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DCEO Program Year 2 Evaluation Results

Presentation to SAG

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DISPUTES & INVESTIGATIONS • ECONOMICS • FINANCIAL ADVISORY • MANAGEMENT CONSULTING

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Programs Evaluated

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Section 2
High Level Results

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Impact Results

	Ex Ante Gross MWh			Ex Post Gross MWh		
	ComEd	Ameren	Total	ComEd	Ameren	Total
Low Income Retrofit (Home Weatherization)	5,475	2,939	8,414	5,475	2,939	8,414
Low Income Retrofit (Home Improvement)	461	205	666	461	205	666
EEAHC	879	164	1,043	1,484	505	1,989
Lights for Learning			956	771	175	946
Standard Incentive	21,084	9,650	30,733	26,727	12,232	38,960
Custom Incentive	16,135	21,713	37,848	9,104	12,252	21,356
Total	44,034	34,671	78,704	44,023	28,308	72,331

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Section 3
Program-Specific Results

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Energy Efficient Affordable Housing Construction

Evaluation Methods

- review of verification and due diligence procedures
- review of tracking systems and quality control
- review of ex-ante impact assumptions
- evaluation of program processes, implementation issues and concerns

Energy Efficient Affordable Housing Construction

Program Year	Expected Funded Units	Actual Funded Units
PY1	652	753
PY2	1,087	1,328
PY3	1,957	N/A

Energy Efficient Affordable Housing Construction

	Total Units	Units PY2	Ex-Ante kWh	Ex-Ante kW	Ex-Post kWh	Ex-Post kW
ComEd	451	417	878,619	555	1,484,126	346
Realization Rate					169%	62%
Ameren	101	78	164,346	103.7	504,538	98.2
Realization Rate					306%	95%
Total	552	495	1,042,965	658.7	1,988,664	444.2
Realization Rate					191%	67%

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Energy Efficient Affordable Housing Construction

	Ex-Ante (Single and Multi-Family)		Recommended Ex-Ante	
Program Measures	**kWh/ unit**	**kW/unit**	**kWh/unit**	**kW/unit**
6 interior fluorescent fixtures & 2 exterior fluorescent fixtures	788	0.09	788	0.09
90% AFUE furnace with efficient air handler	400	0.05	400	0.05
Energy Star rated bathroom exhaust fan	89	0.01	89	0.01
Energy Star refrigerator	95	0.01	95	0.01
Energy Star dishwasher	33	0.01	33	0.01
Energy Star clothes washer	-	-	23	-
Energy Star ceiling fan with lighting (per unit)	-	-	54	0.01
Total Unit Savings	1,405	0.17	1,482	0.18

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Verification, Due Diligence and Tracking System Review

- There were no major changes to verification procedures or program tracking implemented during PY2.
- A new program tracking system is currently under construction and is expected to address many of the following issues concerning documentation and record keeping.
- On-site verification of installed measures is regularly performed by program staff, but is not always recorded. Verification activity with a positive outcome is not documented, while negative outcomes are noted in letters that are stored in files.

Low Income Residential Retrofit Energy Efficiency

Evaluation Methods

- Algorithm review to verify reasonable assumptions and methods were used for assigning ex-ante gross kWh and kW savings per measure.
  - verification of the mathematical soundness of the savings calculations for each measure
  - The reasonableness of the calculation was assessed.
- For PY2 DCEO used the calculation methods suggested in the PY1 evaluation.
- Additional sources examined by EM&V to verify reasonableness:
  - The most current California Database for Energy Efficiency Resources (DEER) reports
  - Efficiency Vermont's Technical Reference User Manual
  - Navigant's own measure studies.

Low Income Residential Retrofit Energy Efficiency

	Measure	Ex Ante kWh per unit	Verified kWh per unit	Difference
1	Energy Star Refrigerator	550	550	0
2a	CFL Installation	38.25	38.25	0
2b	Energy Star Advanced Lighting Package	54.8	54.8	0
3	Energy Star rated bathroom exhaust fan	89	89	0
4a	SEER 16 replacement central air conditioner w/ programmable thermostat	1,287	1,287	0
4b	SEER 14 new central air conditioner w/ programmable thermostat	240	240	0
5	Energy Star rated room air conditioner	176	176	0
6	90% AFUE furnace with efficient air handler	400	400	0
7	Energy Star Dishwasher	62	62	0
8	Reduce required AC tonnage as a result of thermal envelope improvements	216	216	0
9	Ceiling Fan	88	88	0

Low Income Residential Retrofit Energy Efficiency

Weatherization Gross Savings

	Ex Ante			Ex Post		
Measure	**kWh/ Unit**	**Units**	**Total MWh**	**kWh/ Unit**	**Units**	**Total MWh**
Energy Star Refrigerator	550	3,108	1,709	550	3,108	1,709
CFL Installation	38.25	173,595	6,640	38.25	173,595	6,640
Energy Star Bathroom Exhaust Fan	89	729	65	89	729	65
Total			**8,414**			**8,414**

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Low Income Residential Retrofit Energy Efficiency

Home Improvement Program Gross Savings

Total	Ex Ante			Ex Post		
Measure	kWh/ Unit	Units	Total MWH	kWh/ Unit	Units	Total MWH
Energy Star Refrigerator	550	617	339	550	512	339
Energy Star Fixture	54.80	1,717	94	54.80	979	94
Energy Star Bathroom Exhaust Fan	89	155	14	89	38	14
Energy Star Dishwasher	62	73	5	62	51	5
SEER 14 Central AC with programmable thermostat (new installation)	240	64	15	240	9	15
Energy Star Room AC	176	152	27	176	139	27
Reduce required tonnage as a result of thermal envelope improvements	216	282	61	216	133	61
90% AFUE furnace with EE air handler	400	108	43	400	41	43
CFL Installation	38.25	984	38	38.25	805	38
Ceiling Fan	88	346	30	88	193	30
TOTAL			666			666

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Low Income Residential Retrofit Energy Efficiency

Key Impact Findings

- Most of the measure-specific ex ante gross savings estimates were reasonable when compared to other authoritative sources.
- The Weatherization ex ante gross savings were the same as the ex post gross savings. The Home Improvement ex ante gross savings were the same as the ex post gross saving for energy savings.

Low Income Residential Retrofit Energy Efficiency

Key Process Findings

- Implemented a strategy that aligns with best practices by partnering with multiple existing entities already serving the low-income sector
- Included a full menu of household energy efficiency improvements
- Enabled more low-income qualified customers to receive energy efficiency upgrades
- Captured more opportunities for saving energy for the low-income sector.
- The program did not always provide incentives or contracts in a timely manner nor communicate the status of funding and contracts well with outside partners;
- The program has a lack of consistency and transparency in its data tracking, record keeping and reporting documentation. The new program tracking database should help.

Lights for Learning

Evaluation Methods

- Review default energy savings assumptions for lighting products
- Quantify gross savings impacts from a review of the program reporting data.
- In-depth interviews with program staff, contract implementers and 10 program participants.
- A review and evaluation of program materials
- Review of tracking database.

Lights for Learning

Gross and Net Parameter and Savings Estimates	DCEO - EEPS	DCEO Non-EEPS
CFL units purchased	20,274	1,791
LED night lights purchased	4,382	263
Subtotal, for Impact Evaluation	24,656	2,054
Energy efficiency products purchased	210	
Units Distributed as Samples	686	
Total all units Purchased and Distributed	27,606	
First-Year Gross MWh and Coincident MW Savings		
DCEO reported Gross MWh Savings (ex ante)	956	86
Evaluation-Adjusted Gross MWh Savings (ex post)	946	85
Realization Rate on MWh	99%	99%
Program Reported Gross Coincident MW savings (ex ante)	0.086	0.008
Evaluation Adjusted Gross Coincident MW savings (ex post)	0.085	0.008
First-Year Net MWh and Coincident MW Savings from Evaluation-Adjusted Gross Savings		
Net-to-Gross Ratio (80% for PY1) (Planned)	80%	80%
Net MWh Savings	757	68
Net Coincident MW Savings	0.07	0.006

Lights for Learning

Key Impact Findings

- For PY2 reporting of energy and peak demand impacts, DCEO implemented the default savings assumptions recommended in the PY1 Lights for Learning impact evaluation report for delta watts, hours of use, mean coincident load factor, and indoor HVAC interaction factor.
- The evaluation team made no modifications to these gross impact parameters between PY1 and PY2, except that the delta watts for baseline to efficient product conversion for each product type was taken from the ComEd PY2 Residential Lighting evaluation report where possible.
- The evaluation team made no adjustments to the number of units purchased reported by the program.
- Installation rate and net adjustments may be warranted in the future.

Lights for Learning

Key Process Findings

- The program sold fewer products than in PY1 but fundraiser proceeds increased by 31%.
- The total number of students participating in fundraisers increased 6% however, the average number of students participating per school decreased.
- 10.5% more organized fundraisers than in PY1
- Nearly 19% more schools and organizations participating in fundraisers
- The roles, relationships and operating procedures between the stakeholders, MEEA, APT, and EFI remain unchanged and are operating effectively for the program to meet its goals.

Public Sector Programs

Net Savings Estimates	Standard MWh	Custom MWh	PSEE MWh
DCEO PY2 Plan Target	89,517	10,000	99,517
DCEO Reported for PY2 (ex ante net)	23,357	38,764	52,122
Total PY2 Second-Year Evaluation-Adjusted Net Savings (ex post net)	29,220	13,972	43,191

Public Sector Standard Incentive Program

Evaluation Methods

- Review default energy savings assumptions for measures eligible for the program
- Quantify gross savings impacts from an engineering review of the program reporting data and project documentation and conduct on-site measurement and verification.
- Self-report survey with program participants yields process results, net impacts and spillover potential.
- In-depth interview with the program manager and SEDAC and a participant phone survey.
- Review and evaluation of program materials and the tracking database.

Public Sector Standard Incentive Program

Public Sector	Ex Ante Gross kWh	Ex Post Gross kWh	KWh Realization Rate	Ex Post Net kWh	NTGR (net kWh / ex post gross kWh)
Ameren	9,649,517	12,232,343	1.27	9,174,257	0.75
ComEd	21,083,880	26,727,271	1.27	20,045,453	0.75
Total	**30,733,397**	38,959,615	1.27	29,219,711	0.75

Public Sector Standard Incentive Program

Key Impact Findings

- Standard program participation increased significantly compared to PY1, from 155 projects completed by 105 participants to 286 projects completed by 226 customers
  - Ex ante gross savings more than doubled.
  - Ex ante net savings nearly tripled.
- Realization Rate of 1.27
  - VFDs applied to HVAC fans and pumps → savings>default
  - Verified hours of use from survey and on-sites were higher
- NTG ratio increased from 0.62 to 0.75
- Spillover was relatively small

Public Sector Standard Incentive Program

Key Impact Findings

- Default HVAC equipment, HVAC fan, and VFD impacts should be updated and differ by utility territory.
- For PY2, DCEO expanded contact information for program applicants and this greatly facilitated evaluation team development of the phone survey sample data.
- The evaluation made recommendations for DCEO's new program tracking system and will be reviewing the structure and content of the new system.

Public Sector Standard Incentive Program

Key Process Findings

- **Satisfaction.** Customer satisfaction with various processes and components of the program remains very high, and few participants reported encountering problems during their participation.
- **Contractors.** 71% of PY2 participants used a contractor for their project. Satisfaction with contractors is high. DCEO conducted training and information dissemination activities for trade allies and leveraged the utility and SEDAC networks.

Public Sector Standard Incentive Program

Key Process Findings

- **Marketing and Outreach.** The program heavily leveraged activities by SEDAC, ComEd, and Ameren and cooperation between the various groups facilitates program processes.
  - Marketing activities increased in PY2 with 49 events and meetings touching a total attendance of 3,790.
  - 30% of participants first learned about the program through a contractor, supplier, distributor, or vendor
- **Barriers to Participation.** The usual suspects: awareness, time, financing, budget changes, staffing changes.

Public Sector Custom Incentive Program

Evaluation Methods

- Project-specific On-site visits and M&V file review was completed for a sample of projects (8) to assess the gross impacts
- Self-report survey (15) with program participants yields process results, net impacts and spillover potential.
- In-depth interview with the program manager
- Review and evaluation of program materials and the tracking database.

Public Sector Custom Incentive Program

	Ex Ante Gross	Ex Post Gross	RR	Ex Post Net	NTGR (ex post gross)
Ameren	21,713,058	12,251,827	0.56	8,015,434	0.65
ComEd	16,134,702	9,104,180	0.56	5,956,169	0.65
kWh	37,847,760	21,356,007	0.56	13,971,602	0.65

Public Sector Custom Incentive Program

Key Impact Findings

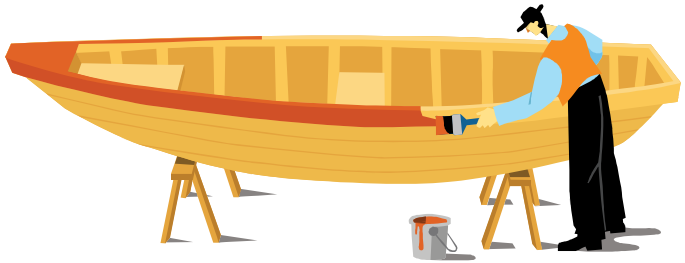
- Improved estimates of operating hours and typical operating conditions would improve the realization rate.
- **Baseline.** Define new equipment as the baseline when the existing equipment being removed has a relatively short remaining useful life or generally requires replacement.
  - The age and operating condition of the existing equipment should be considered before accepting the existing equipment as baseline.
- Free-ridership levels measured are better than expected for a Custom program at roughly 30-40%.

Public Sector Custom Incentive Program

Key Process Findings

- Participation in the Custom Program substantially increased in PY2, with 69 unique organizations completing 82 projects.
- Satisfaction with the Custom Program across various program processes and components remains very high.
- **Contractors.** 67% of PY2 participants used a contractor for their project. Satisfaction with contractors is high. DCEO conducted training and information dissemination activities for trade allies and leveraged the utility and SEDAC networks.
- See Standard Incentive for other findings

Section 4
Questions?



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