, Wigner Auditorium, Room 250

Abstract

Efficient energy use at US Army's forward operating bases is critical to avoid casualties on refueling convoys and minimize costly fuel use (up to $400 a gallon) at remote posts in places like Afghanistan. A typical 300-person camp uses over 400,000 gallons of fuel per year, 50% of it to heat and cool shelters. An ORNL study for the Army Corps of Engineers showed that improving building envelopes can cut air conditioning energy use in barrack huts by 75–80%. As a result, the Army is placing 20 energy-efficient huts in Afghanistan as a pilot, which may become the new normal if successful.

Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs) leaking into the atmosphere account for over 5% of global greenhouse gas emissions. Research conducted at ORNL can help achieve the international goal of limiting average global warming to 2°C by accelerating the transition to lower-global warming potential (GWP) refrigerants. ORNL conducted research to develop an understanding of how air conditioners perform when using lower-GWP refrigerants under high-ambient-temperatures and identified viable alternatives. The study was coordinated by the Executive Office of the President to build support among hot climate countries for the accelerated transition.

Dr. Som Shrestha

is an R&D Staff member in the Building Technologies Research and Integration Center whose research focuses on experimental and analytical studies to improve the energy performance of building envelopes, equipment, and systems. His recent work at ORNL includes energy efficiency enhancement of Army huts, thermal performance evaluation of various radiant barrier systems, life-time energy and environmental impact of building insulation materials, performance of equipment when using lower-GWP refrigerants, and procedures for evaluating portable air conditioner performance. He earned an MS and a PhD in mechanical engineering from Iowa State University.