

ANNUAL STAKEHOLDER MEETING

2013 Statewide Residential Baseline Study

July 10, 2014

Presented by the Statewide Evaluation Team:

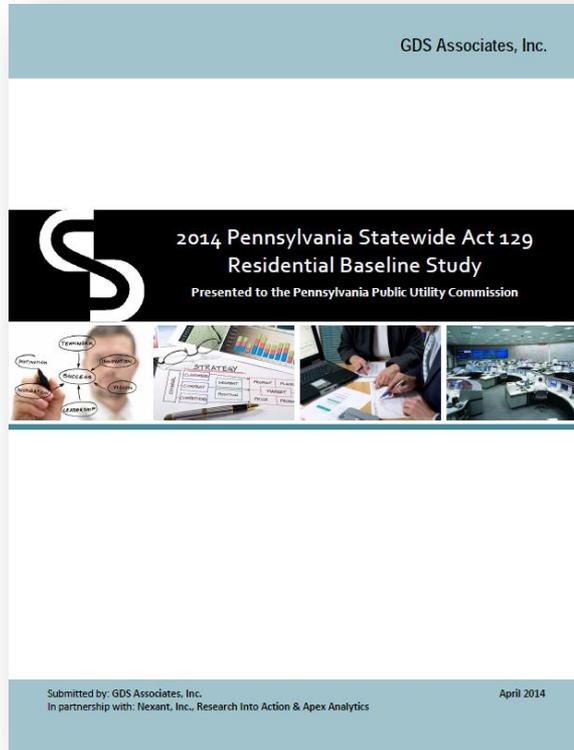
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APEX
ANALYTICS, LLC

RESIDENTIAL SECTOR BASELINE STUDY: AGENDA



- Background
- Recruitment Overview
- Final Sample Counts & Weighting
- Summary of Results
- Select Comparison of Results



Residential Sector Baseline Study Update

BACKGROUND



RESIDENTIAL BASELINE STUDY: BACKGROUND

- Similar design and scope as 2011 Residential Baseline Study
- On-site assessments allow for detailed data collection to determine energy efficient characteristics
- Results can be utilized for:
 - Inputs into the Phase III Market Potential Study
 - TRM Improvement
 - EDC Plan inputs



Residential Sector Baseline Study Update

RECRUITMENT OVERVIEW



RECRUITMENT OVERVIEW

- Recruited 70 participants from a recruitment sample of 2,100 homes, per EDC
- Stratified by Housing Type & annual kWh consumption
 - Additional quotas during recruitment (ex. Own vs. rent)
- Recruitment calls made 6 days a week (mixture of day and evening calls)
- On-Site surveys conducted M-F between 8AM & 6PM
 - 3 site visits per day
 - Limited Saturday appointments available as well



RECRUITMENT DISPOSITION LOGS

Disposition	PECO	PPL	MET-ED	PENELEC	WPP	PP	DLC
SCHEDULED	83	78	85	73	75	76	78
REFUSED	104	193	229	112	170	157	80
HUNG UP	22	35	51	26	30	19	17
NO ANSWER; NO VOICEMAIL	204	243	390	302	314	229	245
LEFT MESSAGE	307	382	380	225	196	270	137
BUSY	12	25	17	12	9	12	3
REQUEST CALL BACK	48	38	36	32	23	26	10
OTHER	17	16	19	9	10	13	6
NOT APPLICABLE	318	187	315	282	278	276	193
NOT CALLED; QUOTA FULL	985	903	578	1027	995	1022	1331
TOTAL	2,100						

Success Rate	10.4%	7.7%	7.0%	9.2%	9.1%	9.5%	13.5%
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Excludes N/A (i.e. no phone number) and sample not called



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FINAL SAMPLE COUNTS AND WEIGHTS



EDC LEVEL WEIGHTING

EDC Population	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	63.4%	62.0%	70.9%	71.9%	70.2%	38.3%	70.4%
SF-Attached	9.5%	17.9%	3.8%	4.6%	5.7%	34.7%	15.3%
Multi-Family	25.7%	15.9%	15.9%	16.2%	16.7%	26.1%	9.2%
Manufactured	1.3%	4.2%	9.5%	7.3%	7.4%	1.0%	5.1%
EDC Sample	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	62.9%	64.3%	65.7%	68.6%	64.3%	35.7%	61.4%
SF-Attached	10.0%	17.1%	5.7%	11.4%	11.4%	31.4%	21.4%
Multi-Family	25.7%	14.3%	17.1%	11.4%	18.6%	31.4%	11.4%
Manufactured	1.4%	4.3%	11.4%	8.6%	5.7%	1.4%	5.7%
EDC Weights	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	1.01	0.96	1.08	1.05	1.09	1.07	1.15
SF-Attached	0.95	1.04	0.66	0.40	0.50	1.10	0.71
Multi-Family	1.00	1.11	0.93	1.42	0.90	0.83	0.81
Manufactured	0.93	0.99	0.83	0.85	1.29	0.72	0.89



STATEWIDE LEVEL WEIGHTING

Statewide Population	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	6.7%	6.1%	7.2%	2.0%	8.8%	11.2%	17.5%
SF-Attached	1.0%	1.8%	0.4%	0.1%	0.7%	10.1%	3.8%
Multi-Family	2.7%	1.6%	1.6%	0.5%	2.1%	7.6%	2.3%
Manufactured	0.1%	0.4%	1.0%	0.2%	0.9%	0.3%	1.3%
Statewide Sample	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	9.0%	9.2%	9.4%	9.8%	9.2%	5.1%	8.8%
SF-Attached	1.4%	2.4%	0.8%	1.6%	1.6%	4.5%	3.1%
Multi-Family	3.7%	2.0%	2.4%	1.6%	2.7%	4.5%	1.6%
Manufactured	0.2%	0.6%	1.6%	1.2%	0.8%	0.2%	0.8%
Statwide Weights	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
SF-Detached	0.75	0.67	0.77	0.21	0.96	2.19	1.99
SF-Attached	0.62	0.72	0.37	0.08	0.43	2.25	1.24
Multi-Family	0.79	0.77	0.72	0.28	0.79	1.69	1.40
Manufactured	0.69	0.68	0.59	0.17	1.13	1.48	1.55



OTHER CHARACTERISTICS CONSIDERED

Target:	EDC	Own	Rent	< 65	> 65	LI	NLI
	PECO	47	23	54	16	16	54
	PPL	60	10	46	24	16	54
	FE (Met-Ed)	52	18	53	17	14	56
	FE (Penelec)	51	19	51	19	20	50
	FE (WPP)	51	19	51	19	18	52
	FE (Penn Power)	52	18	50	20	19	51
	Duquesne Light	47	23	52	18	18	52
	Total	360	130	357	133	121	369

Based on 2011 American Community Survey . Low Income status assigned for household income \$25,000 or less

Actual:	EDC	Own	Rent	< 65	> 65	LI	NLI
	PECO	47	23	49	21	14	56
	PPL	61	9	47	23	6	64
	FE (Met-Ed)	56	14	54	16	14	56
	FE (Penelec)	51	19	49	21	21	49
	FE (WPP)	51	19	52	18	9	61
	FE (Penn Power)	57	13	50	20	18	52
	Duquesne Light	46	24	49	21	9	61
	Total	369	121	350	140	91	339



OVERALL SAMPLE & RESULTS REPORTING

- 490 on-site surveys statewide ; 70 per EDC
- Statewide level results carry precision +/- 5%, with 95% confidence
- 90/10 at the EDC level
- Data for select variables may fall below 90/10 at the EDC level and 95/5 at the statewide level when observations are more limited (i.e. system type of electric water heaters ; saturation of ENERGY STAR freezers)
- The number of observations are included in all results



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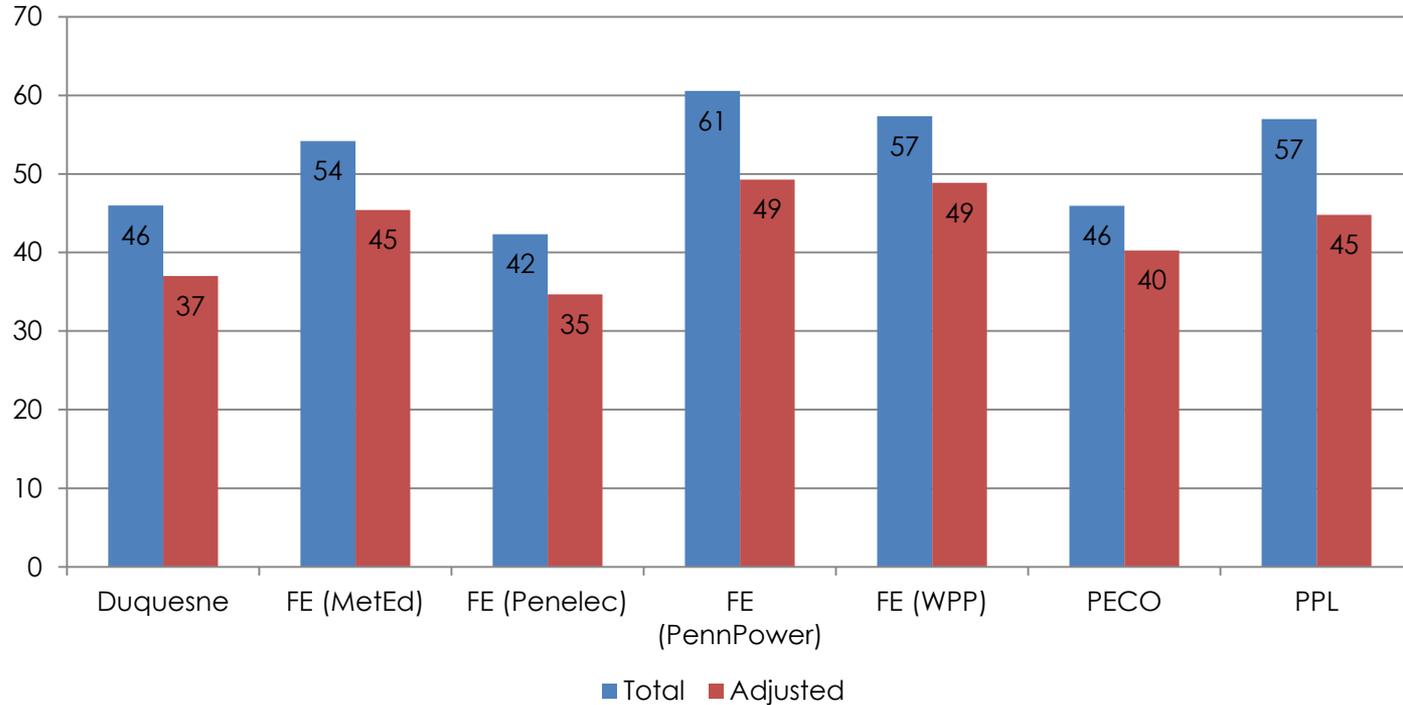


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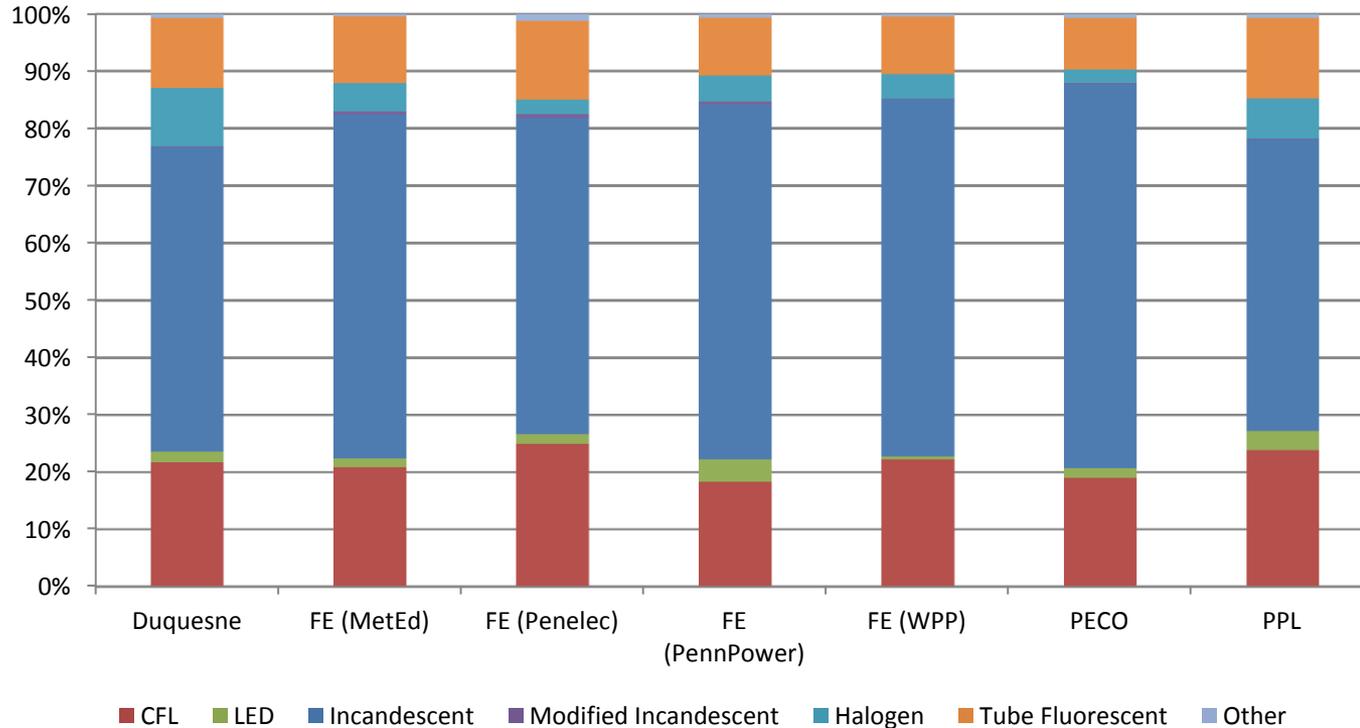
SUMMARY OF RESULTS



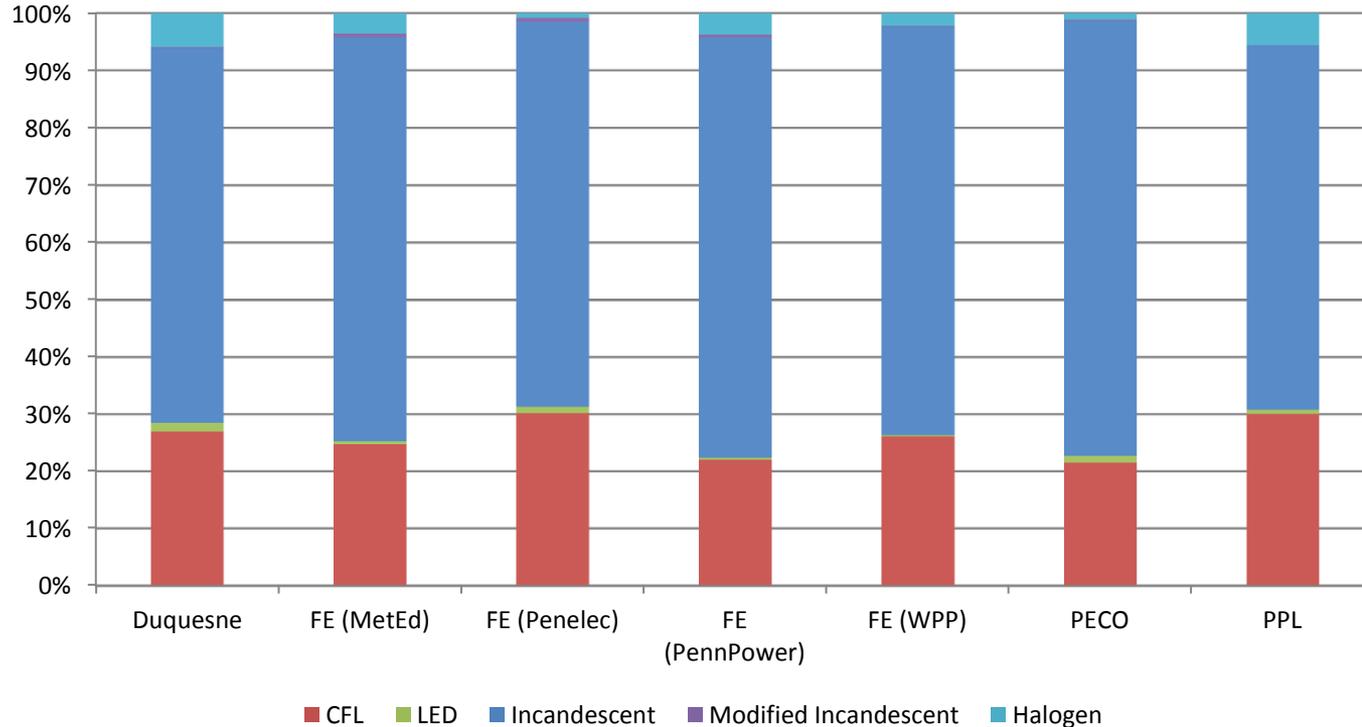
LIGHTING: # OF SOCKETS PER HOME (EDC)



LIGHTING: SATURATION OF ALL SOCKETS (EDC)



LIGHTING: SATURATION OF ADJ. SOCKETS (EDC)

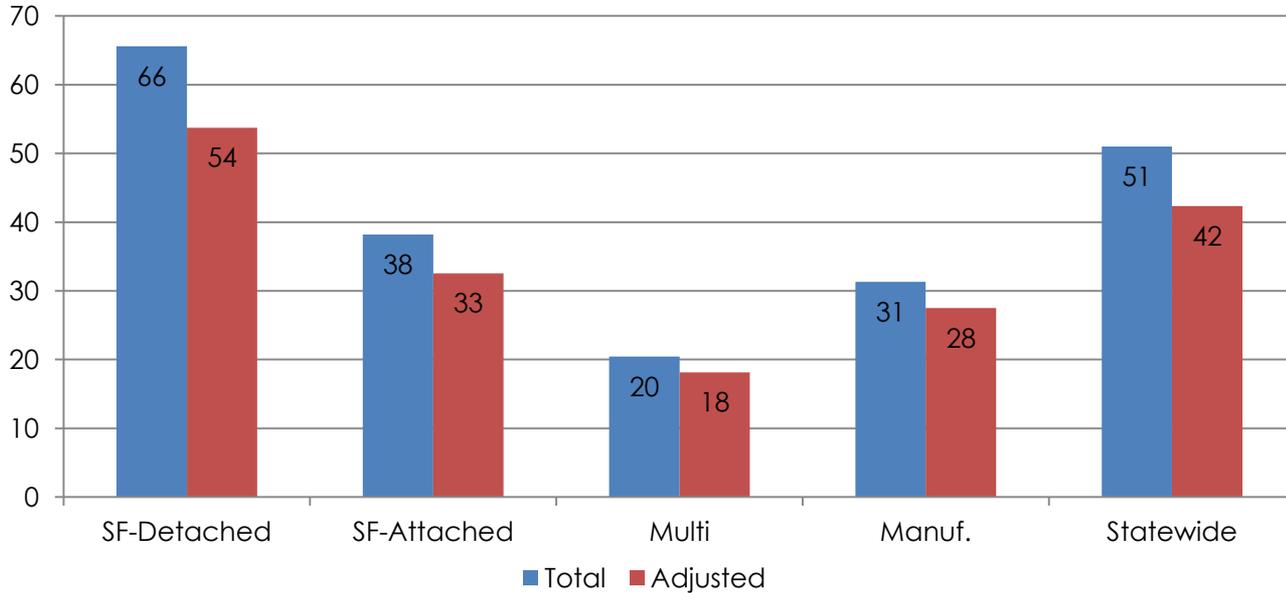


LIGHTING: SOCKETS BY ROOM TYPE (EDC)

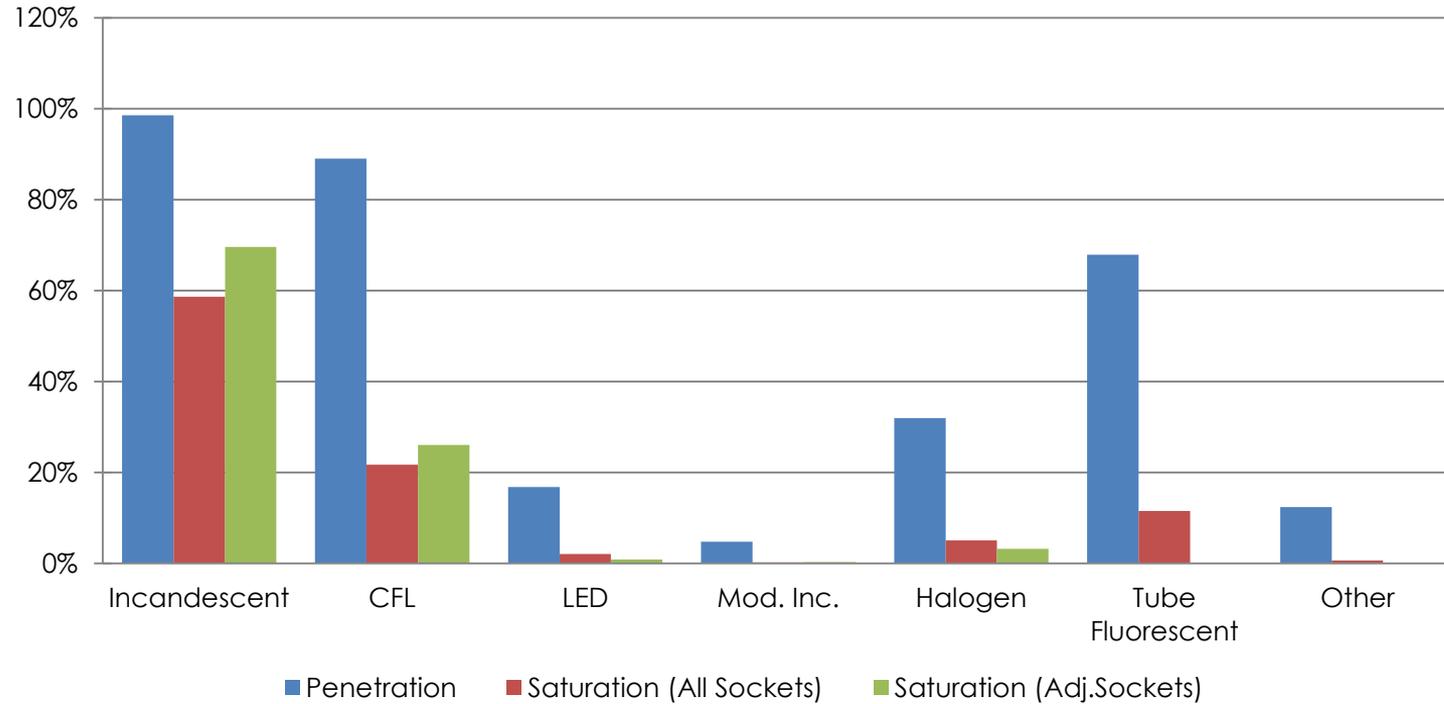
Room Type	DLC	MET-ED	PENELEC	PP	WPP	PECO	PPL
Bathroom	16%	14%	14%	14%	15%	16%	15%
Bedroom	17%	18%	19%	16%	16%	18%	15%
Closet	3%	4%	2%	3%	3%	3%	4%
Dining Room	8%	8%	5%	9%	7%	8%	7%
Foyer/Hallway	8%	8%	8%	9%	10%	11%	9%
Garage	5%	5%	5%	5%	6%	3%	4%
Kitchen	11%	10%	12%	10%	11%	13%	13%
Living Room	11%	11%	16%	12%	11%	11%	10%
Media/Bonus Room	1%	4%	2%	5%	5%	1%	1%
Office/Den	4%	5%	4%	3%	2%	5%	5%
Other	1%	2%	1%	2%	1%	2%	3%
Unfinished Basement/Attic	12%	9%	11%	7%	11%	8%	11%
Utility Room	3%	3%	2%	3%	2%	2%	2%



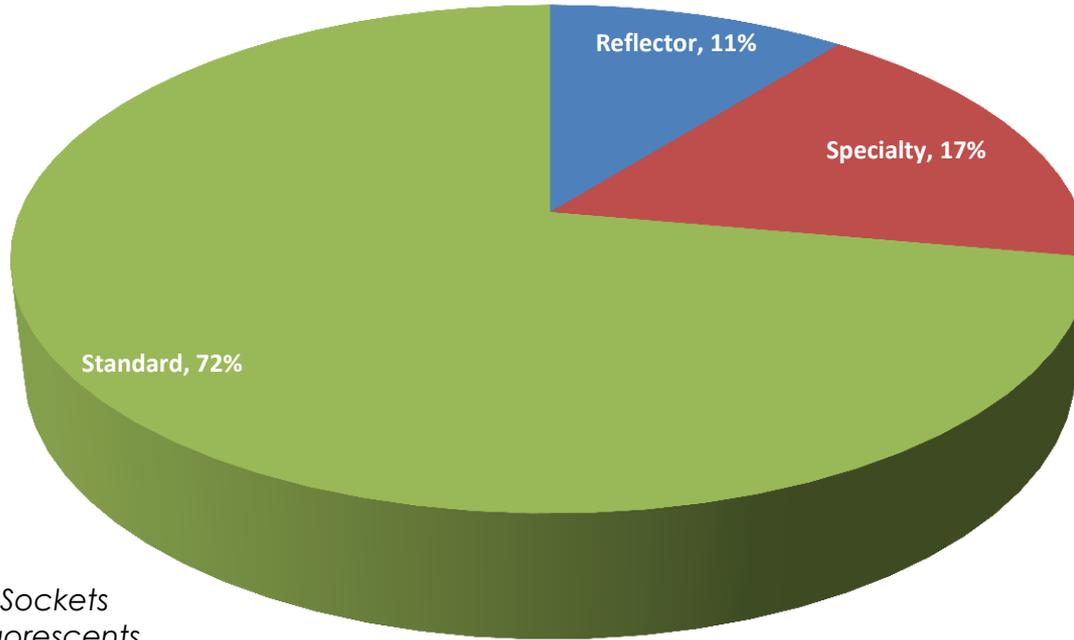
LIGHTING: # OF SOCKETS PER HOME (SW)



LIGHTING: PENETRATION/SATURATION (SW)



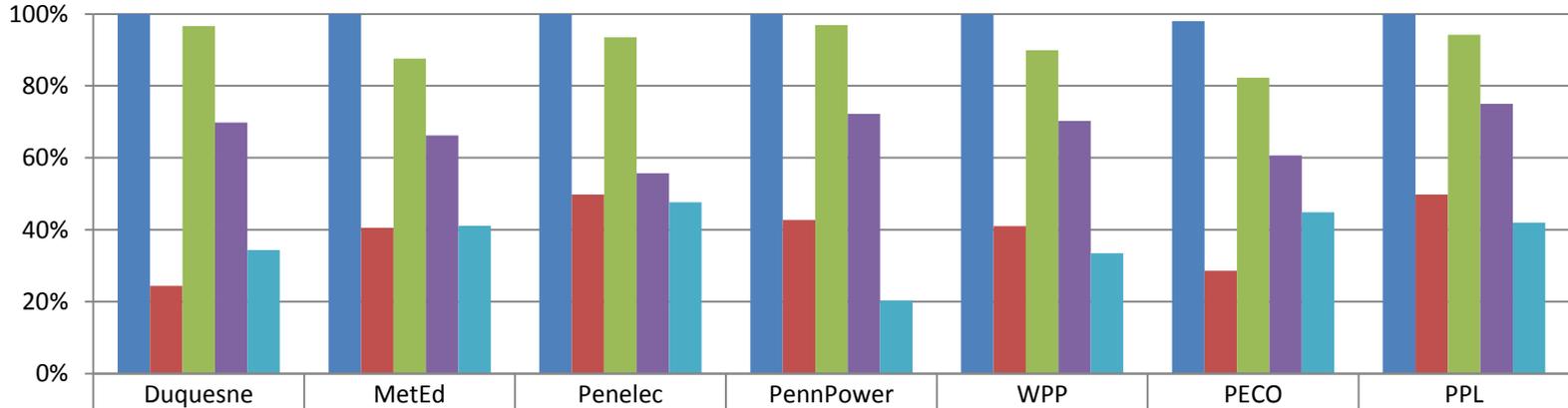
LIGHTING: SPECIALTY VS. STANDARD (SW)



Note: Adjusted Interior Sockets Only. Excludes tube fluorescents, other pin-based lighting, and nightlights, etc.



PENETRATION OF APPLIANCES (EDC)

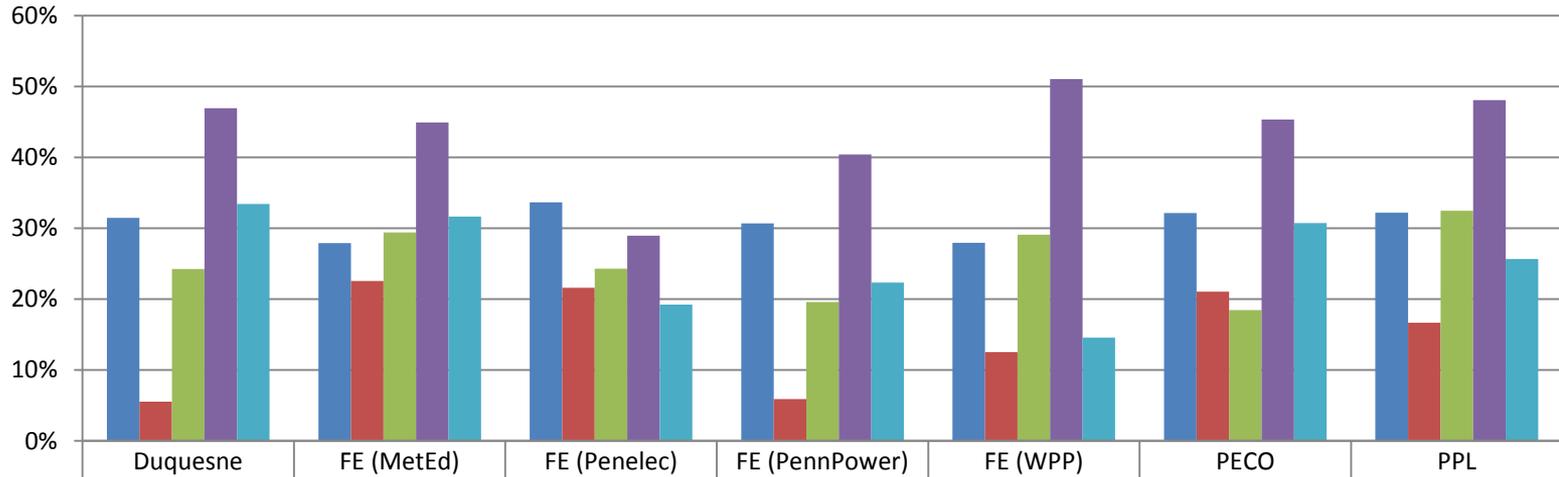


	Duquesne	MetEd	Penelec	PennPower	WPP	PECO	PPL
Refrigerator	100%	100%	100%	100%	100%	98%	100%
Freezer	24%	41%	50%	43%	41%	29%	50%
Clothes Washer	97%	88%	94%	97%	90%	82%	94%
Dishwasher	70%	66%	56%	72%	70%	61%	75%
Room AC	34%	41%	48%	20%	34%	45%	42%

■ Refrigerator
 ■ Freezer
 ■ Clothes Washer
 ■ Dishwasher
 ■ Room AC



ENERGY STAR APPLIANCES (EDC)

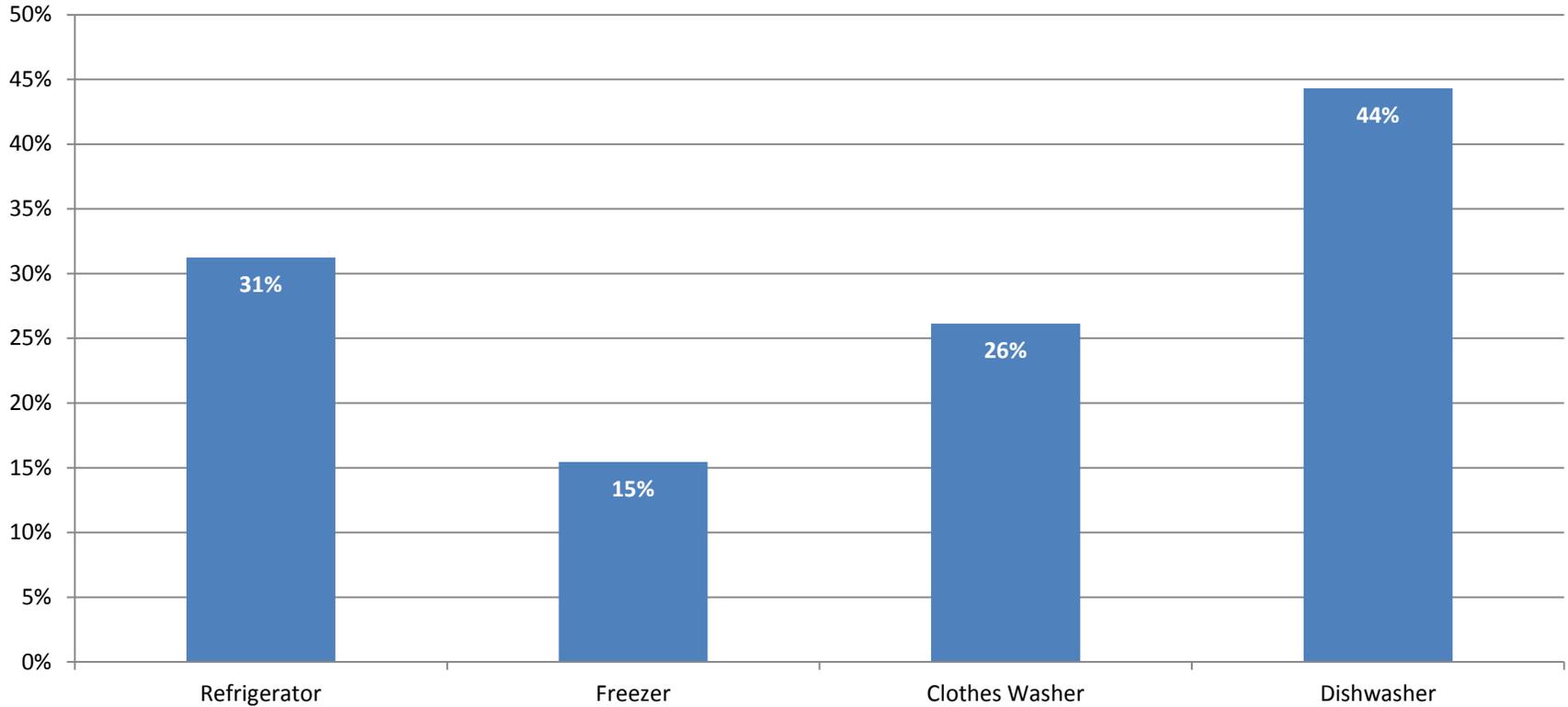


	Duquesne	FE (MetEd)	FE (Penelec)	FE (PennPower)	FE (WPP)	PECO	PPL
Refrigerator	31%	28%	34%	31%	28%	32%	32%
Freezer	6%	23%	22%	6%	13%	21%	17%
Clothes Washer	24%	29%	24%	20%	29%	18%	32%
Dishwasher	47%	45%	29%	40%	51%	45%	48%
Room AC	33%	32%	19%	22%	15%	31%	26%

■ Refrigerator
 ■ Freezer
 ■ Clothes Washer
 ■ Dishwasher
 ■ Room AC



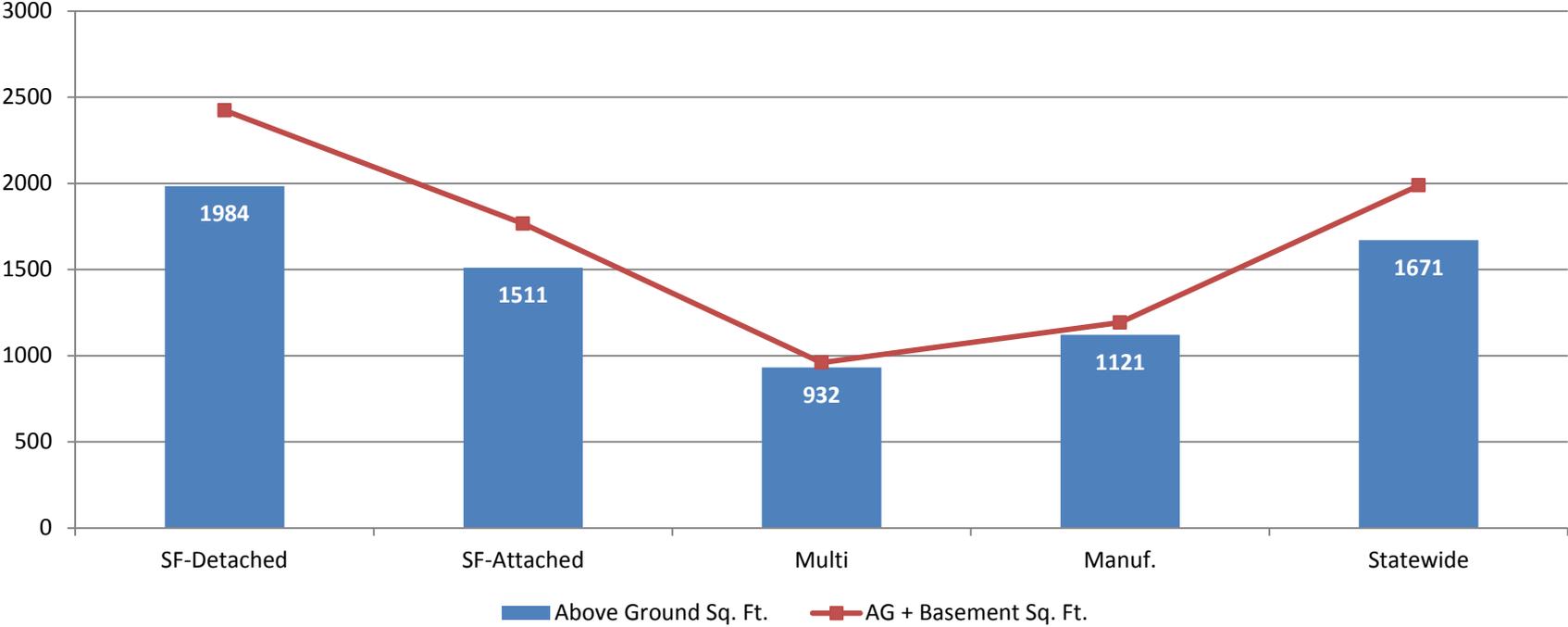
ENERGY STAR APPLIANCES (SW)



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AVERAGE HOUSEHOLD SIZE (SW)

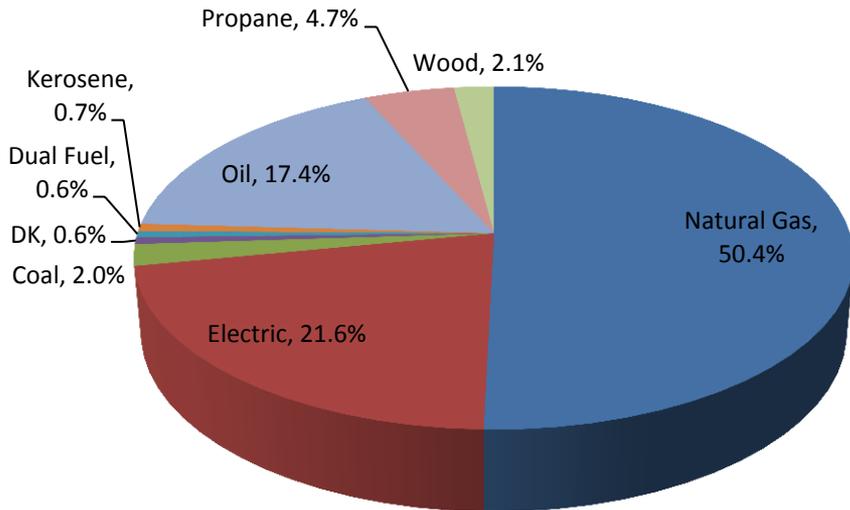


■ Above Ground Sq. Ft. —■ AG + Basement Sq. Ft.

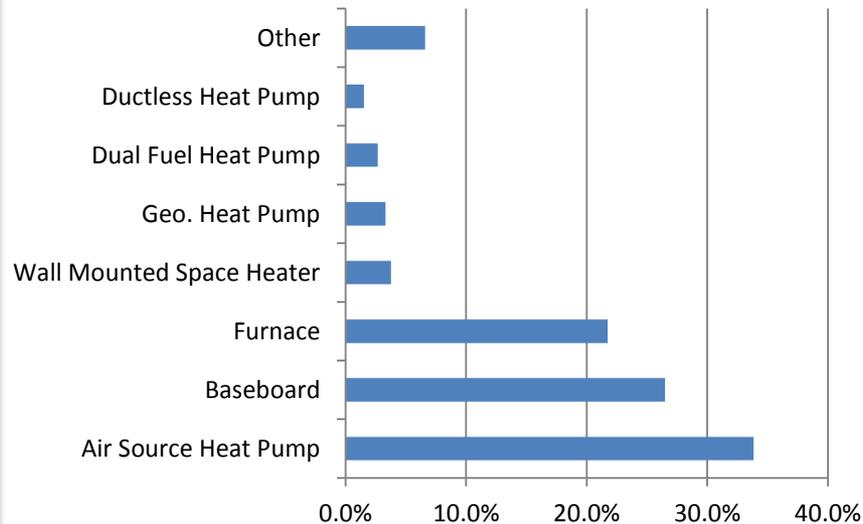


HEATING FUEL TYPE / ELECTRIC SYSTEM TYPE (SW)

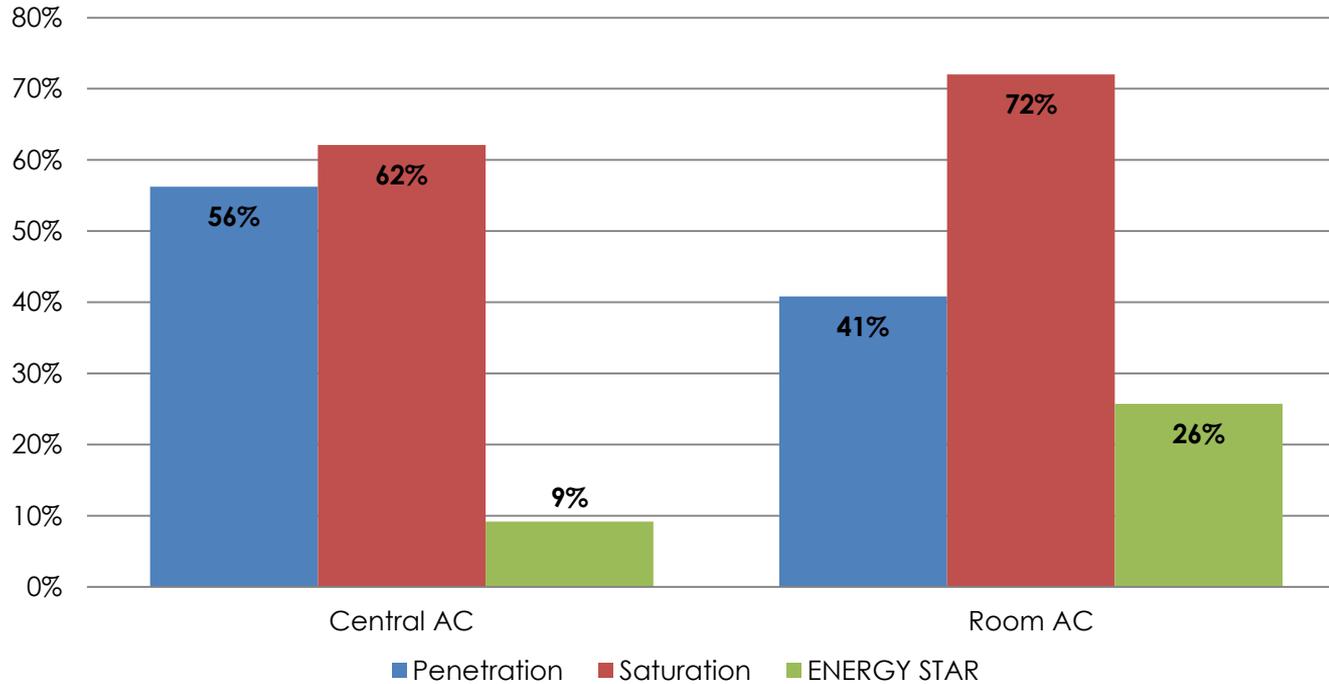
Primary Heat Fuel Type



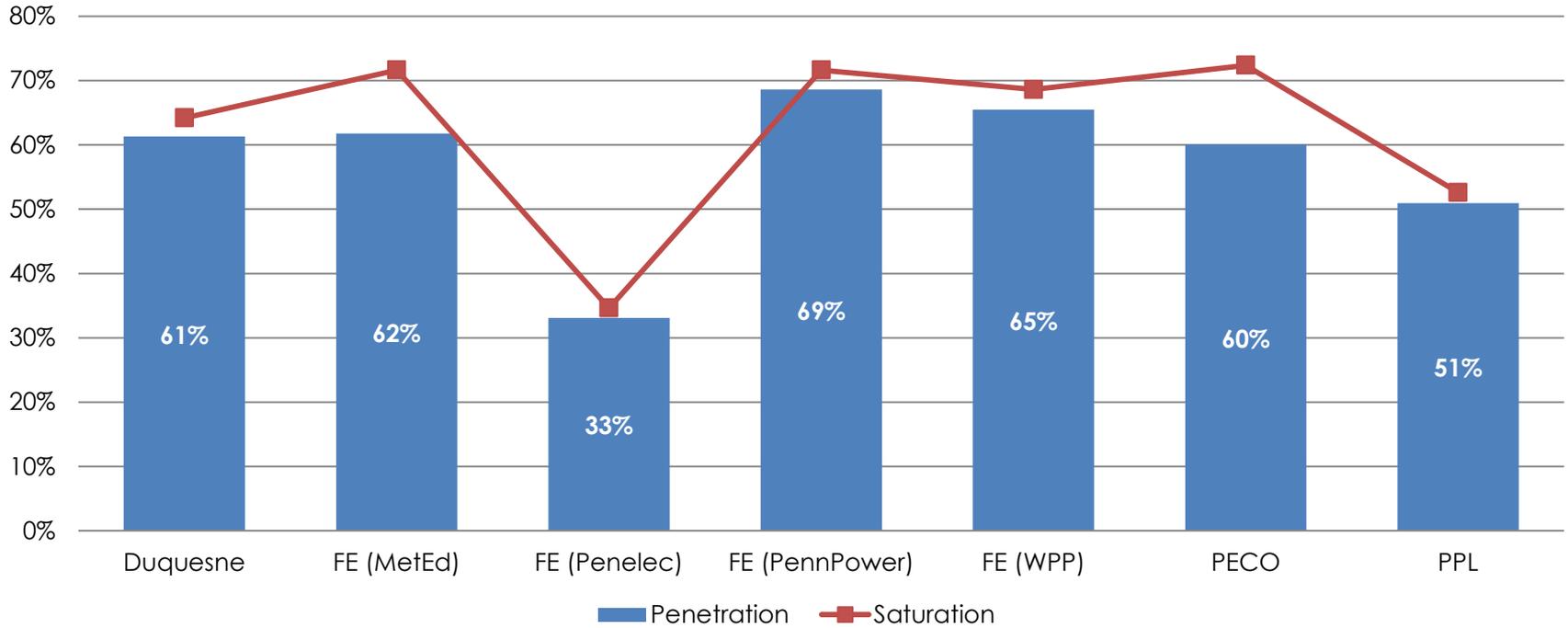
Electric Heat System Type



AC PENETRATION & SATURATION (SW)



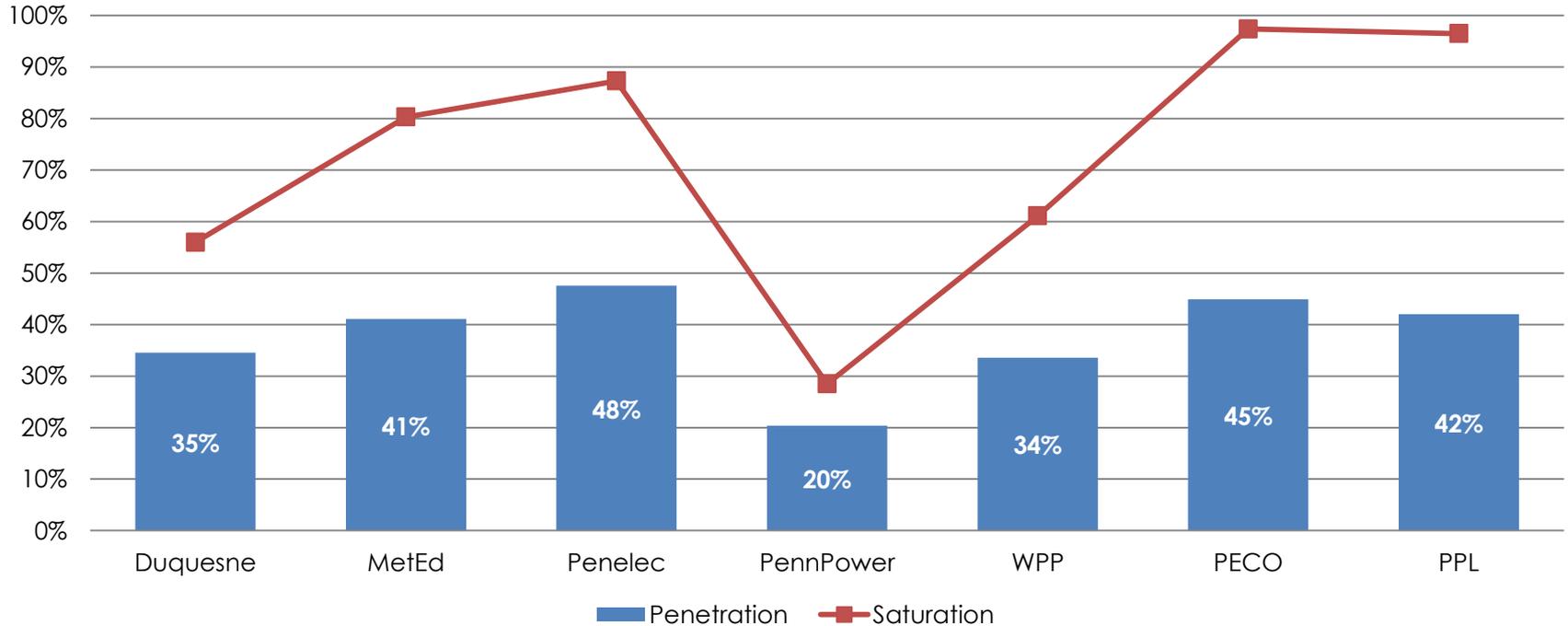
CAC PENETRATION/SATURATION (EDC)



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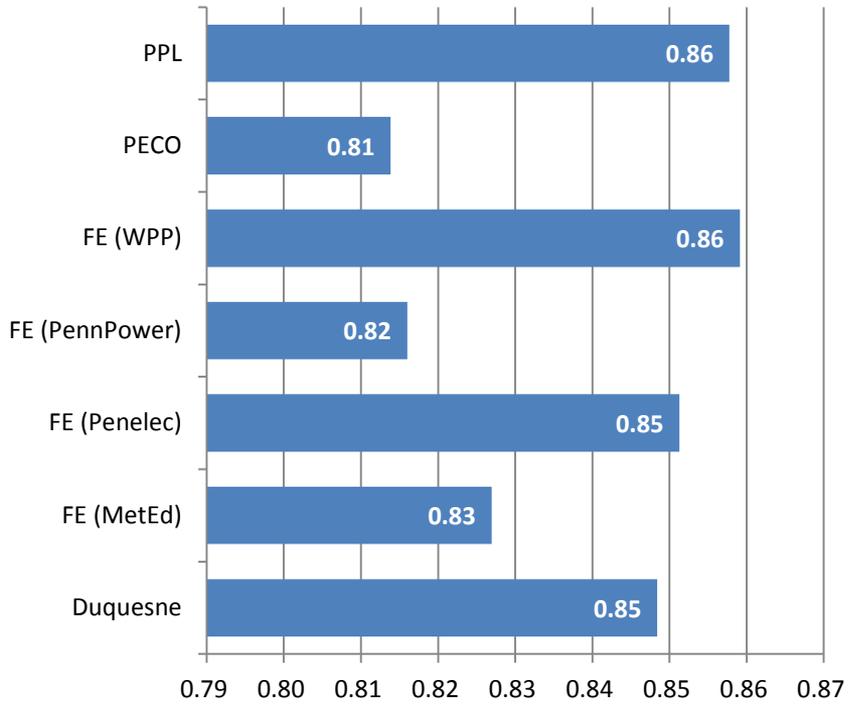


RAC PENETRATION/SATURATION (EDC)



DUCT EFFICIENCY(EDC)

Distribution Efficiency	1. % within conditioned space			2. Duct leakage Characteristics					3. Duct insulation value		
	90% or more inside envelope	50% or more inside envelope	less than 50% inside envelope	Connections sealed w/mastic	No observable leaks	Some observable leaks	Significant leaks	Catastrophic leaks	Ducts outside envelope R-8 or greater	Ducts outside envelope R-4 - R-7	Ducts outside envelope < R-4
95%	XXX			XXX					XXX		
94%	XXX			XXX						XXX	
93%	XXX			XXX							XXX
94%	XXX				XXX				XXX		
93%	XXX				XXX					XXX	
92%	XXX				XXX						XXX
90%	XXX					XXX			XXX		
89%	XXX					XXX				XXX	
88%	XXX					XXX					XXX
85%	XXX						XXX		XXX		
84%	XXX						XXX			XXX	
83%	XXX						XXX				XXX
80%	XXX							XXX	XXX		
79%	XXX							XXX	XXX	XXX	
78%	XXX							XXX	XXX	XXX	
90%		XXX		XXX					XXX		
89%		XXX		XXX						XXX	
88%		XXX		XXX							XXX
84%		XXX			XXX				XXX		
83%		XXX			XXX					XXX	
82%		XXX			XXX						XXX
80%		XXX				XXX			XXX		
79%		XXX				XXX				XXX	
78%		XXX				XXX					XXX
75%		XXX					XXX		XXX		
74%		XXX					XXX			XXX	
73%		XXX					XXX				XXX
70%		XXX						XXX	XXX		
69%		XXX						XXX		XXX	
68%		XXX						XXX			XXX
80%			XXX		XXX				XXX		



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Residential Sector Baseline Study Update

SELECT COMPARISON OF RESULTS



COMPARISON OF DIFFERENCES B/W GROUPS

- For select variables, examined for significant differences between groups
 - Age of head of household
 - Rent vs. own
 - Low income vs. Non-low income
 - 2011 vs. 2013
- Variables considered
 - Saturation of CFL/LED Lighting
 - Avg. # of CFL/LED Lights per Home
 - Energy Star Appliance Saturations
 - Insulation Levels
 - Efficient Windows
- Not intended to review every variable this way



AGE OF HEAD OF HOUSEHOLD (SW)

Variable	Less than 65	65 or older	Result
Lighting			
Saturation of CFL/LED Sockets - %	30%	21%	Significant
Avg. # of CFL/LED bulbs per home	12.3	11.7	Insignificant
Avg. # of CFL/LED bulbs per home (homes with at least 1 CFL/LED)	13.7	13.4	Insignificant
Appliances			
Refrigerator (Energy Star - %)	22%	26%	Insignificant
Freezer (Energy Star - %)	17%	22%	Insignificant
Clothes Washer (Energy Star - %)	25%	22%	Insignificant
Dishwasher (Energy Star - %)	46%	42%	Insignificant
Room AC (Energy Star - %)	26%	26%	Insignificant
Building Shell			
Roof Insulation Avg. R-Value	25.3	24.7	Insignificant
Wall Insulation Avg. R-Value	13.1	12.7	Insignificant
Windows (% Energy Efficiency)	29%	19%	Significant



OWN VS. RENT (SW)

Variable	Own	Rent	Result
Lighting			
Saturation of CFL/LED Sockets - %	26%	33%	Significant
Avg. # of CFL/LED bulbs per home	14.2	6.0	Significant
Avg. # of CFL/LED bulbs per home (homes with at least 1 CFL/LED)	15.4	7.4	Significant
Appliances			
Refrigerator (Energy Star - %)	28%	10%	Significant
Freezer (Energy Star - %)	20%	6%	Insignificant
Clothes Washer (Energy Star - %)	26%	13%	Significant
Dishwasher (Energy Star - %)	47%	24%	Significant
Room AC (Energy Star - %)	30%	14%	Significant
Building Shell			
Roof Insulation Avg. R-Value	25.0	23.9	Insignificant
Wall Insulation Avg. R-Value	13.0	12.4	Insignificant
Windows (% Energy Efficiency)	29%	5%	Significant



LOW INCOME VS. NON-LOW INCOME (SW)

Variable	LI	Non LI	Result
Lighting			
Saturation of CFL/LED Sockets - %	37%	26%	Significant
Avg. # of CFL/LED bulbs per home	6.5	13.4	Significant
Avg. # of CFL/LED bulbs per home (homes with at least 1 CFL/LED)	7.2	15.0	Significant
Appliances			
Refrigerator (Energy Star - %)	25%	23%	Insignificant
Freezer (Energy Star - %)	12%	19%	Insignificant
Clothes Washer (Energy Star - %)	15%	25%	Insignificant
Dishwasher (Energy Star - %)	31%	46%	Insignificant
Room AC (Energy Star - %)	14%	30%	Significant
Building Shell			
Roof Insulation Avg. R-Value	25.1	24.9	Insignificant
Wall Insulation Avg. R-Value	12.8	13.0	Insignificant
Windows (% Energy Efficiency)	2%	29%	Significant



2013 vs. 2011 RESULTS (SW)

Variable	2013	2011	Result
Lighting			
Saturation of CFL/LED Sockets - %	27%	21%	Significant
Avg. # of CFL/LED bulbs per home	12.1	9.4	Significant
Avg. # of CFL/LED bulbs per home (homes with at least 1 CFL/LED)	13.6	11.5	Insignificant
Appliances			
Refrigerator (Energy Star - %)	24%	20%	Insignificant
Freezer (Energy Star - %)	19%	7%	Significant
Clothes Washer (Energy Star - %)	24%	24%	Insignificant
Dishwasher (Energy Star - %)	45%	38%	Insignificant
Room AC (Energy Star - %)	26%	21%	Insignificant
Building Shell			
Roof Insulation Avg. R-Value	24.9	24.1	Insignificant
Wall Insulation Avg. R-Value	13.0	14.6	Insignificant
Windows (% Energy Efficiency)	26%	19%	Significant

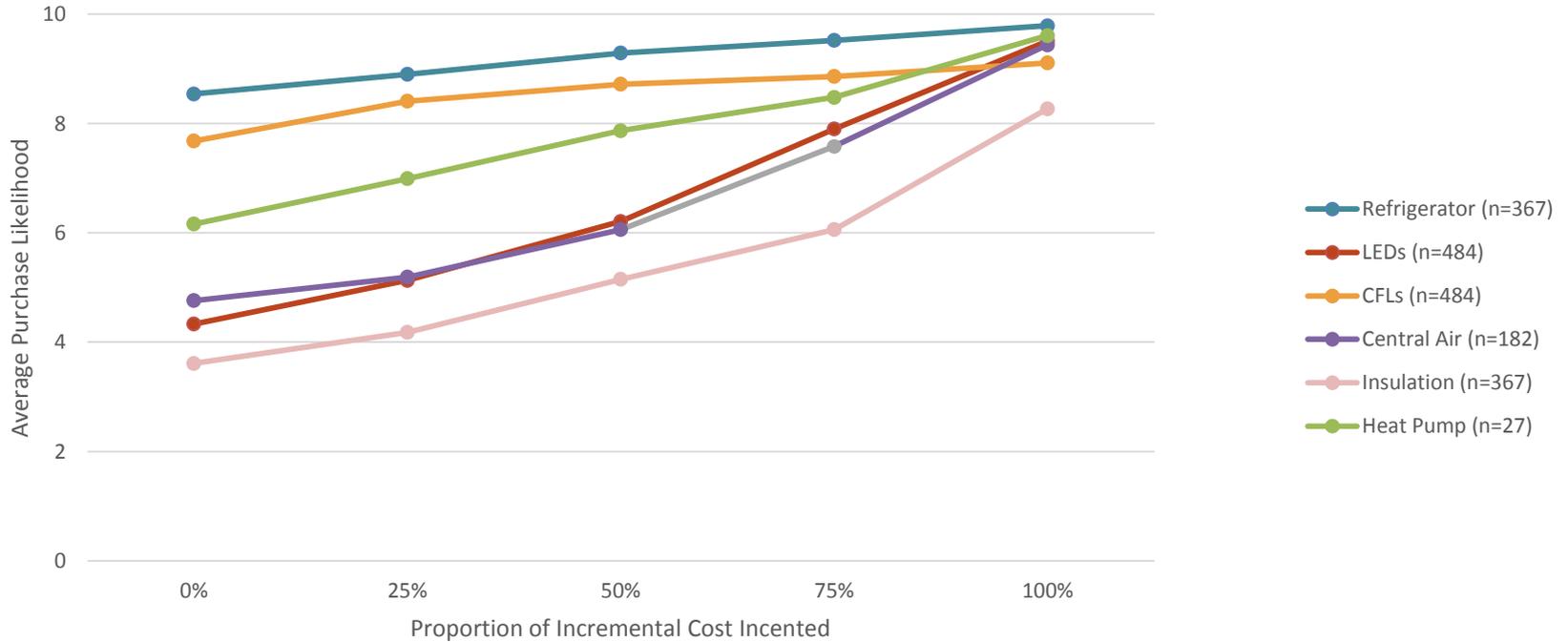


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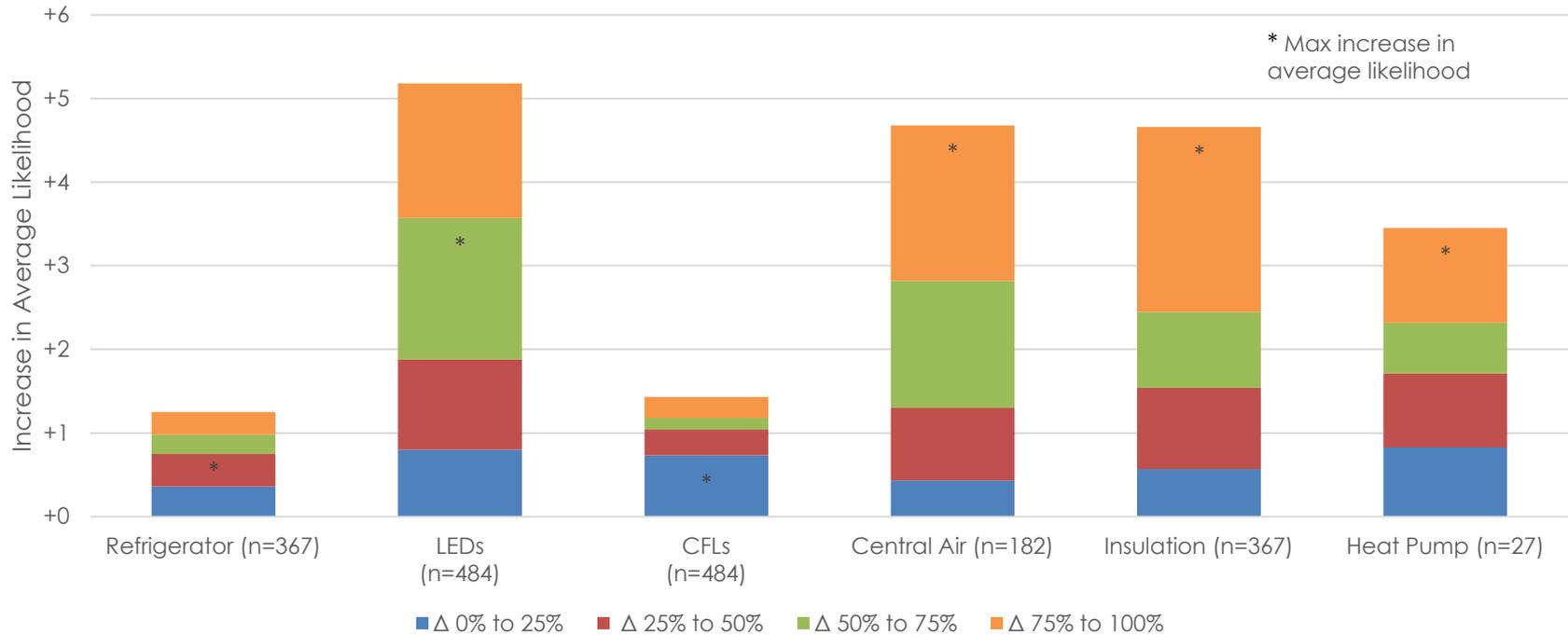
WILLINGNESS TO PAY ANALYSIS



WILLINGNESS TO PAY ANALYSIS



WILLINGNESS TO PAY ANALYSIS



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QUESTIONS?

