ENERGY EFFICIENT TECHNOLOGIES FOR GOVERNMENT BUILDINGS - NEW AND RETROFITS

Sixth Workshop

Endorsed by
IMCOM, US DOE FEMP, ASHRAE, and IEA ECBCS Program

Organized by
VENTILATION/ENERGY APPLICATIONS, PLLC

Orlando, FL
January 21-22, 2010

Handouts

- Name Badge
- Workshop Brochure
- IEA Annex 46 “Energy and Process Assessment Protocol
- CD-ROM with the 4th Workshop Proceedings and materials will be published later and materials will be also available on the website www.Annex46.org

History and Statistics

- First Workshop – Orlando, FL (2005)
  70 participants from 8 countries
- Second Workshop – Chicago, IL (2006)
  90 participants from 10 countries
- Third Workshop – Dallas, TX (2007)
  100+ participants from 7 countries
- Fourth Workshop – New York, NY (2008)
  130+ participants from 9 countries
- Fifth Workshop – Chicago, IL (2009)
  230+ participants from 8 countries
- Sixth Workshop – Orlando, FL (2010) ~ 200 participants from 8 countries

Current Federal/DOD Polices and Directives On Energy Conservation

- The Energy Policy Act of 2005
- Federal Leadership in High Performance and Sustainable Buildings. Memorandum of Understanding of 2006
- Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management of 2007
- The Energy Independence and Security Act of 2007
- Army Energy Security Implementation Strategy of 2009
- Executive Order Executive Order 13514—Federal Leadership in Environmental, Energy and Economic Performance of 2009
- Unified Facilities Criteria (UFC) 3-400-01 Energy Conservation, with changes of 2008 and
- **American Clean Energy and Security Act (ACES 2010) – proposed legislation**

EISA 2007

New buildings and buildings undergoing major renovations shall be designed so that consumption of energy generated offsite or on-site using fossil fuels is reduced, as compared with such energy consumption by a similar building in fiscal year 2003 (as measured by Commercial Buildings Energy Consumption Survey or Residential Energy Consumption Survey data from the Energy Information Agency), by the percentage specified in the following table (EISA 2007):

Fiscal Year	Percentage Reduction
2010	55!!!!
2015	65
2020	80
2025	90
2030	100

FEMP is drafting a ruling providing interpretation of EISA 2007.

Whatever interpretation will be, by 2030 newly constructed buildings and buildings after major renovations shall be **NZEB**

How we can get from where we are now to **NZEB** in 20 years???

How we can reach our energy goals?

- USACE/DOE/ASHRAE Study showed that 30-35% energy reduction from the ASHRAE 90.1 2004 level can be achieved by using currently available technologies and best design and construction practices at no or minimal additional cost.
- In North American climates, energy reduction beyond 35% (up to ~70%) require **better insulation, airtight building envelope**, triple-pane low-e energy efficient windows, energy recovery, **advanced cooling and dehumidification technology**, advanced lighting and control technologies, **internal process improvement** and high efficiency appliances, with a first cost increase < 10%. Main contributor to increased cost are advanced windows, lighting, advanced appliances.
- Between ~70% and 100% of fossil fuel reduction will require the use of **renewable sources** of energy and thermal and electrical storage.

Workshop Objectives

- Provide information on current regulations and requirements to energy conservation;
- Share information and ideas in a collegial forum on technologies and measures to reduce energy and water consumption in buildings and community systems:
- The program will focus on the following topics:
  - Ongoing government energy programs and regulations,
  - Energy assessment for building retrofits – tools and strategies,
  - Improving the building envelope (insulation and air tightness),
  - Advanced heating and cooling systems,
  - Reducing water use and applications for gray water,
  - Experience with solar heating systems, and
  - Approaches to reducing the energy in high use facilities such as cooking & dining, data processing facilities and virtual simulatiors.

Welcome to the Workshop