

# As the World of Commercial HVAC Turns . . .

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## AESP 18<sup>th</sup> National Energy Services Conference

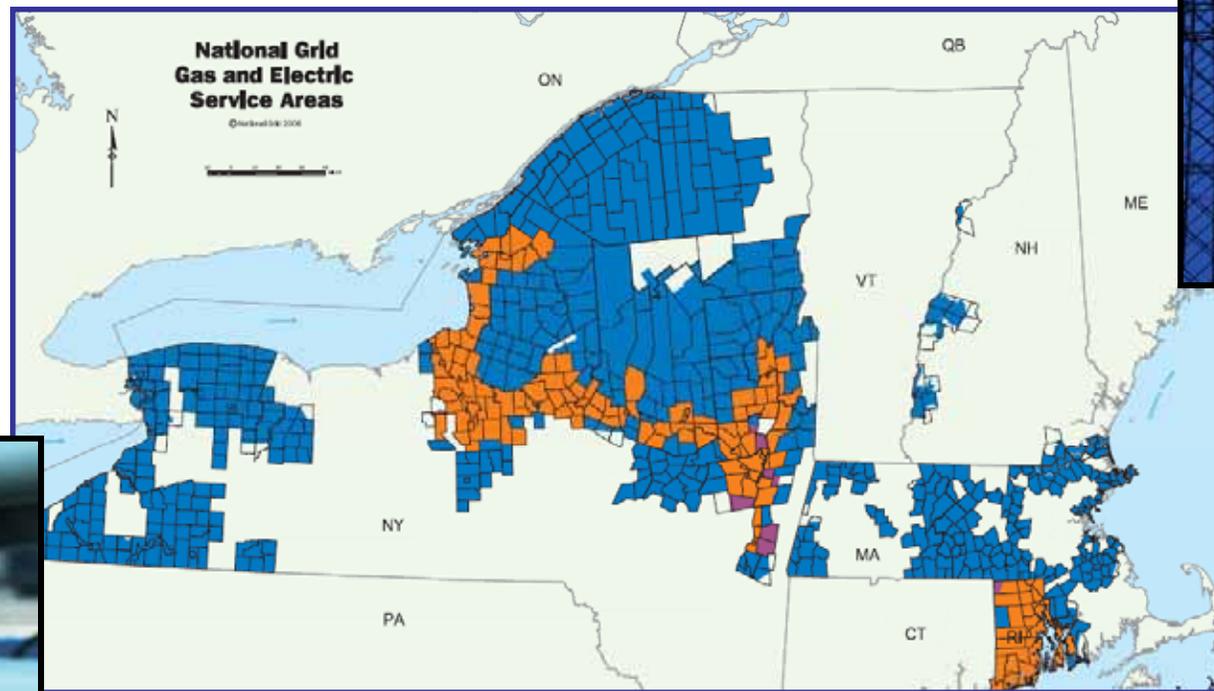
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# National Grid Facts

- ***National Grid's core US business is the delivery of electricity and natural gas***
- ***4.4 million electric customers and 3.4 million natural gas customers in New York and New England***



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# National Grid's Programs

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- ***Promote the installation of energy efficient electric measures and efficient energy management practices.***
- ***In 2007 celebrated 20<sup>th</sup> anniversary.***
- ***Provide technical assistance to identify opportunities to improve the electric energy efficiency of facilities.***
- ***Provide commissioning services for complex installations such as industrial process measures.***
  - Design 2000<sub>plus</sub>, new construction or replacing failed equipment
  - Energy Initiative, existing facilities
  - CoolChoice, jointly sponsored program to assist C&I customers by increasing demand for high-efficiency HVAC equipment and controls



# History

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- *In 2006, National Grid hired PA Consulting to conduct a research study*
- *2006 study findings:*
  - *HVAC market may now be transformed*
  - *Interviewees reported higher levels of efficiency as standard practice*
  - *Higher levels of free-ridership for HVAC projects for national accounts*
  - *More research needed!*
- *The 2007 study focused on standard practice and market transformation for **efficient HVAC** for National Accounts*



# Study Objectives

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- 1. Are national accounts purchasing CEE 2006 Tier 2 or higher HVAC equipment without a utility rebate?**
- 2. What influence have regional and utility programs had on influencing the market?**
- 3. What is the level of free-ridership and spillover (FR/SO) for HVAC for national accounts participants in the 2006 Design2000plus program? Do the results support the analysis of national account free-ridership and spillover based on the 2005 FR/SO surveys?**
- 4. Is it feasible to require minimum efficiency levels that exceed the proposed new 2007 CEE Tier 2 standards for national accounts in the near term? Is equipment readily available to national accounts? What impact would the change have on current purchasing in terms of levels of efficiency for HVAC equipment?**

# Study Methodology

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## ■ **Data Collection Activities:**

- ✓ Literature review
- ✓ Interviews with HVAC market actors
  - ✓ *5 Industry experts*
  - ✓ *12 HVAC supply chain*
- ✓ 6 National chain account customer interviews



## ■ **Results are primarily qualitative . . .**

- **. . . but conclusions are drawn from those responses that were fairly consistent for those interviewed.**

# The Commercial HVAC prior to 2007

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- *Consortium for Energy Efficiency's (CEE) HVAC initiative was launched in 1994.*
- *Cool Choice was a regionalized program run by the Northeast Energy Efficiency Partnership (NEEP)*



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# The Commercial HVAC market in 2007

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- ***New CEE Tier 2 efficiency levels 10-15% higher***
- ***Cool Choice was de-regionalized***
- ***State program have higher levels for incentive eligibility***
- ***State program has higher incentives***
- ***Equipment Tier levels (to CEE's New 2007 Tier 2):***
  - *< 5.4 Ton (from 13.0 to 14.0 SEER)*
  - *>= 5.4 to < 11.25 (from 11.0 to 11.5 EER)*
  - *>= 11.25 to < 20 (from 10.8 to 11.5 EER)*
  - *>= 20 to 30 (unchanged at 10.0 EER)*
- ***• Rebates for controls:***
  - *dual enthalpy control - \$250;*
  - *demand control ventilation (DCV) - \$200;*
  - *ECM Motors (for HVAC) - \$150.*

# Project Findings – the Commercial HVAC Market

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- The HVAC market is multi-layered and there is value in involving the HVAC supply chain in energy efficiency programs.
  - *For national accounts, it is most important to involve manufacturers as they often by-pass the distributor and contractor levels.*
- The HVAC supply chain is important to sell high efficiency equipment, but so is direct marketing and education to consumer.
- Light commercial HVAC equipment (25 tons and under) is the majority of the HVAC equipment market, but national accounts' specification of HVAC equipment size varies considerably.
- High efficiency HVAC equipment is not standard practice for the commercial sector, although there has been “slow growth” in efficiency levels.
- Most discretionary retrofits are lighting, not HVAC.
- The HVAC retrofit and replacement market remains under tapped for energy savings.
- The use of energy management systems to control HVAC is growing

# Project Findings – National Accounts

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- National accounts are varied.
  - “There is a range of policies and practices among them. One of the initial assumptions is that because they have central management they’re ahead, but we’ve found this is not always the case. Some national accounts are much more progressive than others.” --*Expert*
  - *At least half of national accounts are “progressive” based on supply chain reports and customer interviews*
- Corporate culture was reported as the largest barrier for non-participating national accounts.
  - *Certain types of national accounts tend to be less progressive such as restaurants, convenience stores and dollar stores*
- National accounts are increasingly interested in energy efficiency. Reported primary drivers of this are:
  - *Social or corporate responsibility*
  - *lifetime ownership costs*
  - *higher electric prices*
  - *utility rebates*
  - *extended warranties offered by the manufacturers*
- There is a concerted effort to bring national accounts to the energy efficiency table.

# Project Findings – National Accounts and HVAC

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- More progressive national accounts, led by Wal-Mart, will have a large impact on the HVAC market.
  - *Lennox example*
- National accounts' HVAC decision making process are still primarily driven by project payback.
- National accounts' new construction energy equipment decisions are mainly done at the national level with some regional variations.
- National accounts are influenced by utility programs less in new construction than in retrofits.
- Engineering firms and HVAC manufacturers are important in national accounts HVAC purchasing decisions.
- National accounts face lease-spaced barriers to increased HVAC efficiency although they may have enough clout to overcome these.

# 2005/2006 Freeridership Survey Results

Measure	Average Free-Ridership	Average Spillover	Gross kWh Savings*	kWh Weighted Free-Ridership	kWh Weighted Spillover
2005 Commercial HVAC Unitary and Non-Unitary, Not National Account (N=117)	29%	2%	1,215,507	38%	4%
<b>National Account Free-ridership and Spillover</b>					
2005 National Accounts HVAC Unitary and Non-Unitary (N=54)	56%	19%	779,592	79%	5%
2006 National Accounts HVAC Unitary and Non-Unitary (N=15)	27%	7%	69,437	45%	2%
2005 and 2006 National Accounts HVAC Unitary and Non-Unitary	50%	16%	849,030	76%	5%

Source: 2005 and 2006 National Accounts Design 2000*plus* Free-ridership and Spillover Survey

\* Represents surveyed kWh savings

# 2005/2006 Freeridership Survey Results (continued)

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National accounts' 2006 freeridership numbers are still higher than for other commercial customers (based on 2005 results for other commercial customers)  
The 2006 free-ridership rates are significantly lower than the 2005 free-ridership rates.

2006 spillover was slightly less, but still fairly consistent with 2005 national accounts and other commercial customer numbers.

View the analysis carefully because:

- Small sample size

- The algorithm that determines the free-ridership rate adjusts free-ridership based on past program experience.

  - Had previous participation not been taken into account, the weighted free-ridership rate would have been 81 percent, compared with 45 percent.

  - The 2005 analysis did use the same algorithm

# Project Findings - The Cool Choice Program

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- Cool Choice is helping the sales of HVAC efficient equipment.
- The higher 2007 MA Cool Choice incentive levels are viewed as a positive by experts particularly in decreasing freeridership, but there is push-back from the HVAC supply chain.
- Changes in the 2007 MA Cool Choice program will most likely decrease the number of HVAC efficiency projects implemented in National Grid's territory this year, especially for retrofit and replacement projects.
- Benefits and negatives were reported about the de-regionalization of CoolChoice.
- The consensus is that the new 2007 incentive levels will sufficiently push national accounts toward higher efficiency beyond their standard practice.

# Conclusions – Objective 1

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## **Are national accounts purchasing CEE Tier 2 or higher (Cool Choice eligible) HVAC equipment without a utility rebate?**

The majority of national accounts are purchasing CEE 2006 Tier 2 (now Tier 1) or higher HVAC equipment at the smaller equipment levels (less than 20 tons). Industry reports national accounts' standard practice is normally 11.0 EER. This is about a point higher than other commercial customers. At the same time, not all national accounts' standard practice is this efficient, particularly national accounts with smaller stores in terms of square footage such as restaurants, pharmacies and convenience stores. While the use of HVAC control measures is growing, particularly DEECs, industry opinion is that HVAC control measures are not standard practice for national accounts and should continue to be incentivized through the program.

## Conclusions – Objective 2

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**What influence have regional and utility programs (including Cool Choice) had on influencing the market for CEE Tier 2 equipment?**

The 2007 national accounts study and the 2006 national accounts study provide consistent evidence that the HVAC market may now be transformed to higher efficiency standards for national accounts. This transformation was most likely influenced by utility programs. In addition, the lower incremental cost between standard (10.0 EER) and higher efficiency (11.0 EER) HVAC equipment, the greater involvement of HVAC manufacturers with national accounts and a shift in corporate culture for many national accounts may also have played a role in this transformation. Therefore while national accounts may have met the 2006 program standards, their standard practice is less than the 2007 program standards.

# Conclusions – Objective 3

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- **What is the level of free ridership and spillover (FR/SO) for HVAC for national accounts participants in the 2006 Design2000plus Program? Do the results support the analysis of national account free ridership and spillover based on the 2005 FR/SO surveys?**

The 2006 freeridership results do still support higher freeridership for national accounts than other commercial customers, although the difference was smaller (2005 weighted freeridership for commercial customers was 38% compared to 45% for national accounts in 2006). The level of free-ridership for HVAC national account participants in 2006 was significantly lower than was found in 2005 (45% and 79%, respectively).

The spillover estimate remained fairly consistent (2% in 2006, 5% in 2005) with other commercial customers (4% in 2005). However, the sample sizes represented in the 2006 study were also significantly lower (15 measures versus 52 measures represented), which may have significant implications on the results. Combining the two years resulted in a free-ridership estimate of 76% and a spillover estimate of five percent.

# Conclusions – Objective 4

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- **Is it feasible to require minimum efficiency levels that exceed the new CEE Tier 2 standards for national accounts in the near term?**

Experts and the HVAC suppliers are unanimous that the new 2007 CEE Tier 2 standards and 2007 Cool Choice incentive levels will already be pushing the market, including national accounts for the near term.

- **Are equipment readily available to national accounts?**

It was reported that HVAC equipment at premium efficiency levels (11.5 EER and up) have higher incremental costs and are not as readily available as equipment at 11.0 EER.

- **What impact would the change have on current purchasing in terms of levels of efficiency for HVAC equipment?**

The study results suggest that there may actually be a decrease in participating HVAC projects in 2007 as a result of the 2007 CoolChoice changes. However, recent developments in conjunction with utility programs may help transform the market to these higher efficiency levels in the near future. Recent developments include the upcoming changes in federal minimum standards, the growing use of EMSes and a whole building approach, an overall increase in commitment to energy efficiency by national accounts and other commercial customers, and changes in manufacturing practices resulting from the increased efficiency practices of companies such as Wal-Mart.

# Opportunities for Program Improvement

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- Investigate offering a Commercial HVAC Early Retirement Program.
- Continue direct marketing and education to commercial customers but also include other important decision-makers such as energy services and engineering firms and HVAC manufacturers to help with equipment specifications.
  - *Because national accounts have more centralized equipment specification than other commercial customers, it is important to get involved in the process at the design stage.*
- Consider categorizing national accounts based on the results of this study to better target those that are different in terms of their HVAC decisions

# Questions?

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