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DCEO
Energy Efficiency and Demand Response Evaluation PY3 Results Presentation to SAG

Navigant with Subcontractors Itron, Inc., Opinion Dynamics, and Michaels Engineering

Itron

ODC OPINION DYNAMICS CORPORATION

Michaels engineering

February 28, 2012 Corrected

Table of Contents

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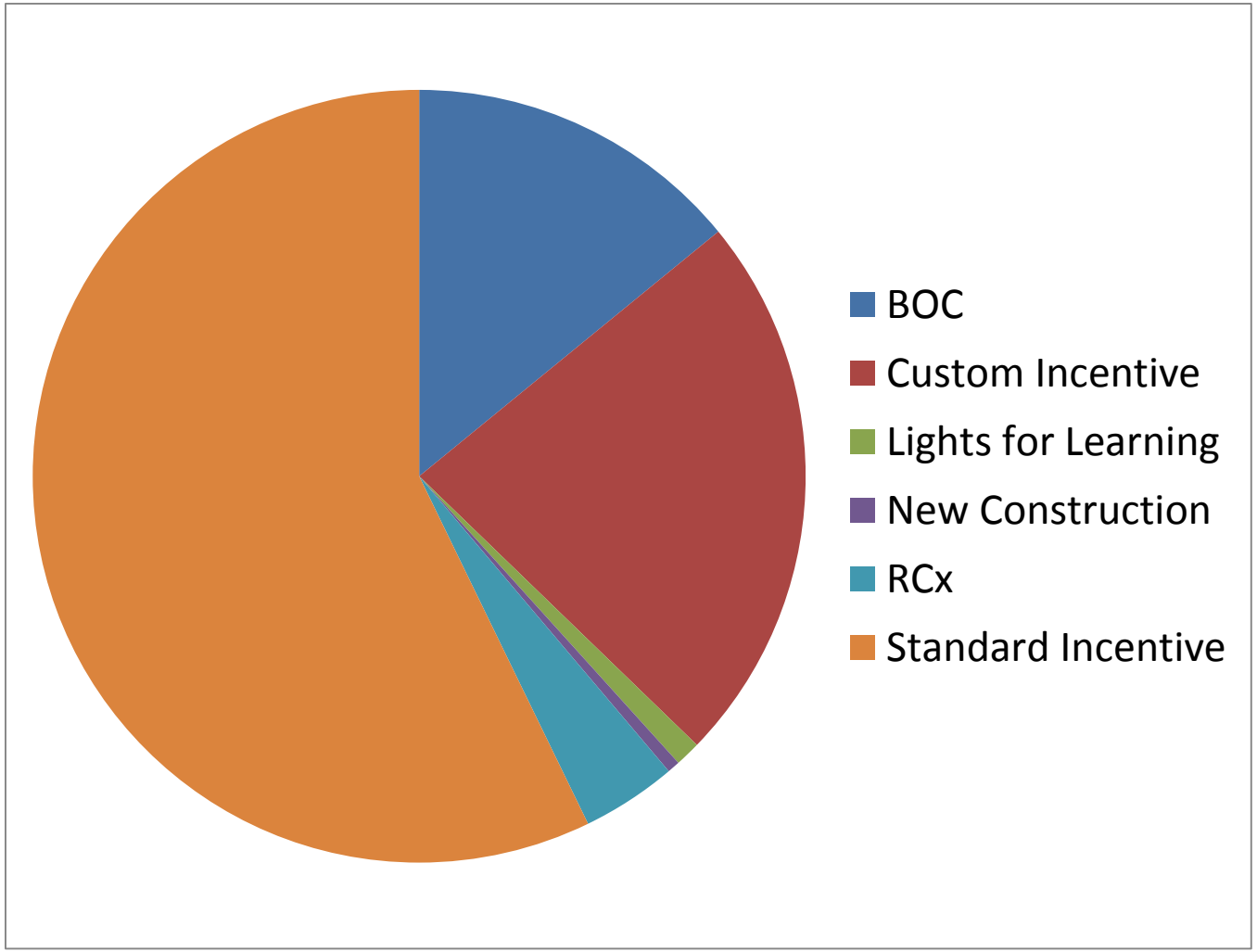
Public Sector Net Savings



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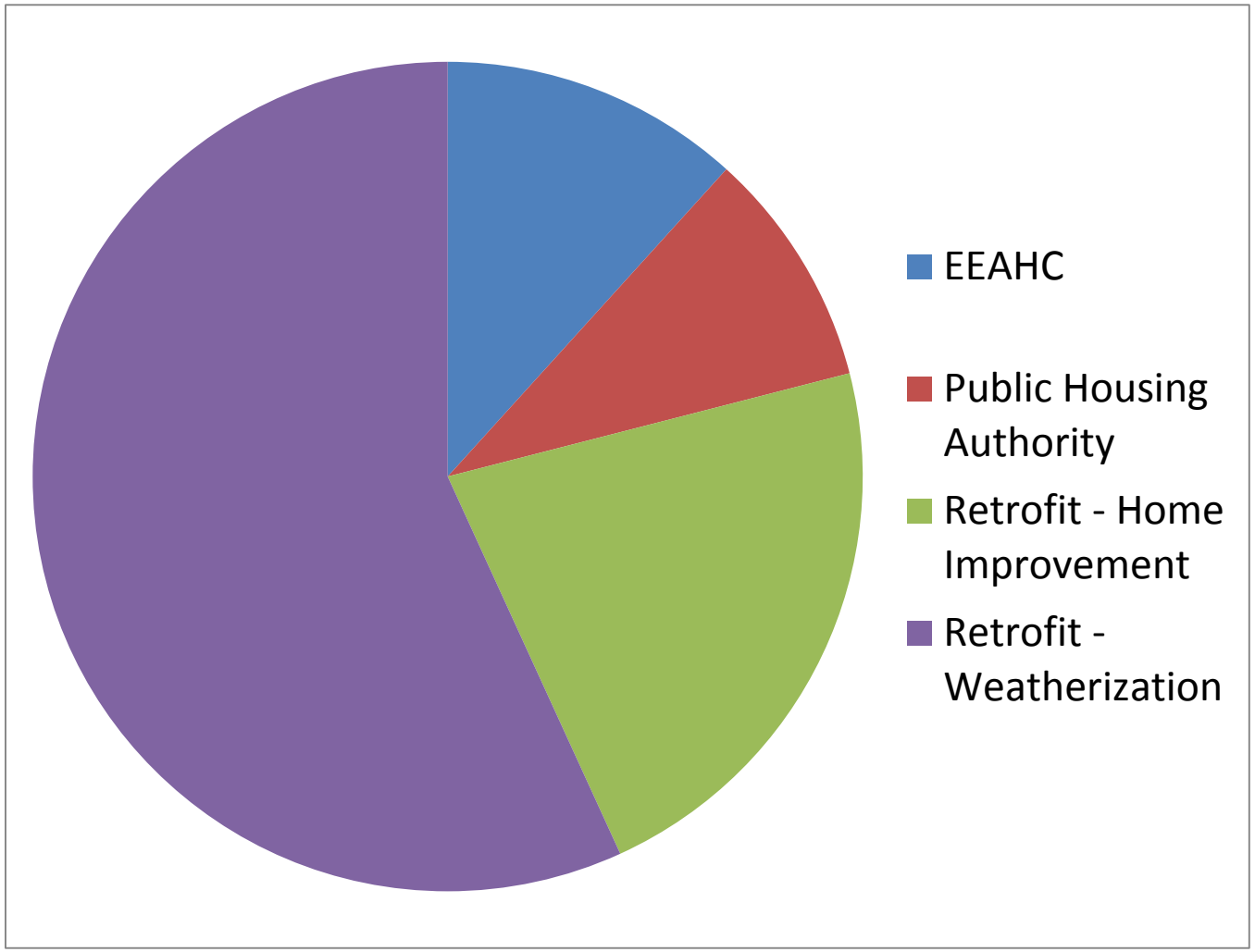
Low Income Net Savings



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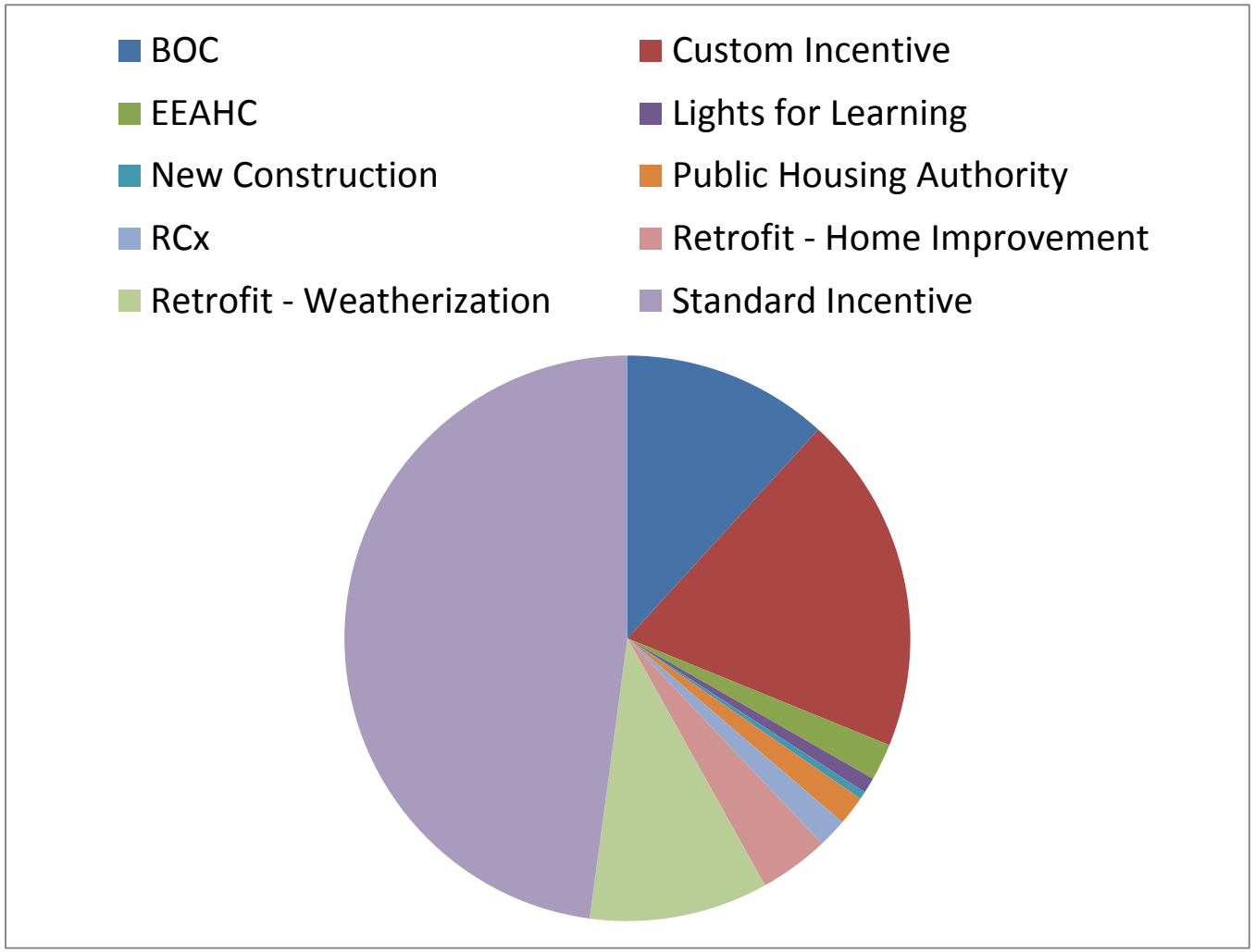
Portfolio Net Savings



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Portfolio Net Savings

Program	Ex Post Net MWh	% of Total
Standard Incentive	38,237	47%
Custom Incentive	15,477	19%
RCx	2,658	3%
New Construction	351	0%
BOC	8,879	11%
Lights for Learning	709	1%
Public Sector Total	**66,311**	**82%**
Retrofit - Home Improvement	3,184	4%
Retrofit - Weatherization	8,157	10%
EEAHC	1,682	2%
Public Housing Authority	1,331	2%
Low Income Total	**14,354**	**18%**
Total	**80,665**	**100%**

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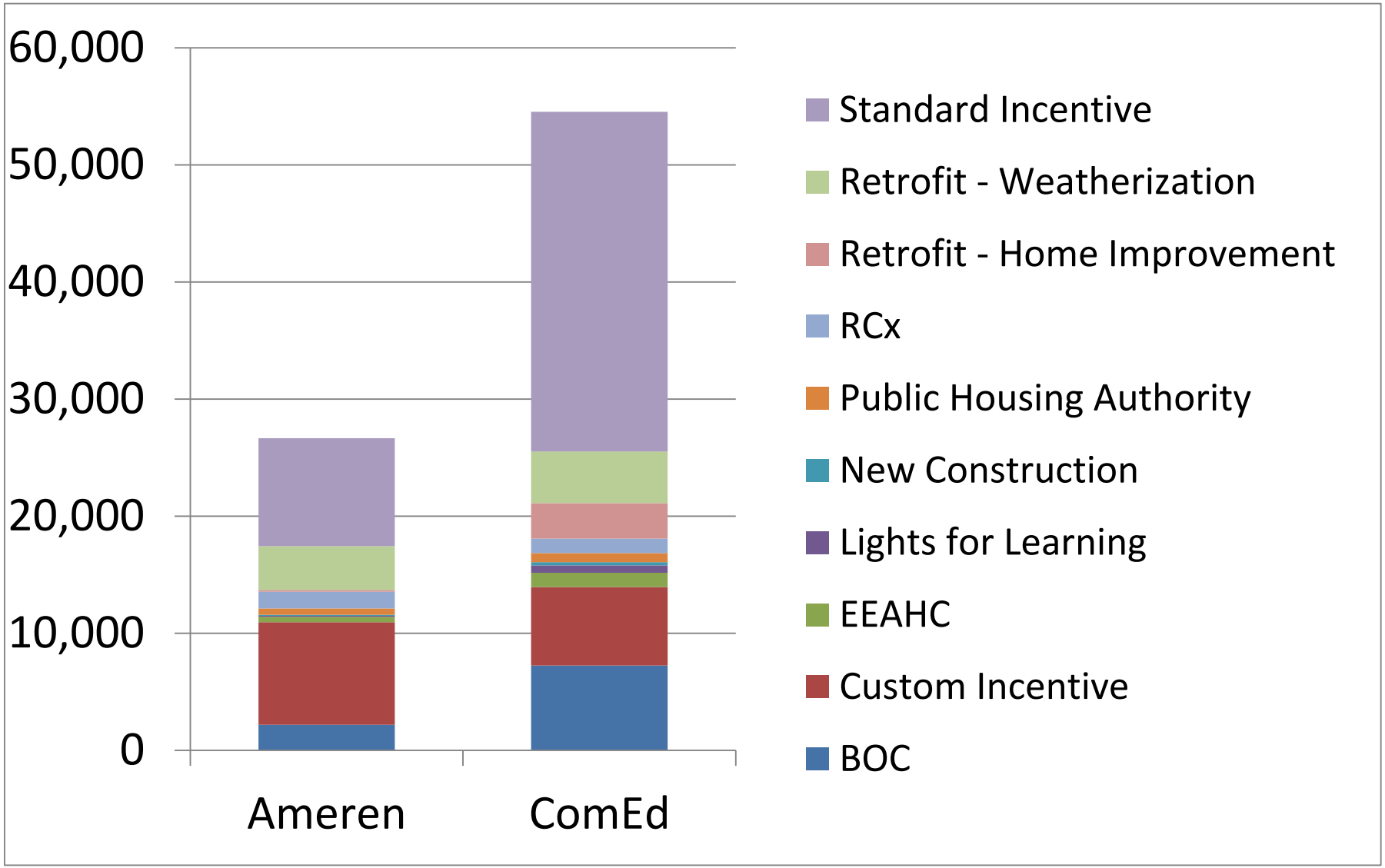
Net Savings by Utility and Program



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Public Sector
Program Specific Results

Public Sector Standard Incentive Program - Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	12,933	14,064	1.09	9,220	0.66
ComEd	40,702	44,264	1.09	29,017	0.66
Total	53,635	58,329	1.09	38,237	0.66

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Public Sector Standard Incentive Program - Results

- Factors that increased the realization rate included K-12 schools and some office buildings with longer hours of use than the default.
- Factors that lowered realization rates on individual projects were adjustments to quantities installed, and adjustments to savings based on installed and baseline equipment performance relative to default assumptions, and lower hours of use than default values.
- The primary difference in overall net-to-gross ratios between PY2 and PY3 was that larger PY3 projects had lower NTG ratios than in PY2. In PY3, some large projects had quite low NTG ratios, and a substantial fraction had results in the 0.60 to 0.65 range.
- DCEO was quite accurate on measure counts in general but some errors contributed to the realization rate movement.
- Some adjustments were made when actual baseline equipment varied from the assumed default baseline.

Public Sector Standard Incentive Program - Results

- Larger PY3 projects had substantially lower NTG ratios than in PY2
- A customer with a high free-ridership score typically has made a decision and committed funds to an efficiency project prior to learning about the DCEO program, and would have been quite likely to implement the exact same measures at the exact same time (or within a year) had the DCEO program not been available.
- One factor that accounts for the lower NTG ratio was that LED traffic signal projects tended to have a NTG ratio lower than the mean value of 0.66, and traffics signals were a large proportion of PY3 savings and sampled projects.
- In PY3, a pilot effort within the Standard program evaluation was made to quantify energy savings implemented as a result of technical services provided by the Smart Energy Design Assistance Center (SEDAC) through the Smart Energy Design Assistance Program (SEDAP).
- Participants are very satisfied with the Standard Program.

Public Sector Custom Incentive Program - Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	15,216	11,840	0.78	8,774	0.74
ComEd	11,623	9,045	0.78	6,703	0.74
Total	**26,839**	**20,885**	**0.78**	**15,477**	**0.74**

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Public Sector Custom Incentive Program - Results

- Realization rate changes came from
  - Measures not operational upon inspection
  - Program estimated annual energy savings were not representative of the typical annual operating conditions
  - program calculations were also not normalized to account for changes in operating conditions
- Free ridership at 26% is somewhat low for a Custom program.
- DCEO has continued to leverage partnerships with organizations such as the Illinois Association of Regional Councils and the Illinois State Board of Education.
- DCEO continued to make use of the utilities' and SEDAC's existing trade ally networks
- Participants are very satisfied with the Standard Program.

Public Sector New Construction Program

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	628	165	0.26	82	0.50
ComEd	344	537	1.56	269	0.50
Total	**971**	**702**	**0.72**	**351**	**0.50**

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Public Sector New Construction Program – Results

- There were four completed projects through the PY2 and PY3 program.
- The changes in ex post gross were mainly due to two projects in which a combination of one or more of the following were present:
  - 1) efficiency measures required by code were awarded incentives;
  - 2) the operation of the facility was not accurately represented in the energy model calculations
  - 3) the energy model submitted by contractors or vendors was not consistent with the modeling approaches given in ASHRAE 90.1 Appendix G.

Public Sector New Construction Program – Results

- NTG of 0.5 Cause: two customers stating that the program had no influence on the energy efficiency choices made on their projects. Both of these customers stated that the designs of their respective projects were set before they knew about the program; and, in one case, construction was already complete.
- Overall participant satisfaction with program processes was mixed. While all participants appreciated the program incentives and found the application process "straightforward", some found the documentation process required to receive the incentives difficult.

Public Sector Retrocommissioning Program – Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	1,921	1,443	0.75	1,415	0.98
ComEd	1,492	1,269	0.85	1,243	0.98
Total	**3,412**	**2,712**	**0.80**	**2,658**	**0.98**

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Public Sector Retrocommissioning Program – Results

- Program Year 3 represents the first year with completed retro-commissioning projects for the Program. A total of nine sites encompassing twelve buildings participated in the program. About fifty measures were implemented among those sites.
- RR of 77.9 causes: infrequent errors in engineering calculations and inaccurate assumptions that affect those estimates. No supporting calculations or insufficiently documented savings estimates.
- Free-Ridership with this program is very low. Budget constraints for public agencies limit the sort of investigation and effort that facility maintenance staff can dedicate to building tune-ups and retro-commissioning.

Public Sector Retrocommissioning Program – Results

- The program was successful during its first year of operation, incorporating many lessons learned from the utility programs upon which it was built.
- Participants report very high satisfaction with the program and their providers

Building Operator Certification Program – Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	NA	4,613	NA	2,049	0.44
ComEd	NA	15,376	NA	6,830	0.44
Total	**NA**	**19,989**	**NA**	**8,879**	**0.44**

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Building Operator Certification Program – Results

- Compared to similar programs, per participant and per square foot kilowatt-hour and kilowatt savings are high, but therm savings are low. This may be due to regional differences in common fuel types.
- Operations and maintenance (O&M) improvements accounted for 33% of net kWh savings
- Participant satisfaction with the course was high

Lights for Learning Program - Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR	Ex Post Net MWh	NTGR (on Ex Post Gross)
Ameren	112	96	0.85	77	0.80
ComEd	922	791	0.86	633	0.80
Total	1,035	887	0.86	709	0.80

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Lights for Learning Program - Results

Products Sold or Distributed

Units	DCEO-EEPS	DCEO Non-EEPS
CFL units purchased	21,095	2,217
LED units purchased	4,893	513
Subtotal, for Impact Evaluation	25,988	2,830
Combined Subtotal for Impact Evaluation	28,818	
Energy efficiency products purchased	62	
Units Distributed as Samples/Outreach	385	
Total all units Purchased and Distributed	29,265	

Source: Applied Proactive Technologies, Inc., Lights for Learning™ Year End Report (July 1, 2010 to May 31, 2011), September 16, 2011

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Lights for Learning Program - Results

Participation and Proceeds

Performance Indicator	DCEO EEPS	DCEO Non-EEPS	Total Program
School Presentations	219	7	226
Participating Students	2,528	83	2,611
Participating Schools	158	9	167
Number of Fundraisers	168	8	176
Proceeds	$42,157.05	$4,643.70	$46,800.75

Source: Applied Proactive Technologies, Inc., Lights for Learning™ Year End Report (July 1, 2010 to May 31, 2011), September 16, 2011.

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Lights for Learning Program - Results

- Recommendation: Update gross energy savings planning assumptions consistent with the ComEd Residential Lighting Evaluation Report.
- Customers reported high satisfaction with the program staff and product offerings.
- Consider integrating a brief customer survey as part of the ordering or delivery process, while purchasers are still engaged in the program and more likely to provide feedback.

Low Income
Program Specific Results

Low Income Residential Retrofit Energy Efficiency Program - Impacts

Program	Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR
Weatherization	Ameren	2,797	3,738	1.34
Weatherization	ComEd	2,980	4,419	1.48
Weatherization	**Total**	**5,777**	**8,157**	**1.41**
Home Improvement	Ameren	121	165	1.36
Home Improvement	ComEd	2,040	3,019	1.48
Home Improvement	**Total**	**2,161**	**3,184**	**1.47**

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Low Income Residential Retrofit Energy Efficiency Program - Results

- The evaluation team recommends that saving estimates from refrigerators and lighting be adjusted due to EM&V evaluation studies that provide more accurate saving estimates.
- All other measure savings estimates remain the same as last year as the estimates continue to be reasonable when compared to other authoritative sources.
- EM&V evaluation of the ComEd Appliance Recycling program revealed that the refrigerator stock has a higher energy use than was estimated in the previous LI Retrofit evaluations.

Low Income Residential Retrofit Energy Efficiency Program - Results

- The partners are very satisfied with the application process and interactions with the program staff.
- The program's implementation strategy meets many of the industry best practices for low-income programs.
- By adding funding to existing programs, DCEO is able to achieve large energy savings with low administrative costs by leveraging existing infrastructure.

Energy Efficiency Affordable Housing Construction - Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR
Ameren	242	462	1.90
ComEd	1,316	1,221	0.93
Total	**1,559**	**1,682**	**1.08**

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Energy Efficiency Affordable Housing Construction - Results

Program Year	Expected * Funded Units	Actual Funded Units^	Annual Accomplish-ments Versus Expectations	Cumulative Accomplish-ments Versus Expectations
PY1	652	753	+101	+101
PY2	1,087	1,328	+241	+342
PY3	1,957	1,708	-249	+93

**Source: pdf file submitted to EM&V Team: 'Template - Low Income new construction and gut rehab.pdf"*
^Source: Excel file submitted to EM&V Team: 'PY3 - FundedProjects.xls'

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Energy Efficiency Affordable Housing Construction - Results

- Recommended that ex-post impacts associated with AC, HP and building envelope measures be developed using data regarding the specific equipment type, efficiency, building envelope specifications, building type, location and applicable building code.
- The program is doing well in terms of marketing and participation.
- Builders have a very favorable view of the program overall. They are very appreciative of the funding and technical support. They find the application process and requirements for eligibility very clear. Builders were also happy that the DCEO program focuses on high rate-of-return measures.

Public Housing Authority – Impacts

Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR
Ameren	563	555	0.99
ComEd	767	776	1.01
Total	**1,330**	**1,331**	**1.00**

Public Housing Authority - Results

- Impact Adjustments
  - CFL Hours of use – ComEd Residential Lighting logger study at 2.57 vs. program value of 3.0.
  - EM&V 3.4 Washer cycles/day vs. program 2.2
- The partners are very satisfied with the application process and interactions with the program staff.
- The program's implementation strategy meets the industry best practices for low-income programs.

Total Portfolio - Impacts

Program	Utility	Ex Ante Gross MWh	Ex Post Gross MWh	MWh RR
Total Public Sector	Ameren	30,809	32,222	1.05
Total Public Sector	ComEd	55,083	71,282	1.29
Total Public Sector	Total	85,891	103,504	1.21
Total Low Income	Ameren	3,723	4,920	1.32
Total Low Income	ComEd	7,103	9,435	1.33
Total Low Income	Total	10,827	14,354	1.33
Total	Ameren	34,532	37,141	1.08
Total	ComEd	62,186	80,717	1.30
Total	Total	96,718	117,858	1.22

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