Rod Fisher from the Air Force (AF) Civil Engineer Center briefed the Joint Committee on Tactical Shelters (JOCOTAS) about projects that improve shelter energy efficiencies worldwide. The efforts focused on both billeting and maintenance shelters in sizes ranging from 640 square feet (sf) to 9000 sf. The goal is to develop shelter systems that are optimized to reduce fuel consumption by a minimum of 50%. The AF teamed with other JOCOTAS partners including the Marine Corps and the Army at Fort Irwin, CA in the Joint Concept Technology Demonstration, Net Zero project and followed with additional joint testing, utilizing lessons learned. Billeting type shelters were evaluated at Ali Al Salem AF Base (AFB) in Kuwait and underwent tropical testing at the Northwest Field, Anderson AFB , Guam. The evaluation was systemic and included shade flys, Photovoltaic covered shade flys (4kW and 5kW peak power), insulated liners, LED lights, ECUs, covers for ECUs and ducts, insulated vestibules with flys, hard doors and, a standalone thermal coatings evaluation at Holloman AFB. The Navy also participated in the tropical evaluation assessing insulation technologies utilized to reduce the cooling requirements of Containerized Housing Units. The AF will move onto winter testing at Ellsworth AFB, SD in late 2014.

The objective on the large shelter side is to maximize energy security for Basic Expeditionary Airfield Resources (BEAR) systems in the field by addressing the energy consumption of medium and larger shelters. The BEAR systems employ prepositioned program assets in, or close to the area of intended use. The basing location has been historically identified as one with adequate runways, taxiways, parking aprons, and a water supply that could be made potable. The BEAR program is also one of the primary AF users of small shelters and their expeditionary basing locations can house thousands of Warfighters. The AF is leading the effort on large shelters. The short term plan is to assess a combination of Government and Commercial of the Shelf (COTS) technologies tailored for retrofit of existing military shelters and for use in the development of next-generation requirements. The Holloman coating assessment included multiple physical models that utilized parings of coated fabrics and insulating liners. The best combination of liner and coated fabric achieved 3°F reduction in the interior temperature as a daytime average and was 4°F less at the peak hours. The AF also looked at door curtains to reduce air exchanges in large open ended hanger structures.

Liner and Coating Test Jigs with AF Small and Medium Shelters in the background