



Condensing Gas PACs

What is the Real Market Opportunity?

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Session Overview

- ▶ Introductions
- ▶ Background of CEE Gas PAC Effort
- ▶ Updates from
 - Doug Kosar, GTI
 - Martin Thomas and Bryan Halliday, NRCan
- ▶ Group Discussion – Role for CEE?

Meeting Ground Rules

- ▶ 100% Participation
- ▶ Parking lot for off topic issues
- ▶ All ideas are valid and valued
- ▶ Confidentiality
- ▶ For the Phone Line
 - *6 to Mute/UnMute
 - **DO NOT PUT CALL ON HOLD**

This meeting will follow **CEE Guidelines**
for Program Meetings

Introductions

1. Name
2. Organization
3. Your goal for this breakout session



Why CEE is Looking at Gas PACs

- ▶ Commercial space heating is a large end use, of which gas RTUs account for a large portion of equipment
- ▶ Not a lot of options for gas savings in these units
 - Demand control ventilation
 - Better thermostats
- ▶ Identified as a top priority at the 2006 Natural Gas Summit
- ▶ Since Summit: Developed market characterization and met with industry on multiple occasions



Gas PAC Efficiencies

- ▶ Gas efficiencies range from 78 to 83%
- ▶ Technically feasible to get well above 90% with condensing
 - No mass-produced packaged units in US
 - Some custom options available

Gas PACs In Other Markets

▼ Europe

- 93% Lennox unit in UK: Rating method is not the same, making about 9-10% difference in efficiency

▼ Dubai

- “Condensing” Trane unit: 83-84% efficient by US standards; includes stainless steel recognizing some condensation will occur

▼ Canada

- Condensing unit: NRCAN will update us on their testing on this unit

What We Know: RTU Market Data

- ▶ Packaged units account for 25% of heating in commercial buildings
- ▶ Offices are the most common building type
 - Followed by food service, retail, and service
- ▶ Predominantly newer (since 1980s), smaller, low rise buildings
- ▶ RTUs are primarily found in warmer climates
- ▶ Split between natural gas and electricity as a heating source is unclear
 - Some sources close to 50/50, others 90/10

What We Know: Barriers

- ▼ Technical Challenges of Condensing on Rooftop
 - Potential freezing of condensate in colder climates
 - Disposal of condensate in compliance with local codes
- ▼ High Development Costs for Manufacturers
- ▼ High First Cost for Consumers
 - Need materials to withstand corrosive condensate
 - Must have a competitive first cost to attract consumers

What We Know: Barriers

◀ Net Energy Savings

- Electrical energy from fan increases due to increased pressure drop with secondary heat exchanger
- Gas savings may not be sufficient in many climates to offset this increase and result in net energy savings

Key: Understanding how big is the market that will see net energy savings

Industry's Conclusions

Manufacturers are **not convinced** that there is a **large enough** market opportunity for condensing gas PACs to offset the investment of development.

Quantifying the Opportunity

- ▶ Need a better understanding of commercial building heat loads
 - Different building types
 - Both new construction and existing buildings (1980's vintage)
 - Across multiple regions
- ▶ Compare various regional loads for new buildings and compare to Lord's data
- ▶ Compare loads for new verses existing buildings and apply this to Lord's data

Gas Technology Institute

Doug Kosar



CEE and GTI Partnership

CEE and GTI signed a MOU outlining collaboration efforts

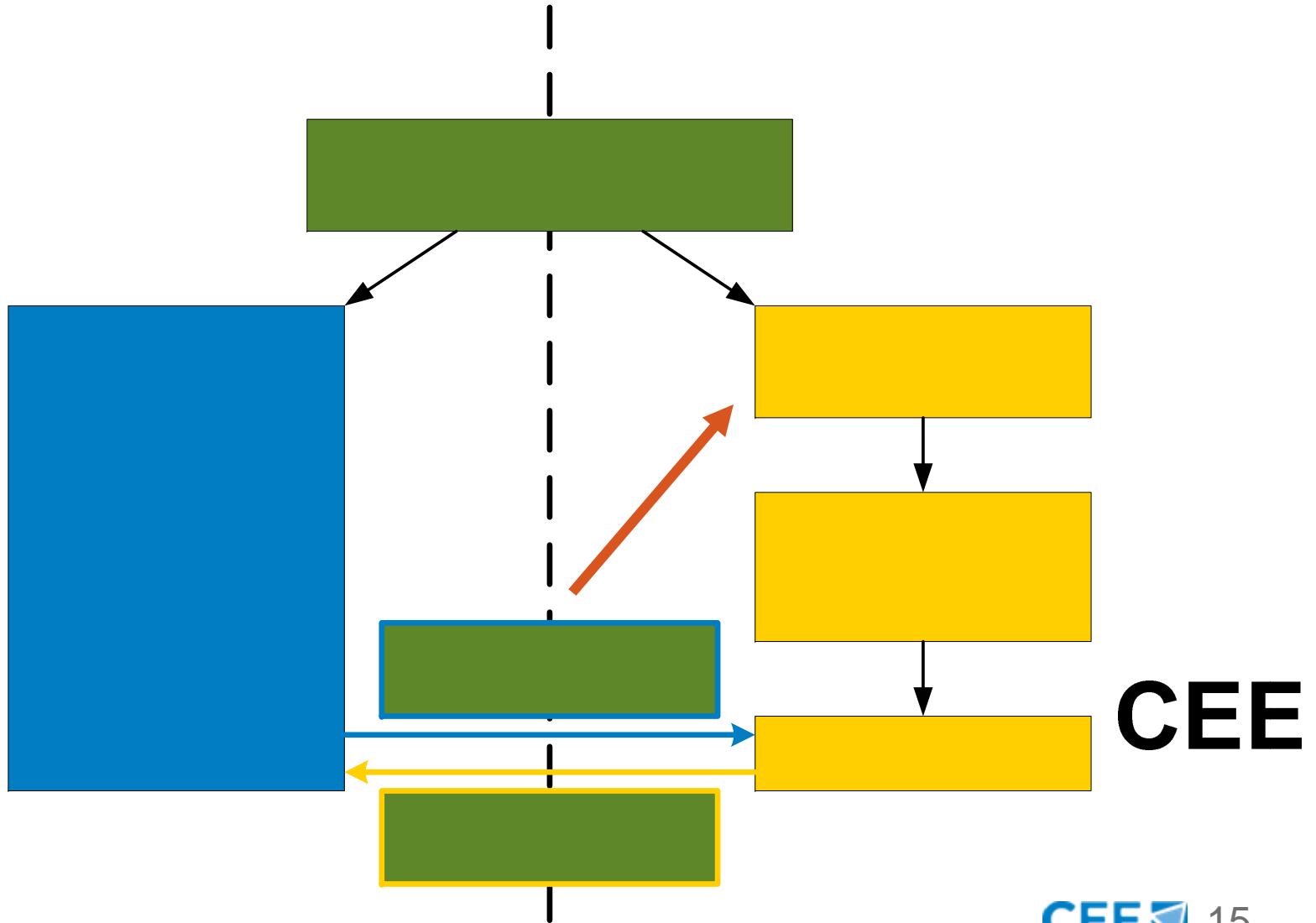
▼ CEE's expertise:

- Preliminary market research
- Consensus building with a variety of stakeholders
- Accelerates market introduction and acceptance of HE equipment

▼ GTI's expertise:

- Can provide technical input into initiatives/explorations
- R&D capabilities to develop and test HE equipment

CEE and GTI Gas PAC Alliance



**Natural Resources Canada
Martin Thomas and Bryan Halliday**



What are the Next Steps for CEE?

Plan A

- ▶ Continue to focus on gas PACs and work to quantify the market opportunity to make the case to industry

Plan B

- ▶ Monitor others' gas PACs efforts and focus on exploring other savings opportunities for commercial buildings with RTUs

Plan A – Full Steam Ahead

▼ Needs:

- Identify means of addressing various market and technical barriers
- Better quantify commercial building heat loads to estimate gas savings

▼ Potential Committee Actions:

- Work together to compile comparable data on building heat loads (already have some that needs to be looked through for consistency)
- Members to conduct monitoring similar to GTI to get actual building heat load data
- Work together to update market characterization report
- Look into potential solutions to other technical problems

Plan B – Identify Other Opportunities

▼ Potential Opportunities

- Whole building approaches with a focus on building envelop
- Greater input into Commercial HVAC advanced rooftop unit (ARTU) work
- Heat recovery ventilation
- Modulating burners – promoting these through initiative effort
- Quality installation and maintenance

Discussion Questions

- ▶ What should CEE's role be in moving forward with the gas PAC effort?
- ▶ Should the Committee spend time to better understand commercial building heat loads?
 - Are members able to devote more time to this effort?
 - Do members want to prioritize other commercial savings?

Contact

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