



Technologies for Buildings – New and Retrofits 6th Workshop

**Advanced Air Cooling and
Heating Session**



Army Energy Goals

- Reduce energy use
- Use solar hot water systems
- Achieve total net zero energy use by 2030



Most Difficult Goal is NZE Use

- Solution includes

- Improve building envelope
- High efficient lighting
- Low energy HVAC Systems
- Optimizing process loads
- Use solar energy and other renewable systems



Today's HVAC Systems

- Fan coil units in barracks
- Variable air volume in administration buildings
- Unit heaters in warehouses, maintenance facilities
- Complex control systems




Future HVAC Systems

- First need to provide NZE ready building envelope & lighting system
- Focus of high efficient HVAC systems that are NZE ready
 - With lower loads low energy systems may provide satisfactory environment
 - May leap frog some technologies and begin to gain experience on a select set of HVAC equipment

Future HVAC Systems

- Low energy intensive may be adequate
 - Heat pumps
 - Radiant systems
 - Evaporative cooling
 - Thermal storage
 - Heat recovery
 - Simple controls
- Where complex HVAC solutions are required consider standardizing on a select few



Advanced Air Cooling & Heating

- Central energy system equipment
- Radiant energy systems
 - High bay buildings
 - Heating and cooling systems
- Variable refrigerant flow



Army Constraints

- Maintenance marginal - minimal funds & staff training
- New energy efficient buildings require more maintenance
 - Systems complex and unique
 - More monitoring and optimizing controls
- Building delivery system results in different systems and equipment