Commonwealth Edison Potential Study

Saturation, Penetration, & Market Share Highlights

Prepared for ComEd
By The Cadmus Group
September 30, 2009

Agenda

- Overview of Potential Study
- Methodology for primary data collection
- Residential findings
- Nonresidential findings

Potential Study Overview

- Energy Use Customer Survey
  - Fuel use and envelope characteristics
  - Demographics and energy use profiles
- Market Penetration Study
  - Penetration of efficient technologies
- Program Potential Assessment
  - Hourly impacts
  - Efficiency potential
  - Demand response and energy efficiency (electric only)

Potential Study Overview

- Goals: The market data collection effort will focus on three broad metrics critical to estimating efficiency potential
  - ***Equipment saturation***. The percent of customers who own specific equipment
  - ***Efficiency penetration***. The percent of the installed equipment stock considered efficient
  - ***Market share***. Current sales percentages for efficient equipment

Potential Study Overview

- Question to Panel During 2009 AESP:
  "Are potential studies valuable?"

- Panelist Response
  "Potential studies are valuable for everything except their estimate of potential!"

Potential Study Overview

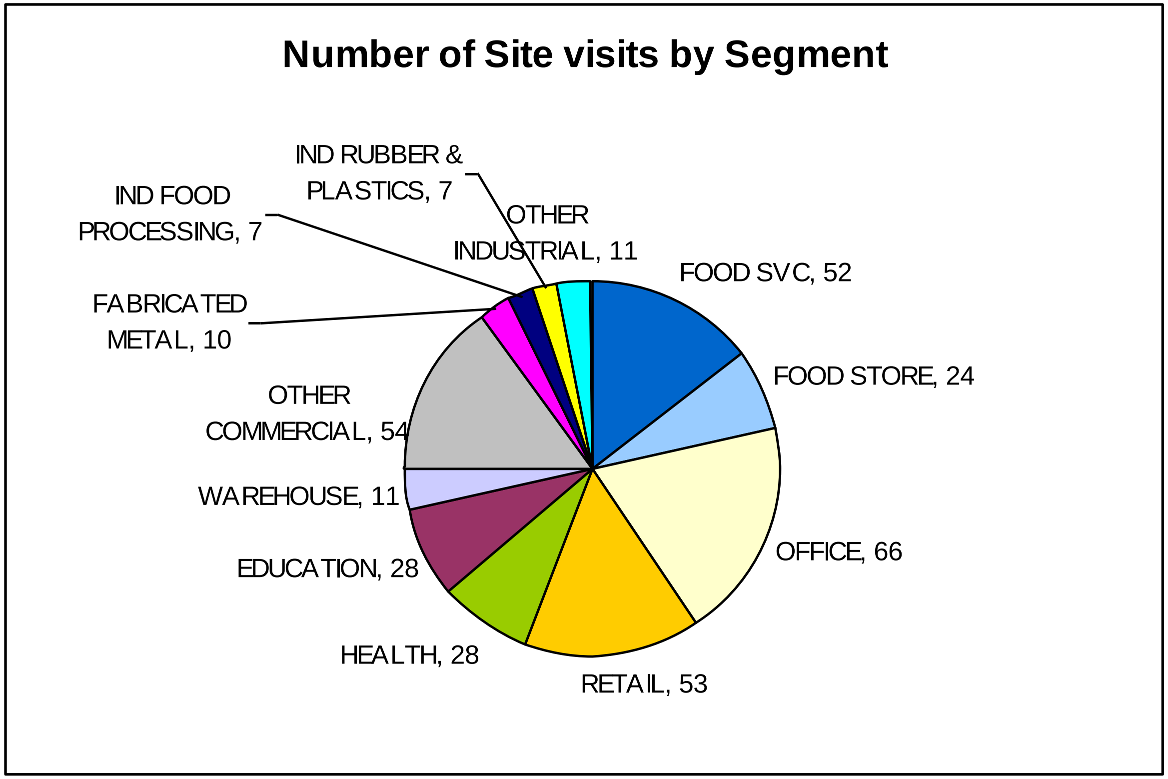
- So what is valuable about potential studies?
  - Comprehensive market characterization study
  - Detailed measure database
- We think potential estimates are also valuable
  - Can be used for program gap analysis
  - Should be used for goal setting

Methodology-Residential

- Telephone surveys (n=521)
  - Residential appliance saturation survey (RASS)
- In-home Audits (n=140)
- Weighting
  - Unweighted for telephone (assume random)
  - Audits weighted for awareness/usage
    - CFL homes more likely to participate in audit

Nonresidential Methodology

- On-site visits with 316 commercial & 35 industrial sites



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Trade Allies Methodology

- Telephone surveys (n=247)
- Participants and nonparticipants
  - ComEd lists plus yellow page searches
  - Mix of larger and smaller trade allies

Trade	Surveys Completed
Residential Builders	26
HVAC dealers	30
NonResidential Builders	25
Architects and Engineers	21
Mechanical Contractors	16
Lighting Vendors	16
Motors	13
Refrigeration	15
Compressed Air	15
Retail	70
	247

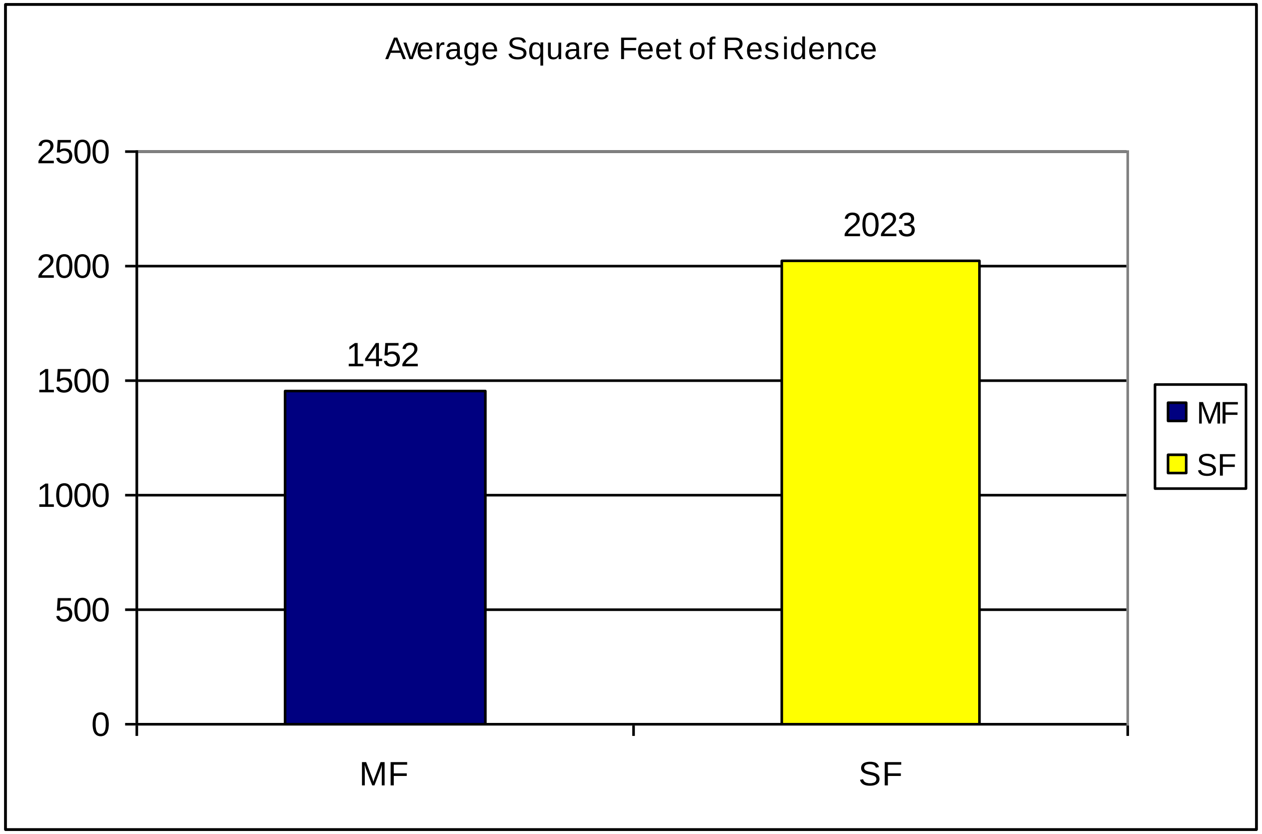
Residential Findings

Key Measures & Segments

- Key Measures Covered
  - Lighting
  - Space Heating
  - Cooling
  - Insulation
  - Appliances

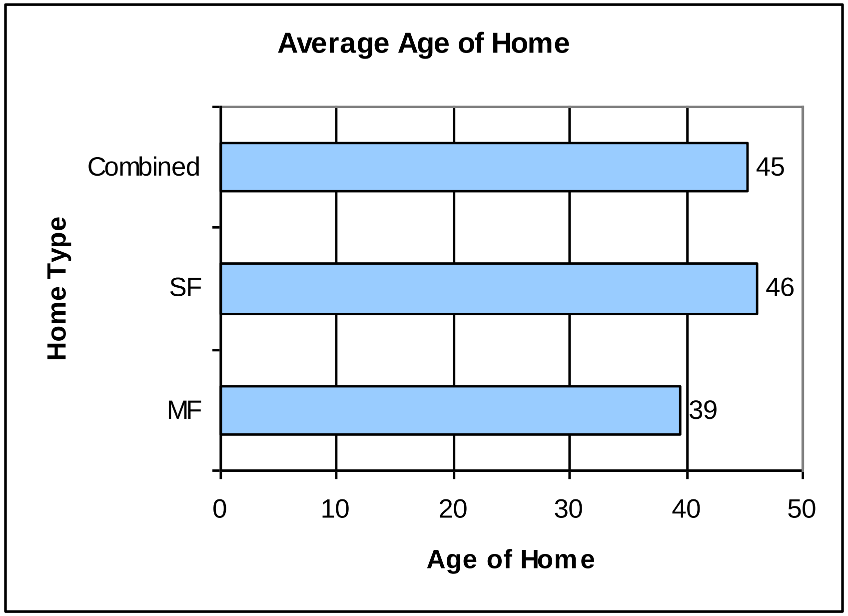
- Residential Segments
  - Existing Single-Family
  - Existing Multi-Family
  - New Construction

Saturation of Equipment: Average Size of Residence

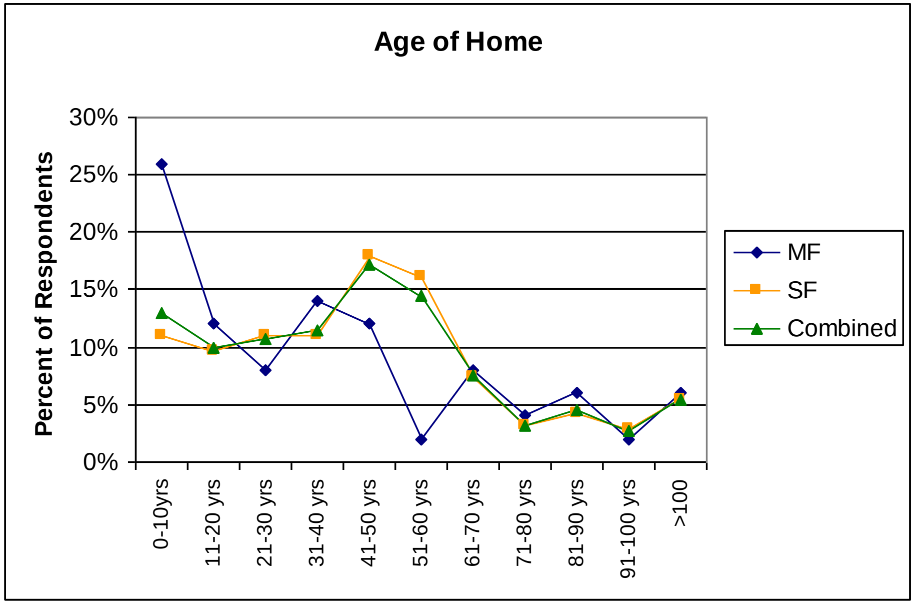


- Most ComEd respondents live in Single Family Detached homes with an average size of over 2000 square feet.

Saturation of Equipment: Age Of Homes

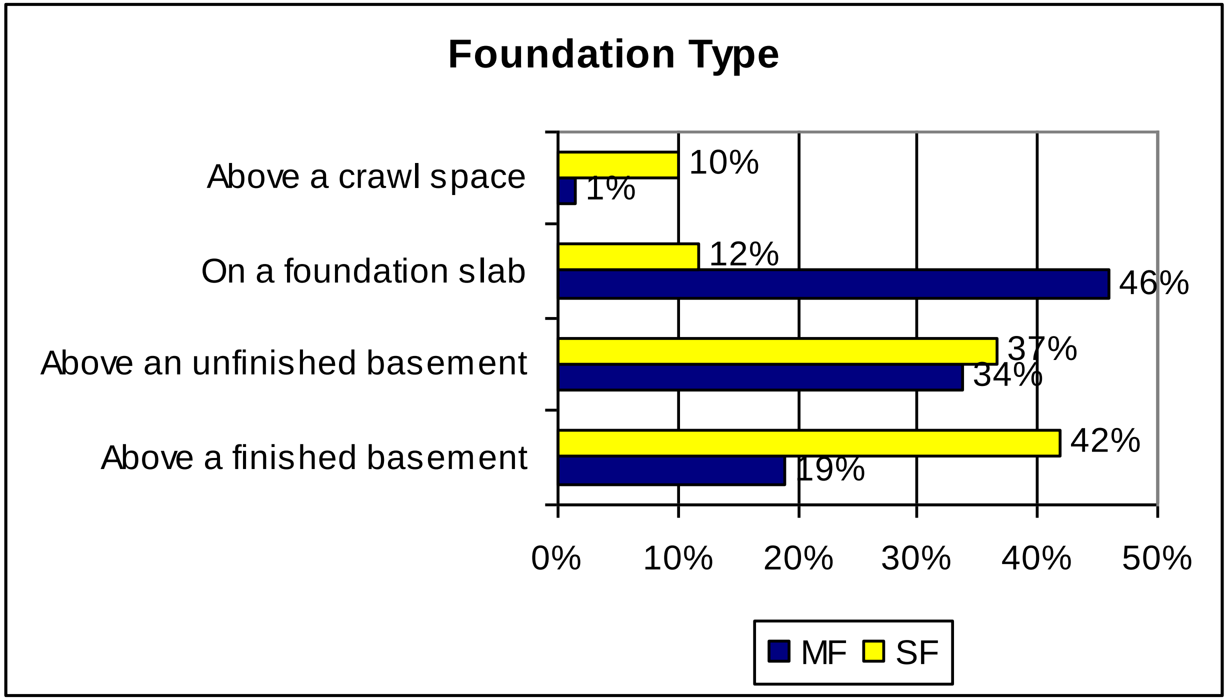


- Multifamily homes tend to be newer (A larger proportion was built within the past 10 years).
- Note: almost half of Multifamily respondents did not know how old their residence was.



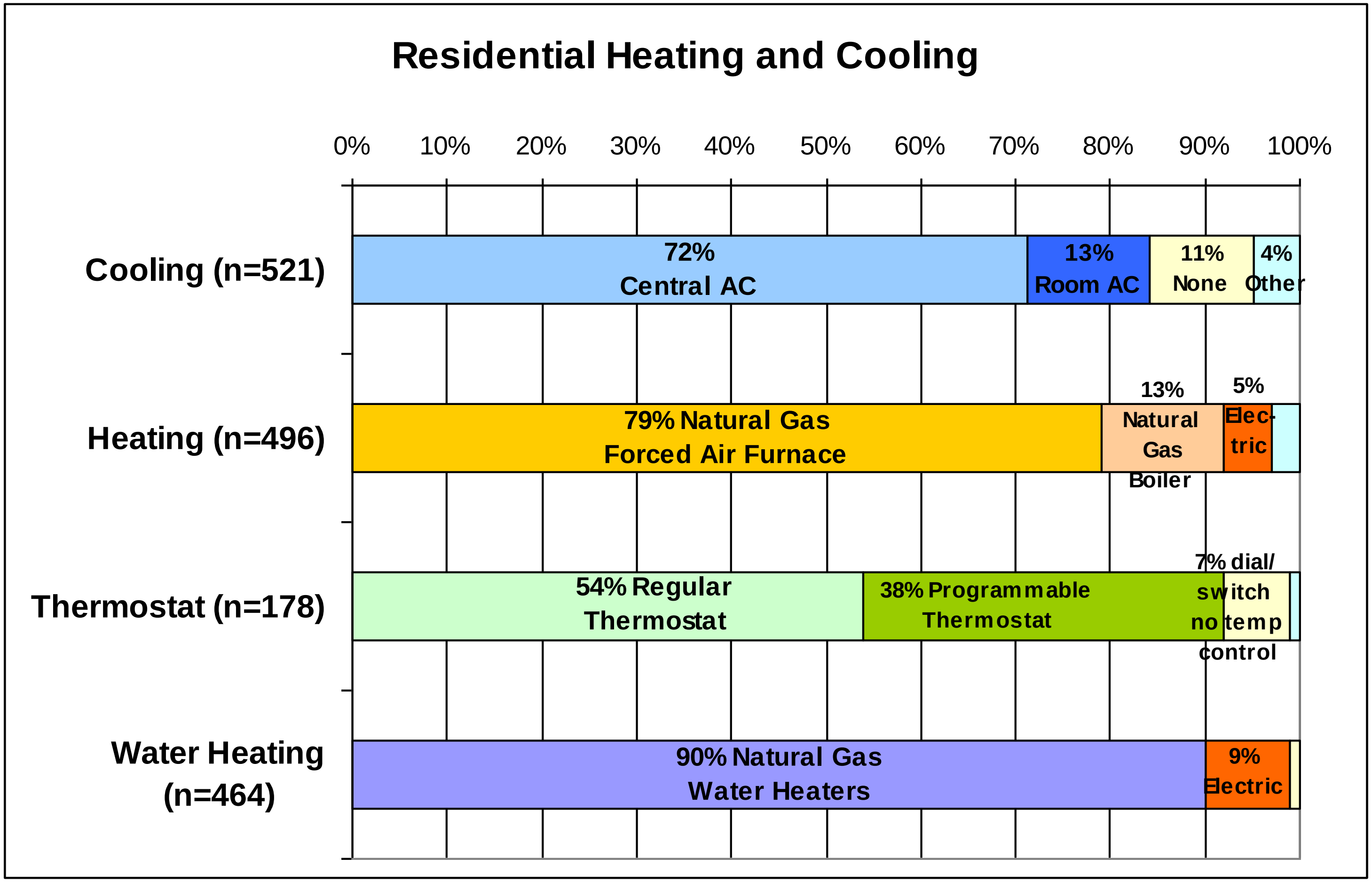
- The age of homes follows a normal distribution for single family detached homes.

Saturation of Equipment: Foundation Types



- Most ComEd residences have basements
- Single family homes are more likely to have finished basements (42%) and less likely to be built on a slab (12%)

Saturation of Equipment: Cooling, Heating & Hot Water



- 11% do not have a cooling system
- Only about half of MF homes have central AC, compared to 86% of SF homes.
- About a third of MF homes have a room AC unit, whereas 13% of SF homes have room AC
- MF homes are more likely to have electric heat (19%)

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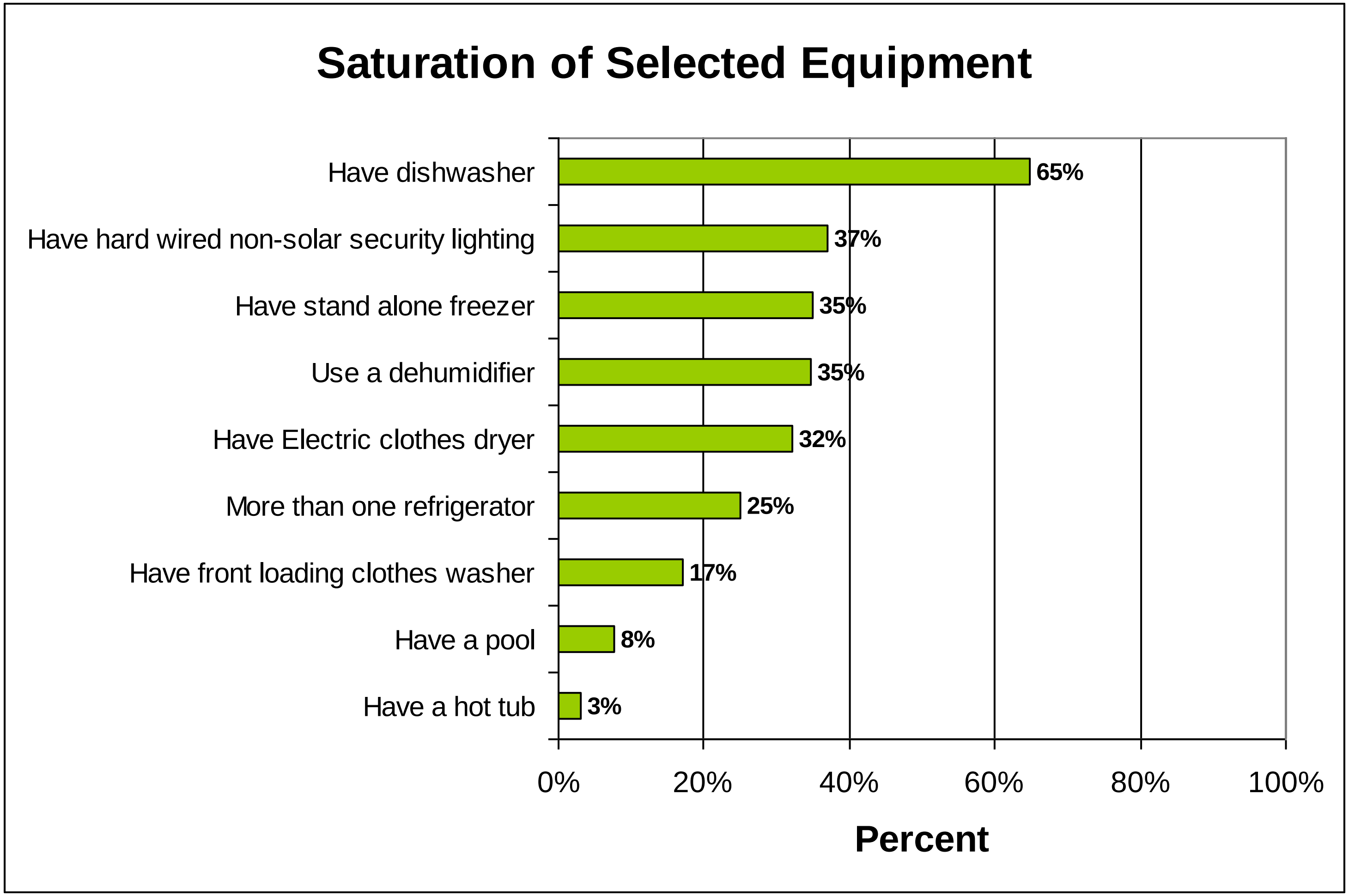
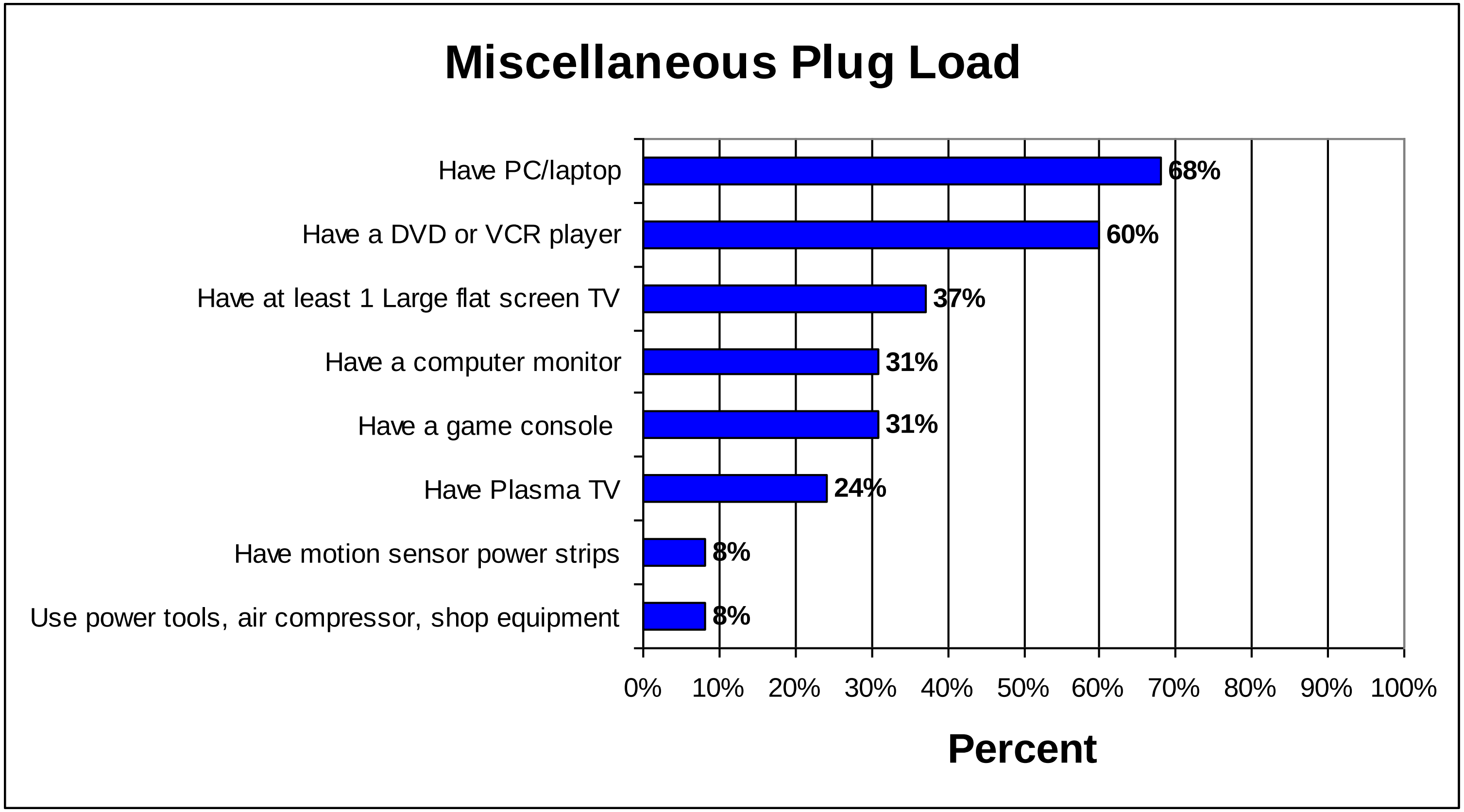
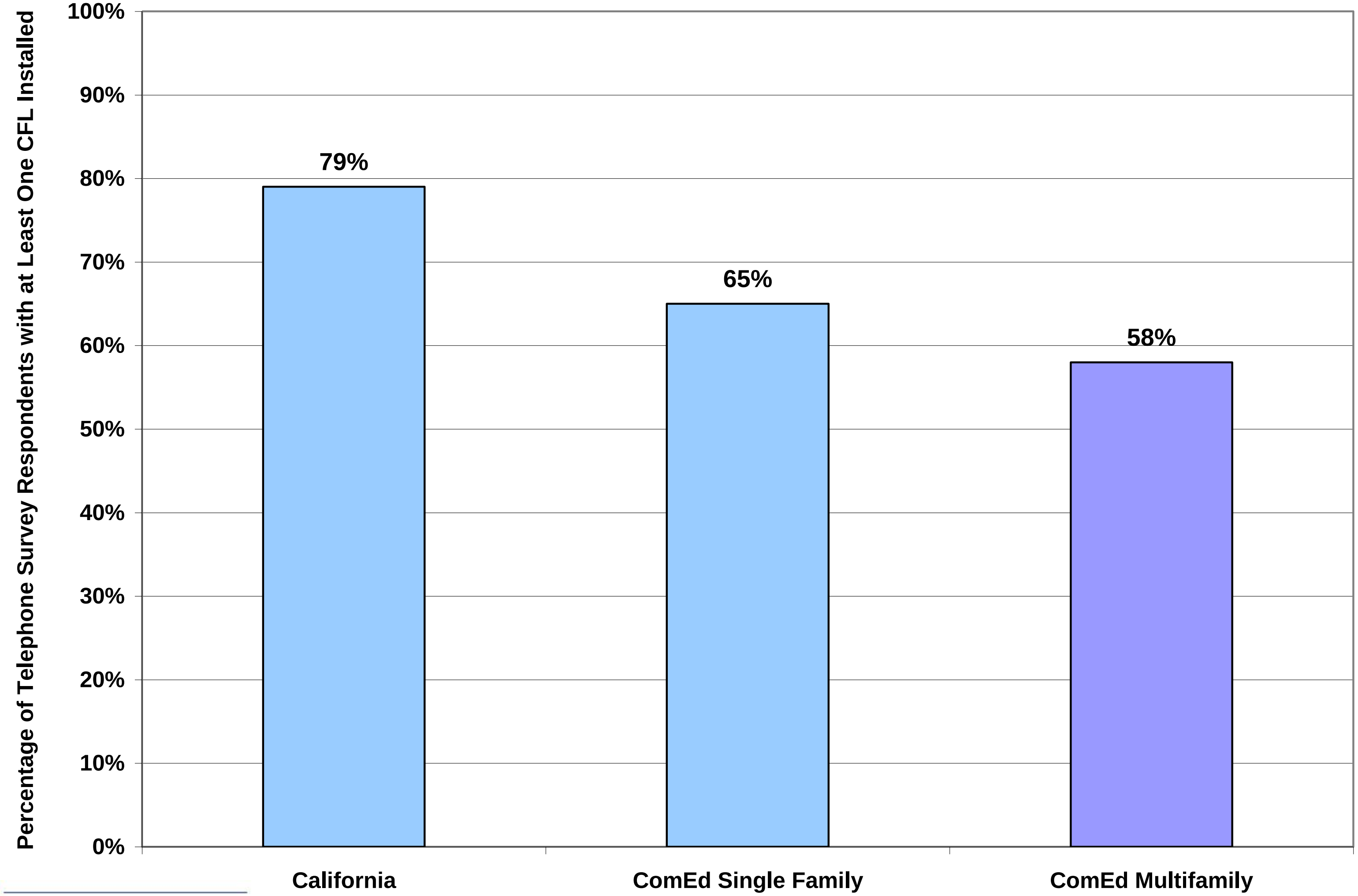
Saturation of Equipment: Miscellaneous Equipment



Saturation of Equipment: Plug Load



CFL Usage—
Phone Survey Respondents with One or More CFL Installed



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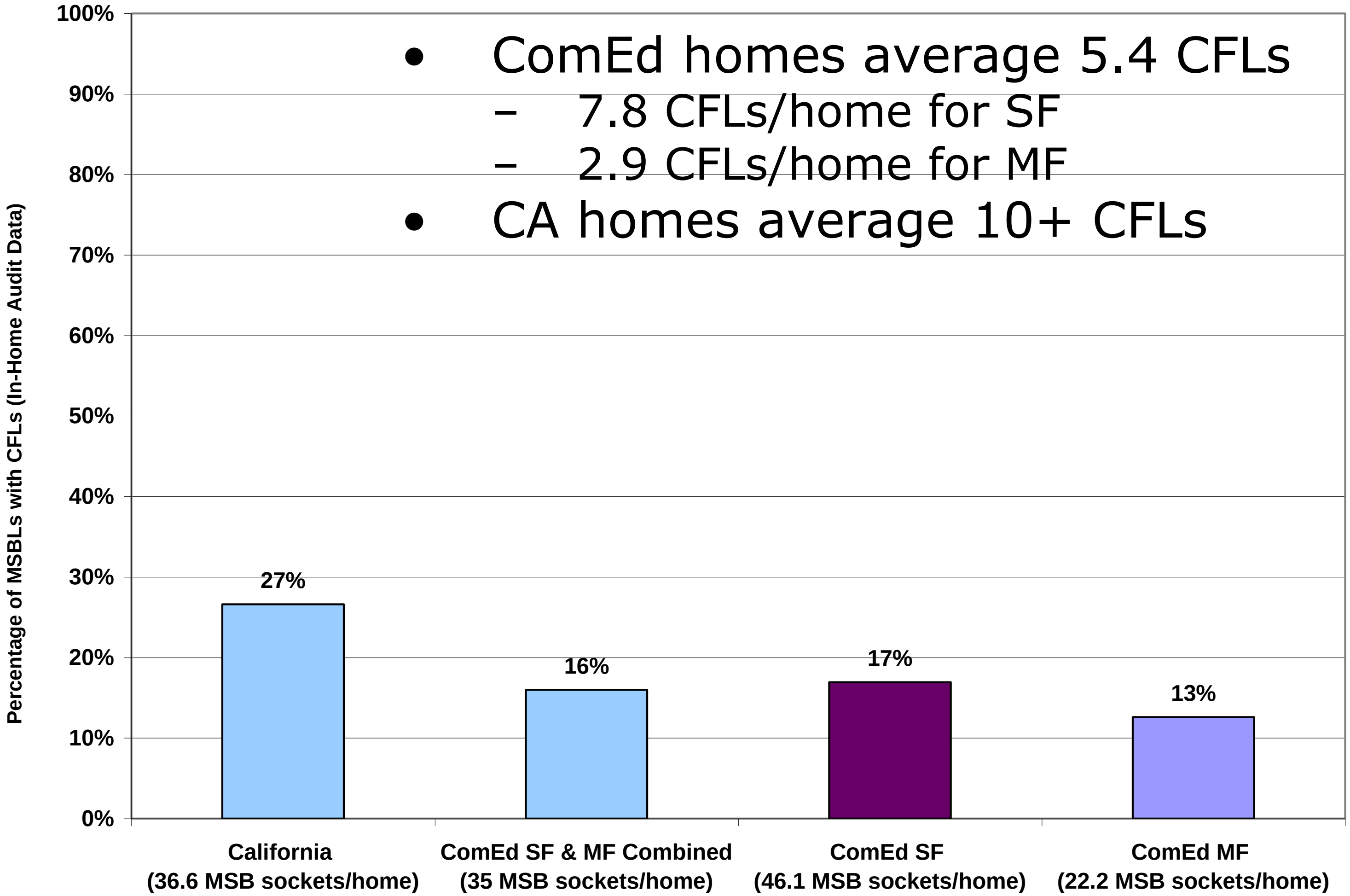
Comparison of CFL Penetration Rates

- ComEd homes average 5.4 CFLs
  - 7.8 CFLs/home for SF
  - 2.9 CFLs/home for MF
- CA homes average 10+ CFLs



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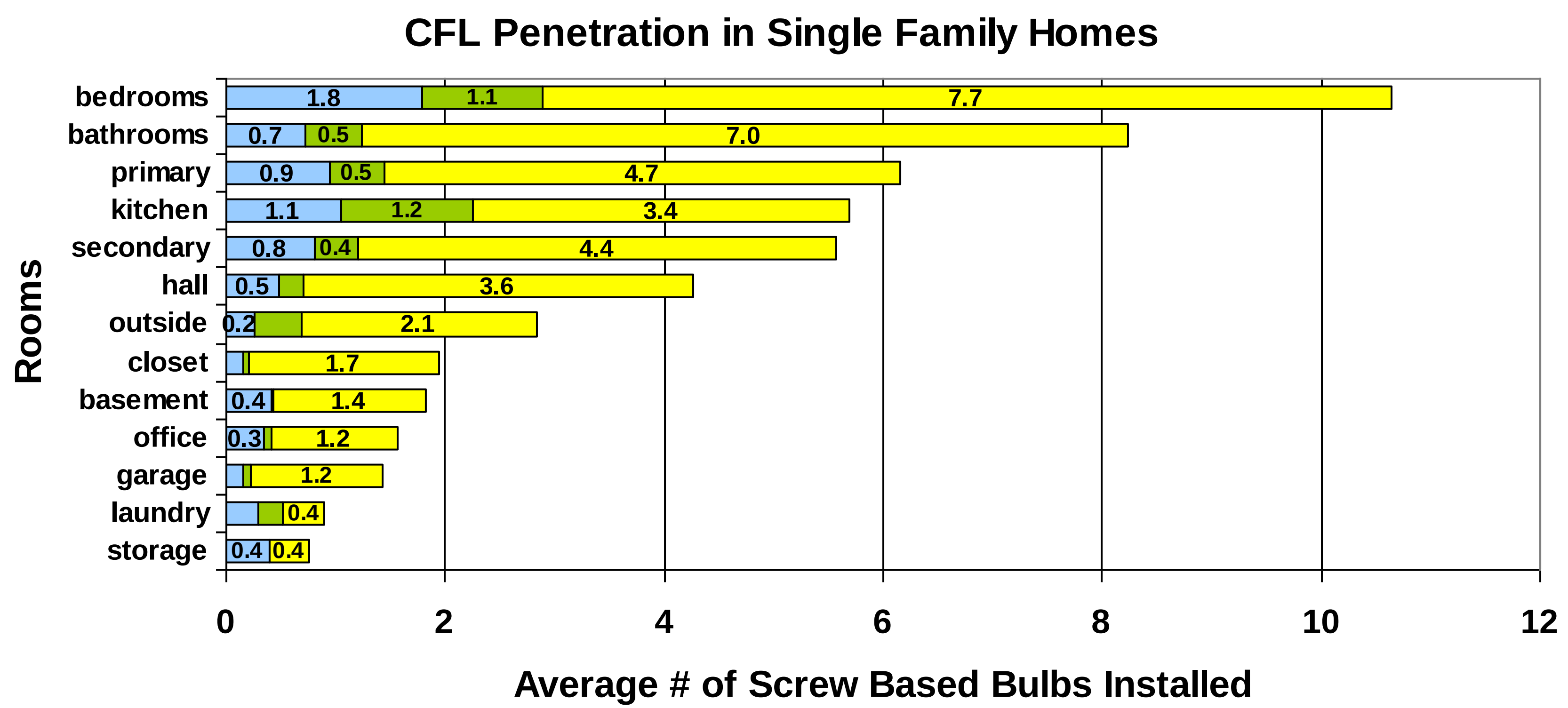
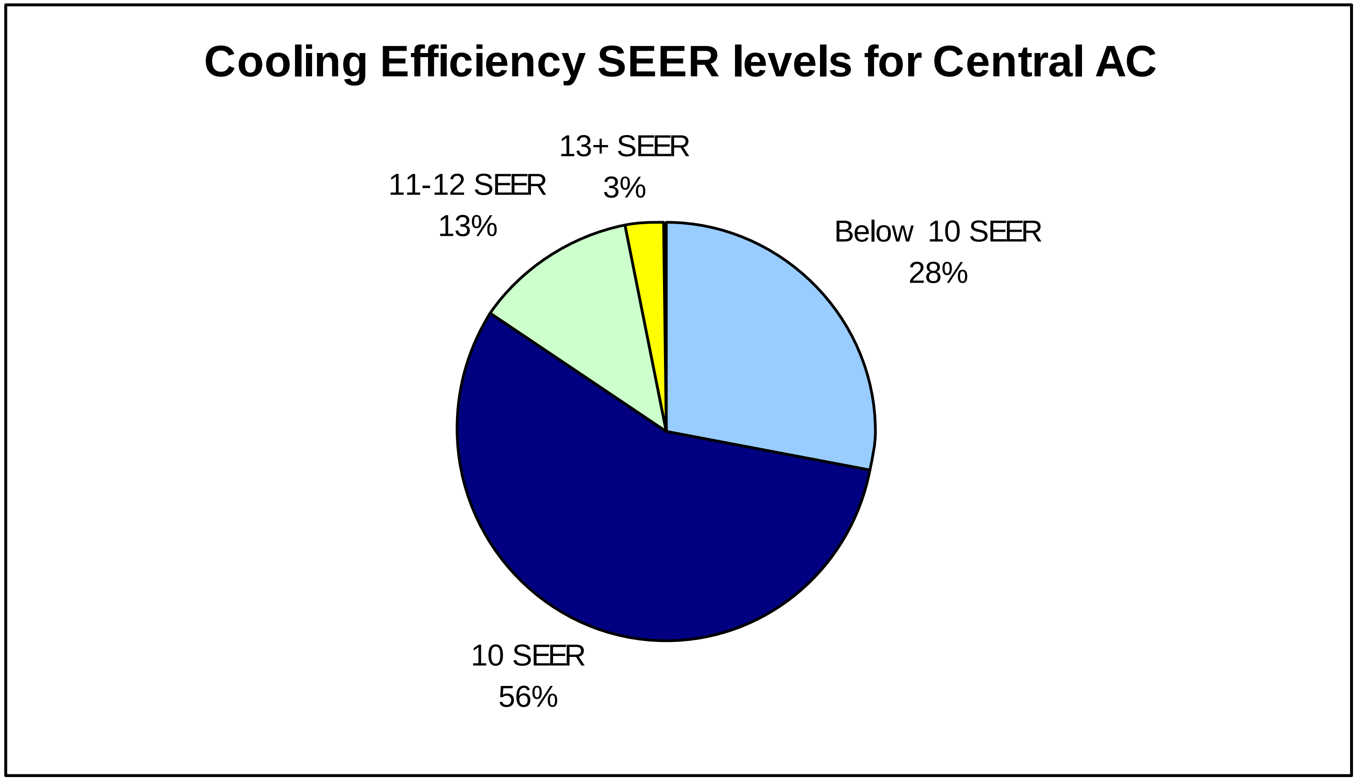
Penetration Levels for Energy-Efficient Equipment: Single Family – Lighting & CFLs



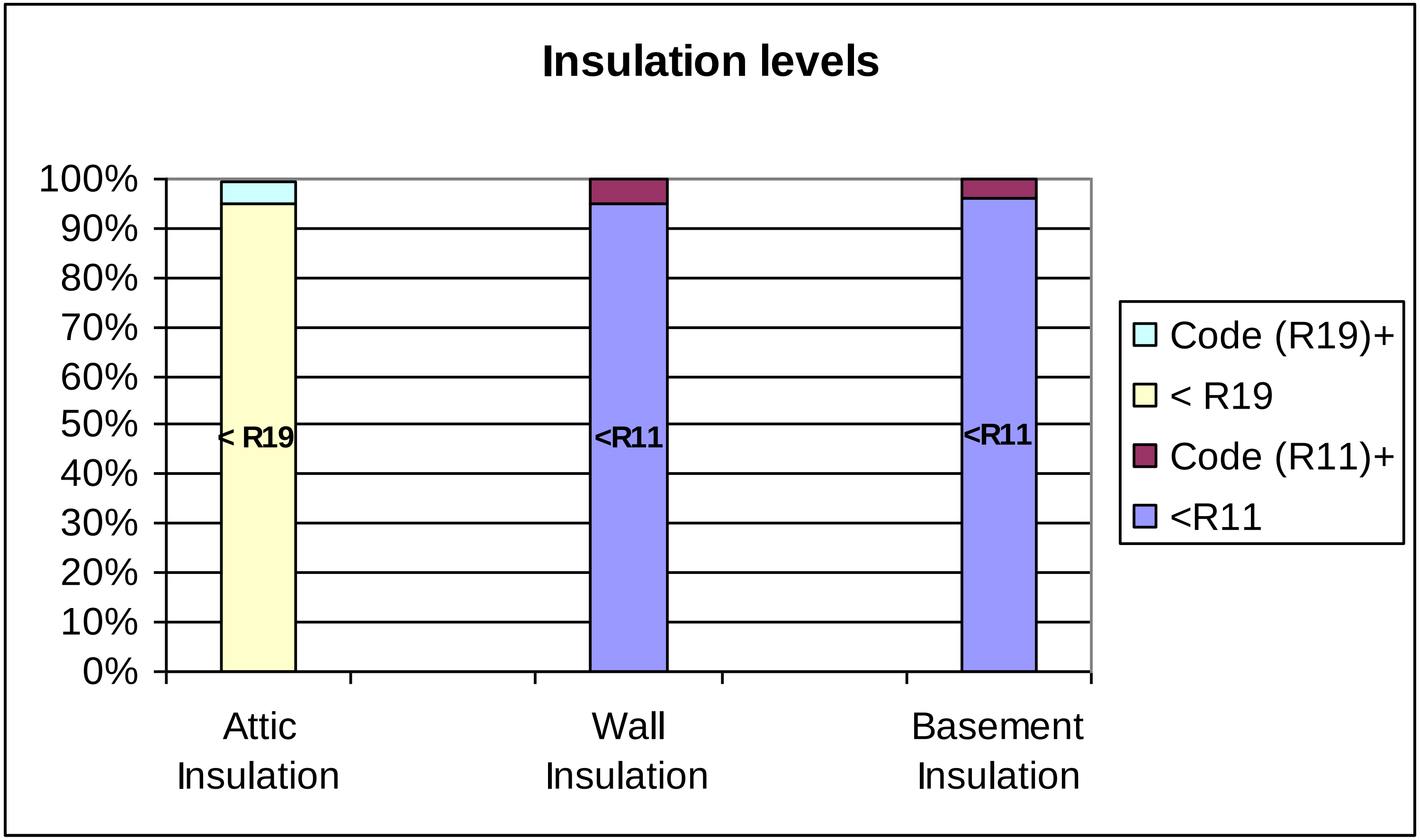
N=72 (Single Family Residential Site visits); weighted

Penetration: Energy Efficient Cooling



- Average SEER rating = 10.4
- 42% of AC units are 10 years old or more

Penetration: Insulation levels



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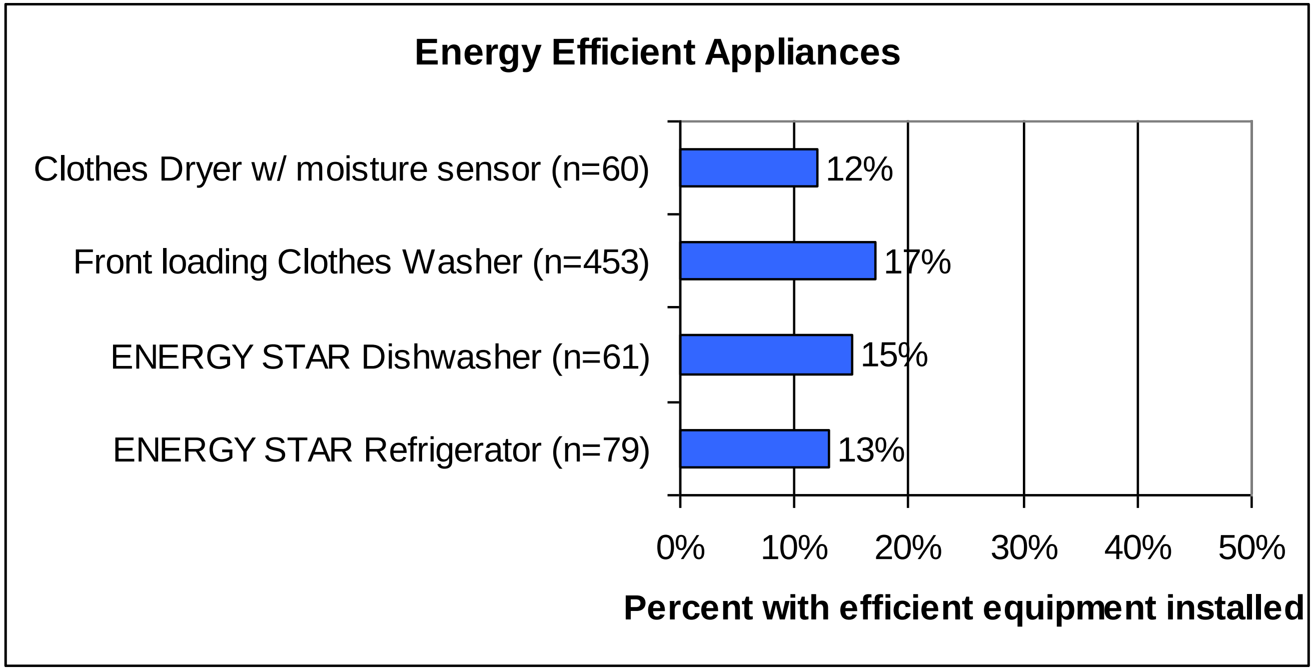
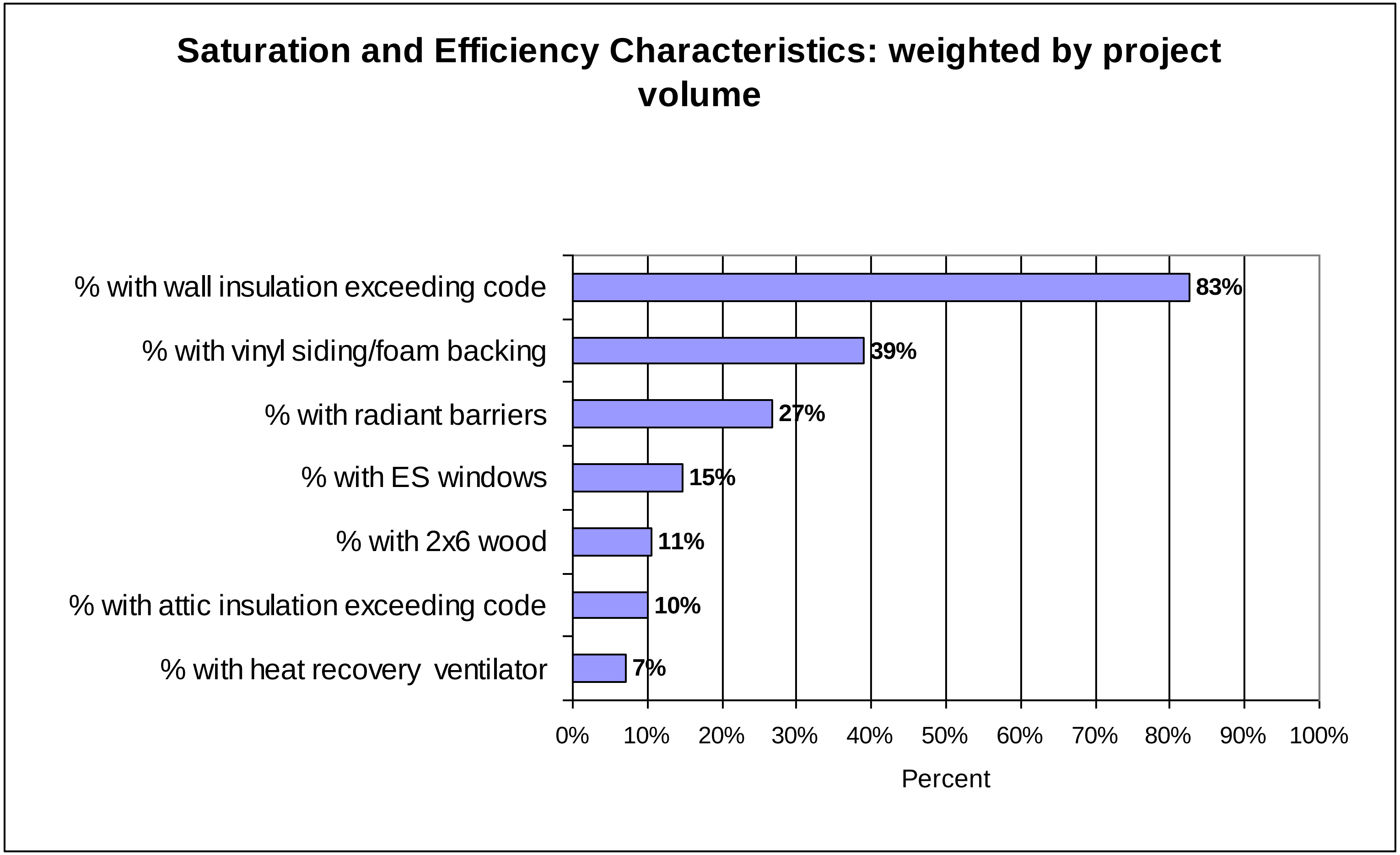
Penetration of Energy Efficient Equipment

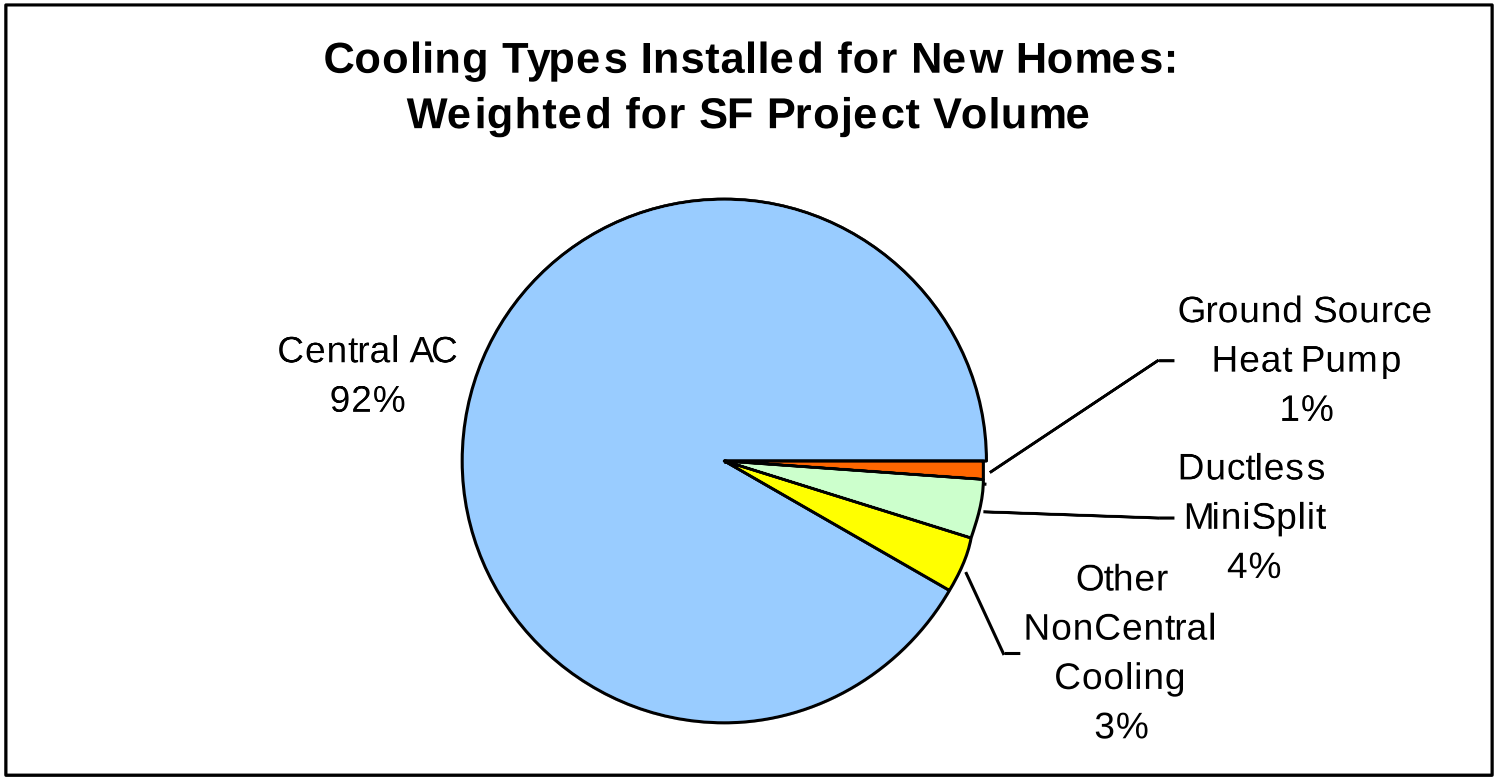


•The actual percent of *currently qualified* ENERGY STAR equipment is less than what is represented. These observations of the ENERGY STAR label do not account for changes in ENERGY STAR standards in years subsequent to installation.

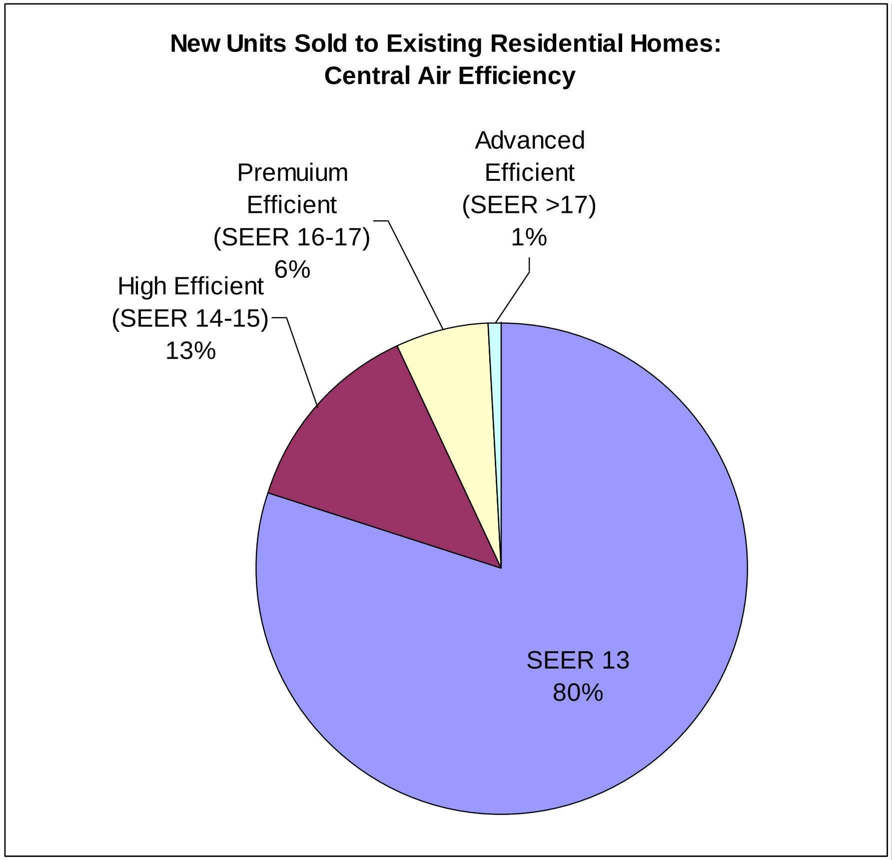
Market Share: Residential New Construction

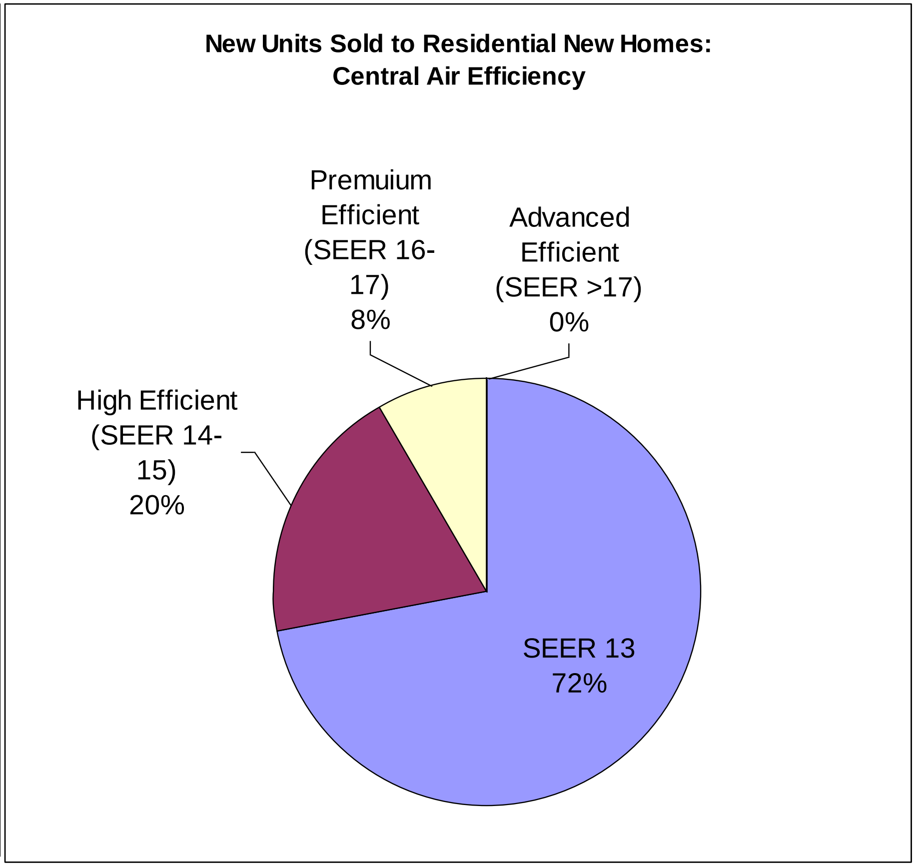


Market Share: Residential New Construction Continued



Market Share: HVAC for Residential Homes





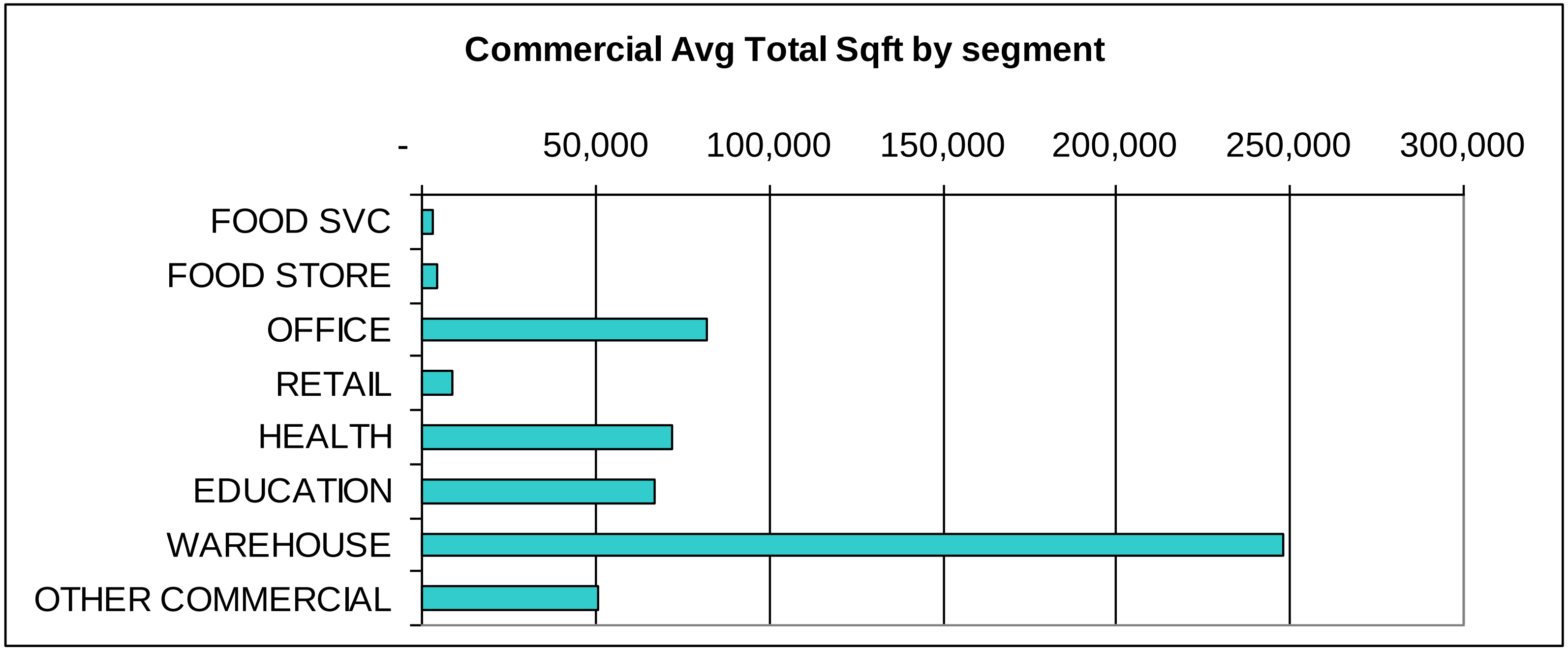
Market Share: Retail for Residential Market

Percent of Sales that are Energy Efficient

Product	Efficiency Standard	ComEd Retailers	2007 National ES Partners (Reporting for IL)
Room AC	ENERGY STAR	69%	51%
Clothes Washers	ENERGY STAR	31%	40%
Dishwashers	ENERGY STAR	63%	80%
Refrigerators	ENERGY STAR	37%	31%
Freezers	ENERGY STAR	23%	NA
Clothes Dryer	Moisture sensor	14%	NA
Lighting Fixtures	ENERGY STAR	12%	NA
Dehumidifiers	ENERGY STAR	19%	NA
Ceiling fans	ENERGY STAR	9%	NA
Windows	U=0.35 or less	54%	NA
Doors	U=0.35 or less	34%	NA

Nonresidential Findings

Saturation—Commercial Building Square Footage



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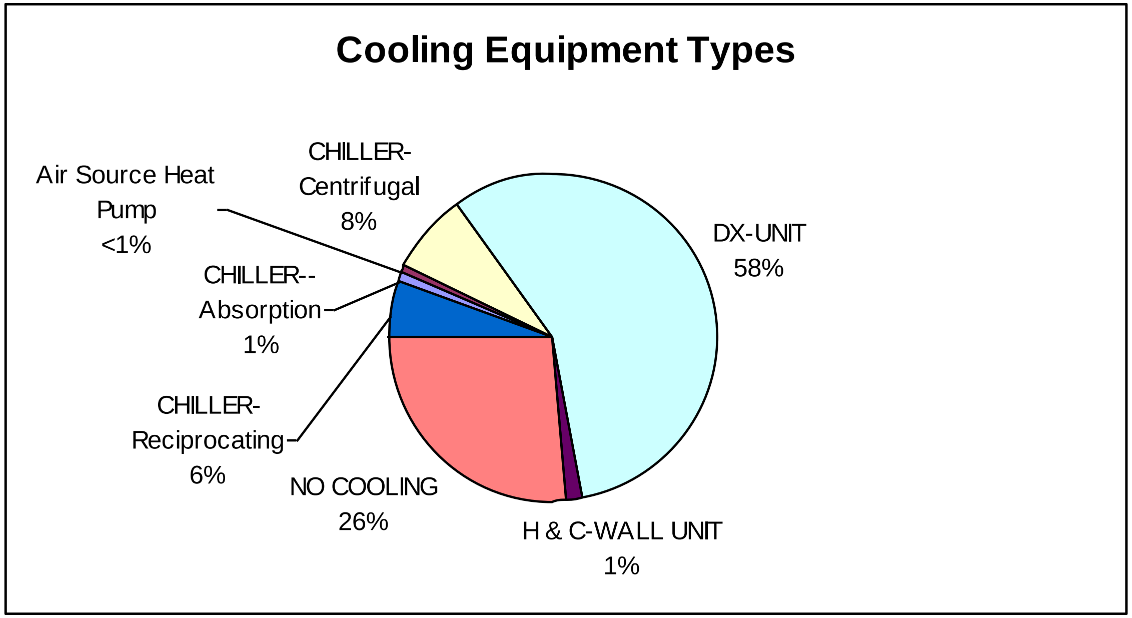
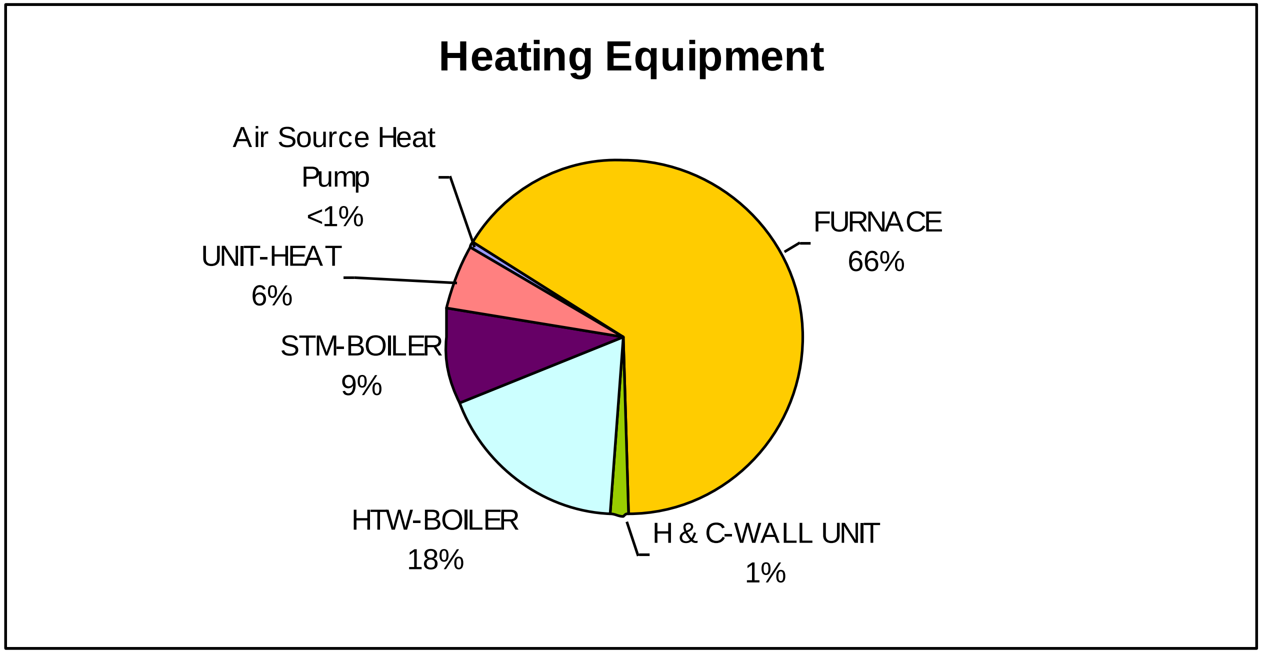
Saturation of Equipment—Cooling



75% of nonresidential customers have cooling

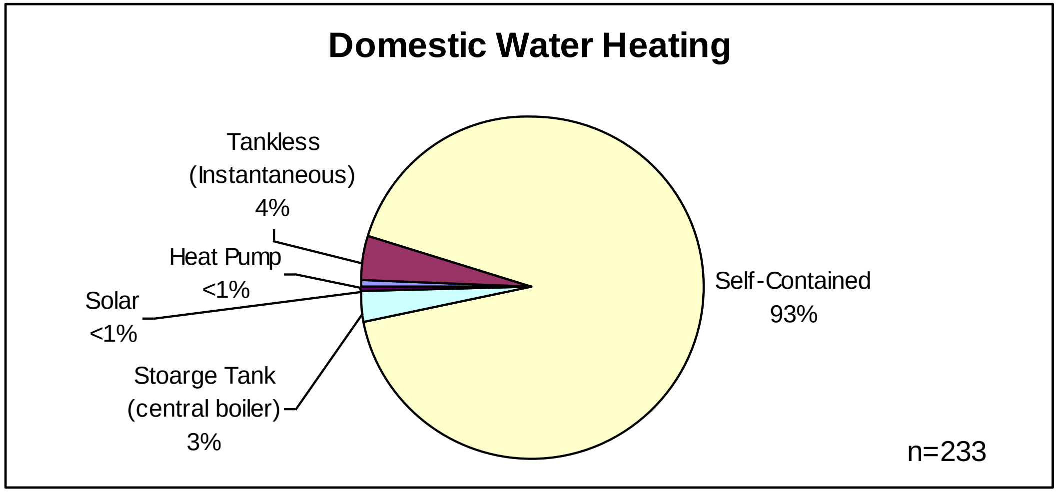
Majority are direct expansion

Saturation—Heating



Only 4% of nonresidential space heating is electric

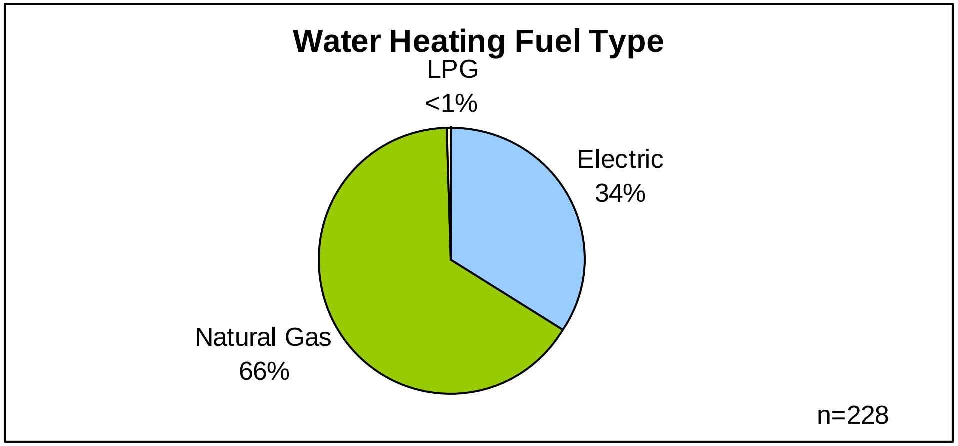
Saturation—Water Heating



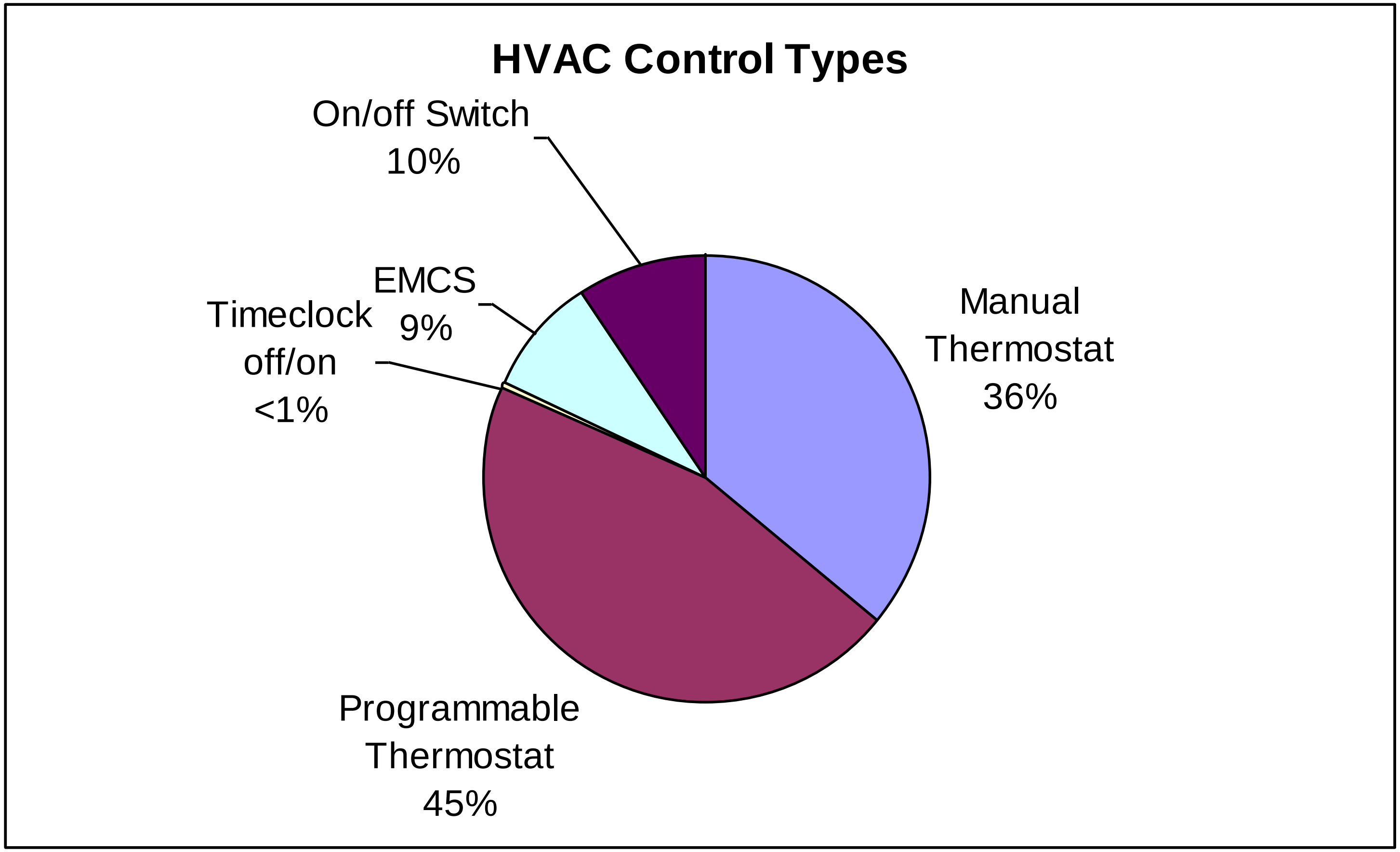
3% had tank insulation

Age is a factor for a little over a quarter, as 29% of water heaters are 10 years or older

The average tank capacity is around 60 gallons across all segments, except warehouses which average over 450 gallons



Saturation—Temperature Control Technologies



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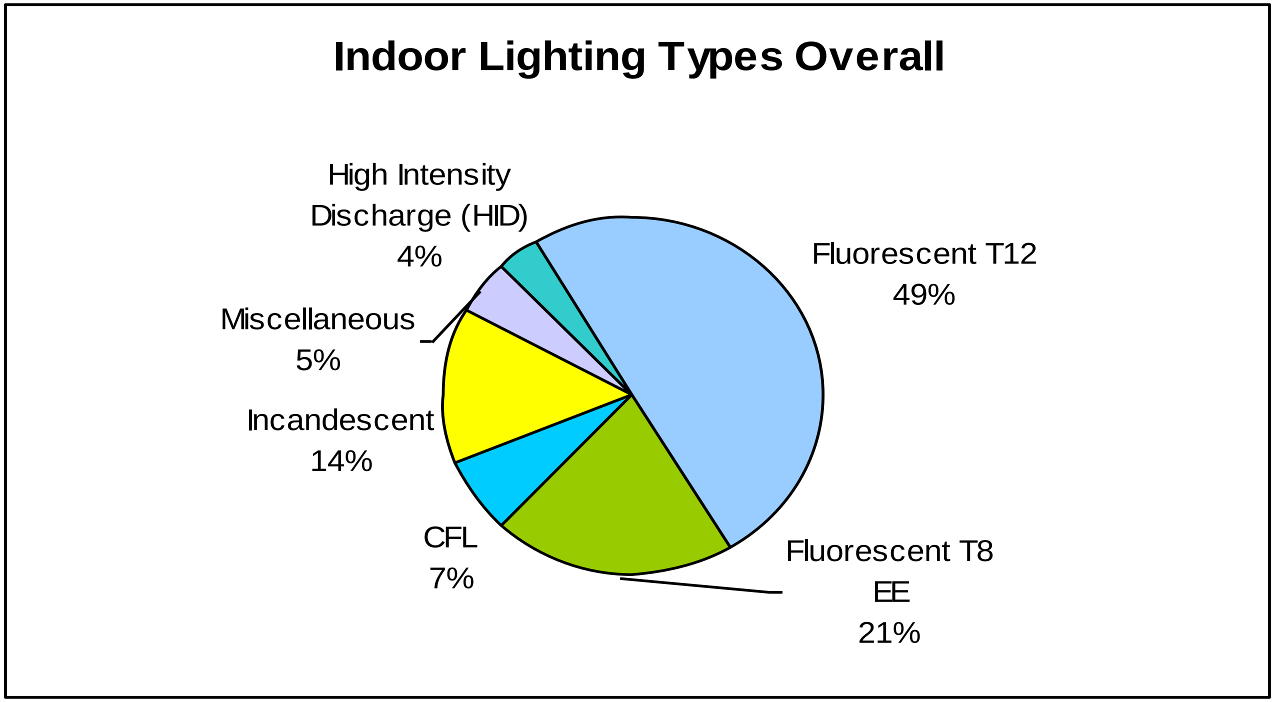
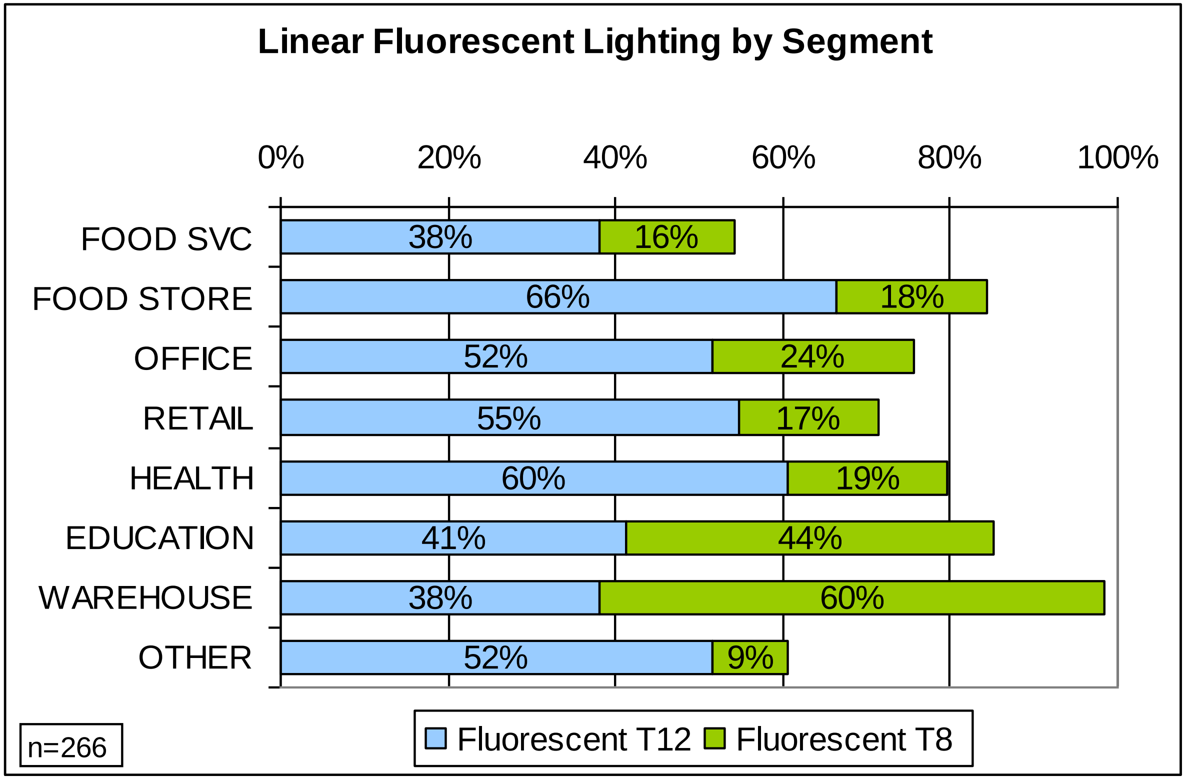
Saturation—Indoor Lighting Technologies



Manual on/off switches are the predominant type of lighting control across all segments.

Saturation of T8 Lighting by Segment



Warehouses have the largest penetration of T8 lighting

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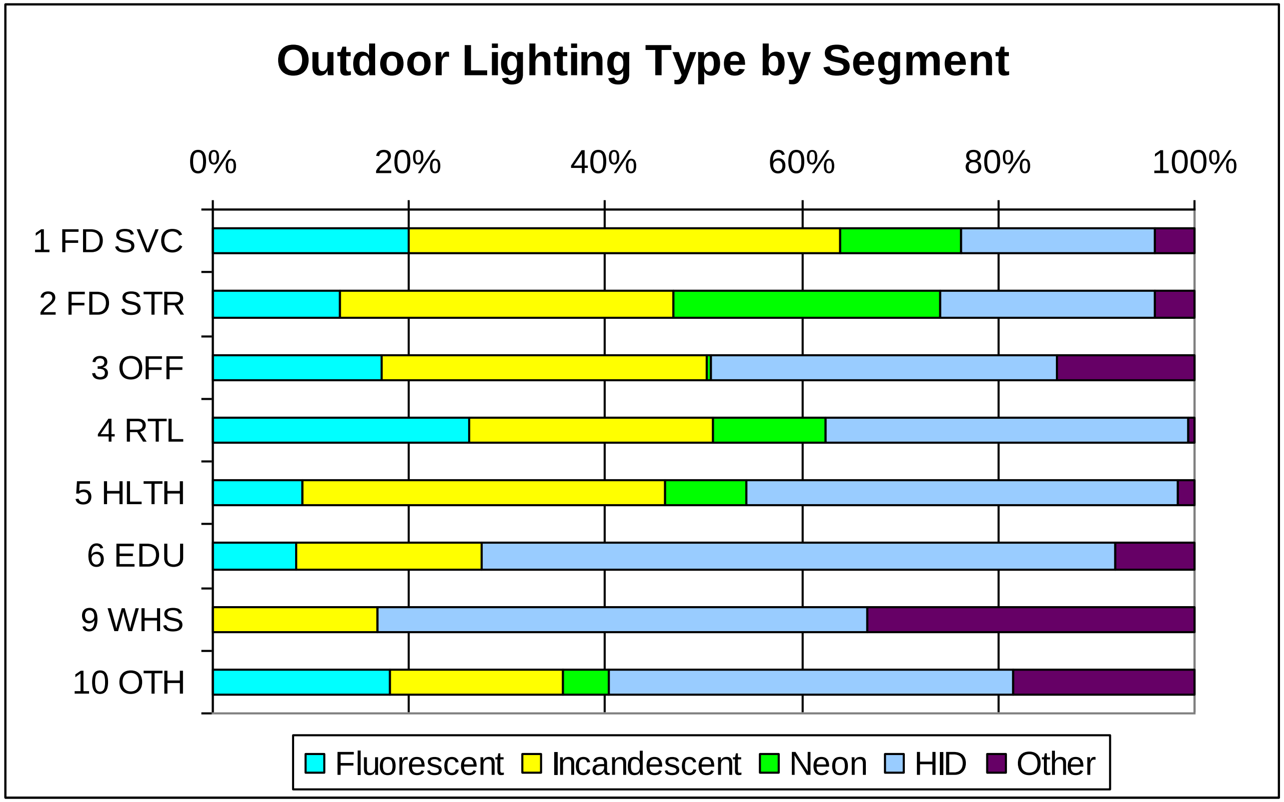
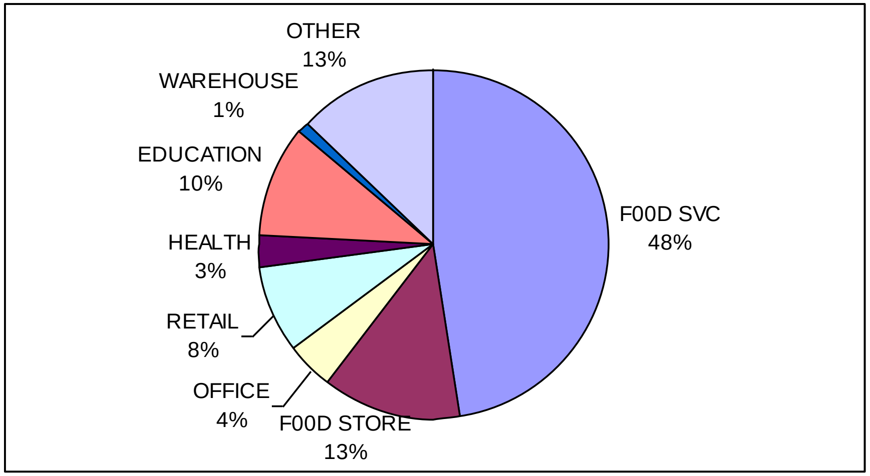
Saturation: Outdoor Lighting

The type of dominant outdoor lighting varies by segment. Incandescent and High Intensity Discharge (HID) are the two most common.

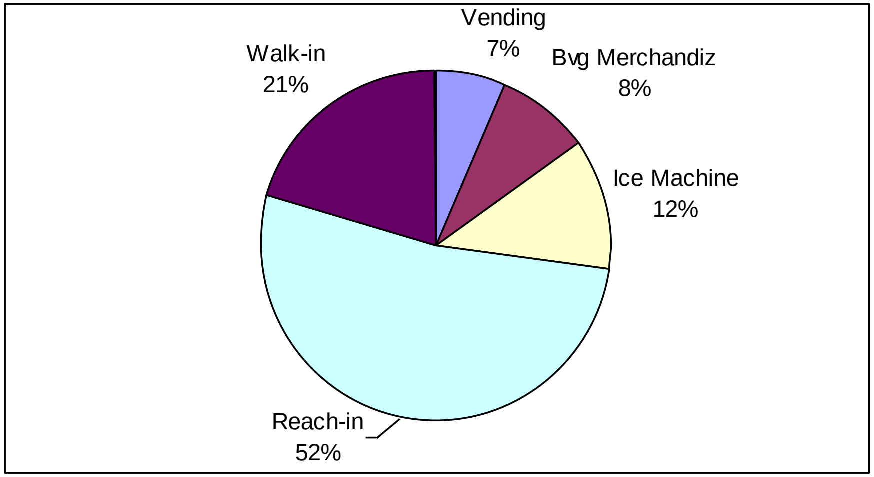


Time clocks with an on/off switch are the most common control types across all segments.

Saturation--Refrigeration



Nearly half of refrigeration equipment is found in restaurants (food service)



Over half of refrigeration equipment is reach-in (coolers and freezers)

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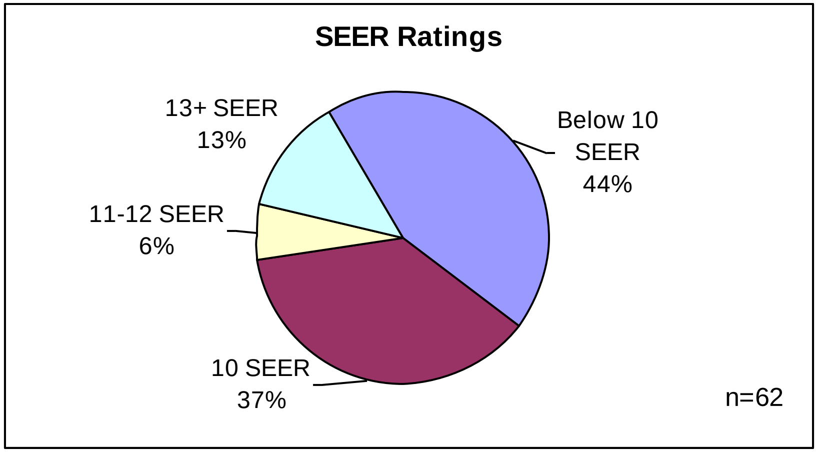
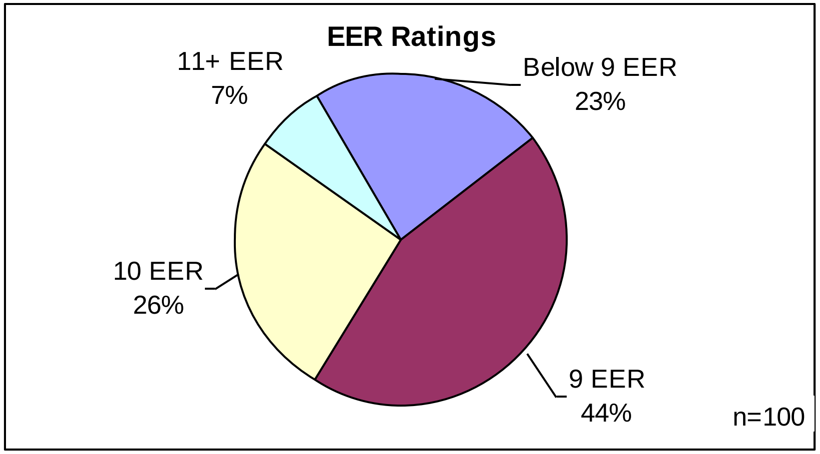
Penetration of Energy Efficient Equipment—Cooling





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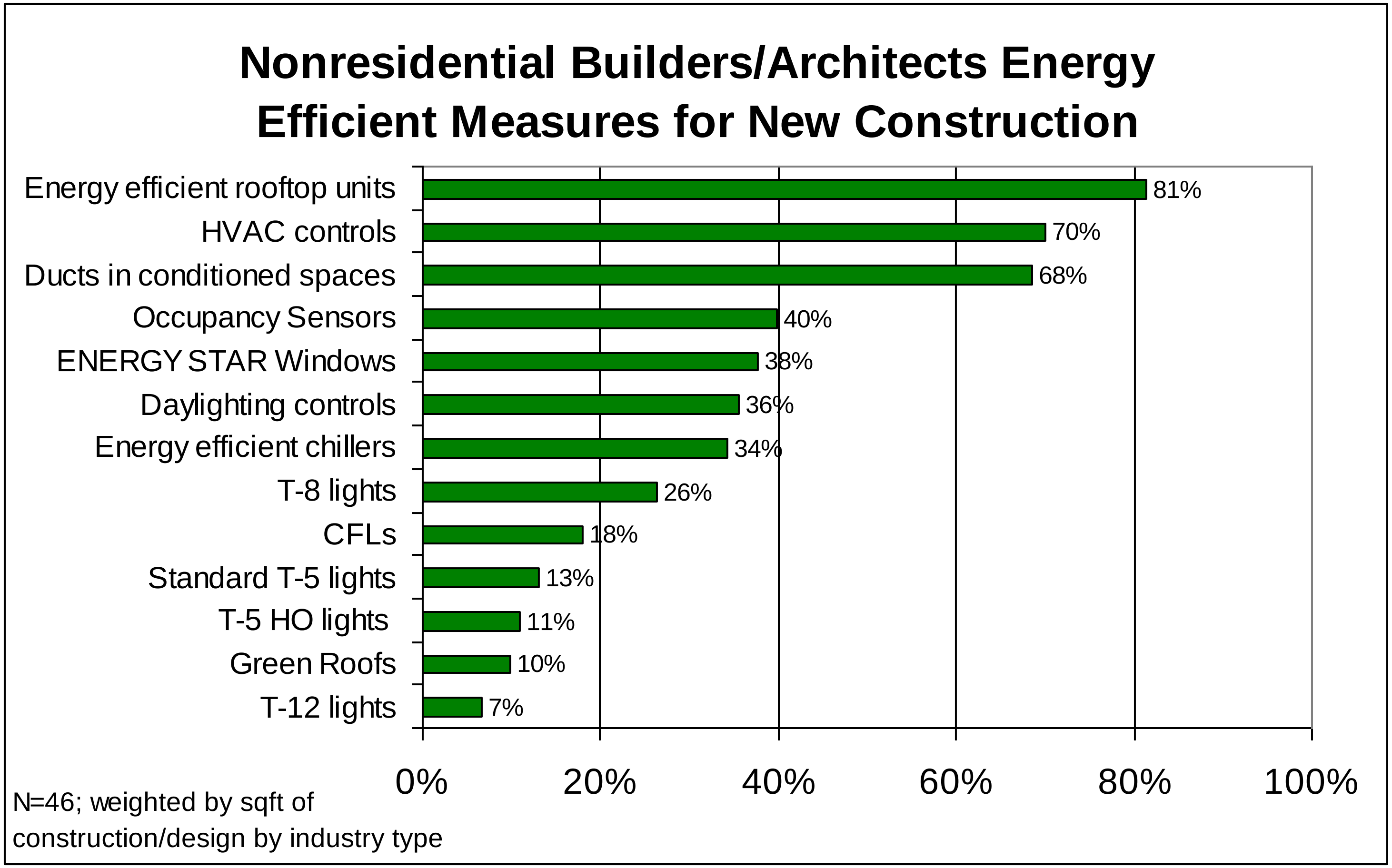
Market Share: Nonresidential New Construction & Design



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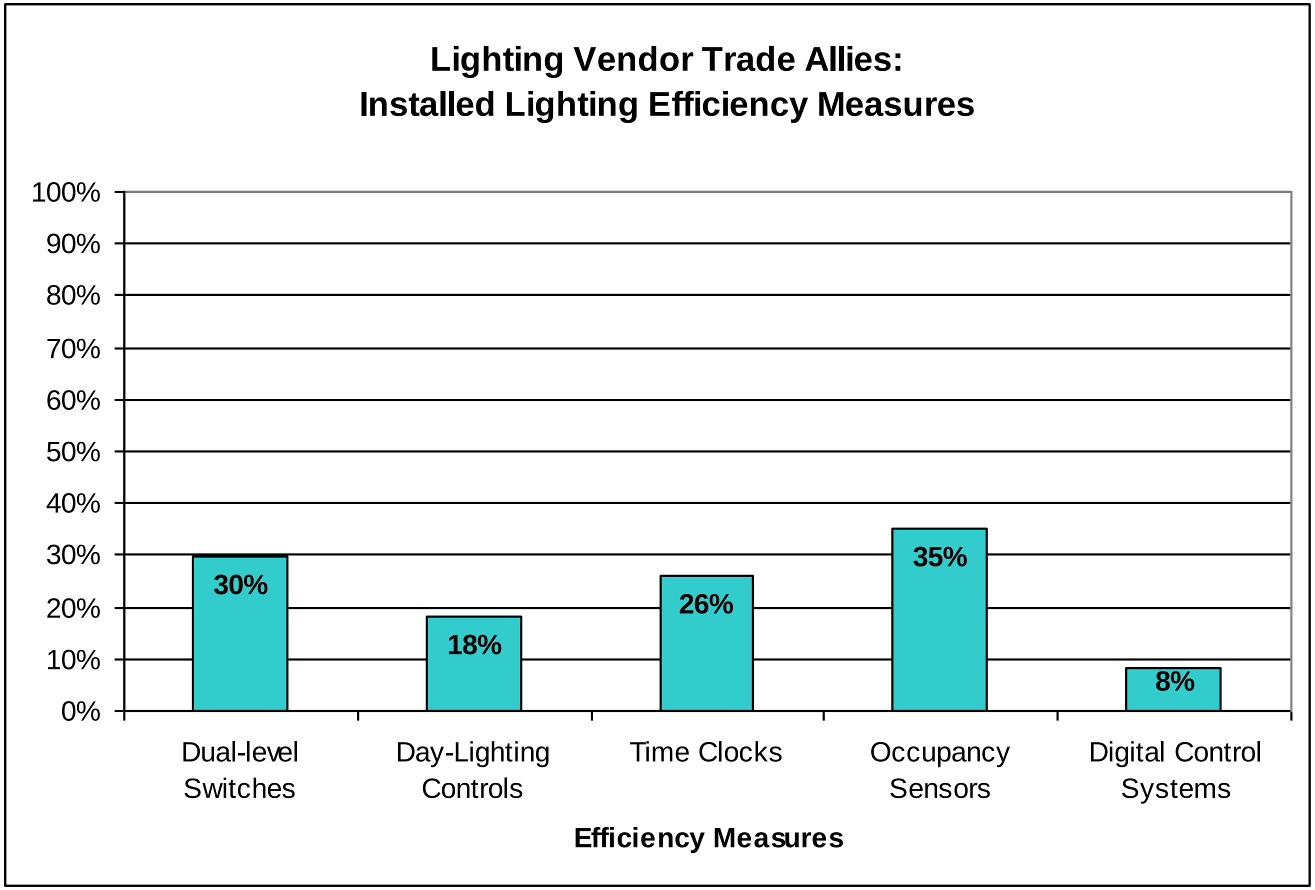
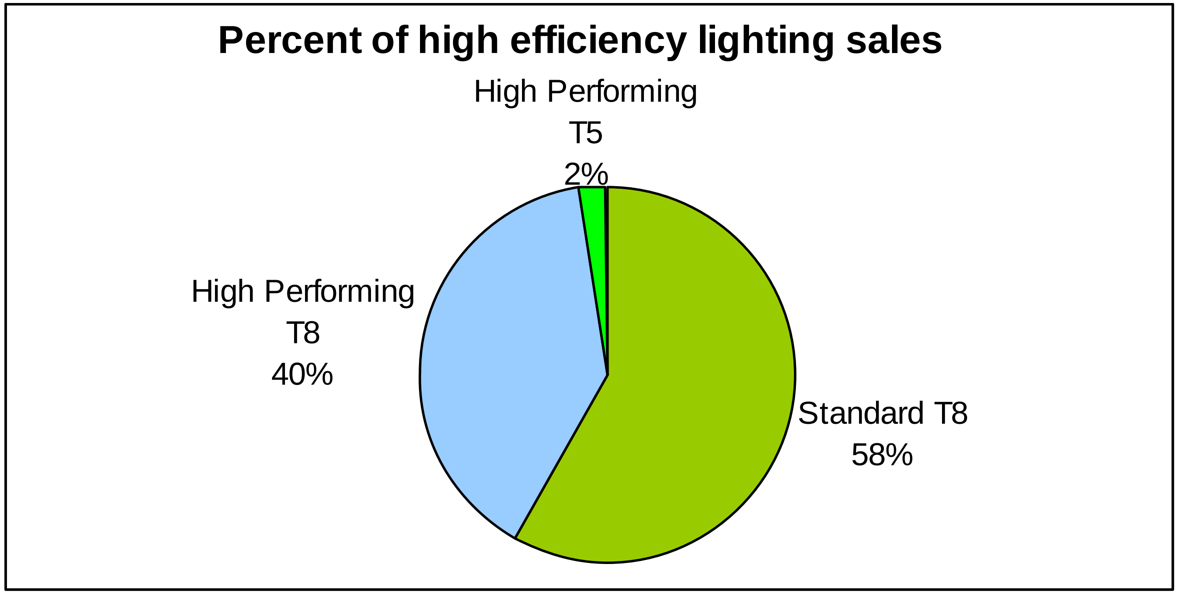
Market Share: Lighting Vendors



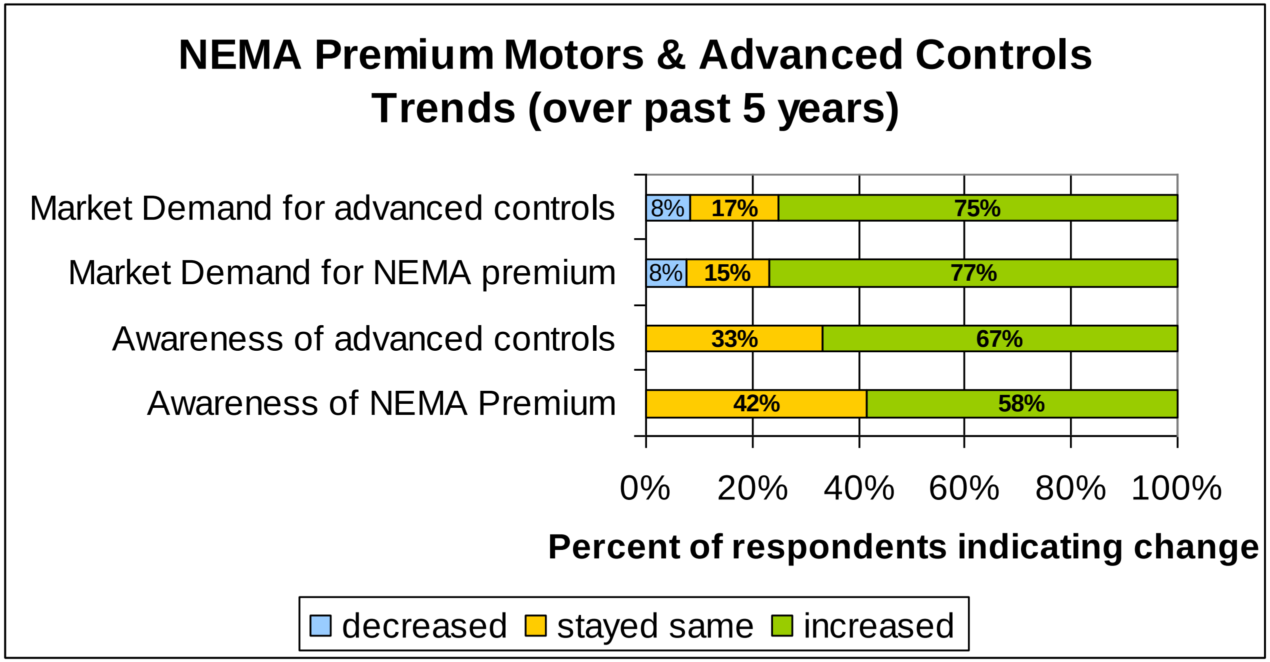
Market Share: Lighting Vendors-- Efficient Lighting



Lighting vendors were also still selling and servicing T-12s

High performance T8s were defined as 28 watts or less

Market Share: Motors



Comments Regarding ComEd's Motors Program Influence:

• ComEd's motors program incentives had a positive impact on these trends, but the program ran out of money too quickly

Additional Comments:

•NEMA premium motor sales will increase dramatically with the new law taking effect in December, 2010.

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Market Share: Motors continued

NEMA Premium motor sales	Within the past 5 years					
Application	% of sales NPEM	% Eligible to be NPEMs	% NPEM w/o ComEd	% of Sales Include Controls	% Eligible to Incorporate Controls	Replacement motor sales with controls Decrease/Increase 1-5
Motors for any use	35%	71%	54%	16%	63%	3.6
use in HVAC equipment	21%	71%		30%	64%	3.5
use in compressors	26%	76%		25%	57%	4
use in horizontal pumps	16%	70%		8%	56%	3.50

Market Share: Refrigeration

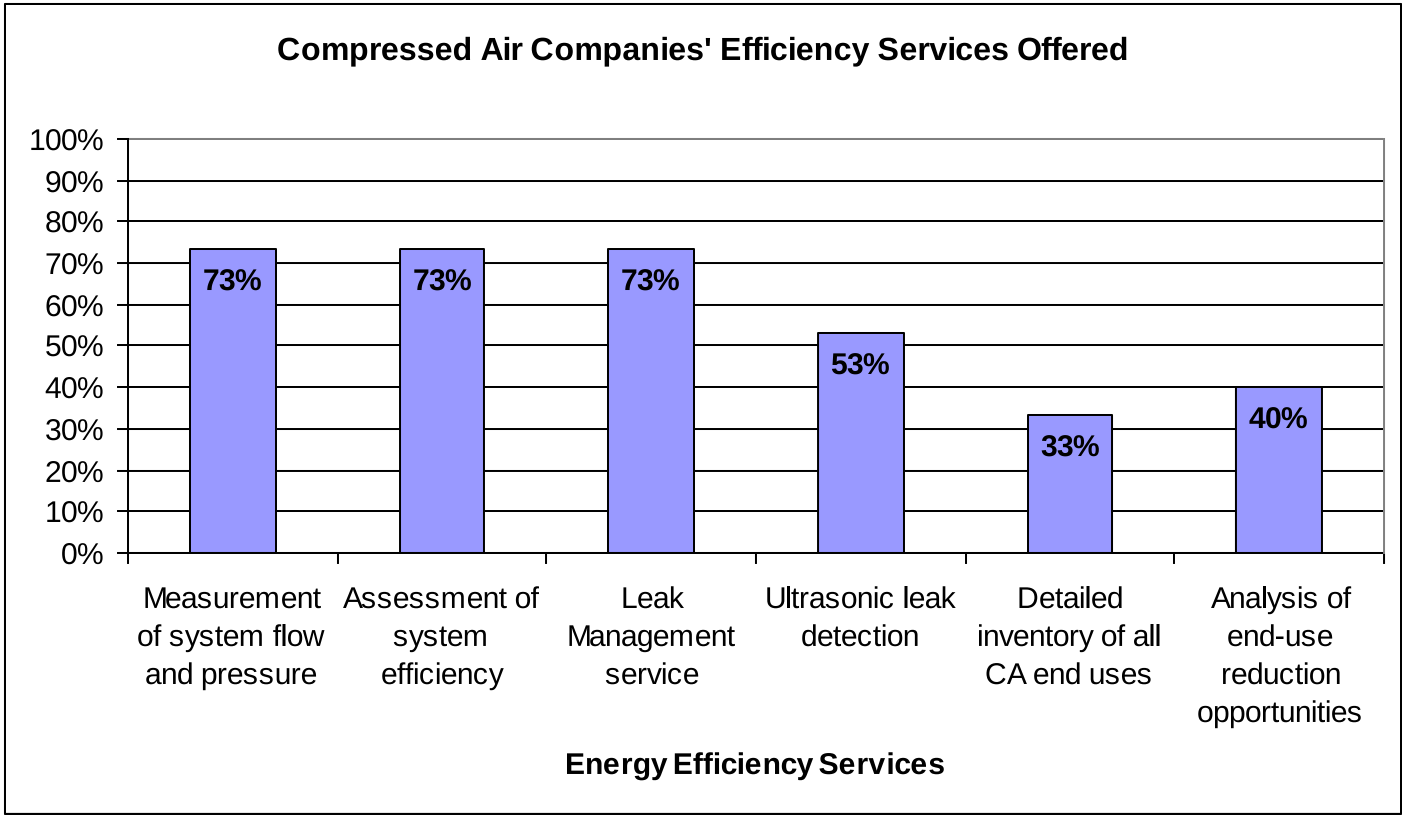
Efficiency Measure	% of Customers that Have Measures Installed
Premium efficiency motors	56%
Digital Controls	48%
Refrigeration System Optimization	47%
Advanced defrost controls	40%
High efficiency lighting for display cases or reach-ins	38%
Strip Curtains for Walk-ins	35%
Pulse Modulating Anti-Sweat controller	30%
Heat Recovery for Water Heating	30%
Load Management/Reduction	29%
FSC on Condenser Fans	27%
VSD on compressor	25%
Floating Head pressure control	25%
VSD on Evaporator Fans	22%
Sub-cooling	21%
New High Efficiency refrigerated case installation	19%
Night Covers for Display Cases	6%

- Respondents were mixed on the volume of efficiency services they have sold in the past year:
27% said they increased;
33% stayed the same;
40% decreased.

- New standards in effect for walk-in freezers/coolers effective Jan 1, 2009.

New Standards for Refrigeration: http://blog.uscooler.com/index.php/2009/eisa-walk-in-cooler-freezer-standards/

Market Share: Compressed Air



Survey question: Please tell me which of the following energy services your company offers.

Next Steps

- Complete data analysis
- Potential model
- Reporting