# Residential Central Air Conditioning Regional Assessment

January 13, 2010

ADM Associates, Inc.™

# Overview of Effort

- Evaluated High Efficiency Residential CAC units for
  - Connecticut Light & Power
  - United Illuminating
  - National Grid (MA & RI)
  - NSTAR Gas & Electric
- Sample of 96 sites, covering CT, RI, NEMA, SEMA, and WCMA ISO Load Zones,
- Monitored 101 units
  - CAC runtime
  - Indoor temperature

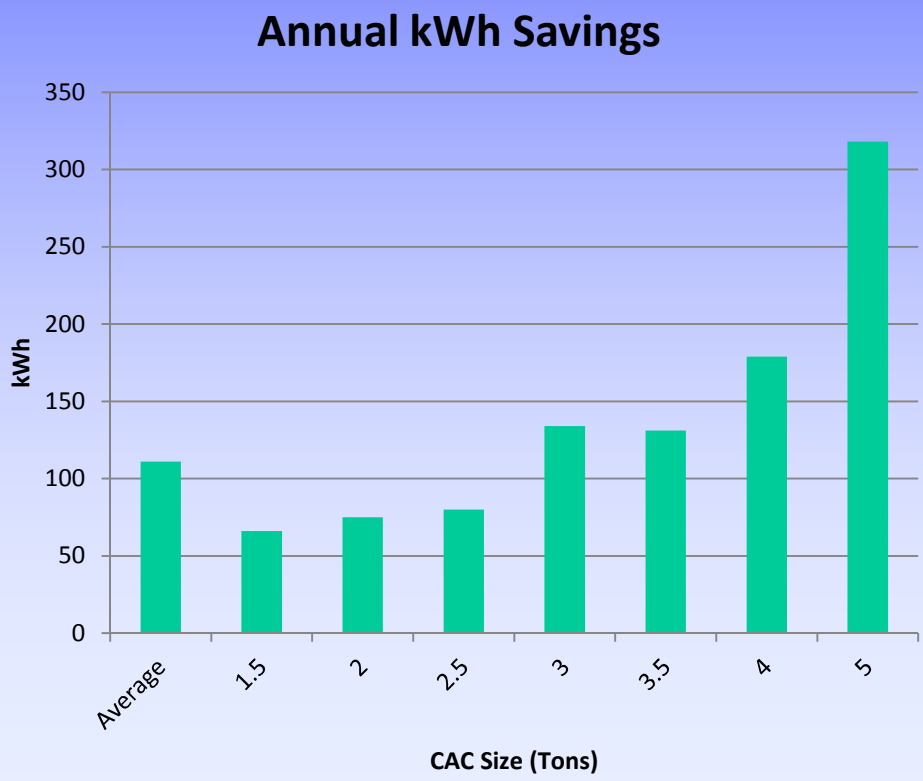
# Overview of Effort

- Regression models were developed for each household, based on outside weather and time of day variables
  - With each household's response coefficients to weather determined, they could then be "transplanted" to different load zones by inputting the appropriate weather
  - By containing a cross-section of load zones, the model is more robust and flexible in application to various local weather patterns

- Results from regression models include
  - Annual kWh savings
  - On-peak kW reductions & coincidence factors
  - Seasonal peak kW reductions & coincidence factors

# Per-Site Average Annual kWh Savings

| CAC Size | Sample Points |
|---|---|
| 1.5 | 2 |
| 2 | 26 |
| 2.5 | 18 |
| 3 | 38 |
| 3.5 | 4 |
| 4 | 7 |
| 5 | 1 |

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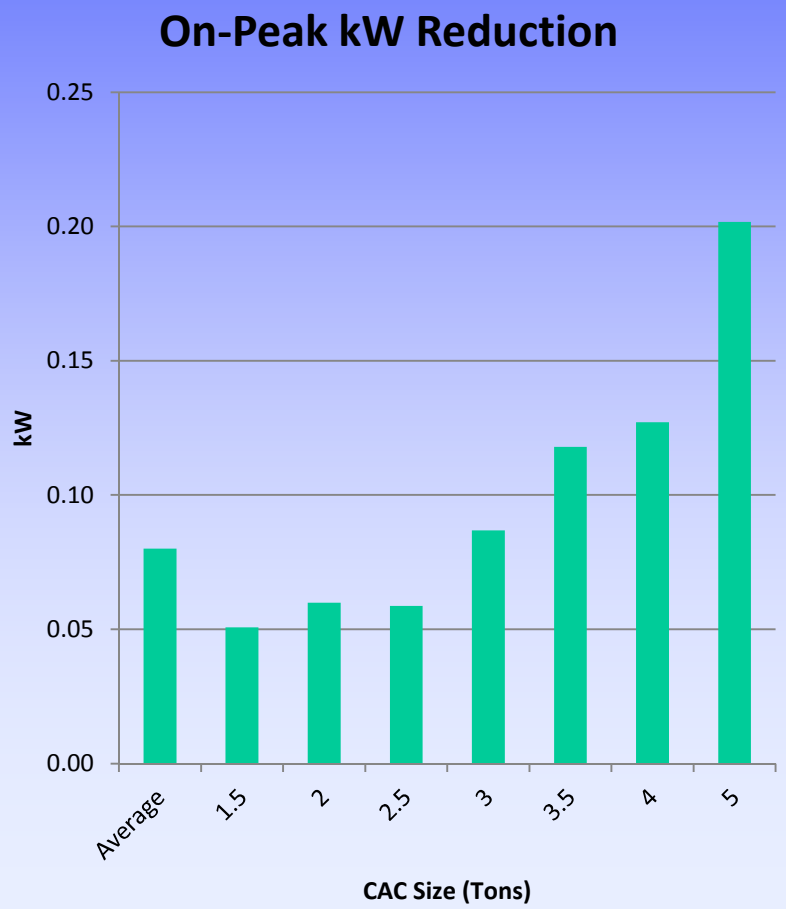
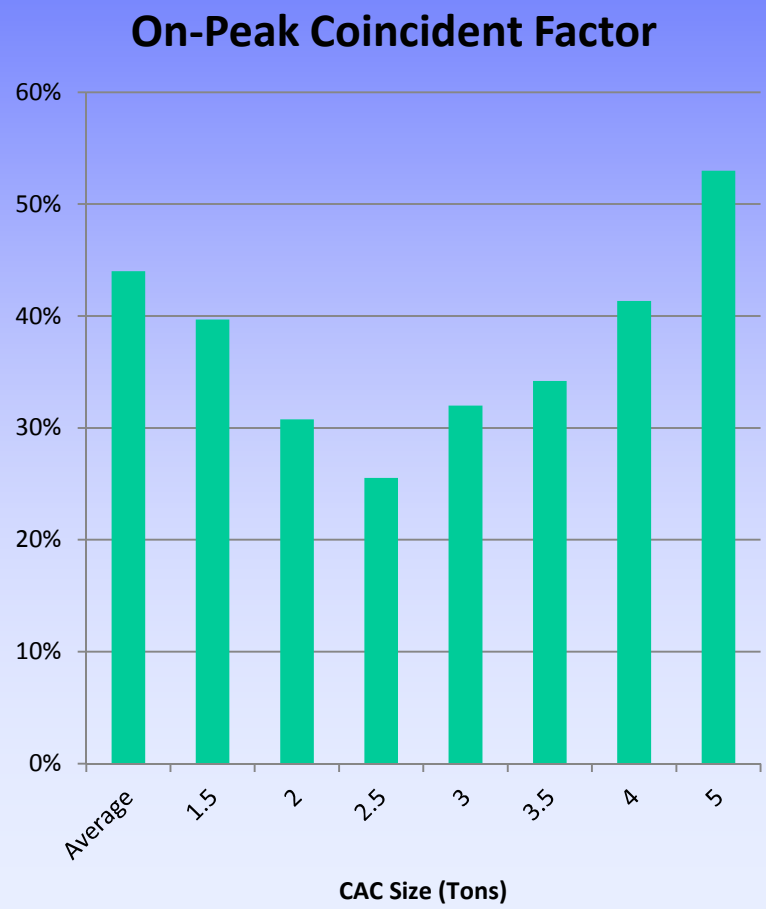
# Per-Site Average On-Peak Reductions

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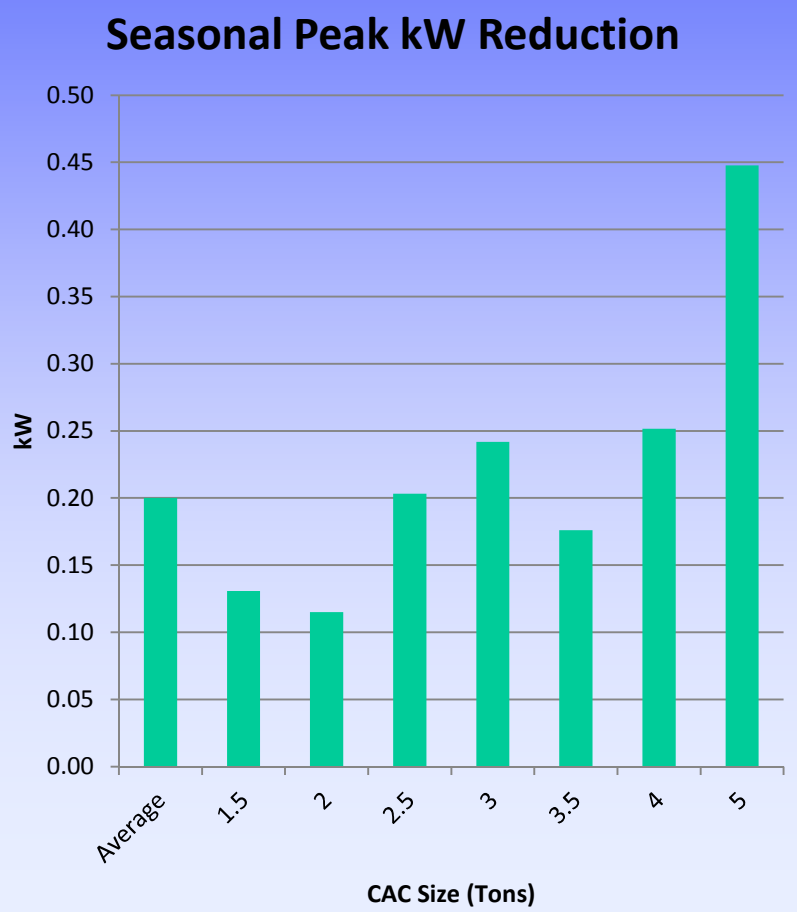
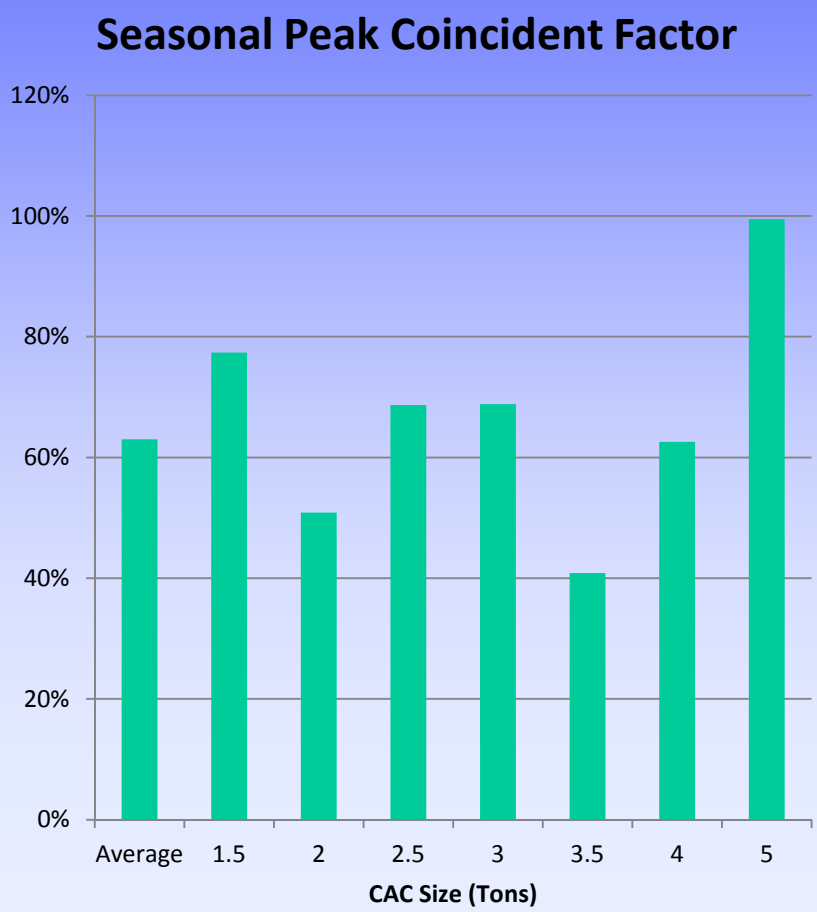
# Per-Site Seasonal Peak Reductions

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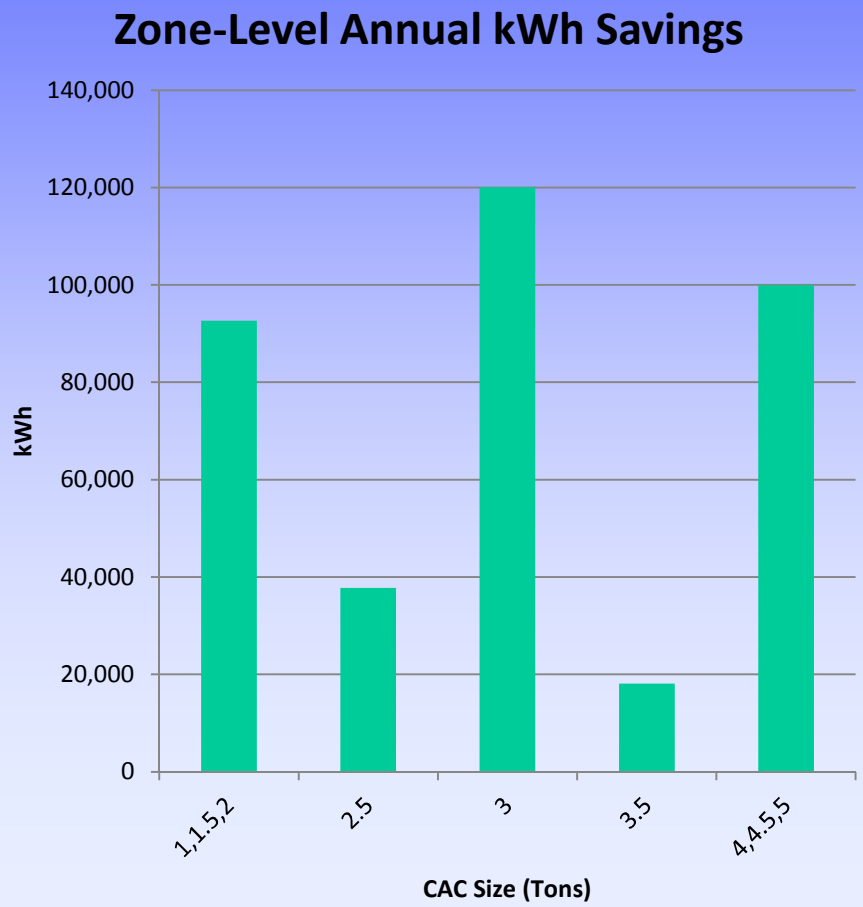
# Zone-Level Annual kWh Savings

| CAC Size | # Units in Population |
|---|---|
| 1 | 220 |
| 1.5 | 246 |
| 2 | 785 |
| 2.5 | 474 |
| 3 | 898 |
| 3.5 | 138 |
| 4 | 409 |
| 4.5 | 14 |
| 5 | 85 |

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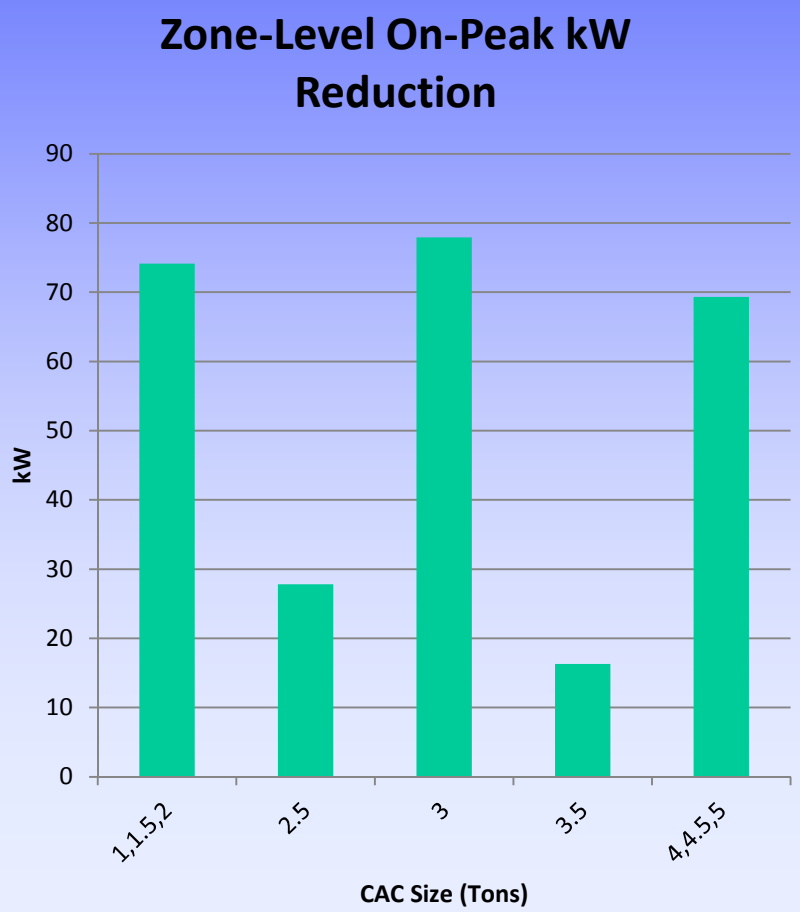


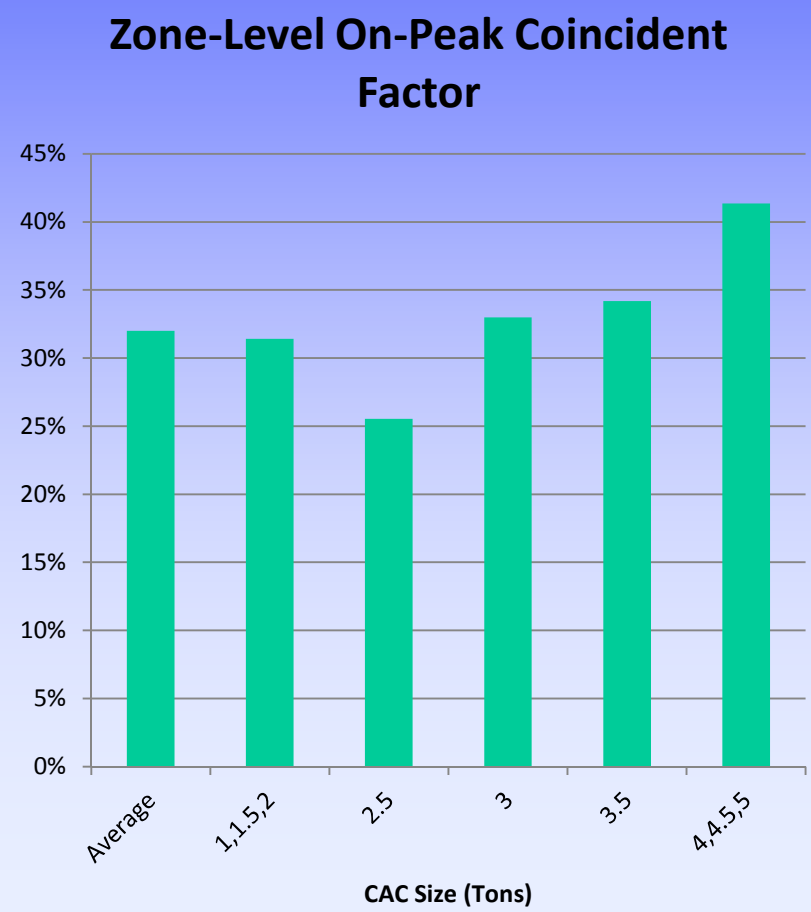


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# Net-to-Gross Analysis

- Surveyed 70 customers for each utility
- Assess  Free-Ridership from multiple approaches
  - Could the respondent have afforded High Efficiency CAC without the rebate?
  - Did the respondent change their plans after learning of the available rebate?
  - How important was the rebate in their decision making?

# Key Survey Results

| | CL&P | United Illuminating |
|---|---|---|
| Could Afford w/o Rebate? | 89.7% | 73.9% |
| Would Purchase High Efficiency Equipment Within One Year? | 73.3% | 75.41% |
| Changed Equipment Purchase to Qualify for Rebate? | 19.3% | 11.5% |
| Rebate Very Important? | 27.9% | 34.8% |
| Learned of Rebate After Purchasing High Efficiency Equipment? | 30.9% | 18.8% |
| Free-Ridership Percentage: | 50.1% | 31.8% |

# Differences in Program Participants

- Whether or not a participant is financially able to purchase high efficiency equipment absent the rebate is a direct indicator of free-ridership
- % of participants that could afford high-efficiency equipment without a rebate was 15.8% greater among CL&P participants.
- This accounts for 82.3% of variation in free-ridership between the two utilities