

# ANNUAL STAKEHOLDER MEETING

## *2013 Statewide Non-Residential End Use & Saturation (Baseline) Study*

July 10, 2014

*Presented by the Statewide Evaluation Team:*

 **Nexant**

  
GDS Associates, Inc.  
Engineers and Consultants

  
research/into/action™

  
**APEX**  
ANALYTICS, LLC

# AGENDA

- Background
- Overview of the study
- 2013 Findings
  - End use penetrations and fuel shares
  - Energy use intensities
  - Lighting
  - Heating and cooling
  - Water heating
- Changes between 2011 and 2013 findings



## BACKGROUND: THE NEED FOR A BASELINE STUDY

### Why conduct a statewide baseline study?

- Inputs into the Phase III market potential studies
- EE program development
- TRM improvement
  - State-specific values
  - Replace outdated values
- System planning
- General understanding of the energy using equipment throughout PA



## OVERVIEW: KEY POINTS TO NOTE

- Phase I data and Phase II data – not aggregated to allow changes to be shown
- EDC weights based on premise counts
- Key changes from the Phase I Baseline Study
  - Lighting presented on a connected load or fixture count basis – no longer sq ft. served
  - Addition of “Institutional” sector



# OVERVIEW: GROUPING

Sector	Segment
Institutional	Healthcare
	Public Service/Institutional
	Government
	Religious
	Other Institutional
	Education
Commercial	Office
	Restaurant
	Retail
	Grocery
	Retail
	Warehouse
	Misc.
	Lodging
	Other Commercial
Industrial	Industrial



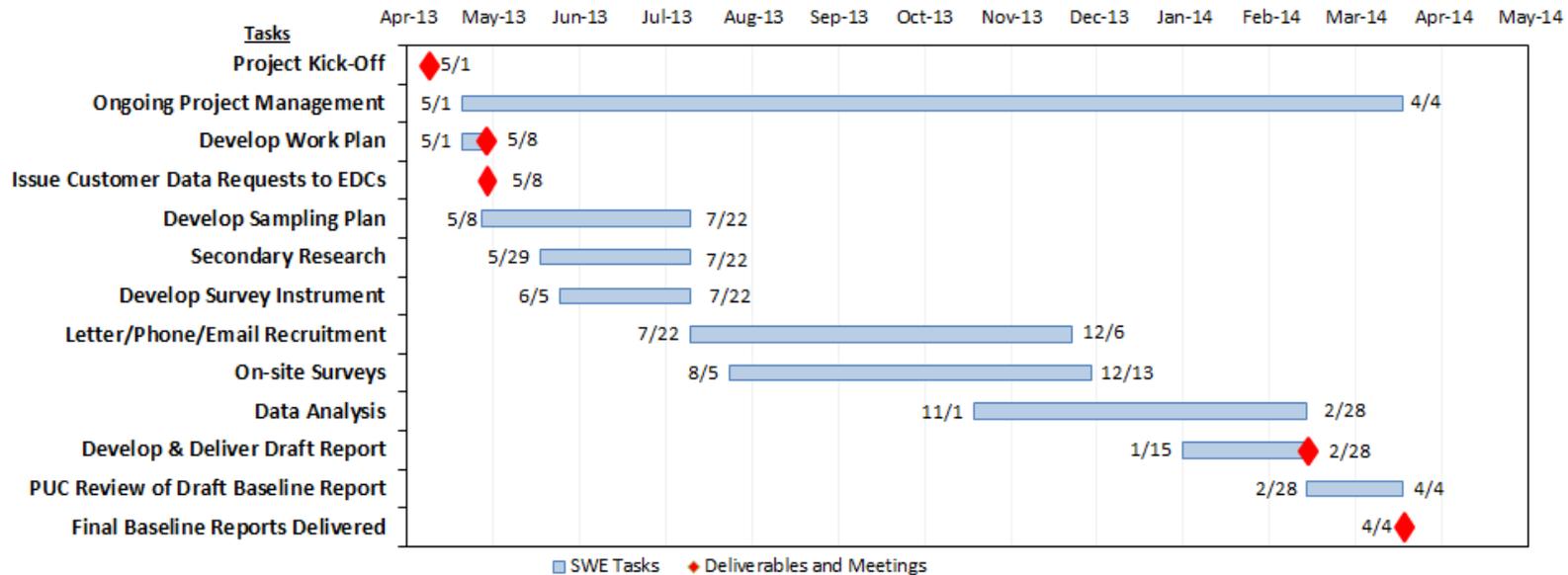
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# OVERVIEW: TIMELINE

## PA Phase II Baseline Study Schedule



# OVERVIEW: SITE VISITS

## Completed Site Visits and Sample Confidence/Precision

Segment	DLC	Met-Ed	PECO	Penelec	Penn Power	PPL	WPP	State	Confidence / Precision
Education	9	8	6	8	3	7	11	52	90/15
Healthcare	7	7	6	8	7	6	2	43	90/15
Industrial	7	9	15	9	9	11	8	68	90/10
Misc.	9	6	6	12	7	10	9	59	90/15
Office	16	9	7	6	13	10	7	68	90/10
Public Service/Inst.	6	9	7	14	9	7	15	67	90/15
Restaurant	3	5	6	3	4	3	4	28	90/20
Retail	10	15	16	10	15	10	12	88	90/10
Warehouse	3	2	2	3	1	5	2	18	90/20
<b>Total Completed</b>	<b>70</b>	<b>70</b>	<b>71</b>	<b>73</b>	<b>68</b>	<b>69</b>	<b>70</b>	<b>491</b>	<b>95/5</b>
Confidence/ Precision	90/10	90/10	90/10	90/10	90/10	90/10	90/10	95/5	



# OVERVIEW: EDC WEIGHTS

## EDC Weighting Factors

EDC	Non-Residential	Commercial	Industrial	Institutional
Duquesne	8.8%	9.4%	3.2%	10.0%
Met-Ed	9.1%	8.7%	11.1%	9.9%
PECO	31.5%	30.0%	30.4%	41.0%
Penelec	12.0%	11.8%	14.0%	11.5%
Penn Power	3.2%	3.0%	3.7%	3.5%
PPL	21.9%	23.4%	23.2%	11.8%
WPP	13.6%	13.8%	14.5%	12.1%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



# 2013 FINDINGS: END USE PENETRATIONS AND FUEL SHARES

## Non-Residential End Use Penetrations and Fuel Shares

End Use	Penetration	Fuel Share				n-values <sup>(4)</sup>
		Electric	Natural Gas	Fuel Oil	Other <sup>(2)</sup>	
Lighting	100.0%	100.0%	0.0%	0.0%	0.0%	-
Space Heating <sup>(3)</sup>	100.0%	6.8%	84.4%	4.3%	4.5%	449
Space Cooling	84.3%	100.0%	0.0%	0.0%	0.0%	-
Plug Load	100.0%	100.0%	0.0%	0.0%	0.0%	-
Refrigeration	35.0%	100.0%	0.0%	0.0%	0.0%	-
Cooking	27.9%	53.3%	42.5%	0.0%	4.2%	659
Water Heating <sup>(3)</sup>	92.7%	37.8%	56.3%	1.9%	3.8%	540
Other <sup>(1)</sup>	100.0%	100.0%	0.0%	0.0%	0.0%	-

<sup>(1)</sup> "Other" End Use includes pumps, motors, and misc. equipment

<sup>(2)</sup> "Other" fuel share includes LPG, purchase HW or steam, wood, and misc. fuels

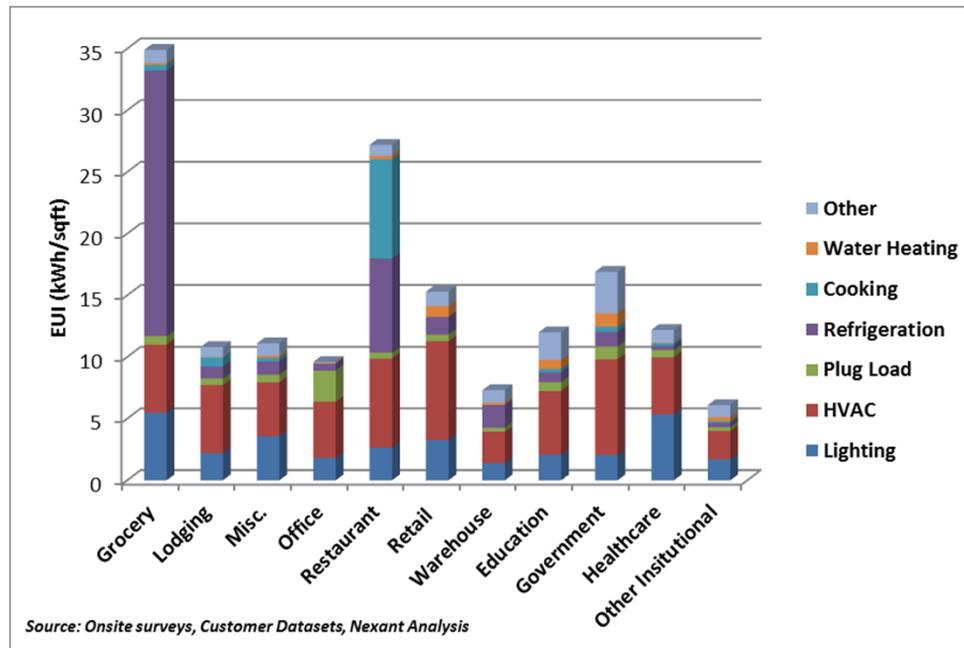
<sup>(3)</sup> Fuel shares for space heating and water heating are based on square footage served and tank capacity, respectively. All others are per premise

<sup>(4)</sup> n-values for fuel share only



# 2013 FINDINGS: ENERGY USE INTENSITIES

Energy Use Intensity (kWh/ft<sup>2</sup>) by End Use by Segment



# 2013 FINDINGS: LIGHTING

Lighting System Technology Load Share by Sector/Segment (% of Connected Load)

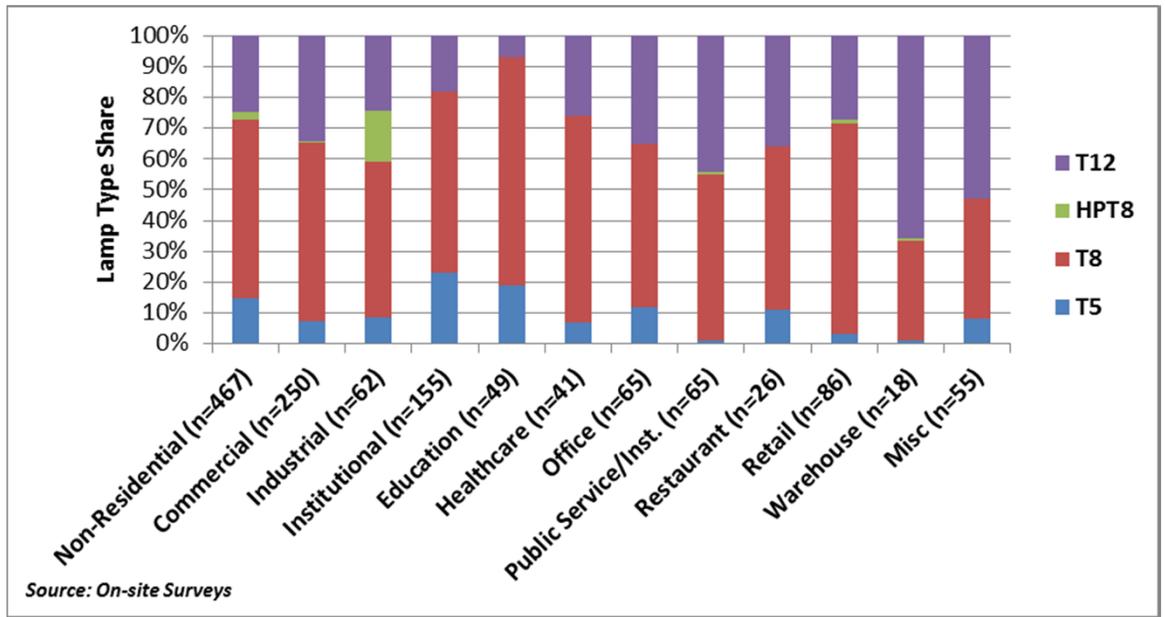
Type	Non-Residential	Commercial	Industrial	Institutional	Education	Healthcare	Office	Public Service / Institutional	Restaurant	Retail	Warehouse	Misc.
Linear Fluorescent	78%	75%	61%	89%	94%	87%	88%	77%	48%	85%	83%	54%
CFL	3%	5%	0%	3%	1%	8%	2%	4%	3%	1%	0%	16%
Incandescent	6%	13%	1%	5%	1%	4%	6%	12%	44%	6%	2%	21%
Metal Halide	10%	7%	29%	2%	3%	0%	4%	5%	1%	8%	13%	9%
High Pressure Sodium	2%	0%	7%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Mercury Vapor	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LED	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	0%
Neon	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%
Other	1%	0%	2%	0%	1%	0%	0%	0%	1%	0%	0%	0%
n-value	491	261	68	162	52	43	68	67	28	88	18	59

Source: On-site Surveys



# 2013 FINDINGS: LIGHTING

## Linear Florescent Lamp Types by Sector and Segment



# 2013 FINDINGS: LIGHTING

## T12 Stockpiling: Percentages of Replacement T12 Lamps Currently in Storage

EDC	Sites with T12 Fixtures	Total Count of T12 Lamps	Total Count of Replacement Lamps in Storage	Percent of Lamps
Duquesne	36	3,099	210	6.8%
Met-Ed	49	9,283	1,393	15.0%
PECO	51	4,934	356	7.2%
Penelec	40	5,628	199	3.5%
Penn Power	37	4,781	334	7.0%
PPL	40	7,187	389	5.4%
West Penn Power	44	4,520	458	10.1%
<b>Statewide Total</b>	<b>297</b>	<b>39,432</b>	<b>3,339</b>	<b>7.4%<sup>(1)</sup></b>

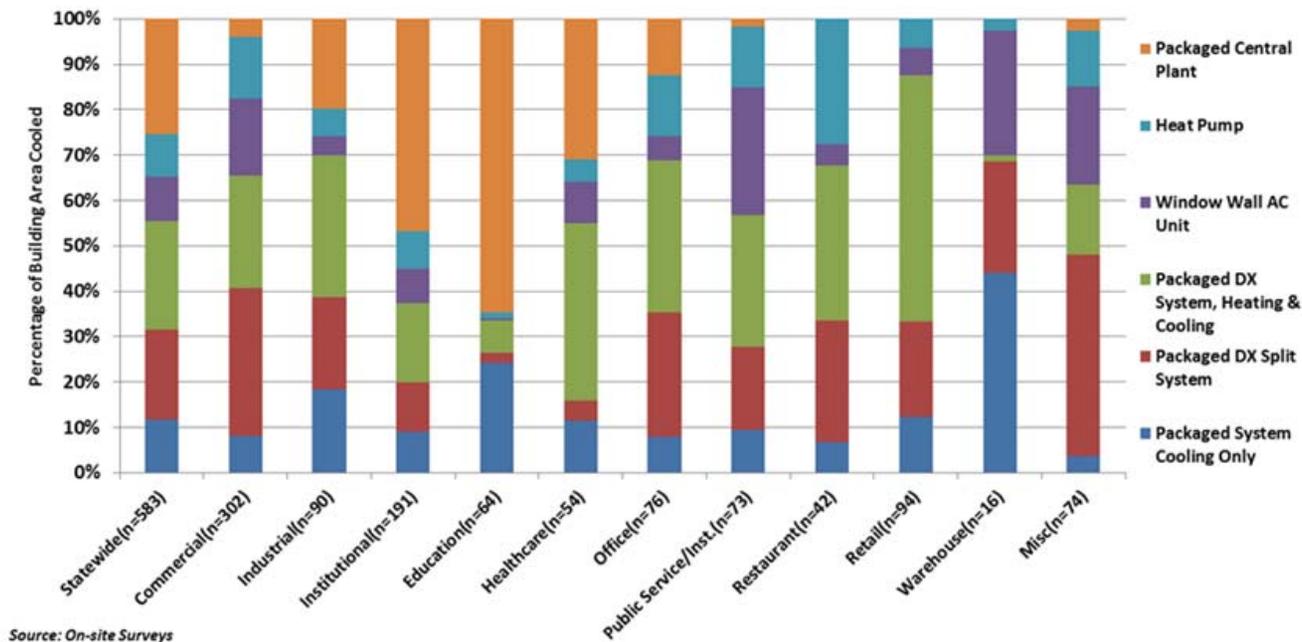
Source: on-site surveys

<sup>(1)</sup> Statewide total percentage is weighted by EDC and is not a straight average of the percentages for each EDC



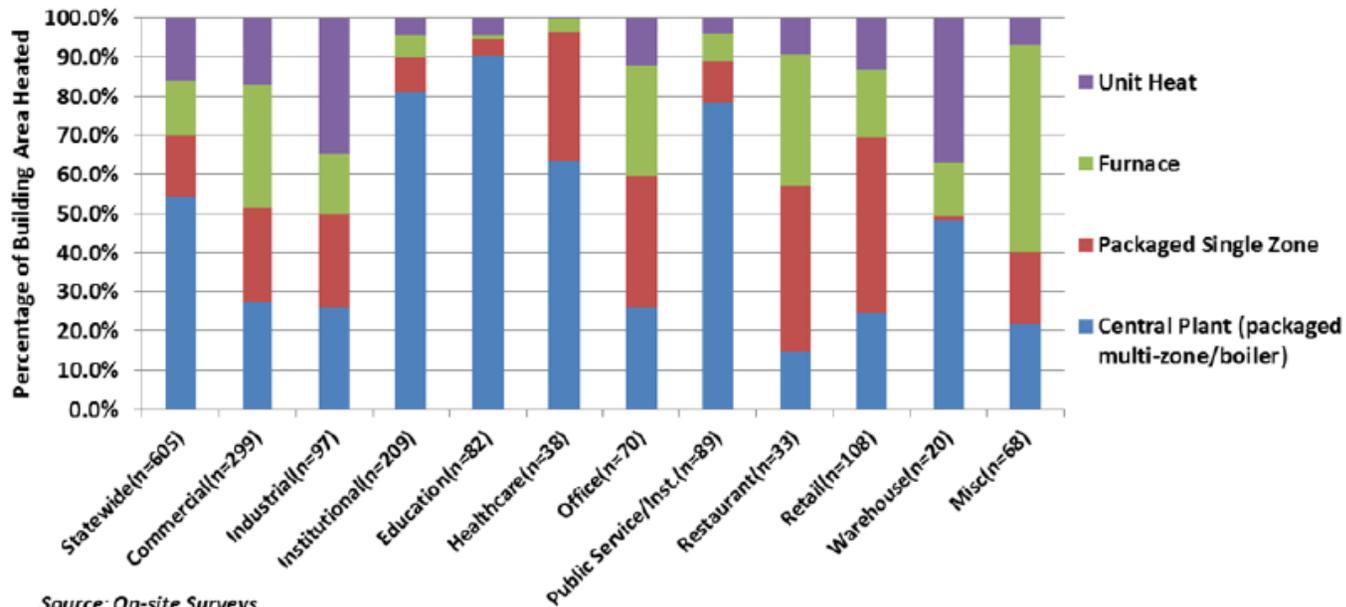
# 2013 FINDINGS: HEATING AND COOLING

## Percentage of Building Area Cooled by Equipment Type



# 2013 FINDINGS: HEATING AND COOLING

Percentage of Building Area Heated by Equipment Type

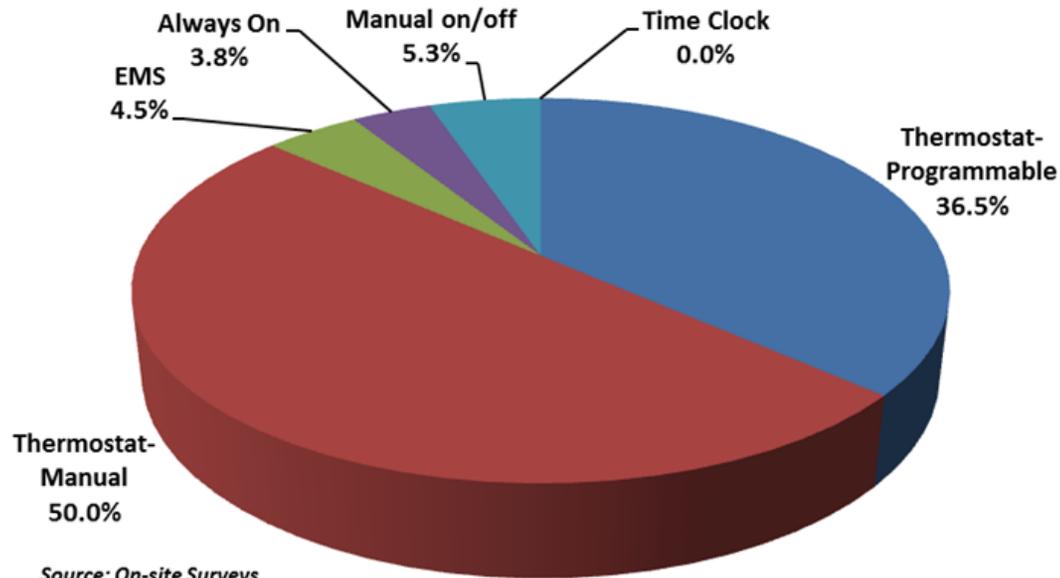


Source: On-site Surveys



# 2013 FINDINGS: HEATING AND COOLING

Percentage of Conditioned Building Area by Control Type

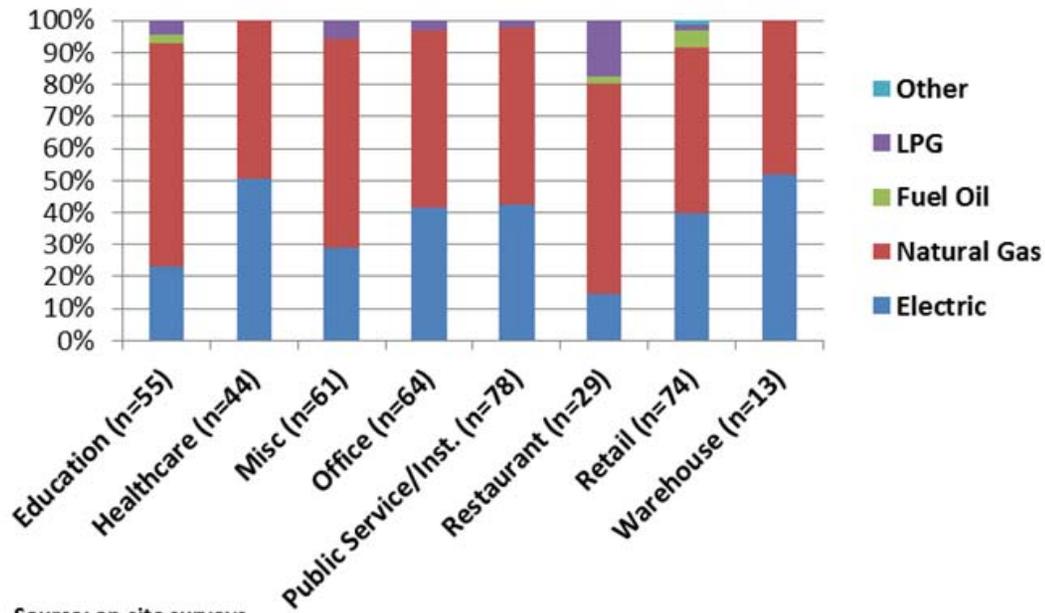


Source: On-site Surveys  
n= 645



# 2013 FINDINGS: WATER HEATING

Water Heating Fuel Share by Segment, by Storage Capacity

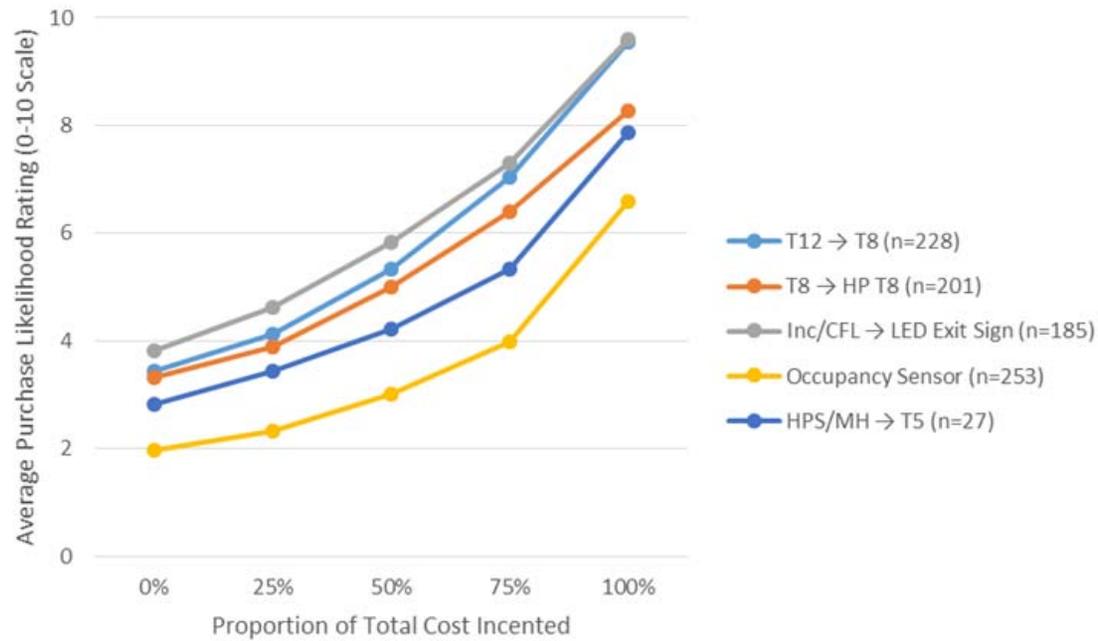


Source: on-site surveys



# 2013 FINDINGS: WILLINGNESS TO PAY

## Average Purchase Likelihood by Incentive Level

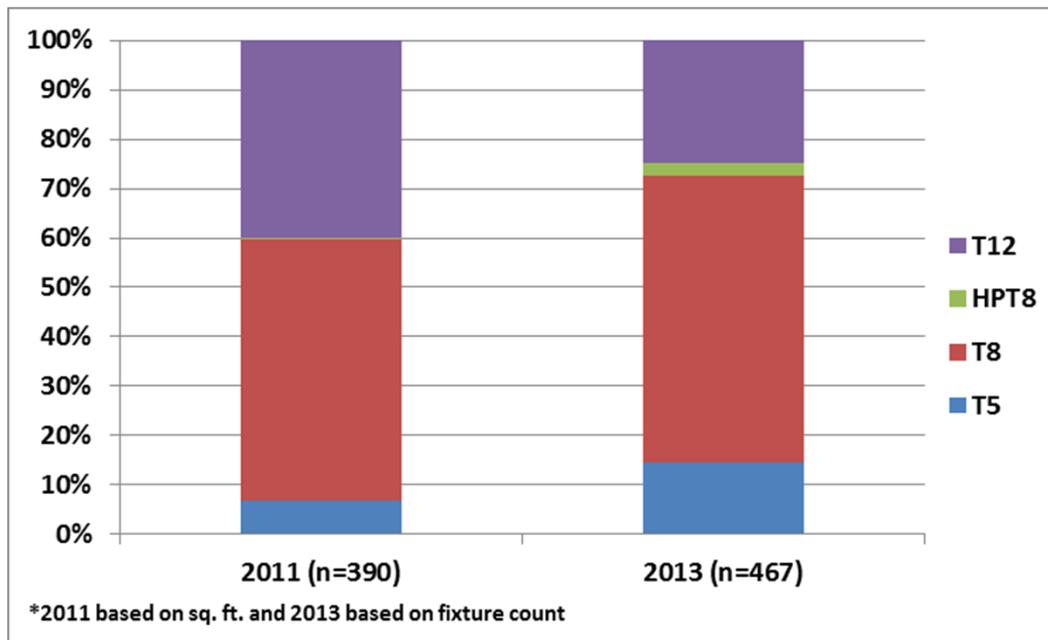


Source: on-site surveys



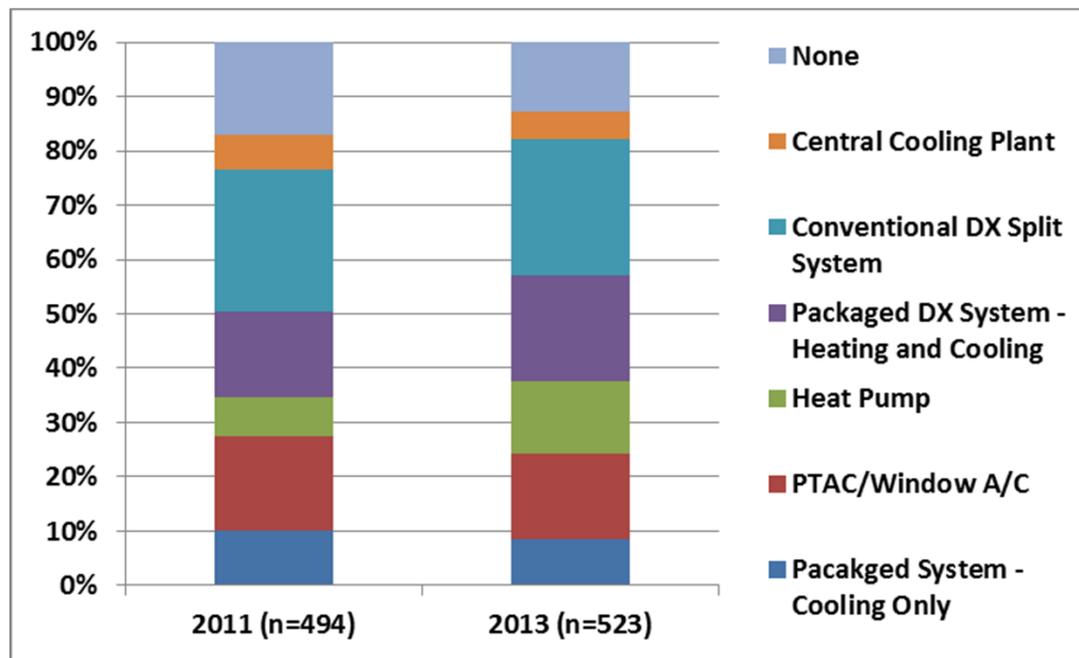
# CHANGES BETWEEN 2011 AND 2013 FINDINGS: LIGHTING

## Comparison of Linear Fluorescent Lighting Type Saturations



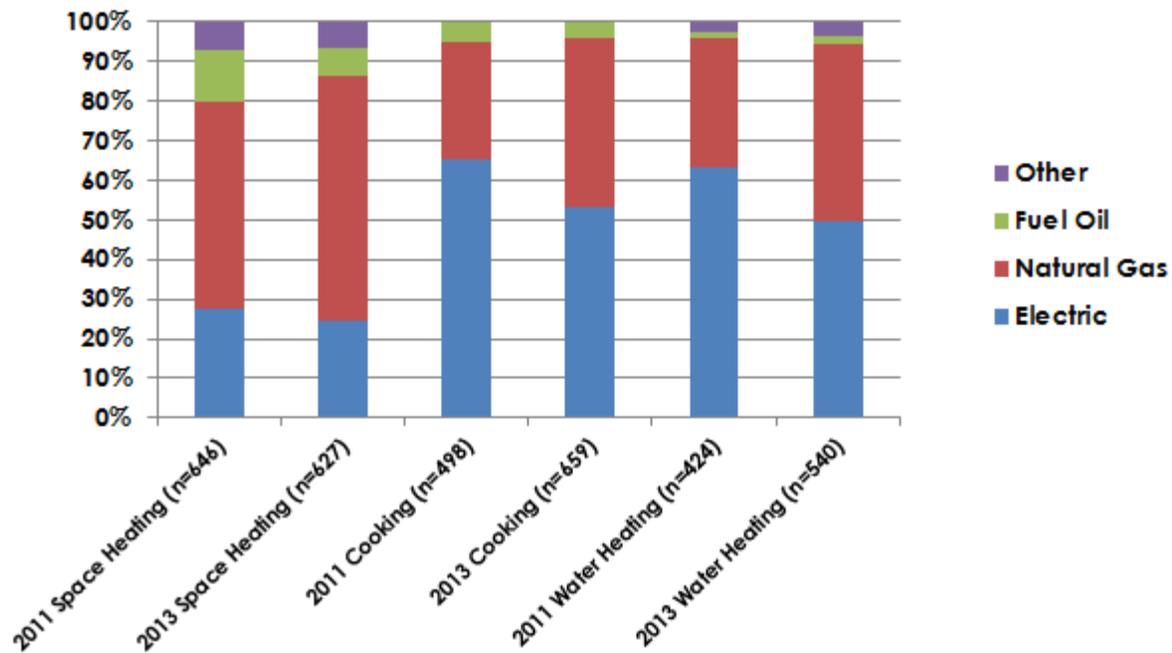
# CHANGES BETWEEN 2011 AND 2013 FINDINGS: COOLING

Comparison of Cooling Equipment Saturations



# CHANGES BETWEEN 2011 AND 2013 FINDINGS: FUEL SHARES

Comparison of Fuel Shares for End Uses that are Not Exclusively Electric, by Equipment Count



# QUESTIONS?

