

NJCEP BENCHMARKING STUDY

EE Committee Meeting



AGENDA



- ❑ Research background
- ❑ Highlighted program-specific results
- ❑ Thematic results

Research Background

RESEARCH BACKGROUND



1. Residential Existing Homes
2. Residential New Construction
3. Residential Gas & Electric HVAC
4. EEP: Appliance Recycling
5. EEP: Appliance Rebates
6. EEP: Upstream Lighting
7. Commercial New Construction
8. Commercial Retrofit
9. P4P New Construction
10. P4P Retrofit
11. Small Business Direct Install
12. CHP and Fuel Cells
13. Large Energy Users
14. Local Government Energy Audit

RESEARCH BACKGROUND



- Benchmarked against peer programs
 - 7 metrics
 - 25 program administrators (PAs)
- Further research on certain programs
 - Benchmarking results tell only partial story
 - Interviews and online research (slide 15)
- Synthesized the combination into actionable recommendations and target metrics

METRICS



Metric	Description
\$/kWh	The average cost for the program to acquire a unit of electric energy savings
\$/kW	The average cost for the program to acquire a unit of electric demand savings
\$/therm	The average cost for the program to acquire a unit of gas savings
kWh/participant	The average electric energy savings acquired per participating customer
kW/participant	The average electric demand savings acquired per participating customer
therm/participant	The average gas savings acquired per participating customer
% spending on incentives	The percentage of program spending that goes towards incentives (as opposed to administrative costs)

COMPARISON PAs



#	Program Administrator (PA)	State	Utility or Statewide
1	Con Edison	NY	Utility
2	Long Island Power Authority (LIPA)	NY	Utility
3	National Grid (NGrid NY)	NY	Utility
4	NYSERDA	NY	Statewide PA
5	Connecticut Light & Power (CL&P)	CT	Utility
6	Baltimore Gas & Electric (BGE)	MD	Utility
7	Potomac Electric Power Co (Pepco)	MD	Utility
8	Southern Maryland Electric Cooperative (SMECo)	MD	Utility
9	Delmarva Power (Delmarva)	MD	Utility
10	Pacific Gas & Electric (PG&E)	CA	Utility
11	Southern California Edison (SCE)	CA	Utility
12	San Diego Gas & Electric (SDGE)	CA	Utility
13	Southern California Gas (SCG)	CA	Utility
14	PECO	PA	Utility
15	Duquesne Light (Duquesne)	PA	Utility
16	First Energy Met-Ed	PA	Utility
17	First Energy Penelec	PA	Utility
18	PPL Electric Utilities (PPL)	PA	Utility
19	NSTAR	MA	Utility
20	National Grid (NGrid MA)	MA	Utility
21	Public Service of New Hampshire (PSNH)	NH	Statewide PA
22	Efficiency Vermont (Vermont)	VT	Statewide PA
23	Wisconsin Focus on Energy (Wisconsin)	WI	Statewide PA
24	Commonwealth Edison (ComEd)	IL	Utility
25	Austin Energy	TX	Utility

HOW TO INTERPRET

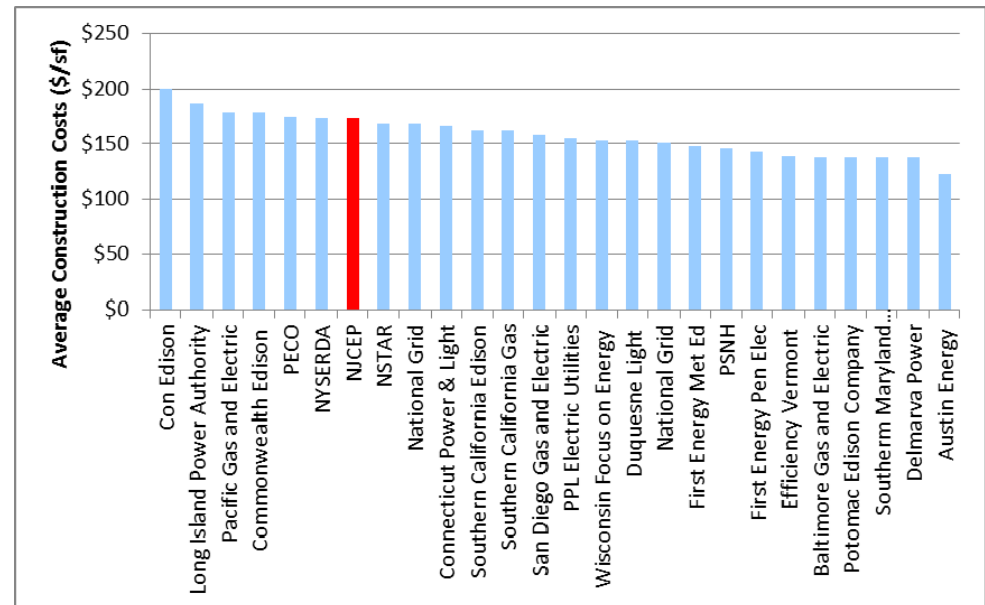


- ❑ Be careful with apples and oranges
 - Values presented are “raw”: unadjusted except where necessary to develop a metric (e.g., \$/kWh)
 - Best to triangulate with other data/information
- ❑ Reference year: 2012 (back to 2010, too)
- ❑ Benchmark on gross savings (net as add'l info)
- ❑ First-year savings (not lifetime)
- ❑ Electric v. gas adjustments made
 - For NJCEP: program-reported spending splits
 - For non-NJCEP: category average \$/savings
- ❑ Accounting and business costs (next slide)

TWO TRENDS CANCEL OUT



- ❑ NJCEP centralizes certain functions, reducing program-specific budgets
 - Evaluation: 3%-5% of budget
 - Marketing: 7% of budget (avg. program)
- ❑ NJCEP experiences naturally high cost of doing business
 - 9% higher than average
- ❑ Roughly cancel out



SUMMARY OF BENCHMARK RESULTS

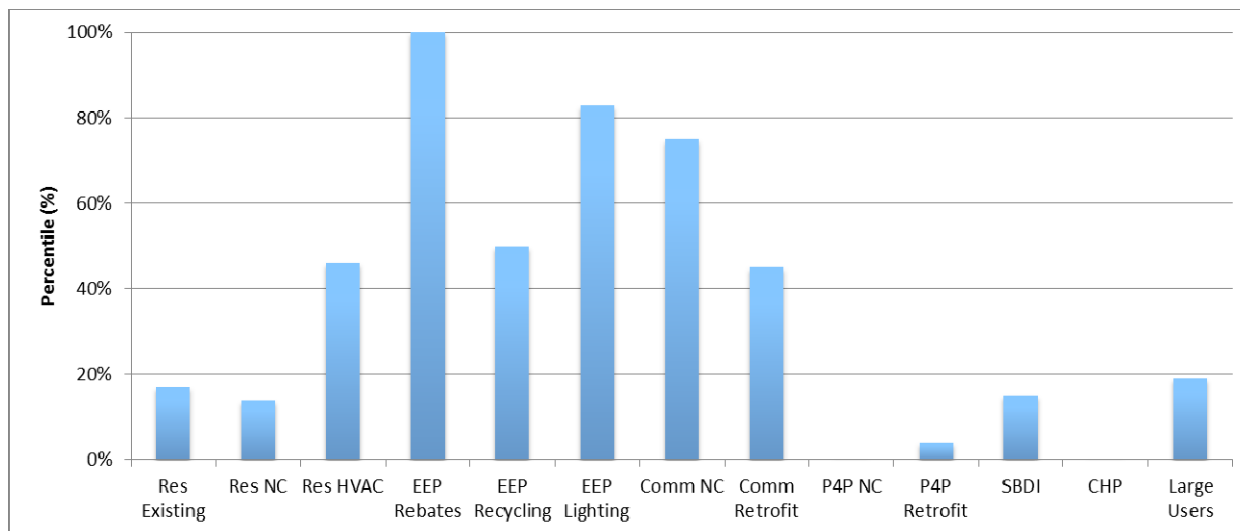
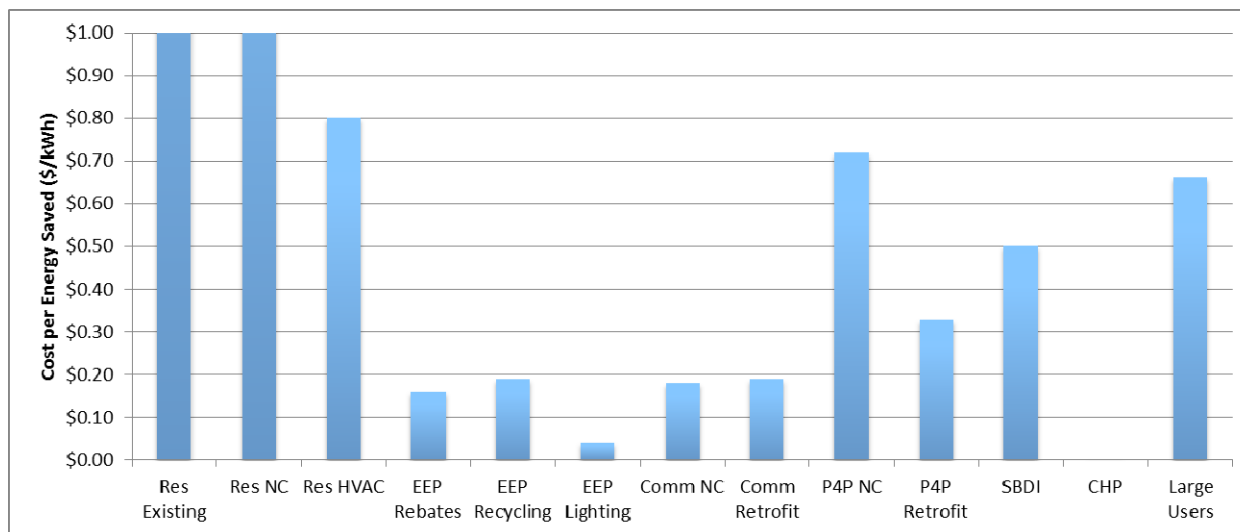


Program Metric	Res Existing	Res NC	Res HVAC	EEP Rebates	EEP Recycling	EEP Lighting	Comm NC	Comm Retrofit	P4P NC	P4P Retrofit	SBDI	CHP	Large Energy Users
\$/kWh	\$3.51	\$2.47	\$0.80	\$0.16	\$0.19	\$0.04	\$0.18	\$0.19	\$0.72	\$0.33	\$0.50	-	\$0.66
Percentile	17%	14%	46%	100%	50%	83%	75%	45%	0%	4%	15%	-	19%
\$/kW	\$12,193	\$1,316	\$1,443	\$1,141	\$677	\$359	\$621	\$623	\$837	\$1,249	\$2,173	\$1,758	\$4,308
Percentile	22%	73%	70%	100%	87%	82%	83%	70%	92%	57%	52%	N/A	24%
\$/therm	\$29.42	\$8.88	\$3.23	-	-	-	\$1.79	\$0.70	\$0.34	\$2.08	-	-	\$0.37
Percentile	9%	23%	25%	-	-	-	50%	84%	100%	46%	-	-	88%
kWh/part.	764	823	1,644	N/A	950	N/A	116,505	48,775	452,431	324,486	28,094	-	N/A
Percentile	50%	0%	100%	N/A	30%	N/A	47%	20%	67%	86%	88%	-	N/A
kW/part.	0.2	1.5	0.9	N/A	0.2	N/A	34.6	14.6	389.0	85.8	6.5	645.0	N/A
Percentile	64%	100%	100%	N/A	75%	N/A	75%	50%	100%	86%	100%	N/A	N/A
therms/part.	137	153	407	-	-	-	12,031	12,933	9,598	3,284	-	-	N/A
Percentile	67%	50%	N/A	-	-	-	N/A	N/A	N/A	N/A	-	-	N/A

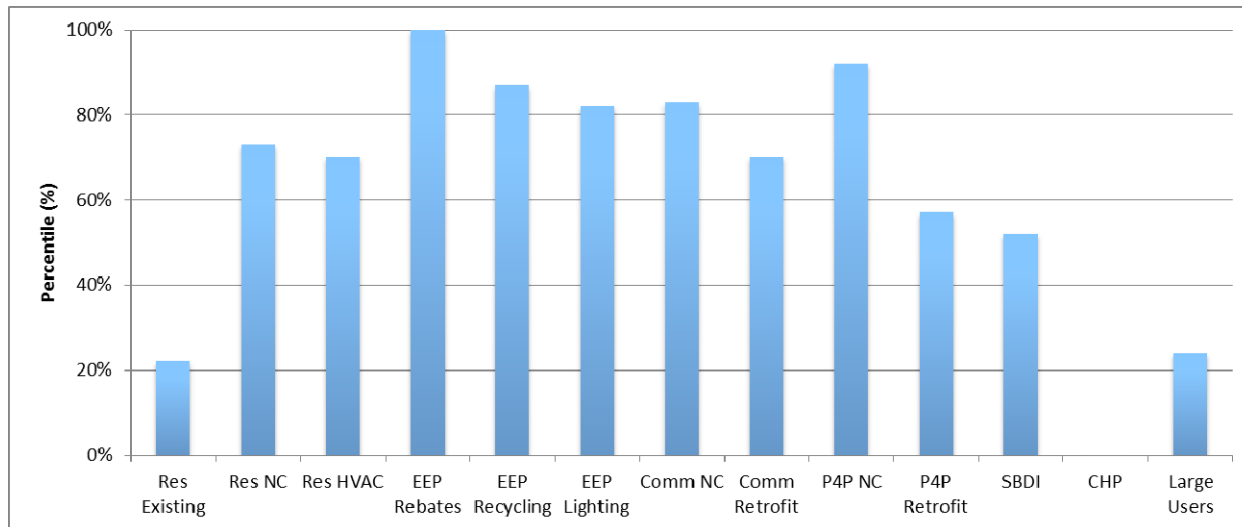
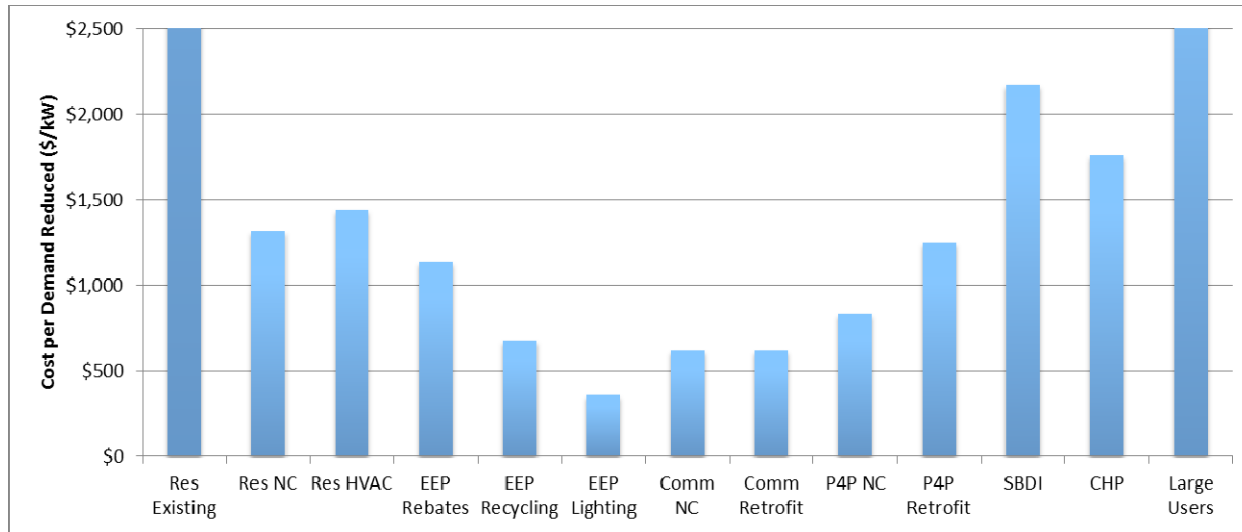
“N/A” = insufficient sample or data

“-” = data not relevant to the program

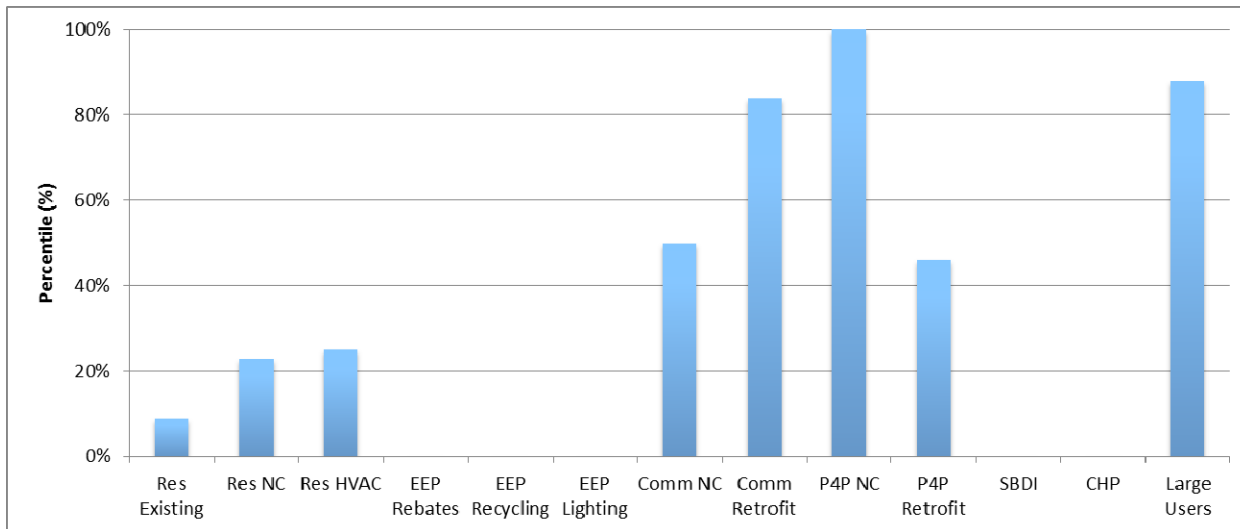
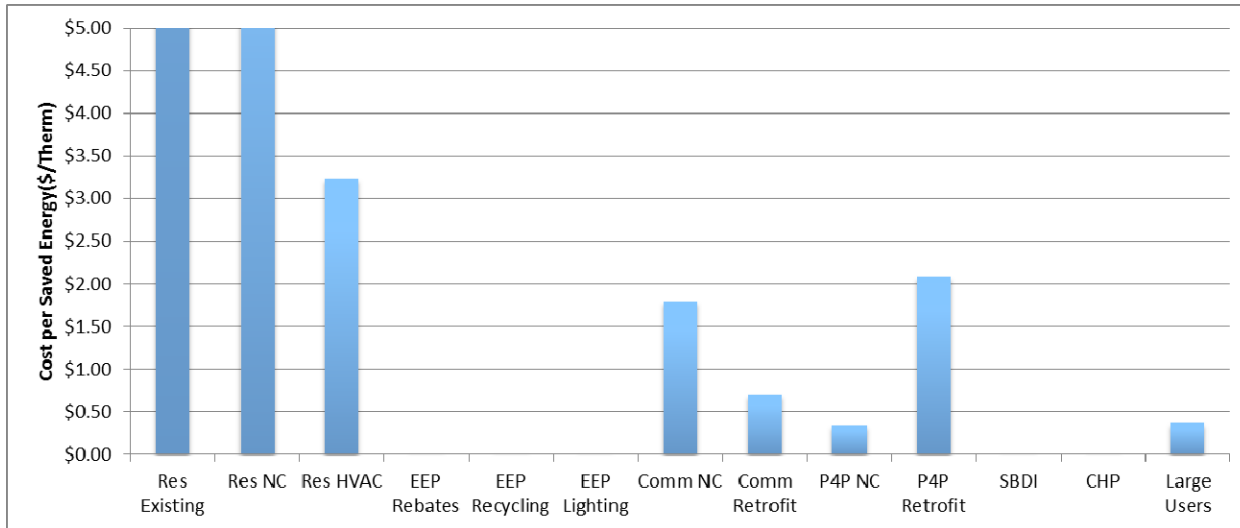
\$/kWh SUMMARY



\$/kW SUMMARY



\$/THERM SUMMARY



PORTFOLIO B'MARK FINDINGS



- NJCEP is relatively expensive
 - Average: 39th percentile
 - Median: 32nd percentile
- \$/kWh v. \$/kW differential is a mirage
 - Program-specific factors explain most of the difference

Program	Sufficient Data for First-Pass Analysis?	Recommended Next Steps				
		No Further Research	Further Analysis	Web Search	External Interview	NJCEP Interview
Residential Existing Homes	Yes			X	X	X
Residential New Construction	Yes				X	X
Residential Gas & Electric HVAC	Yes			X	Partial	
EEP: Appliance Recycling	Yes		X		Partial	
EEP: Appliance Rebates	Yes	X				
EEP: Upstream Lighting	Yes		X		X	X
Commercial New Construction	Yes	X				
Commercial Retrofit	Yes		X	X	X	X
Pay for Performance New Construction	Yes			X		X
Pay for Performance Retrofit	Yes	X				
Direct Install (SBDI)	Yes			X	X	X
Combined Heat & Power and Fuel Cells	No		X		X	X
Large Energy Users Program	Partial	X				
Local Government Energy Audit	No	X				

COMMON RESEARCH AREAS

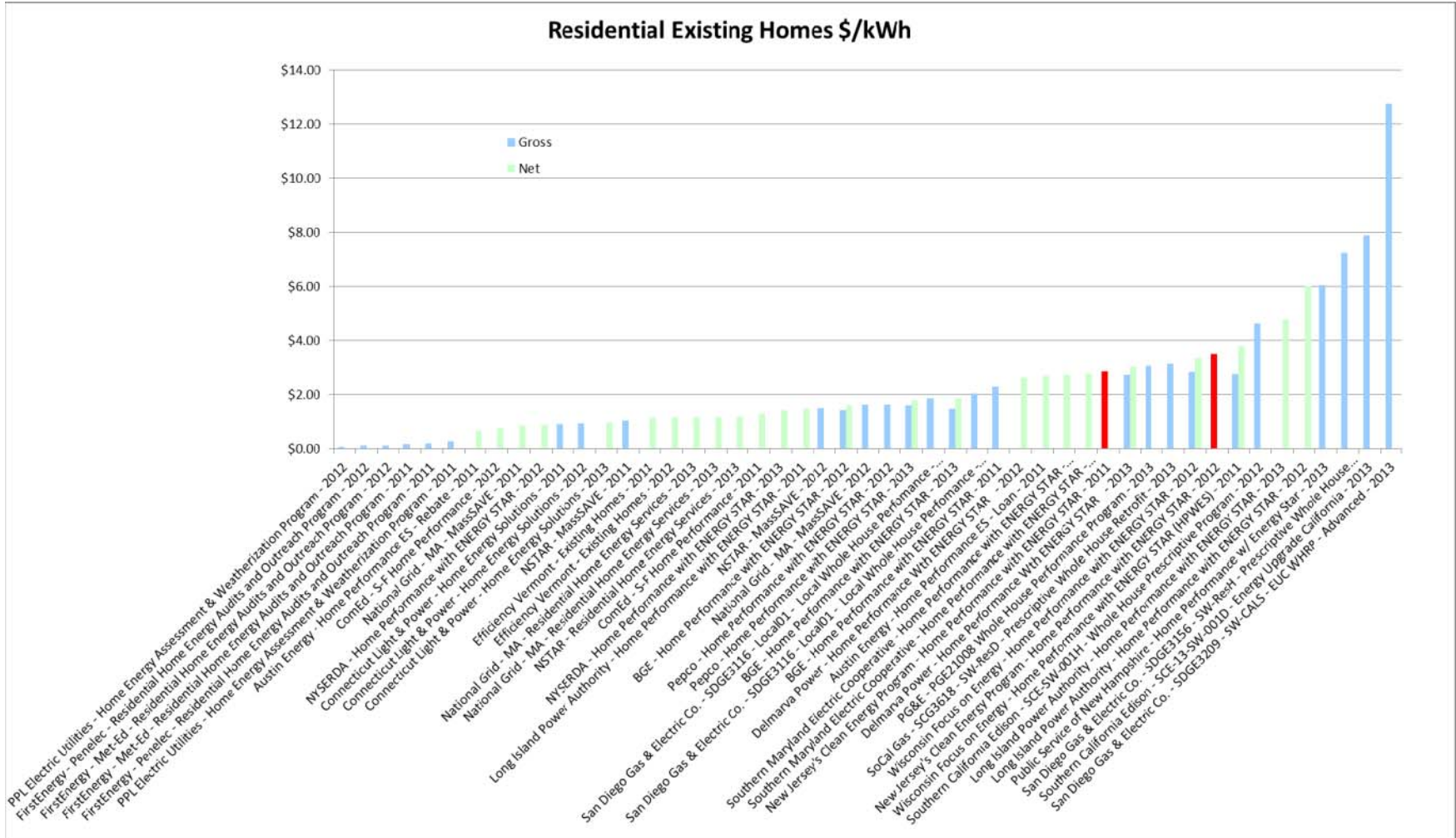


- ❑ Offerings and incentives
- ❑ Contractor model
- ❑ Savings and assumptions
- ❑ Non-incentive costs
- ❑ Quality assurance

Highlighted Program-Specific Results

Residential Existing Homes

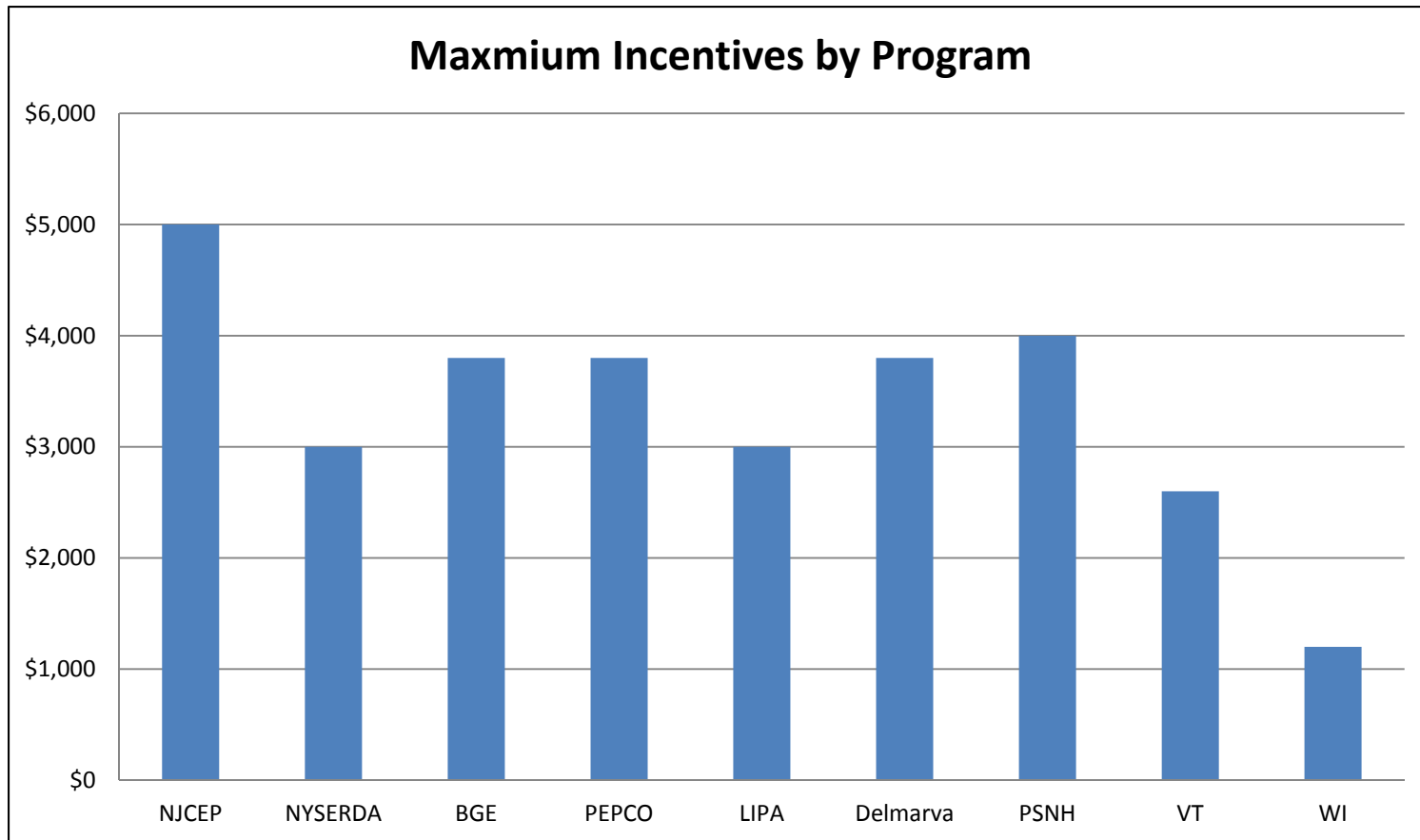
RESIDENTIAL EXISTING HOMES



RESIDENTIAL EXISTING HOMES



Other programs' incentives are generally 20%-40% lower than those of NJCEP



RESIDENTIAL EXISTING HOMES



Cost per Gross Savings			
Category	\$/kWh	\$/kW	\$/therm
Existing Homes 2012	\$3.51	\$12,193	\$29.42
NJCEP Percentile	17%	22%	9%
Sample Size	30	28	12
Std Deviation	\$2.76	\$8,369	\$10.96
Min	\$0.08	\$1,496	\$0.99
75th Percentile	\$0.97	\$3,513	\$5.65
Average	\$2.63	\$8,696	\$11.70
Median	\$1.75	\$5,954	\$7.10
25th Percentile	\$3.03	\$10,522	\$13.81
Max	\$12.76	\$38,545	\$32.13

- ❑ \$3.51/kWh
- ❑ 20% premium for loan subsidies
- ❑ 20%-40% premium purely on incentive levels
- ❑ 20% + 20%-40% = net ~50% premium
- ❑ $\$3.51 \times 50\% = \$1.76/\text{kWh}$ or basically the median

RESIDENTIAL EXISTING HOMES



Other programs' tend to offer measure-specific rebates ("prescriptive" measures) as opposed to lump incentives for hitting performance metrics

Program Administrator	NJCEP	NYSERDA	CL&P	BGE	TX	PEPCO	LIPA	Delmarva	PSNH	VT	WI
Lump incentives?	Yes	No	No	No	No	No	Yes	No	Unclear	Yes	Yes
Measure-specific rebates?	No	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Unclear	Yes*	No
Maximum possible incentive	\$5,000	\$3,000	Unclear	\$3,800	unclear	\$3,800	\$3,000	\$3,800	\$4,000	\$2,600	\$1,200-\$2,000*

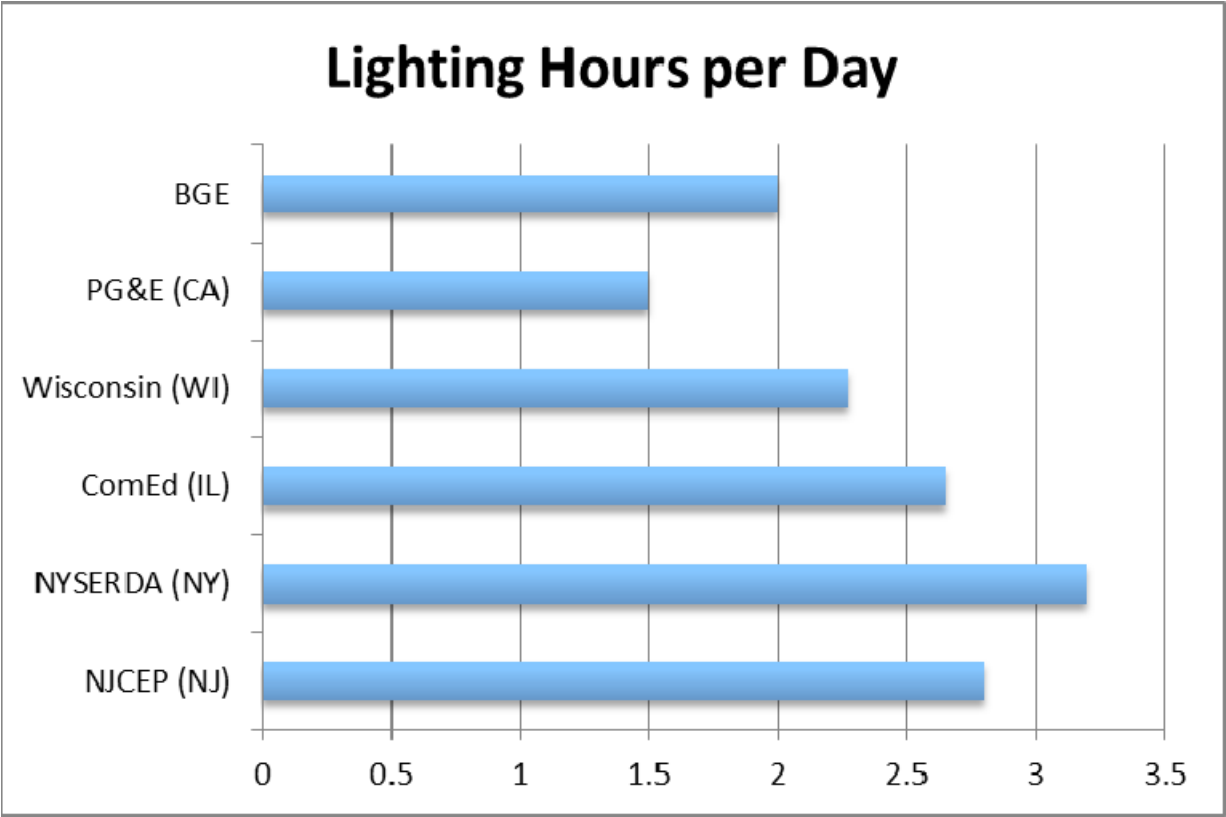
RESIDENTIAL EXISTING HOMES



- ❑ Finding: Program cost-per-savings is among the highest in the nation – but when high incentives and loan subsidies are taken into account, the program comes out around the median.
 - Maximum incentive levels are 20%-40% higher than other programs.
 - The loan subsidies inflate costs by 20% (typically budgeted separately).
- ❑ Finding: Approach and delivery mechanisms are generally in line with those of similar programs across the country.
- ❑ Recommendation: Budget and account for loans separately.
- ❑ Recommendation: Reduce incentives.
 - Evidence suggests that they could be lower and achieve similar results.
- ❑ Recommendation: Consider going to measure-specific rebates.
 - More common among peer programs and ties rebates to savings more directly.

EEP: Upstream Lighting

EEP: UPSTREAM LIGHTING



EEP: UPSTREAM LIGHTING



energy resource solutions

PA	NJCEP	Wisconsin	BG&E	PG&E	ComEd	NYSERDA
Baseline technology (CFL, inc., mixed?)	Incandescent	Mixed	Incandescent 62.6%/CFL 20%	50% CFL/50% Incandescent	Halogen	Incandescent
Baseline wattage (W)	~55-70 W	33-76 W (mostly 49 W)	54 W	Bulb-specific	Bulb-specific	60 W
Incent standard CFLs?	Yes	Yes	Yes	No	Yes	No
Savings for standard CFLs (kWh)	41.3 kWh	20-44 kWh (mostly 30 kWh)	Bulb-specific	N/A	Bulb-specific	N/A
Incentive per bulb for standard CFLs	\$0.60	~\$1.25	up to \$1.60	N/A	\$1.17 average	N/A
Incent specialty CFLs?	Yes	Yes	Yes	Yes (hard-to-reach only)	Yes	Yes
Savings for specialty CFLs (kWh)	43.9 kWh	20-44 kWh (mostly 30 kWh)	Bulb-specific	Bulb-specific	Bulb-specific	59 kWh
Incentive per bulb for specialty CFLs	\$1.50-\$2.00	~\$1.25	up to \$3.00	\$0.50-\$1.50	\$1.95 average	\$1.50
Incent LEDs?	Yes	Next year	Yes	Yes	Yes	Yes
Savings for LEDs (kWh)	55.1 kWh	N/A (will be 35 kWh)	Bulb-specific	Bulb-specific	Bulb-specific	61 kWh
Incentive per bulb for LEDs	\$1.00-\$7.00	N/A (will be \$3-\$8)	up to \$5.00	\$4.00-\$8.00	\$2.00-\$4.00	\$3.00
Incent other? (please specify)	No	No	Fixtures - up to \$10	Hard-to-reach areas for CFLs	"Specialty" LEDs (cans) for \$4	No
In-service rate	83%-100%	75%-99%	88%	100% LED/67% CFL	72% (CFL) - 95% (Specialty LED)	100%

EEP: UPSTREAM LIGHTING



Creative approaches to retaining CFL savings:

- PG&E – Designated “hard-to-reach” zip codes, in which they continue to incent CFLs.
- NYSERDA – Had some retail locations act as controls (incentives not paid), while some received incentives.
 - Goal was to claim savings on normalized sales difference.
 - Failed due to logistical reasons and data privacy.
 - Can learn from their mistakes.

EEP: UPSTREAM LIGHTING



PA	NJCEP	Wisconsin	BG&E	PG&E	ComEd	NYSERDA
Apply free-ridership screen?	No	Yes	Yes	Yes	Yes	Yes
Estimated FR?	0%	19%	31%	15% LED/46% CFL	30% LED/34% CFL	59%
When is FR applied?	N/A	Evaluation (ex post)	Evaluation (ex post)	Upfront (ex ante)	Evaluation (ex post)	Evaluation (ex post)

EEP: UPSTREAM LIGHTING



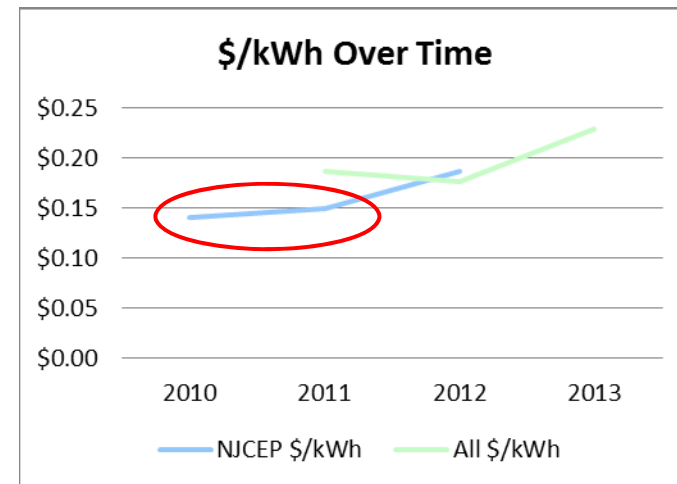
- ❑ Finding: \$/kWh is very good (>80th percentile).
- ❑ Recommendation: Commission a new residential lighting study.
 - Hours-of-use assumption may be a tad high.
 - Baseline needs updating. Full incandescent baselines are being phased out.
- ❑ Recommendation: Accelerate movement to LEDs, but consider creative ways to retain CFLs.
 - CFLs on there way out. Limited incentives in NY and CA, already.
 - Other PAs have approached creatively. Look to their lead for ways to wring savings from this market as CFLs are phased out.
- ❑ Recommendation: Perform regular impact evaluation of this program including free ridership/attribution study.
 - Of all the programs, the lack of evaluation is most problematic here. Peer programs exhibit high free ridership.
- ❑ Recommendation: Develop long-term strategy to address inevitable savings gap left by loss of CFL savings.

Commercial Retrofit

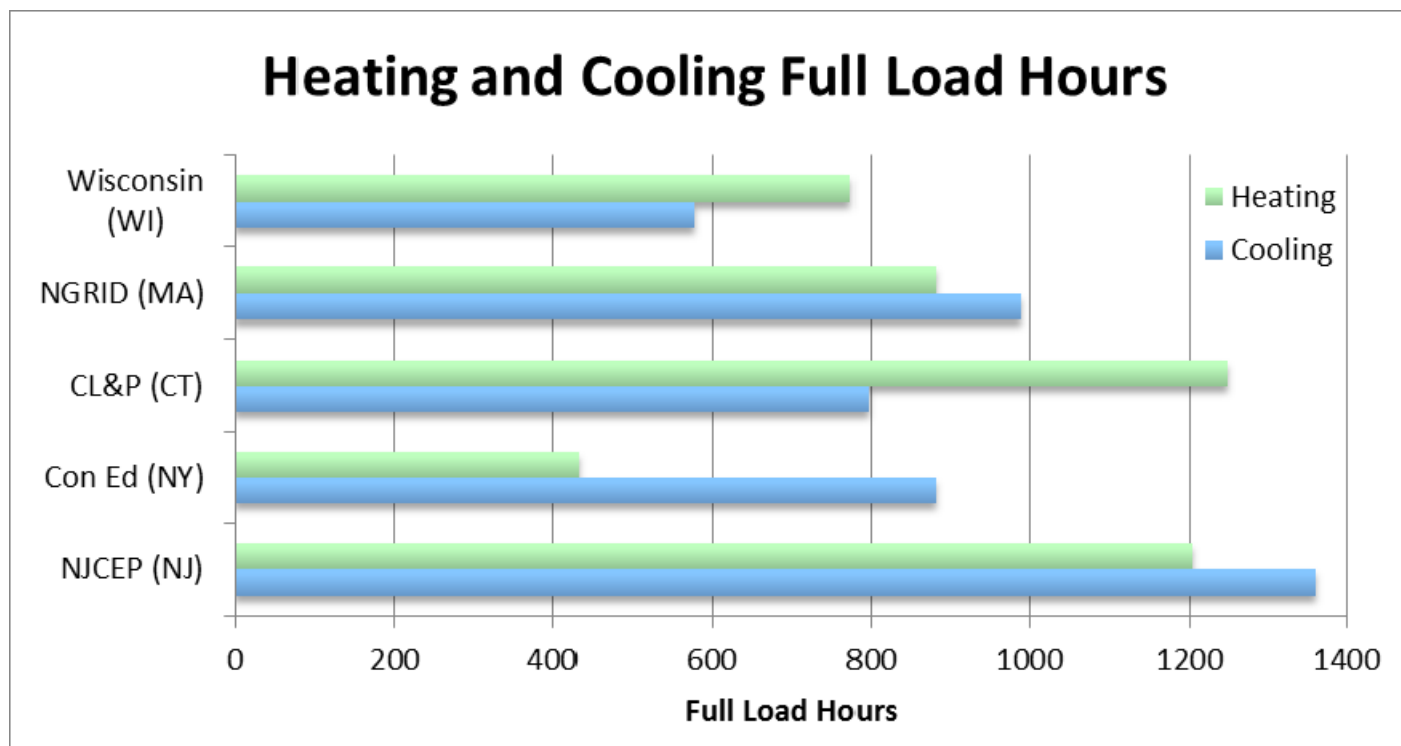
COMMERCIAL RETROFIT



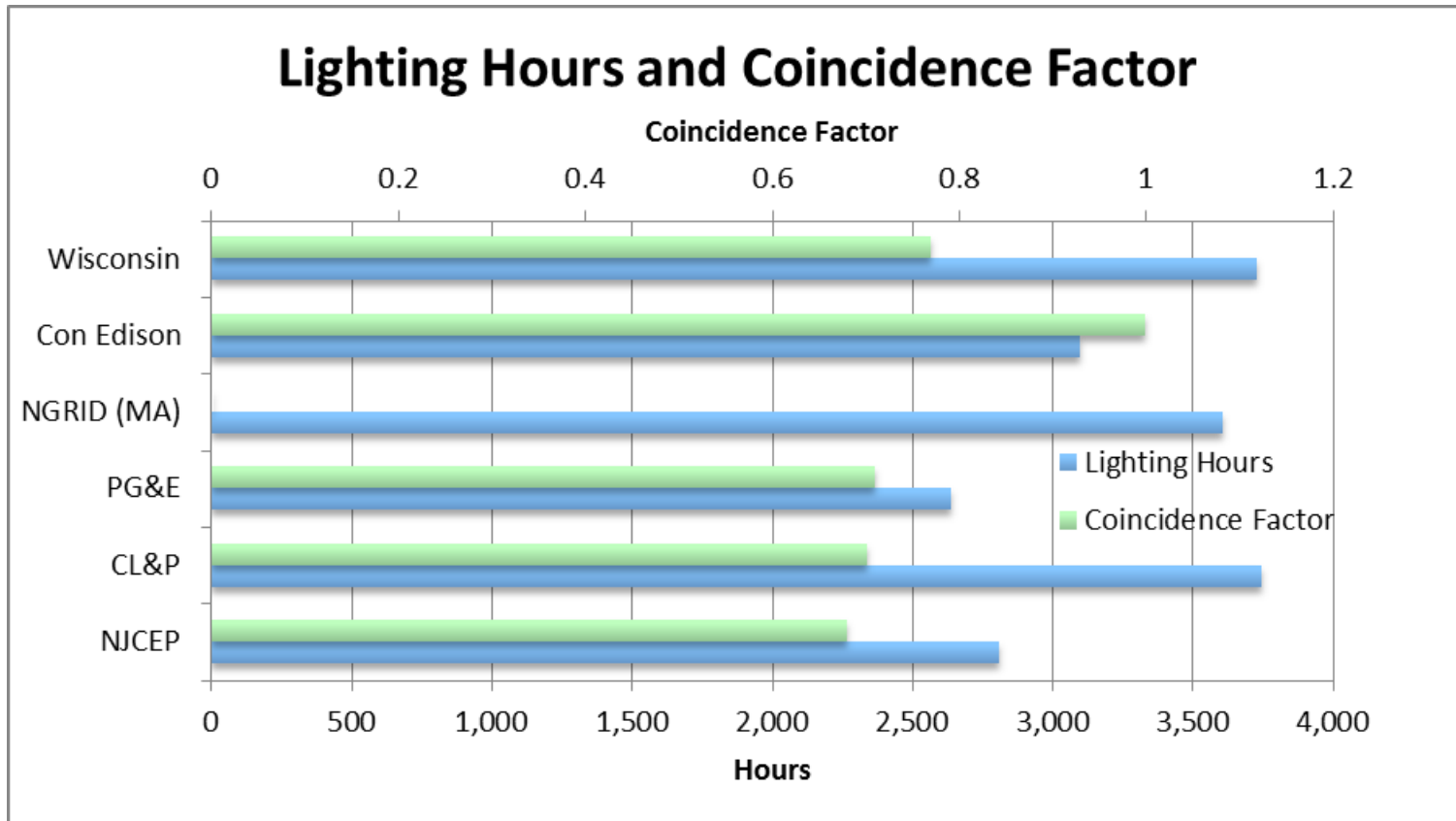
Cost per Gross Savings			
Category	\$/kWh	\$/kW	\$/therm
Comm. Retrofit 2012	\$0.19	\$623	\$0.70
NJCEP Percentile	45%	70%	84%
Sample Size	52	51	26
Std Deviation	\$0.09	\$622	\$4.68
Min	\$0.05	\$120	\$0.28
75th Percentile	\$0.14	\$587	\$1.10
Average	\$0.19	\$1,040	\$3.71
Median	\$0.18	\$880	\$2.28
25th Percentile	\$0.23	\$1,320	\$3.98
Max	\$0.53	\$2,766	\$19.56



COMMERCIAL RETROFIT



COMMERCIAL RETROFIT



COMMERCIAL RETROFIT



PA	NJCEP	CL&P	PG & E	NGrid MA	Con Edison	WI
Unitary AC/split system (10 tons): \$/ton	\$73	\$50	N/A	N/A	\$60	\$55
Unitary AC/split system (10 tons): EER	12	12	N/A	N/A	12	meet AHRI requirements
Gas hot water boiler (1,000 Mbtuh): \$/M btuh	\$2	unclear	\$2	\$8	\$3	\$1
Gas hot water boiler (1,000 Mbtuh): AFUE	0.85	N/A	N/A	0.90	0.85	0.85
Wall mounted occupancy sensor: \$/sensor	\$20	N/A	N/A	\$30	\$50	\$8
HPT8 replacing Standard (32W) T8: \$/fixture (1-4 lamps, 4')	\$10	\$15	\$1-1.50	\$15	\$10	\$3-\$7
25 HP VFD for chilled water pump: \$/hp	\$60	\$132	N/A	\$186	\$60	\$50

PA	NJCEP	National Grid MA	Con Edison	Wisconsin
Inspection/QC approach	Inspect all applications over \$25,000 and 30%-80% of all others based on technology (e.g., lighting is 30% while VFDs are 80%)	Pre & post inspections on almost all large projects (> \$100,000 incentive or 500,000kW); small and prescriptive projects ~ 10% inspection rate	100% of projects have post inspection. This is a marketing technique to get new applications for other equipment.	Inspect all applications over \$25,000 and 10% of all other projects

COMMERCIAL RETROFIT



- ❑ Finding: Program is a solid to strong performer.
 - 2012 \$/kWh around the median.
 - 2010 and 2011 \$/kWh were around the 75th percentile.
 - \$/kW and \$/therm generally in top quartile.
 - However: savings-per-participant relatively low.
- ❑ Finding: Savings assumptions generally reasonable:
 - HVAC hours a bit high; lighting a bit low.
- ❑ Finding: Incentives are in line with comparable programs.
- ❑ Recommendation: Consider reducing inspection rates.
 - Use process evaluation to validate appropriate levels.

Small Business Direct Install

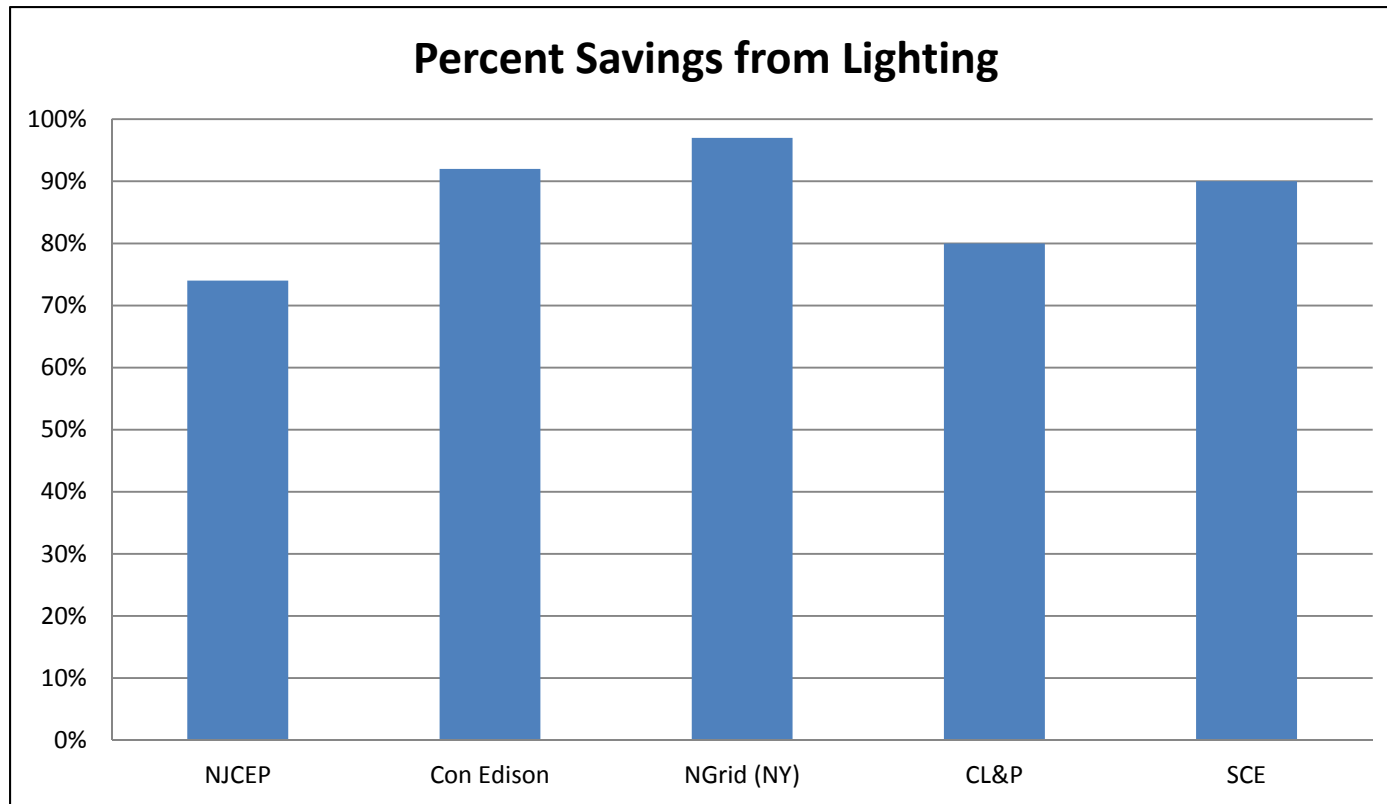
SMALL BUSINESS DIRECT INSTALL



Cost per Gross Savings		
Category	\$/kWh	\$/kW
SBDI 2012	\$0.50	\$2,173
NJCEP Percentile	15%	52%
Sample Size	21	20
Std Deviation	\$0.18	\$934
Min	\$0.05	\$185
75th Percentile	\$0.38	\$1,635
Average	\$0.44	\$2,158
Median	\$0.41	\$2,227
25th Percentile	\$0.48	\$2,534
Max	\$0.86	\$4,530

Gross Savings Per Participant		
Category	kWh/part.	kW/part.
SBDI 2012	28,094	6.5
NJCEP Percentile	88%	100%
Sample Size	9	8
Std Deviation	8,012	2.0
Min	8,842	1.7
25th Percentile	11,028	2.0
Average	18,240	3.6
Median	19,054	2.8
75th Percentile	21,376	5.0
Max	31,426	6.6

SMALL BUSINESS DIRECT INSTALL

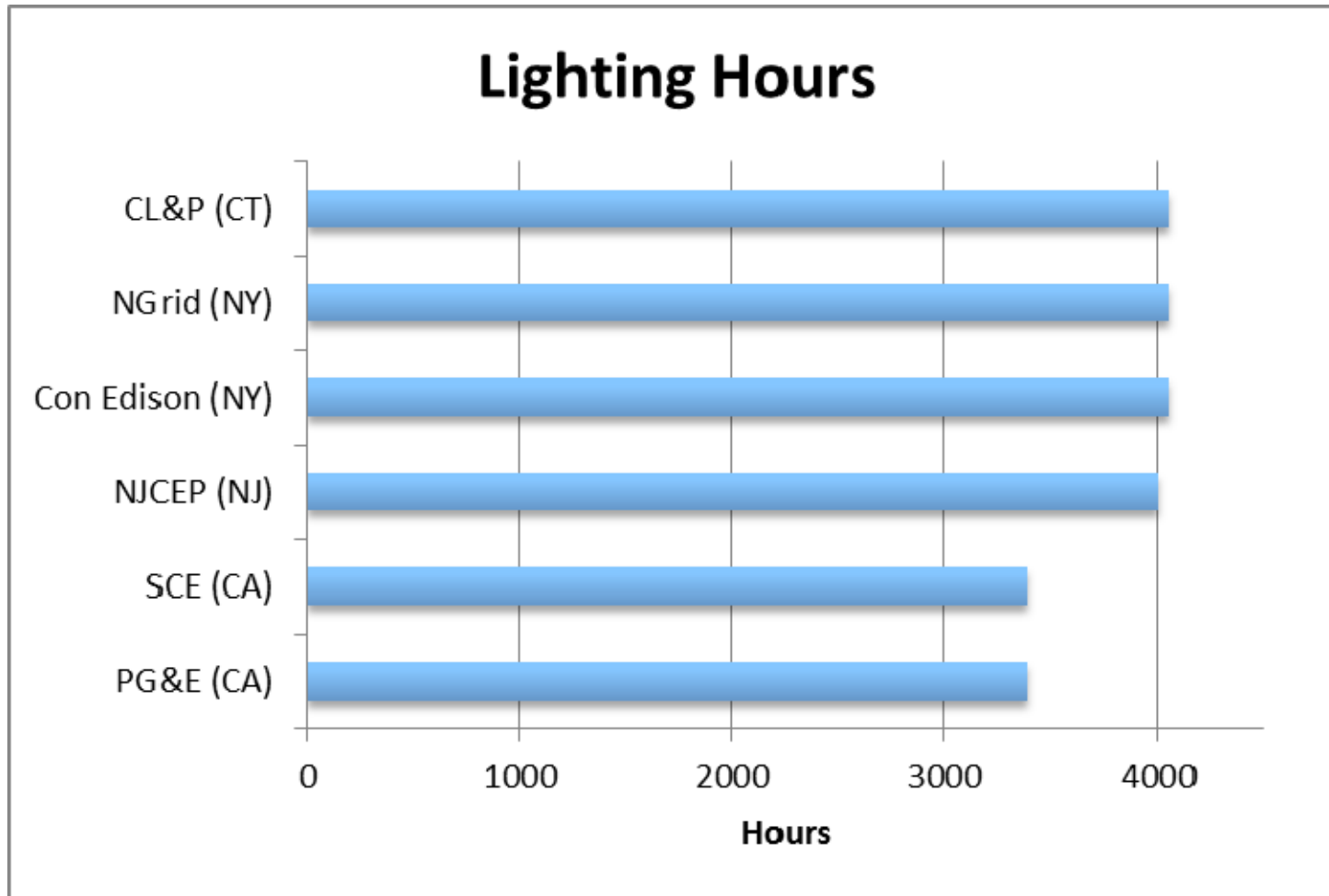


SMALL BUSINESS DIRECT INSTALL



Program Administrator	Customer Cost Share	Maximum Eligible Monthly Peak Demand (kW)
NGRID (NY)	30%	100
Con Edison (NY)	30%	100
CL&P (CT)	50%-65%, measure dependant	200
NJCEP (NJ)	30%	200
SCE (CA)	0%	200
PG&E (CA)	0%	200

SMALL BUSINESS DIRECT INSTALL



SMALL BUSINESS DIRECT INSTALL



- ❑ Finding: High \$/kWh, lower \$/kW, and high kWh/ and kW/participant.
 - Factor: Program is somewhat unique in the level of emphasis placed on whole-building approach/non-lighting measures.
- ❑ Finding: Cost-share varies, but program peak-kW minimums and hours of use assumptions are reasonable.

SMALL BUSINESS DIRECT INSTALL



- ❑ Recommendation: Consider leveraging a more turnkey contractor model.
 - Shown to improve \$/kWh and improve overall quality control.
 - Caveat: conflicts with strategic emphasis on deep savings.
- ❑ Recommendation: Develop a 0% cost-share model pilot to see if economic dynamics make it worth it.
 - Has been successful in CA and is being piloted by Con Edison.
- ❑ Recommendation: Investigate subcontractor attitudes towards measure prices as part of process evaluation.

Thematic Results

THEMATIC RESULTS



- ❑ Cost efficiency needs improvement
- ❑ Too dependent on fleeting CFL savings
- ❑ Too little marketing and outreach
- ❑ Evaluation needs to be elevated
- ❑ Incentives commonly too high
- ❑ Budgeting and accounting needs standardizing for accountability
 - Program-specific marketing/eval budgets
 - Narrow the definition of “incentive” spending

CONTACTS



Thank you!

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Program-by-Program Results Snapshots

RESIDENTIAL EXISTING HOMES



Residential Existing Homes								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$3.51	\$12,193	\$29.42	764	0.2	137	\$/kWh	\$1.50
Percentile	17%	22%	9%	50%	64%	67%	\$/therm	\$13.50
Conclusions								
<ul style="list-style-type: none"> • On an unadjusted basis and compared only with those programs that follow the ENERGY STAR model, the NJCEP Residential Existing Homes program had \$/kWh costs among the highest in the country. • The incentive levels offered by the program are 20%-40% higher than other similar programs. • The program's loan buy-down component is part of the program budget, which is atypical. If the program budgeted these funds separately, it would improve program \$/kWh by roughly 20%. • If the program reduced the incentives to a more average level and budgeted loans separately, the program's \$/kWh costs would align to the median among programs in the benchmarking sample. • The program approach and delivery mechanisms are generally in line with those of similar programs across the country. • Other programs more typically offer measure-specific rebates as opposed to lump incentives. • Other programs perform inspections at a significantly lower rate than NJCEP. 								
Recommendations								
<ul style="list-style-type: none"> • R7: Reduce incentive levels by 20%-40% to better align with industry average. • R8: Consider converting to a measure-specific rebate approach, which is more common and ties rebates to savings more directly. • R9: Budget program loans separately in program accounting (i.e., as if a separate program) in order to track program performance more directly. • R10: Consider reducing inspections by as much as half in order to reduce costs. 								

RESIDENTIAL NEW CONSTR.



Residential New Construction								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$2.47	\$1,316	\$8.88	823	1.5	153	\$/kWh	\$1.00
Percentile	14%	73%	23%	0%	100%	50%	\$/therm	\$4.00
Conclusions								
<ul style="list-style-type: none"> • Program performance degraded significantly from 2011 to 2012. Most ENERGY STAR New Homes (ESNH) programs experienced an increase in \$/kWh during that time, as a consequence of increasing ENERGY STAR standards that had higher costs. However, NJCEP's program \$/kWh increased approximately 150%, roughly three times the nationwide average increase. • ESNH programs nationwide are grappling with how to incentivize and claim savings associated with unregulated loads (i.e., those not covered by the energy code such as lighting, appliances, and plug loads) in order to counteract the diminishing and increasingly expensive savings offered by regulated loads (i.e., those covered by the energy code). • The NJCEP ESNH program incentives are higher and less targeted, by and large, than nationwide counterparts. 								
Recommendations								
<ul style="list-style-type: none"> • R11: Review and consider alternative ESNH models that better incentivize and claim savings from unregulated loads. • R12: Reduce incentive levels to better align with industry average. The specific reductions will vary by tier and offering. • R13: Adopt a more targeted incentive approach to align program spending more closely to project savings (e.g., by aligning payments to home size or type, or by including prescriptive requirements that more consistently deliver savings than the ENERGY STAR requirements). 								

RES. GAS AND ELEC. HVAC



Residential Gas and Electric HVAC								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.80	\$1,443	\$3.23	1,644	0.9	407	\$/kWh	\$0.75
Percentile	46%	70%	25%	100%	100%	N/A	\$/therm	\$2.50
Conclusions								
<ul style="list-style-type: none"> • Program performance is overall fairly typical. Although the NJCEP program's performance percentiles for \$/kWh, \$/kW, and \$/therm range widely, the raw data is tightly grouped and the NJCEP values are around the middle of the pack in all instances. Moreover, those programs with significantly better results are in jurisdictions with less rigorous standards for evaluation, suggesting that their performance may be based on dubious assumptions. • The key program assumptions, specifically heating and cooling full load hours, are reasonable, suggesting that savings claims are reasonable as well. • Incentive levels and measure requirements align to industry-wide averages and trends, which suggests that program is well targeted. 								
Recommendations								
<ul style="list-style-type: none"> • R14: Examine application and review processes as well as measure mix as part of upcoming process evaluation to identify any opportunities for improvement. 								

EEP: APPLIANCE RECYCLING



Energy Efficient Products: Appliance Recycling								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.19	\$677	N/A	950	0.2	N/A	\$/kWh	\$0.20
Percentile	50%	87%	N/A	30%	75%	N/A	\$/kW	\$1,000
Conclusions								
<ul style="list-style-type: none"> • The program's performance is around the median on a \$/kWh-basis, with \$/kW somewhat better than average. • Energy savings claims are on the high side, with very high demand savings claims. • Other programs commonly structure the contract to pay less for the second unit picked up at the same location. • There is a lack of consensus in the industry on how to approach the difference between primary and secondary refrigerators, but knowing the percentage of each being picked up can help programs gauge their performance. 								
Recommendations								
<ul style="list-style-type: none"> • R15: Restructure the contract with the implementation firm to pay less for the second unit picked up at a location recycling more than one unit. • R16: Savings claims, in particular the demand (kW) savings, should be revisited during an upcoming evaluation to ensure they are realistic and in line with units being recycled by the program. • R17: Differentiate between primary and secondary units during screening calls or as part of pickup. Down the road, the program could then consider claiming different savings levels based on the type of unit picked up. 								

EEP: APPLIANCE REBATE



Energy Efficient Products: Appliance Rebates								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.16	\$1,141	N/A	N/A	N/A	N/A	\$/kWh	N/A
Percentile	100%	100%	N/A	N/A	N/A	N/A	\$/kW	N/A
Conclusions								
<ul style="list-style-type: none"> The benchmarking data is shown, but should be considered with less confidence than other conclusions. The program was not selected for further review. 								
Recommendations								
<ul style="list-style-type: none"> No recommendations are offered 								

EEP: UPSTREAM LIGHTING



Energy Efficient Products: Upstream Lighting								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.04	\$359	N/A	N/A	N/A	N/A	\$/kWh	\$0.08
Percentile	83%	82%	N/A	N/A	N/A	N/A	\$/kW	\$500
Conclusions								
<ul style="list-style-type: none"> • The program performance appears strong (\$/kWh was in the top quartile). However, upstream lighting programs' \$/kWh depends heavily on savings-per-unit because program delivery is low cost and fairly straightforward. Thus, strong \$/kWh performance tend to correlate exaggerated savings claims, as opposed to operational excellence. • Key NJCEP savings assumptions come from studies that are many years old. • Programs nationwide are struggling with the erosion of the incandescent baseline and are looking for ways to continue to promote and claim savings from CFLs. • Programs nationwide are ramping up LED promotions. • Free ridership in point-of-sale programs is high, and NJCEP does not take it into consideration. 								
Recommendations								
<ul style="list-style-type: none"> • R18: Accelerate promotion of LEDs. • R19: Consider creative ways to retain CFLs through targeted promotions, in particular a geographically targeted approach. • R20: Commission a new residential lighting study to update hours-of-use and CFL penetration estimates to develop a mixed baseline for accurate savings estimates. • R21: Perform regular impact evaluations that include FR and apply an appropriate net-to-gross estimate to program savings. 								

COMMERCIAL NEW CONSTR.



Commercial New Construction								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.18	\$621	\$1.79	116,505	34.6	12031	\$/kWh	\$0.15
Percentile	75%	83%	50%	47%	75%	N/A	\$/therm	\$2.00
Conclusions								
<ul style="list-style-type: none"> • The program has operational characteristics similar to the analogous retrofit program and is a comparatively small program. • The program appears to be performing well, with both the \$/kWh and \$/kW values in the top quartile with meaningful comparison samples (both samples greater than twenty data points). • The program was not slated for further review following the initial benchmark. 								
Recommendations								
<ul style="list-style-type: none"> • No recommendations are offered. 								

COMMERCIAL RETROFIT



Commercial Retrofit								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.19	\$623	\$0.70	48,775	14.6	12933	\$/kWh	\$0.20
Percentile	45%	70%	84%	20%	50%	N/A	\$/therm	\$1.00
Conclusions								
<ul style="list-style-type: none"> • The program appears to be a solid to strong performer, with some variability in key metrics. The \$/savings metrics have generally been in the top quartile the last few years, the most notable exception being the 2012 \$/kWh figure which came in at the median. • The savings/participant values are somewhat low, but this may be more attributable to portfolio construction (specifically the pay-for-performance program) and not a fault of the Commercial Retrofit program specifically. • Overall, savings assumptions are reasonable, though lighting assumptions may be leading to underestimated savings while HVAC assumptions may be leading to overestimated savings. • Incentive levels are in line with comparable programs. • NJCEP's inspection rates are the highest among programs that ERS interviewed. 								
Recommendations								
<ul style="list-style-type: none"> • R22: Revise key savings assumptions as part of any upcoming evaluation. • R23: Consider reducing inspection rates to roughly half their current levels. 								

P4P NEW CONSTRUCTION



Pay-for-Performance (P4P): New Construction								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.72	\$837	\$0.34	452,431	389.0	9598	\$/kWh	\$0.25
Percentile	0%	92%	100%	67%	100%	N/A	\$/therm	\$0.75
Conclusions								
<ul style="list-style-type: none"> • Program incentives are much higher than peer programs. • The \$/square-foot approach to incentives is abnormal, with most peer programs utilizing a \$/savings approach to incentives. 								
Recommendations								
<ul style="list-style-type: none"> • R24: Reduce incentive levels by roughly one half to better align with industry averages. • R25: Convert the incentive approach to \$/savings (as opposed to the current \$/square-foot approach). 								

P4P RETROFIT



Pay-for-Performance (P4P): Retrofit								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.33	\$1,249	\$2.08	324,486	85.8	3284	\$/kWh	\$0.30
Percentile	4%	57%	46%	86%	86%	N/A	\$/therm	\$3.00
Conclusions								
<ul style="list-style-type: none"> The program's \$/savings are high compared to other non-prescriptive programs, but so are the savings/participant. This should be expected of a deep savings program that goes beyond the low hanging fruit. This is a unique program, with no true comparables in the comparison set. 								
Recommendations								
<ul style="list-style-type: none"> No recommendations are offered. 								

SMALL BIZ DIRECT INSTALL



Small Business Direct Install (SBDI)								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.50	\$2,173	N/A	28,094	6.5	N/A	\$/kWh	\$0.45
Percentile	15%	52%	N/A	88%	100%	N/A	\$/kW	\$2,000
Conclusions								
<ul style="list-style-type: none"> • The program is relatively expensive among its peers on a \$/kWh basis, but also achieves higher average savings/participant. • NJCEP’s program is unique in its emphasis on HVAC-related measures, which is a strategic choice that does lead to the higher average \$/kWh and deeper savings mentioned above. • Key program parameters – cost-share and peak kW maximum – are reasonable and in line with industry standard practice, though other PAs are trying new approaches that may be worth a look. • The NJCEP assumed hours of use for lighting projects are reasonable. • There is a trend in industry towards greater and greater use of turnkey contractor models, which offer greater efficiency in program delivery and greater control by the program. • NJCEP’s inspection rates in line with those of PAs selected for further review. 								
Recommendations								
<ul style="list-style-type: none"> • R26: Examine implementing a 0% cost-share model to increase sales conversion rate and expand participants and market penetration. • R27: Investigate subcontractor attitudes towards measure prices as part of the process evaluation. Greater-than-needed incentives are common in SBDI programs and may be contributing to poor \$/savings results with this program. • R28: Consider re-orienting the contractor model to a turnkey approach, where TRC’s contractors are responsible for projects end to end (i.e., no subcontracting), which reduces costs and increases control and quality. Note that it is challenging to follow this approach while also emphasizing HVAC-related measures; contractors generally do not offer both lighting and HVAC measures. 								

CHP AND FUEL CELLS



Combined Heat and Power (CHP) and Fuel Cells								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Percentile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conclusions								
<ul style="list-style-type: none"> • The program has suffered through years of instability arising from circumstances beyond the program’s control. • The nature of the CHP program comparison sample – few programs, often bundled, few projects per cycle, etc. – did not lend itself to benchmarking. Moreover, NJCEP experienced fewer than ten projects per year for the years in question, which leads to high variability. Consequently, the program was benchmarked on a very limited basis. • The program’s incentive levels are somewhat higher on a per-kW basis than comparison programs for the smaller scale projects (i.e., <1 MW). • The incentive structure is complex and likely confusing to potential participants. • The project intake process, including sizing evaluation and technology filtering, follow industry standard practices, but potentially more effective alternatives exist. • NJCEP’s post-installation performance period and associated requirements are somewhat limited in comparison to other programs. For example, the performance period is shorter (only 1 year) than most and does not include any recommissioning requirements. 								
Recommendations								
<ul style="list-style-type: none"> • R29: Reboot the program, both the offerings and the approach. The following recommendations feed into this reboot. • R30: Use the process evaluation to identify demand-side/perception factors that are impeding participation. • R31: Simplify, harmonize, and consolidate the incentive system. • R32: Consider using an “exploding” incentive rate (i.e., one that has a scheduled decline in incentive rate over a period of years) to signal a long-term commitment and to motivate projects today. • R33: Consider adopting NYSERDA’s alternative approaches to sizing evaluation and technology approval. • R34: Reexamine M&V and performance payment structure and levels as part of the upcoming process evaluation, with an eye towards expanding performance data collection and including recommissioning requirements. 								

LARGE ENERGY USERS



Large Energy Users								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	\$0.66	\$4,308	\$0.37	N/A	N/A	N/A	\$/kWh	\$0.30/kWh
Percentile	19%	24%	88%	N/A	N/A	N/A	\$/therm	\$1/therm
Conclusions								
<ul style="list-style-type: none"> • The NJCEP LEU is more expensive than other industrially focused programs on a \$/savings basis as well as more expensive than NJCEP nonresidential alternatives. • The incentive rates are very high for \$/kWh ad \$/therm incentives. • The program reports a challenge of recruiting new members. 								
Recommendations								
<ul style="list-style-type: none"> • R35: Reduce the incentives by about half. • R36: Consider developing an outreach model to expand participation and tap into the deep savings potential of the industrial sector. 								

LOCAL GOV. ENERGY AUDIT



Local Government Energy Audit								
Benchmarking Results							Proposed Target Metrics	
Category	\$/kWh	\$/kW	\$/therm	kWh/part.	kW/part.	Therm/part.	Metric	Value
Value	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Percentile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Conclusions								
<ul style="list-style-type: none"> • The LGEA program did not receive a benchmarking analysis or further review • It is atypical for a PA to offer only a targeted audit program 								
Recommendations								
<ul style="list-style-type: none"> • R37: Explore the appetite for audit programs within NJ as part of the process evaluation. 								