



CBEA Space Conditioning Project Team

Discussion Materials for
Energy Efficiency Forum

May 23-24, 2012

Space Conditioning Breakout #1

May 24 Agenda

- Introductions
- 2012 Projects – Michael Deru to facilitate
 - RTU Challenge
 - Advanced Gas Unit Heater Specification
 - Advanced RTU Controller Retrofit
- For Each 2012 Project (30 min each)
 - Project deliverable and market potential – 2 min
 - Overview of CBEA implementation so far – 2 min
 - Overview of top implementation barriers – 3 min
 - Vet proposed solutions – 20+ min
- Compile solutions for closing plenary – 15 min

Fall 2010: DOE with CBEA input drafts stretch RTU spec

- 18 IEER: up to 50% energy reduction relative to ASHRAE 90.1 requirements
- \$1 billion annual energy savings if all 10-20 ton units in U.S. were replaced

Jan 2011: Spec released - a “challenge”, but feasible

May 2012: Deadline to *Enter* the RTU Challenge – Five Manufacturers

Apr 2013: Deadline to *Meet* the RTU Challenge

1. Cost and life cycle performance

- Initial cost, installation cost, O&M cost, cost of maintaining high performance (does performance fall off quickly if not maintained?)

Potential Paths Forward:

- Demonstrations and accelerated testing of components
- Performance guarantee

2. Physical

- Weight, size, alignment with existing connections
- Additional structural or connection requirements may push this system beyond cost effectiveness

Potential Paths Forward:

- Demonstrations and accelerated testing of components
- Performance guarantee

3. Additional/new O&M requirements

- Is additional training required?
- Will operation be so difficult that service techs just override the features?

Potential Paths Forward:

- O&M manuals
- Training materials provided in different formats – electronic, pod casts
- Develop a preventative maintenance spec.
- Make interfaces with the equipment simple

4. Difficult to integrate RTU controls with BAS

- Will the RTU DDCs play nice with most BASs?

Potential Paths Forward:

- Include language in spec
- Talk to manufacturers
- Implement a 3rd party system to sit on top of everything

5. Oversizing of retrofit systems

- Retrofit systems are often replaced with the same size unit even when loads have been reduced.

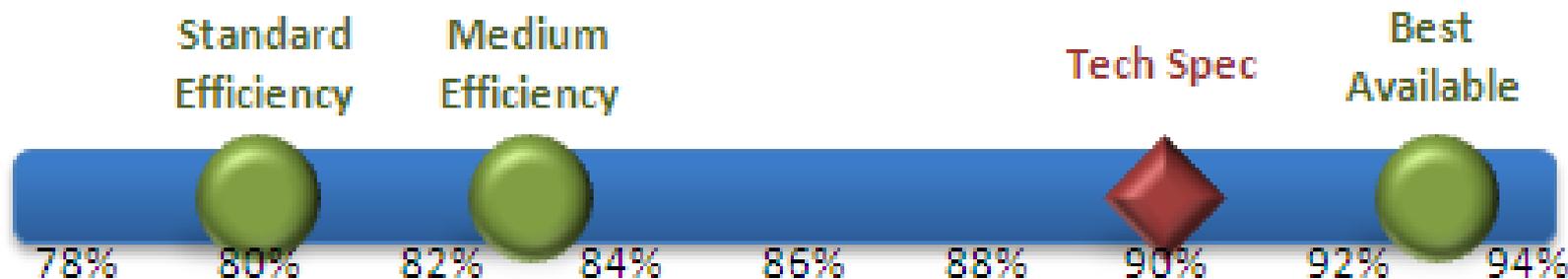
Potential Paths Forward:

- Provide easy to use design/sizing tools

Standard- and medium-efficiency equipment make up 95% of shipments.

Tech Spec Efficiency Level in Perspective

Scale is in terms of Thermal Efficiency (%)



1. Costs

- Equipment costs, installation costs, and maintenance costs
- Natural gas costs are very low

Potential Paths Forward:

- Minimize total cost of ownership
- Incentives to offset costs

2. Increased O&M requirements

- Will there be increased maintenance requirements?
 - Condensate neutralization, condensate line maintenance

Potential Paths Forward:

- Simple/low maintenance solutions

3. Low market potential with CBEA members

Potential Paths Forward:

- Work with outside groups

- An advanced controller that can be retrofitted to existing packaged rooftop units
- Features of the controller
 - Integrated differential (or high limit) dry-bulb or enthalpy economizer
 - Multi-speed supply fan controls; converts existing 3-phase supply fan into a multi-speed supply fan by adding a variable speed drive
 - Demand controlled ventilation using a return air CO₂ measurement
- A commercial product with UL listing

1. Costs

- Equipment costs, installation costs, and maintenance costs

Potential Paths Forward:

- Demonstrations, results by building type and climate
- Incentives to offset costs

2. Understanding the technology and impact on existing equipment

- Are existing OA/economizer dampers replaced?
- Does this work with older motors?
- Is there an easy override of the VFD?
- How is the minimum OA maintained?
- Are there air distribution problems at low fan speeds?

Potential Paths Forward:

- Talk with vendors
- Clear technical and implementation information from vendors

3. Is there an opportunity to implement a low cost advanced controller to new equipment from the factory?

Space Conditioning Breakout #2

May 24 Agenda

Purpose: Gather actionable input on proposed 2013 CBEA projects and brainstorm innovative new ideas from industry stakeholders that have not been discussed

- Introduction and Agenda – 5 min
- Vet CBEA member's proposed new 2013 project areas – 20 min, each project
 - Project deliverable, market potential, and deployment path – 5 min
 - Vet proposed project– 15 min
- Open floor for Stakeholders to propose new ideas to CBEA – 5 min, each stakeholder
- Compile top 2013 projects and stakeholder ideas for closing plenary – 15 min

1. High efficiency gas furnace specification for RTUs.
2. Improved controls/standard control sequences for AHUs serving varied space types.
3. Improved methods for increased use of low-grade waste heat.
4. Simplified/standard methods for analysis of building loads to better guide building operations.
5. Application guidance for ASHRAE ventilation requirements for different space types.
6. Solutions/guides for expanded use of hydronic based radiant systems by building and space type.
7. High efficiency chiller solutions dedicated to operating rooms.
8. Thermal energy storage solutions for hospitals

- Understand additional revenue opportunities for new technologies. What are the added value streams?