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Illinois Department of Commerce and Economic Opportunity Summary Impact Evaluation Report

Electric Program Year (EPY) 7-9 / Gas Program Year (GPY) 4-6 (June 1, 2014 to May 31, 2017)

Presented to
Commonwealth Edison Company (ComEd)
Nicor Gas Company
The Peoples Gas Light and Coke Company
North Shore Gas Company

Final Report

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DCEO Summary Impact Evaluation Report

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1. INTRODUCTION

Sections 8-103 and 8-104 of the Public Utilities Act require annual independent evaluations of Energy Efficiency Plan portfolio measures as well as final review of multi-year plan results. The firm ADM Associates Inc. (ADM) performed independent evaluations of Illinois Department of Commerce and Economic Opportunity (DCEO's) Energy Efficiency Plan (EEP) for 2014-2015 (Electric Program Year 7/Gas Program Year 4) and 2015-2016 (Electric Program Year 8/Gas Program Year 5) but has not evaluated or prepared a final report for 2016-2017 (Electric Program Year 9/Gas Program Year 6) due to the lack of funding appropriation. On March 7, 2018, the Illinois Commerce Commission (ICC) in Docket No. 17-0212 ordered that the independent evaluator(s) selected by ComEd, Ameren Illinois, Nicor Gas, Peoples Gas, and North Shore Gas, shall, with full cooperation of DCEO, perform any remaining evaluation work relating to DCEO's Energy Efficiency Plan for the period June 1, 2014 through May 31, 2017.

This report summarizes the results of the impact evaluations of the DCEO program activities for the EEP 2016-2017 (EPY9/GPY6) program year and provides an abridged summarization of DCEO's key program activities, funds spent, cost-effectiveness, and energy savings, as applicable, for the period June 1, 2014 through May 31, 2017 (EEP 2014-2017). Section 6 (Appendix A) describes the programs offered during EPY7-9/GPY4-6. Section 7 (Appendix B) describes data collection efforts and analysis approach.

The summary results of the energy impacts and program costs are broken out by utility, program, and program year. Navigant produced this report for ComEd, Nicor Gas, Peoples Gas, and North Shore Gas. Results for Ameren Illinois were produced and reported separately by Opinion Dynamics.[1] Summary savings and spending totals for Ameren Illinois were added to this report to create a statewide summary of results. Program-specific results for Ameren Illinois are contained in the Opinion Dynamics report.

[1] Opinion Dynamics, *Illinois Department of Commerce and Economic Opportunity Plan 3 Summary Impact Evaluation Report for Ameren Illinois Company, Final Report*, February 2019.

2. PROGRAM OFFERINGS

Program offerings with reported costs and savings varied across utilities and program years, as summarized in Table 2-1.[2]

Table 2-1. DCEO Program Offerings by Utility and Program Year

Sector	Program	ComEd			Nicor Gas			Peoples Gas			North Shore Gas		
		EPY7	EPY8	EPY9	GPY4	GPY5	GPY6	GPY4	GPY5	GPY6	GPY4	GPY5	GPY6
Public	Custom	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓
Public	Standard	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Public	New Construction	✓		✓	✓		✓			✓			
Public	Retro-Commissioning	✓		✓	✓		✓	✓		✓	✓		✓
Public	Boiler System Efficiency				✓		✓	✓		✓	✓		✓
Public	Savings Through Efficient Products (STEP)	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
Public	Clean Water Custom		✓	✓									
Public	Energy Efficiency Aggregation Custom		✓	✓		✓	✓		✓	✓			✓
Public	Energy Efficiency Aggregation Standard		✓	✓		✓	✓		✓	✓			
Public	Combined Heat and Power			✓			✓						
Public	Free Lights			✓									
Low-Income	Residential Retrofit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low-Income	Weatherization			✓			✓			✓			✓
Low-Income	Affordable New Construction	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Low-Income	Illinois Public Housing Authority	✓		✓	✓		✓	✓		✓	✓		✓
Market Transformation	Energy Assessments (administered by SEDAC)	✓		✓	✓		✓	✓		✓	✓		✓
Market Transformation	Data Centers	✓											
Market Transformation	K-12 Energy Efficiency	✓		✓									
Market Transformation	Building Operator Certification	✓	✓	✓			✓			✓			✓

Source: Navigant review of DCEO reports and tracking data.

Section 6 (Appendix A) describes the design and key activities of each program offered during EPY7-9/GPY4-6.

[2] For Ameren Illinois, see Opinion Dynamics, *Illinois Department of Commerce and Economic Opportunity Plan 3 Summary Impact Evaluation Report for Ameren Illinois Company, Final Report,* February 2019.

3. Summary of Energy Impacts and Program Costs

Table 3-1 presents incremental energy savings achieved during EPY7-9/GPY4-6 from DCEO programs for Illinois utilities compared with savings goals authorized by the Illinois Commerce Commission (ICC).

Table 3-1. Summary of DCEO Energy Impacts

Utility	Program Year	Ex Post Net Savings (kWh, therms)	ICC Authorized Savings Goal (kWh, therms)	% of ICC Savings Goal
ComEd	EPY7	85,124,306	103,113,632	83%
ComEd	EPY8	30,340,597	106,041,145	29%
ComEd	EPY9	171,941,090	111,274,966	155%
ComEd	Subtotal	287,405,993	320,429,743	90%
Ameren (AIC) Electric	EPY7	33,496,606	38,350,983	87%
Ameren (AIC) Electric	EPY8	18,944,618	39,485,849	48%
Ameren (AIC) Electric	EPY9	40,705,535	41,481,630	98%
Ameren (AIC) Electric	Subtotal	93,146,759	119,318,462	78%
Ameren (AIC) Gas	GPY4	824,815	872,983	94%
Ameren (AIC) Gas	GPY5	651,005	912,209	71%
Ameren (AIC) Gas	GPY6	1,667,500	962,759	173%
Ameren (AIC) Gas	Subtotal	3,143,320	2,747,951	114%
Nicor Gas	GPY4	2,086,608	2,715,341	77%
Nicor Gas	GPY5	167,681	2,744,998	6%
Nicor Gas	GPY6	3,930,748	2,749,889	143%
Nicor Gas	Subtotal	6,185,037	8,210,228	75%
Peoples Gas	GPY4	1,698,460	1,337,115	127%
Peoples Gas	GPY5	665,858	1,388,829	48%
Peoples Gas	GPY6	2,165,478	1,435,917	151%
Peoples Gas	Subtotal	4,529,796	4,161,861	109%
North Shore Gas	GPY4	173,093	274,737	63%
North Shore Gas	GPY5	10,992	285,051	4%
North Shore Gas	GPY6	285,181	295,408	97%
North Shore Gas	Subtotal	469,266	855,196	55%
Electric	**Total**	**380,552,752**	**439,748,205**	**87%**
Natural Gas*	**Total**	**14,327,419**	**15,975,236**	**90%**

Source: DCEO reports and tracking data: Navigant analysis for ComEd, Nicor Gas, Peoples Gas, and North Shore Gas, and Opinion Dynamics analysis for Ameren Illinois Companies (AIC). ICC Authorized Savings Goal sourced from DCEO EEPS Plan 2014-17 Ex 1.2: https://www.icc.illinois.gov/downloads/public/edocket/370615.pdf

* Natural gas therms achieved for the gas utilities does not include electric interactive effects penalties.

Table 3-2 presents program costs during EPY7-9/GPY4-6 for the Utilities compared with funds authorized by the Illinois Commerce Commission (ICC).

Table 3-2. Summary of DCEO Program Costs

Utility	Program Year	Portfolio Cost	ICC Authorized Funds	% of ICC Spending Goal
ComEd	EPY7	$32,796,561	$39,250,000	84%
ComEd	EPY8	$11,974,031	$39,675,000	30%
ComEd	EPY9	$53,854,999	$39,850,000	135%
ComEd	Subtotal	$98,625,591	$118,775,000	83%
Ameren (AIC) Electric	EPY7	$11,512,407	$14,896,734	77%
Ameren (AIC) Electric	EPY8	$5,312,109	$15,137,763	35%
Ameren (AIC) Electric	EPY9	$16,465,052	$15,219,781	108%
Ameren (AIC) Electric	Subtotal	$33,289,568	$45,254,278	74%
Ameren (AIC) Gas	GPY4	$3,072,339	$3,885,540	79%
Ameren (AIC) Gas	GPY5	$2,111,019	$3,915,655	54%
Ameren (AIC) Gas	GPY6	$5,328,403	$3,923,603	136%
Ameren (AIC) Gas	Subtotal	$10,511,761	$11,724,798	90%
Nicor Gas	GPY4	$7,944,167	$10,669,057	74%
Nicor Gas	GPY5	$1,779,172	$10,401,000	17%
Nicor Gas	GPY6	$13,774,148	$10,001,000	138%
Nicor Gas	Subtotal	$23,497,487	$31,071,057	76%
Peoples Gas	GPY4	$5,027,989	$6,113,468	82%
Peoples Gas	GPY5	$2,651,595	$6,138,905	43%
Peoples Gas	GPY6	$7,373,857	$6,138,905	120%
Peoples Gas	Subtotal	$15,053,441	$18,391,278	82%
North Shore Gas	GPY4	$913,825	$1,095,514	83%
North Shore Gas	GPY5	$100,594	$1,090,967	9%
North Shore Gas	GPY6	$1,393,328	$1,090,967	128%
North Shore Gas	Subtotal	$2,407,747	$3,277,448	73%
All	**Total**	**$183,385,595**	**$228,493,859**	**80%**

Source: DCEO reports and tracking data: Navigant analysis for ComEd, Nicor Gas, Peoples Gas, and North Shore Gas, and Opinion Dynamics analysis for Ameren Illinois Companies (AIC). ICC Authorized Funds sourced from DCEO EEPS Plan 2014-17 Ex 1.2: https://www.icc.illinois.gov/downloads/public/edocket/370615.pdf

4. Program Savings and Costs by Utility

This section presents program-level incremental energy savings and costs by utility and program year for ComEd, Nicor Gas, Peoples Gas, and North Shore Gas. Detailed results for Ameren Illinois are provided in a separate report by Opinion Dynamics.[3]

4.1 ComEd

The program-level incremental energy savings and costs for DCEO's programs for ComEd are provided in Table 4-1 for EPY7, in Table 4-2 for EPY8, and in Table 4-3 for EPY9.

Table 4-1. DCEO EPY7 Program Savings and Costs for ComEd

Program	Ex Ante Gross (kWh)	Program Gross Realization Rate	Ex Post Gross Savings (kWh)	Program Net-to-Gross Ratio	Ex Post Net Savings (kWh)	Program Cost
Custom	27,689,505	0.72	19,806,713	0.81	16,091,467	$4,365,967
Standard	41,493,314	1.28	53,162,374	0.90	47,599,344	$10,982,810
New Construction	393,666	1.00	393,666	0.87	343,019	$137,768
Retro-Commissioning	6,449,821	0.93	5,973,482	1.01	6,044,128	$1,790,635
STEP	3,015,070	1.11	3,337,554	0.96	3,198,470	$784,919
Residential Retrofit			5,137,788	1.00	5,137,788	$4,351,868
Affordable New Construction	2,984,443	0.56	1,674,479	1.00	1,674,479	$2,742,686
Public Housing Authority	1,716,129	1.05	1,804,949	1.00	1,804,949	$1,656,114
Energy Assessments (SEDAC)					1,974,920	$1,555,130
K-12 Energy Efficiency	36,285	0.84	30,315	0.84	25,334	$286,191
Building Operator Certification					1,230,408	$162,506
Data Center	0	N/A	0	N/A	0	$287,236
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$3,692,731
Total					**85,124,306**	**$32,796,561**
ICC Goal					**103,113,632**	**$39,250,000**
% of ICC Goal					**83%**	**84%**

Source: Navigant analysis of DCEO reports and tracking data

[3] Similar tables for Ameren Illinois Companies were developed and reported by Opinion Dynamics: *Illinois Department of Commerce and Economic Opportunity Plan 3 Summary Impact Evaluation Report for Ameren Illinois Company, Final Report.* February 2019.

Table 4-2. DCEO EPY8 Program Savings and Costs for ComEd

Program	Ex Ante Gross (kWh)	Program Gross Realization Rate	Ex Post Gross Savings (kWh)	Program Net-to-Gross Ratio	Ex Post Net Savings (kWh)	Program Cost
Custom	11,890,895	0.51	6,016,661	0.97	5,833,024	$1,531,350
Standard	21,583,789	1.23	26,509,210	0.73	19,440,497	
Boiler System Efficiency	0	N/A	0	N/A	0	$15,729
STEP	125,491	1.13	141,752	0.96	135,845	$47,102
Clean Water Custom					909,480	$99,750
Energy Efficiency Aggregation						$3,406,529
Combined Heat and Power						$487,500
Residential Retrofit			918,604	1.00	918,604	$2,427,388
Affordable New Construction	2,473,698	1.25	3,087,350	1.00	3,087,350	$1,222,957
Building Operator Certification					15,797	$73,993
Other Market Transformation (MT) - BITE					0	$249,248
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$2,412,485
Total					**30,340,597**	**$11,974,031**
ICC Goal					**106,041,145**	**$39,675,000**
% of ICC Goal					**29%**	**30%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-3. DCEO EPY9 Program Savings and Costs for ComEd

Program	Ex Ante Gross (kWh)	Program Gross Realization Rate	Ex Post Gross Savings (kWh)	Program Net-to-Gross Ratio	Ex Post Net Savings (kWh)	Program Cost
Custom	10,570,148	1.00	10,570,148	0.83	8,773,223	$20,070,033
Standard	70,002,774	1.00	70,002,774	0.65	45,501,803	
New Construction	4,610,103	1.00	4,610,103	0.53	2,443,355	
Retro-commissioning	6,116,073	1.00	6,116,073	0.98	5,993,752	
Boiler System Efficiency	0	NA	0	N/A	0	
Clean Water Custom	15,347,233	1.00	15,347,233	0.83	12,738,204	
STEP	3,806,291	1.00	3,799,415	0.96	3,647,438	$1,248,909
Energy Efficiency Aggregation Custom	11,414,042	2.46	28,034,635	0.83	23,268,747	$7,787,330
Energy Efficiency Aggregation Standard	2,030,928	3.65	7,411,009	0.65	4,817,156	
Combined Heat and Power	55,137,349	1.00	55,137,349	0.80	44,109,879	$1,624,743
Free Lights	6,341,795	0.93	5,875,783	0.96	5,640,751	$3,022,032
Residential Retrofit	5,103,514	0.93	4,731,367	1.00	4,731,367	$4,358,663
Affordable New Construction	1,609,739	1.00	1,609,739	1.00	1,609,739	$1,130,203
Public Housing Authority	2,563,865	1.00	2,563,865	1.00	2,563,865	$1,992,583
Weatherization	1,912,722	1.00	1,912,722	1.00	1,912,722	$2,648,876
Energy Assessments (SEDAC)	1,000,000	0.91	908,526	N/A	908,526	$5,333,838
K-12 Energy Efficiency	458,761	1.00	458,761	0.84	385,359	$229,994
Building Operator Certification	1,731,728	1.67	2,895,204	1.00	2,895,204	$181,780
Other MT (DOMUS, Future Energy Enterprises, BITE, ERC, Codes, IL HP, LEIDOS)					0	$1,615,183
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$2,610,832
Total					**171,941,090**	**$53,854,999**
ICC Goal					**111,274,966**	**$39,850,000**
% of ICC Goal					**155%**	**135%**

Source: Navigant analysis of DCEO reports and tracking data

4.2 Nicor Gas Company

The program-level incremental energy savings and costs for DCEO for Nicor Gas are provided in Table 4-4 for GPY4, in Table 4-5 for GPY5, and in Table 4-6 for GPY6.

Table 4-4. DCEO GPY4 Program Savings and Costs for Nicor Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	625,166	0.77	480,991	0.78	377,312	$2,132,386
Standard	119,821	1.16	139,431	0.49	68,113	$989,903
New Construction	172,091	1.15	197,832	0.74	146,810	$430,135
Retro-Commissioning	442,237	0.96	424,029	0.95	403,824	$484,399
Boiler System Efficiency	720,204	0.98	707,323	0.84	597,253	$555,682
STEP	34,551	0.91	31,549	0.89	28,198	$68,387
Residential Retrofit			324,876	1.00	324,876	$700,000
Affordable New Construction	33,762	1.66	55,960	1.00	55,960	$536,042
Public Housing Authority	71,715	1.00	71,891	1.00	71,891	$362,436
Energy Assessments (SEDAC)					12,371	$434,404
Building Operator Certification	0	N/A	0	N/A	0	$49,087
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$1,201,306
Total					**2,086,608**	**$7,944,167**
ICC Goal					**2,715,341**	**$10,669,057**
% of ICC Goal					**77%**	**74%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-5. DCEO GPY5 Program Savings and Costs for Nicor Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Standard	14,428	1.00	14,428	0.94	13,562	$33,250
Boiler Tune-Up						$48,728
STEP	1,890	0.88	1,654	0.89	1,478	$14,226
Energy Efficiency Aggregation						$41,000
Combined Heat and Power						$162,500
Residential Retrofit			102,513	1.00	102,513	$481,962
Affordable New Construction	47,472	1.06	50,128	1.00	50,128	$268,433
Building Operator Certification				N/A		$22,347
BITE						$56,053
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$650,673
Total					**167,681**	**$1,779,172**
ICC Goal					**2,744,998**	**$10,401,000**
% of ICC Goal					**6%**	**17%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-6. DCEO GPY6 Program Savings and Costs for Nicor Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	733,478	1.00	733,478	0.74	542,773	
Standard	625,918	0.99	622,470	0.46	286,336	$4,263,889
New Construction	182,734	1.00	182,734	0.65	118,777	
Retro-commissioning	505,701	1.00	505,701	0.94	475,359	$0
Boiler System Efficiency	586,601	0.89	519,850	0.87	452,269	$423,893
STEP	112,253	1.03	116,119	0.90	104,507	$223,893
Energy Efficiency Aggregation Custom	739,352	0.67	493,403	0.74	365,118	$2,231,706
Energy Efficiency Aggregation Standard	127,117	1.77	224,826	0.46	103,420	
Combined Heat and Power	1,146,668	1.00	1,146,668	0.80	917,334	$466,848
Free Lights	0	NA	0	NA	0	$733
Residential Retrofit	131,181	0.78	102,230	1.00	102,230	$540,285
Affordable New Construction	31,145	1.00	31,145	1.00	31,145	$159,914
Public Housing Authority	127,693	0.98	124,880	1.00	124,880	$807,352
Weatherization	301,174	1.00	301,174	1.00	301,174	$1,629,379
Energy Assessments (SEDAC)	0		4,602	N/A	4,602	$1,769,523
Building Operator Certification	7,241	0.11	822	N/A	822	$54,888
Other MT (DOMUS, Future Energy Enterprises, BITE, Trade Ally, Building Codes, IL HP, LEIDOS)					0	$484,614
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$717,231
Total					**3,930,748**	**$13,774,148**
ICC Goal					**2,749,889**	**$10,001,000**
% of ICC Goal					**143%**	**138%**

Source: Navigant analysis of DCEO reports and tracking data

4.3 The Peoples Gas Light and Coke Company

The program-level incremental energy savings and costs for DCEO for Peoples Gas are provided in Table 4-7 for GPY4, in Table 4-8 for GPY5, and in Table 4-9 for GPY6.

Table 4-7. DCEO GPY4 Program Savings and Costs for Peoples Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	676,240	0.74	497,205	0.92	457,174	$1,523,465
Standard	56,019	1.19	66,392	0.55	36,322	$357,679
New Construction	0	N/A	0	N/A	0	$14,180
Retro-Commissioning	28,534	1.10	31,509	0.97	30,456	$198,124
Boiler System Efficiency	537,832	0.86	461,777	0.90	413,845	$215,205
STEP	97,041	0.99	95,675	0.90	86,435	$37,257
Residential Retrofit			440,701	1.00	440,701	$784,555
Affordable Housing Construction	65,010	0.60	39,163	1.00	39,163	$637,472
Public Housing Authority	187,028	1.00	187,028	1.00	187,028	$430,852
Energy Assessments (SEDAC)				N/A	7,336	$219,253
Building Operator Certification	0	N/A	0	N/A	0	$22,341
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$587,606
Total					**1,698,460**	**$5,027,989**
ICC Goal					**1,337,115**	**$6,113,468**
% of ICC Goal					**127%**	**82%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-8. DCEO GPY5 Program Savings and Costs for Peoples Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	299,972	1.20	360,039	0.94	338,437	$476,265
Standard	76,410	1.08	82,218	0.94	77,285	
Boiler System Efficiency						$10,168
STEP						$6,513
Energy Efficiency Aggregation						$814,265
Residential Retrofit			124,269	1.00	124,269	$507,197
Affordable New Construction	89,108	1.41	125,867	1.00	125,867	$429,321
Building Operator Certification				N/A		$10,223
BITE						$26,224
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$371,419
Total					**665,858**	**$2,651,595**
ICC Goal					**1,388,829**	**$6,138,905**
% of ICC Goal					**48%**	**43%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-9. DCEO GPY6 Program Savings and Costs for Peoples Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	165,618	1.00	165,618	0.74	122,557	$794,378
Standard	711	1.00	711	0.46	327	
New Construction	28,023	1.00	28,023	0.65	18,215	
Retro-commissioning	101,318	1.00	101,318	0.94	95,239	$0
Boiler System Efficiency	111,181	1.48	164,986	0.87	143,538	$79,136
STEP	58,665	0.93	54,367	0.90	48,930	$72,304
Energy Efficiency Aggregation Custom	219,455	1.00	219,455	0.74	162,397	$646,713
Energy Efficiency Aggregation Standard	428,286	0.87	374,481	0.46	172,261	
Residential Retrofit	1,193,581	1.00	1,195,504	1.00	1,195,504	$3,439,346
Affordable New Construction	77,320	1.00	77,320	1.00	77,320	$253,005
Public Housing Authority	40,161	1.00	40,161	1.00	40,161	$462,568
Weatherization	86,627	1.00	86,627	1.00	86,627	$434,588
Energy Assessments (SEDAC)	0		0	N/A	0	$580,172
Building Operator Certification	25,622	0.09	2,402	N/A	2,402	$25,047
Other MT (DOMUS, Future Energy Enterprises, BITE, ERC, Codes, IL HP, LEIDOS)					0	$176,742
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$409,858
Total					**2,165,478**	**$7,373,857**
ICC Goal					**1,435,917**	**$6,138,905**
% of ICC Goal					**151%**	**120%**

Source: Navigant analysis of DCEO reports and tracking data

4.4 North Shore Gas Company

The program-level incremental energy savings and costs for DCEO for North Shore Gas are provided in Table 4-10 for GPY4, in Table 4-11 for GPY5, and in Table 4-12 for GPY6.

Table 4-10. DCEO GPY4 Program Savings and Costs for North Shore Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	173,611	0.77	134,264	0.78	104,182	$504,417
Standard	5,756	1.18	6,769	0.49	3,291	$59,079
New Construction	0	N/A	0	N/A	0	$3,492
Retro-Commissioning	9,167	1.11	10,216	1.00	10,216	$42,243
Boiler System Efficiency	16,806	0.88	14,842	0.77	11,413	$42,218
STEP	2,113	0.66	1,402	0.91	1,272	$7,759
Residential Retrofit			36,328	1.00	36,328	$100,000
Public Housing Authority	6,035	1.00	6,035	1.00	6,035	$38,408
Energy Assessments (SEDAC)					356	$48,389
Building Operator Certification	0	N/A	0	N/A	0	$5,349
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$62,471
Total					**173,093**	**$913,825**
ICC Goal					**274,737**	**$1,095,514**
% of ICC Goal					**63%**	**83%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-11. DCEO GPY5 Program Savings and Costs for North Shore Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
STEP					0	$1,523
Residential Retrofit			10,992	1.00	10,992	$44,350
Building Operator Certification					0	$2,391
BITE					0	$5,923
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	0	$46,407
Total					**10,992**	**$100,594**
ICC Goal					**285,051**	**$1,090,967**
% of ICC Goal					**4%**	**9%**

Source: Navigant analysis of DCEO reports and tracking data

Table 4-12. DCEO GPY6 Program Savings and Costs for North Shore Gas

Program	Ex Ante Gross (therms)	Program Gross Realization Rate	Ex Post Gross Savings (therms)	Program Net-to-Gross Ratio	Ex Post Net Savings (therms)	Program Cost
Custom	49,045	1.00	49,045	0.74	36,293	$324,121
Standard	64,516	1.00	64,516	0.46	29,677	
Retro-commissioning	23,564	1.00	23,564	0.94	22,150	$0
Boiler System Efficiency	48,465	1.00	48,465	0.87	42,165	$25,606
STEP	760	1.00	761	0.90	685	$13,708
Energy Efficiency Aggregation Custom	166,779	0.82	137,482	0.74	101,737	$404,046
Public Housing Authority	22,707	1.00	22,707	1.00	22,707	$199,525
Weatherization	25,021	1.00	25,021	1.00	25,021	$130,851
Residential Retrofit (Elevate)			4,621	1.00	4,621	$5,671
Energy Assessments (SEDAC)	0		0	N/A	0	$199,949
Building Operator Certification	1,671	0.08	126	N/A	126	$5,770
Other MT (DOMUS, Future Energy Enterprises, BITE, ERC, Codes, IL HP, LEIDOS)					0	$32,856
Portfolio Non-Program Costs	N/A	N/A	N/A	N/A	N/A	$51,225
Total					**285,181**	**$1,393,328**
ICC Goal					**295,408**	**$1,090,967**
% of ICC Goal					**97%**	**128%**

Source: Navigant analysis of DCEO reports and tracking data

5. Cost Effectiveness Results

In Docket No. 17-0212, the ICC ordered that the abridged summarization of DCEO's program activities include reporting cost-effectiveness for the period June 1, 2014 through May 31, 2017. ADM presented the results of the Total Resource Cost (TRC) test score of cost-effectiveness of all programs offered by DCEO during EPY7/GPY4. ADM's cost-effectiveness summary report presented program and portfolio benefits, costs, and TRC scores by Utility. ADM calculated a TRC of 3.23 for the entire statewide DCEO portfolio in EPY7/GPY4 using a 10-Year Treasury discount rate and including non-energy benefits.[4] ADM did not complete the cost-effectiveness analysis for EPY8/GPY5, EPY9/GPY6, or for the three-year combined period.

Table 5-1 below shows the TRC cost effectiveness inputs for EPY7/GPY4 produced by ADM, and inputs for EPY8/GPY5 and EPY9/GPY6 produced by Navigant. The inputs are shown for each utility, by fuel type, and program year. The statewide totals appear in the bottom three rows of the table. The negative therm savings shown for the electric utilities are due to the interactive effects of electricity savings causing an increase in natural gas heating. The natural gas therms total achieved for the gas utilities does not include electric interactive effects penalties. The combined electric and gas summary in the very bottom row includes the electric interactive effects penalty on the gas savings total. Table 5-2 below shows the TRC cost effectiveness results for EPY7/GPY4 produced by ADM, and results for EPY8/GPY5 and EPY9/GPY6 produced by Navigant.

The methodology for Navigant's cost-effectiveness analysis is provided in Section 7.2.3. Due to limitations in the data available, we were unable to conduct cost effectiveness testing at a measure level. We were able to leverage detailed data produced by ADM for EPY7/GPY4 to resolve gaps in the data for later years and estimate cost effectiveness inputs by sector (Public Sector, Income Qualified Sector, Market Transformation), by utility, and by program year. Although the methodology is approximate, from the results shown in Table 5-2 we conclude that the DCEO programs were cost effective for each utility portfolio over the three-year plan cycle, and for the State of Illinois overall, based on the Illinois TRC test.

[4] ADM Associates, *EPY7/GPY4 Cost Effectiveness Summary Report: June 2014 through May 2015*, October 2016. Available at: http://www.ilsag.info/evaluation-documents.html

Table 5-1. Summary of DCEO TRC Cost-Effectiveness Inputs

Utility	Program Year	Verified Net Savings (kWh)	Verified Net Savings (kW)	Verified Net Savings (therms)	Portfolio Measure Life	Net Incremental Costs	Non-Incentive Costs	Total TRC Costs
ComEd	EPY7	85,124,306	9,101	-451,913	14	$23,741,080	$5,836,803	$29,577,883
ComEd	EPY8	30,340,597	3,244	-161,074	14	$8,479,368	$3,066,100	$11,545,468
ComEd	EPY9	171,941,090	18,382	-912,811	14	$43,317,082	$6,813,155	$50,130,236
ComEd	Subtotal	287,405,993	30,726	-1,525,798	14	$75,537,529	$15,716,057	$91,253,587
AIC Electric	EPY7	33,496,605	3,951	-149,762	15	$8,304,151	$2,375,739	$10,679,890
AIC Electric	EPY8	18,944,618	2,235	-84,701	15	$5,744,673	$1,325,145	$7,069,817
AIC Electric	EPY9	40,705,536	4,801	-181,993	15	$9,571,675	$2,113,829	$11,685,504
AIC Electric	Subtotal	93,146,759	10,987	-416,455	15	$23,620,499	$5,814,712	$29,435,211
AIC Gas	GPY4			824,814	14	$2,484,538	$656,442	$3,140,980
AIC Gas	GPY5			651,005	13	$1,748,863	$373,829	$2,122,692
AIC Gas	GPY6			1,667,501	13	$4,313,621	$611,696	$4,925,318
AIC Gas	Subtotal	0	0	3,143,320	13	$8,547,023	$1,641,967	$10,188,990
Nicor Gas	GPY4			2,086,608	13	$4,997,186	$1,812,932	$6,810,118
Nicor Gas	GPY5			167,681	18	$596,925	$751,808	$1,348,732
Nicor Gas	GPY6			3,930,748	13	$8,269,849	$1,988,337	$10,258,186
Nicor Gas	Subtotal	0	0	6,185,037	13	$13,863,960	$4,553,076	$18,417,036
Peoples Gas	GPY4			1,698,460	15	$4,321,388	$965,184	$5,286,572
Peoples Gas	GPY5			665,858	15	$1,602,154	$560,000	$2,162,154
Peoples Gas	GPY6			2,165,478	17	$6,029,928	$1,027,738	$7,057,666
Peoples Gas	Subtotal	0	0	4,529,796	16	$11,953,470	$2,552,922	$14,506,392
North Shore	GPY4			173,093	14	$627,273	$156,718	$783,991
North Shore	GPY5			10,992	15	$24,587	$52,646	$77,232
North Shore	GPY6			285,181	14	$1,003,480	$209,285	$1,212,765
North Shore	Subtotal	0	0	469,266	14	$1,655,340	$418,649	$2,073,989
Electric *	**Total**	**380,552,752**	**41,713**	**-1,942,254**	**14**	**$99,158,028**	**$21,530,770**	**$120,688,798**
Natural Gas †	**Total**			**14,327,419**	**14**	**$36,019,793**	**$9,166,614**	**$45,186,407**
Elec. & Gas ‡	**Total**	**380,552,752**	**41,713**	**12,385,165**	**14**	**$135,177,820**	**$30,697,384**	**$165,875,205**

Source: EPY7/GPY4 results from Cost Effectiveness Summary Report, prepared by ADM Associates. Navigant analysis for EPY8/GPY5 and EPY9/GPY6.

* The negative therm savings shown for the electric utilities are due to the interactive effects of electric savings causing an increase in natural gas heating.

† Natural gas therms total achieved for the gas utilities does not include electric interactive effects penalties.

‡ The natural gas savings in this statewide total includes the electric interactive effects penalty.

Table 5-2. Summary of DCEO TRC Cost-Effectiveness Results

Utility	Program Year	Total TRC Benefits	Total TRC Costs	Total TRC Net Benefits	TRC
ComEd	EPY7	$85,456,542	$29,577,883	$55,878,659	2.89
ComEd	EPY8	$27,666,020	$11,545,468	$16,120,552	2.40
ComEd	EPY9	$163,025,458	$50,130,236	$112,895,221	3.25
ComEd	Subtotal	$276,148,019	$91,253,587	$184,894,433	3.03
Ameren Electric	EPY7	$40,418,203	$10,679,890	$29,738,313	3.78
Ameren Electric	EPY8	$15,701,663	$7,069,817	$8,631,846	2.22
Ameren Electric	EPY9	$35,176,756	$11,685,504	$23,491,253	3.01
Ameren Electric	Subtotal	$91,296,623	$29,435,211	$61,861,412	3.10
Ameren Gas	GPY4	$12,522,441	$3,140,980	$9,381,461	3.99
Ameren Gas	GPY5	$4,819,850	$2,122,692	$2,697,158	2.27
Ameren Gas	GPY6	$12,884,689	$4,925,318	$7,959,371	2.62
Ameren Gas	Subtotal	$30,226,980	$10,188,990	$20,037,990	2.97
Nicor Gas	GPY4	$15,913,819	$6,810,118	$9,103,701	2.34
Nicor Gas	GPY5	$2,034,031	$1,348,732	$685,298	1.51
Nicor Gas	GPY6	$32,158,447	$10,258,186	$21,900,261	3.13
Nicor Gas	Subtotal	$50,106,297	$18,417,036	$31,689,261	2.72
Peoples Gas	GPY4	$25,020,073	$5,286,572	$19,733,501	4.73
Peoples Gas	GPY5	$5,566,232	$2,162,154	$3,404,078	2.57
Peoples Gas	GPY6	$20,885,661	$7,057,666	$13,827,995	2.96
Peoples Gas	Subtotal	$51,471,966	$14,506,392	$36,965,574	3.55
North Shore Gas	GPY4	$2,349,525	$783,991	$1,565,534	3.00
North Shore Gas	GPY5	$76,240	$77,232	-$993	0.99
North Shore Gas	GPY6	$1,837,067	$1,212,765	$624,302	1.51
North Shore Gas	Subtotal	$4,262,832	$2,073,989	$2,188,843	2.06
Electric Utilities *	**Total**	**$367,444,642**	**$120,688,798**	**$246,755,844**	3.04
Natural Gas Utilities †	**Total**	**$136,068,075**	**$45,186,407**	**$90,881,668**	**3.01**
Electric and Gas ‡	**Total**	**$485,067,055**	**$165,875,205**	**$319,191,851**	**2.92**

Source: TRC cost effectiveness results for EPY7/GPY4 produced by ADM Associates, and results for EPY8/GPY5 and EPY9/GPY6 produced by Navigant.

* The Total TRC Benefits shown for the electric utilities do not include a reduction for the increase in natural gas heating caused by the interactive effects of electricity savings.

† The Total TRC Benefits shown for the natural gas utilities do not include a reduction for the increase in natural gas heating caused by the interactive effects of electricity savings.

‡ The statewide Total TRC Benefits for Electric and Gas reflect a reduction in natural gas benefits due to electric interactive heating penalties.

6. Appendix A: Program Descriptions and Key Activities

This section describes the design and key activities of each program offered during EPY7-9/GPY4-6.

6.1 Public Sector

6.1.1 Custom Incentives

The Custom Incentives (Custom) Program generated electric and natural gas savings by helping public sector entities identify and implement energy savings projects. The program provided incentives on a per kilowatt hour (kWh) or per therm basis. A payback period of one to seven years was required for custom incentive projects. Incentives provided by the program could not exceed 100% of the incremental measure cost or 75% of the total project cost.

6.1.2 Standard Incentives

The Standard Incentives (Standard) Program generated electric and natural gas savings by helping public sector entities identify and implement energy saving projects. The program offered incentives on a prescriptive basis for qualifying equipment purchased and installed by the participant. Incentives provided by the program could not exceed 100% of the incremental measure cost or 75% of the total project cost.

6.1.3 New Construction

The New Construction Program generated electric and natural gas savings through new construction and major renovation of public sector buildings that exceeded the requirements of the current Illinois Energy Conservation Code for Commercial Buildings. Applicants received incentives for incorporating energy saving technologies and designing features that exceeded the building code requirements that were in effect at the time of application. Applicants were eligible to receive custom incentives for energy savings or prescriptive incentives with fixed dollar amounts for equipment installed.

6.1.4 Retro-Commissioning

The Retro-Commissioning Program was operated through the Smart Energy Design Assistance Center (SEDAC) and managed by staff at the 360 Energy Group (360 Energy). The program helped customers improve the performance and reduce energy consumption of their facilities through the systematic analysis of *existing* building systems. In general, facilities had to comprise at least 150,000 ft^2 of conditioned space and be at least five years old. However, newer and smaller buildings with an energy use profile suggesting a large potential for savings were also eligible for the program on a case-by-case basis. In addition to size and age criteria, buildings were required to have a functioning building automation system (BAS). Generally, the program paid for 100% of a retro-commissioning study, contingent upon a participant's commitment to spend $10,000 implementing a bundle of study recommendations having a simple payback of 18 months or less. The program did not provide incentives to the participant to implement the measures.

6.1.5 Boiler System Efficiency

The Boiler System Efficiency Program generated natural gas savings through efficiency improvements to boilers (i.e., boiler tune-ups), installation of insulating pipe wrap, steam trap repair or replacement, boiler reset controls, and parallel positioning systems. The program was available to local governments, municipal corporations, public school districts, community college districts, public universities, and state

and federal facilities. Incentives were only available for sites receiving natural gas service from Ameren Illinois, Nicor Gas, Peoples Gas, or North Shore Gas. DCEO partnered with the Energy Resources Center (ERC) at the University of Illinois at Chicago to administer the Boiler System Efficiency Program. Incentives were available to encourage owners of natural gas boilers to invest in efficiency improvements made by a qualified contractor. Applicants for large projects were required to receive preapproval prior to beginning the project.

6.1.6 Savings Through Efficient Products (STEP)

The STEP Program offered qualified public facilities energy-saving equipment at no cost. The program was originally offered as a self-install component of the Lights for Learning® program but was renamed and established as a separate program. Some products offered through the STEP Program include: LED exit signs, low-flow faucet aerators, low-flow showerheads, low-flow pre-rinse spray-valves, CFLs, vending machine controls, occupancy sensors, and exterior LED bulbs.

STEP participation began with a free onsite facility energy assessment to identify opportunities for upgrades. The Midwest Energy Efficiency Alliance (MEEA) then ordered applicable products and provided a comprehensive report outlining the free upgrades and relevant information about additional statewide energy savings programs. Facility maintenance staff members installed the energy-saving products within five months of delivery or by May 31, (whichever date comes first), resulting in energy and cost savings for the facility. Following installation, program participants sent MEEA signed verification forms and photographs of the energy saving measures.

6.1.7 Clean Water Custom

The Clean Water Custom Program targeted energy use by wastewater treatment plants, which are typically the highest energy users within a municipality. DCEO partnered with the Energy Resources Center (ERC) at the University of Illinois at Chicago for marketing, technical assistance, and managing incentives. The program leveraged funding opportunities available at the state and national levels. ERC worked with wastewater treatment plant managers and trade allies to make recommendations specific to each facility. Aeration systems can account for 50% or more of overall facility energy usage. The program promoted high efficiency aeration technology, including high efficiency aeration blowers, fine or ultra-fine bubble diffusers, and oxygen sensor devices.

6.1.8 Energy Efficiency Aggregation

The Energy Efficiency Aggregation Program allowed eligible applicants to combine projects to simplify the overall application process, quickly deliver energy efficiency savings, and capture projects that are not worthwhile for submittal as a standalone project. Moreover, the program sought to engage multiple projects within a local government (public works, police, fire, library, school, parks) and, in the case of non-profit grantees, multiple projects across municipal boundaries. In addition, the program served as a new delivery channel for hard-to-reach customers. The program provided grant awards to units of local government and non-profit entities to compile eligible energy efficiency projects, submitted those projects to DCEO for approval, and managed project implementation. This category also includes a municipal outdoor lighting program that served as a one-stop street lighting resource for municipalities in Illinois by offering LED upgrades to street, protective, area, and decorative lighting.

6.1.9 Combined Heat and Power

This Combined Heat and Power Program achieved electric and natural gas savings through the use of combined heat and power (CHP) systems. Specifically, the program was designed to encourage investment in Conventional or Topping Cycle CHP systems, as well as Waste Heat-to-Power or

Bottoming cycle CHP systems. The projects under this program have the potential to accrue electric savings or both electric and natural gas savings. This program was offered for the first time in 2014 and was structured in a three-year format: year one for engineering and design, year two for construction, and year three for savings verification. Incentives were structured so that funding is provided for each phase, rather than a lump sum. Unlike many other energy efficiency projects, most CHP projects take in excess of 12 months to develop and implement. The ability to roll-over program funds during the three-year program cycle for both gas and electric program funds allowed this program to adapt to the development and implementation time frames associated with most CHP projects.

6.1.10 Free Lights

The Free Lights Program supplied free lighting retrofits to nonresidential public-sector building customers, qualified by either the DesignLights Consortium or ENERGY STAR. Once an applicant was accepted to the Free Lights Program, customers ordered lighting products through a web-based application form on the Grainger website. The ordered lights were then delivered to the respective nonresidential public-sector building. Grainger only supplied the lighting fixtures and controls for the program.

6.2 Low-income Sector

6.2.1 Residential Retrofit and Weatherization/Home Weatherization Assistance

The objective of these programs was to perform energy retrofits to achieve electricity and natural gas savings in existing low-income single-family and multi-family homes. Funds used for weatherization were targeted at households at or below 200% of the federal poverty level. Low income home improvements were targeted at households at or below 80% of the area Average Median Income (AMI). DCEO used trusted community partners as third-party administrators to promote energy efficiency and perform home energy repair and renovation in low-income neighborhoods. DCEO identified a list of eligible measures and incentive levels for each measure. Partners then performed outreach and education, audits, and energy upgrades in existing low income single- and multi-family housing. Partners included the DCEO's Illinois Home Weatherization Assistance Program, which administers its funding through its statewide network of community action agencies, as well as a handful of experienced, trusted non-profits. The programs offered implementers a comprehensive list of energy efficiency measures to choose from, including: high efficiency appliances, air conditioners, lighting, insulation, furnaces, water heaters, and smart thermostats. Partners often leveraged alternative financial resources for complete projects, including: federal, state, and local funds and private sector finance.

6.2.2 Affordable New Construction

The Affordable New Construction Program provided grants to non-profit and for-profit affordable housing developers to help offset the cost of incorporating energy efficient building practices in residential construction. The program promoted the benefits of lower utility bills for low income households within energy efficient buildings. Eligible projects were targeted at households at or below 80% of the Average Median Income (AMI) level. Grant amounts for projects were calculated per living unit, building, or living space square footage. To receive grant funding, the new construction or rehab project had to meet program guidelines and implement all specified measures. These guidelines specified requirements for insulation, windows, air sealing, mechanical systems, ventilation, appliances, and lighting.

6.2.3 Public Housing Authority

The Public Housing Authority Program was designed to help improve the energy efficiency of public housing in Illinois. The program was operated in partnership with the School of Architecture-Building

Research Council located at the University of Illinois at Urbana-Champaign (UIUC). The program provided grants to fund energy efficiency improvements for public housing buildings, including retrofit, new construction, and gut / rehab projects. Eligible energy efficiency measures were installed in common areas or in residential units. A wide variety of measures were eligible for incentive funds including exit signs, exterior and interior lighting, controls, ENERGY STAR® appliances and HVAC equipment. Grants were capped at $450,000 per project, and covered up to, but did not exceed, 100% of the total project cost.

6.3 Market Transformation Sector

6.3.1 Energy Assessments (SEDAC)

The Energy Assessments Program was implemented by the Smart Energy Design Assistance Center (SEDAC) and provided participants with technical assistance to encourage the adoption of energy efficiency measures in nonresidential facilities. The program offered four levels of assistance: initial consultations, energy audits, design assistance, and implementation support. A key component of the program was the design assistance reports that detailed energy cost reduction measures (ECRMs) that were deemed appropriate for the participant. The reports listed ECRMs individually, but rather than encourage the participant to invest in individual measures, the recommendations bundled cost-effective measures that resulted from interactive effects attainable when the building was analyzed as a whole. Cost-effective strategies are those bundles of ECRMs where the internal rate of return on the investment was greater than the discount rate and where the net present value of the investment was greater than zero.

6.3.2 K-12 Energy Efficiency

The K-12 Energy Efficiency Program is a unique, youth-oriented program that raises money for K-12 schools through the sale of energy efficient products including ENERGY STAR qualified CFLs, LEDs, LED strands and nightlights, and power strips. The program was designed to provide basic energy and energy efficiency literacy to young people at public and private schools - with eligibility extended to related organizations, such as public libraries - while providing the opportunity for these organizations to raise funds and promote energy efficiency in their communities. Children sold energy efficiency products by utilizing take-home order forms, an online ordering system, and organized booth sales at school or community events. Products were also sold through permanent sales kiosks. As a token of appreciation, each classroom at top performing schools were sent a book, tailored to the learning level and age-range of the class. The program supported free educational assemblies or classroom presentations to demonstrate to students, parents, and the educational community the environmental, economic, and energy efficiency benefits of energy efficiency products and behaviors. The K-12 Energy Efficiency Program was funded by the Department of Commerce and was administered by the Midwest Energy Efficiency Alliance (MEEA) with assistance from their implementation partners CLEAResult and Resource Action Programs.

6.3.3 Data Centers

Data Centers included research assessments and a pilot project to show the value of a program targeting energy efficiency opportunities in public sector data centers in Illinois.

6.3.4 Building Operator Certification (BOC)

The Building Operator Certification (BOC) Program is a nationally recognized competency-based training and education program for building operators. The Department of Commerce provided funds for program

administration, instructor fees and travel, training coordination fees and travel, marketing and outreach, and tuition rebates for program graduates. The program was administered in partnership with the Midwest Energy Efficiency Alliance (MEEA), which administers a regional program in eight states through a license from the BOC copyright holder, the Northwest Energy Efficiency Council (NEEC). The Department of Commerce and MEEA launched the BOC Program in Illinois in 2003.

7. Appendix B: Data Collection and Analysis Approach

This Appendix describes our data collection efforts and analysis approach. As indicated, the Opinion Dynamics Corporation (ODC) and Navigant evaluation teams collaborated and coordinated on acquiring data from DCEO as well as the various program implementers that were contracted by the DCEO to perform the day-to-day implementation of their energy efficiency programs. In addition to coordinating on data acquisition, we also coordinated on data analysis and reporting to ensure consistency in data analysis and/or impact evaluation and reporting.

7.1 Data Collection

7.1.1 Program Years EPY7 / GPY4 and EPY8 / GPY5

Program costs were obtained from Deirdre Coughlin at DCEO.

For EPY7/GPY4, the final reports produced by ADM available on the Illinois Energy Efficiency Stakeholder Advisory Group (SAG) web site were used for reporting verified gross and net savings.[5] For EPY8/GPY5, ADM produced draft reports that were not designated as final prior to termination of funding, however, Deirdre Coughlin indicated that no further revisions to the impact results were anticipated. The draft reports produced by ADM available on the SAG web site were used for reporting verified gross and net savings for EPY8/GPY5.[6]

7.1.2 Program Years EPY9 / GPY6

ADM had not delivered any evaluation work products for EPY9/GPY6 when evaluation funding was terminated. Navigant collaborated with the evaluator for Ameren Illinois, ODC, to obtain EPY9/GPY6 program data to evaluate from DCEO and their former implementation contractors. Some data and contact names were obtained from Deirdre Coughlin at DCEO, and other contacts were available through the SAG and the utilities. Navigant and ODC reached out to contacts with data requests from June 2018 through October 2018.

While the ODC and Navigant evaluation teams were successful in acquiring data for most of the DCEO energy efficiency programs, there are various limitations to program tracking data received from the various program implementers. We describe the data received for each program in Table 7-1.

[5] EPY7 / GPY4 DCEO final evaluation reports are available for download at http://www.ilsag.info/dceo_eval_reports.html
[6] EPY8 / GPY5 DCEO draft evaluation reports are available for download at http://www.ilsag.info/draft_evaluation_reports.html

Table 7-1. Description of EPY9/GPY6 Program Tracking Data Received

Program	Data Received	Data Received Date	Description of Data/Materials Received
Public Sector Portfolio			
Standard	√	October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
Custom	√	October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
Energy Efficiency Aggregation Standard	√	August 16, 2018 and October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
Energy Efficiency Aggregation Custom	√	October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
Free Lights	√	August 16, 2018 and October 12, 2018	• Received project level data by utility • Data received includes electric savings and project level cost/incentive payments
New Construction	√	August 21, 2018	• Received project level data by utility that includes electric and gas savings and project level cost
Cleanwater Custom	√	October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
CHP Incentive Program	√	September 6, 2018	Received detailed project studies and other supporting documents for applications
Retro-commissioning	√	August 21, 2018	• Received property/project level data by utility that includes electric and gas savings and property/project level cost
STEP	√	August 27, 2018 and October 5, 2018	• Received measure level data by utility that includes electric and gas savings • Received program level cost
Boiler System Efficiency	√	October 2, 2018	• Received limited measure level data that includes gas savings and incentives paid by utility
Residential Portfolio			
Affordable Housing New Construction	√	September 6, 2018	• Received property level data that includes electric and gas savings by utility • Also received additional materials such as application forms, measure spec sheets, checklists, photos/images, by property • Did not receive program or property level cost data
Residential Retrofit	√	See program component level details below	
Residential Retrofit External Grants	√	October 12, 2018	• Received project and measure level data by utility, program, and subprogram that includes electric and gas savings and project level incentive payments
Weatherization Assistance	√	October 3, 2018	• Received measure level data as well as data summarizing electric and gas savings by utility and measure type (e.g., LED, furnace, attic insulation, air sealing, etc.) as well as program cost by utility

Program	Data Received	Data Received Date	Description of Data/Materials Received
Energy Savers Multifamily	√	November 2, 2018	• Received project and measure level data by utility that includes electric and gas savings and project level cost
Public Housing	√	November 5, 2018	• Received high level summary of PY9 results in terms of number of participating PHAs, properties, measures, electric and gas savings, and grant amounts; also received measure level data
Market Transformation Portfolio			
K-12 Energy Efficiency Program	√	October 4, 2018	• Received program level cost/spend and estimated electric energy savings
BOC	√	August 23, 2018	• Received participant data, including corresponding utility as well as program level spend by utility • Received Narrative Report, which includes information on participants, trainings conducted/attended, including training start and end dates, and number of training hours
Energy Assessments (SEDAC)	√	August 21, 2018	• Received Narrative Report and spreadsheet tracking data that includes measure level data by utility that includes electric and gas savings
Building Energy Code Compliance	X	Not Applicable	• No participation nor program cost data received • Since this is a compliance training program, it incurs no savings

Source: Opinion Dynamics and Navigant

7.2 Analysis Approach

7.2.1 Gross Impact Evaluation Approach

As part of this evaluation, we conducted an abridged impact evaluation based on the review of program tracking data acquired from DCEO and the various program implementers. Due to the short evaluation timeline after receipt of data and limited detail within most of the program datasets, we did not individually verify savings for each EPY9/GPY6 measure and/or project for every program. The depth of our impact review was tailored to the quality and detail of the data provided, and the energy savings impact of the program. We focused our review on the largest programs with the best data. We did not conduct any on-site verification fieldwork. Our impact evaluation review primarily consisted of the following steps:

- We reviewed datasets in their entirety for reasonableness and to identify any obvious or significant errors
- We limited our analysis to only projects indicated to be “complete” or “paid.” Projects that were marked as “in-progress” or “pending” were not included in our analysis.
- We limited our analysis to include only data that was specific to the Utilities service territory during the specific program year in question.
- We identified the most appropriate data fields for analysis of savings and spending, reaching out to the data source for clarification if needed.
- Where available, we reviewed reports or program summaries and documentation for major projects to verify savings, measures installed, projects completed, and participation.

- We conducted engineering review of measure assumptions and algorithms for programs when detailed measure level tracking data was available, consistent with the Illinois TRM.[7]

7.2.2 Net Impact Evaluation Approach

The most recent net-to-gross (NTG) ratios calculated by DCEO's evaluator, ADM Associates, Inc (ADM) available on the Illinois Energy Efficiency Stakeholder Advisory Group (SAG) web site were used to calculate net savings for the former DCEO programs, summarized in Table 7-2 and Table 7-3 below. Where ADM did not establish a NTG for a program, Navigant used values from like Utility programs.

For some programs covered in the EPY7/GPY4 reports, ADM included an "Energy Efficiency Plans Score" adjustment in their calculation of free-ridership. Navigant recommended using NTG ratios without the "plans score" adjustment because ADM's approach to the "plans score" is not allowed within the TRM NTG protocols effective for EPY9/GPY6. The TRM does not specify that the "had plans" criteria should be addressed in survey questions nor does it specify how the result should be treated in the algorithm. ADM reported the free ridership estimates without the "plans score" adjustment in the appendices of the EPY7/GPY4 evaluation reports for the Custom, Standard, New Construction, and Retro-Commissioning programs. Navigant used the appendices to determine the NTG without the "plans score" reported in the tables below.

[7] State of Illinois Technical Reference Manual (TRM) versions available from http://www.ilsag.info/technical-reference-manual.html.

Table 7-2. Navigant Recommended NTG Ratios for Natural Gas for GPY6 DCEO Programs.

Programs	Recommended NTG Ratios (Therms)	Source[8] for Recommendation
Energy Efficiency Custom and Standard Aggregation	Custom: 0.74	Evaluation of Illinois Energy Now Public Sector Custom, Standard, and New Construction Incentives Programs: June 2014 through May 2015[9]
	Standard: 0.46	
New Construction	NC: 0.65	
Boiler System Efficiency Program	0.87	Evaluation of Illinois Energy Now Public Sector Natural Gas Boiler System Efficiency Program: June 2014 through May 2015. [10]
Savings Through Efficient Products (STEP)	0.90	Evaluation of Illinois Energy Now Savings Through Efficient Products Program: June 2014 through May 2015[11]
Retro-Commissioning Program	0.94	Evaluation of Illinois Energy Now Public Sector Retro-Commissioning Program: June 2014 through May 2015[12]
Combined Heat and Power	0.80	Project-specific NTG values to be determined by evaluation early in each project. If that is not possible, as in this case, a default of 0.8 NTG to be used.
Energy Assessments (SEDAC)	N/A	Evaluation methodology for determining savings captured only savings influenced by the program. Therefore, there is no NTG research available for this program.
Building Operator Certification	N/A	
Affordable New Construction	1.00	Value provided in the TRM[13]
Residential Retrofit	1.00	
Public Housing Authority	1.00	

Source: Navigant research and analysis

[8] Available at: http://www.ilsag.info/evaluation-documents.html
[9] Department_of_Commerce_Public_Sector_CS_NC_Programs_EPY7-GPY4_Final.pdf. Navigant used the EPY7-GPY4 results because the EPY8-GPY5 evaluation completed only one gas NTG interview and the type of projects covered was not provided (Department_of_Commerce_Public_Sector_CS_Programs_EPY8_GPY5_Draft.docx). Navigant recommended NTGs do not include the "plans score" adjustment.
[10] DCEO_Public_Sector_Boiler_System Efficiency_EPY7_GPY4_Final_REVISED_10-04-16.pdf. A draft report is not available for EPY8/GPY5.
[11] DCEO_STEP_Program_EPY7_GPY4_Final_Report.pdf. Navigant selected the most current NTG ratios from ADM's evaluation of STEP in EPY7/GPY4. NTG was not calculated in EPY8/GPY5 due to limited participation.
[12] Department_of_Commerce_Public_Sector_Retro-Commissioning_EPY7_GPY4_Final.pdf. A draft NTG result for Retro-Commissioning is not available for EPY8/GPY5. Navigant recommended NTG does not include the "plans score" adjustment.
[13]The TRM NTG section recommends a NTG ratio of 1.00 for the low-income (income-eligible) sector per Attachment A: Illinois Statewide Net-to-Gross Methodologies, Section 4.

Table 7-3. Navigant Recommended NTG ratios for Electricity for EPY9 DCEO Programs

Program	Recommended NTG Ratios	Source[14] for Recommendation
Aggregation (MMC, Elevate – Street Lighting, Elevate Park District Lighting)	Custom: 0.83 kWh, 0.82 kW	Evaluation of Illinois Energy Now Public-Sector Custom and Standard Incentives Programs: June 2015 through May 2016[15]
	Standard: 0.65 kWh, 0.65 kW	
Waste Water Treatment	0.83 kWh, 0.82 kW	
Standard and Custom: Data Centers	0.83 kWh, 0.82 kW	
New Construction	0.53 kWh	Evaluation of Illinois Energy Now Public Sector Custom, Standard, and New Construction Incentives Programs: June 2014 through May 2015[16]
Savings Through Efficient Products (STEP)	0.96 kWh, 0.96 kW	Evaluation of Illinois Energy Now Savings Through Efficient Products Program: June 2014 through May 2015[17]
Free Lights		
Retro-commissioning	0.98 kWh, 1.03 kW	Evaluation of Illinois Energy Now Public Sector Retro-Commissioning Program: June 2014 through May 2015[18]
Combined Heat and Power	0.80	Project-specific NTG values to be determined by evaluation early in each project. If that is not possible, as in this case, a default of 0.8 NTG to be used.
Energy Assessments (SEDAC)	N/A	Evaluation methodology for determining savings captured only savings influenced by the program. Therefore, there is no NTG research available for this program.
Building Operator Certification	N/A	
K-12 Energy Efficiency	0.84	Evaluation of Illinois Energy Now K-12 Energy Efficiency Program: June 2014 through May 2015[19]
Affordable New Construction Residential Retrofit Public Housing Authority	1.00	Deemed in the TRM[20]

Source: Navigant Analysis

7.2.3 Cost-Effectiveness Approach

The data points needed to conduct the Illinois TRC test are provided in Table 7-4 below and are divided into generic and program and measure specific categories. The program and measure specific data points are further subdivided into those that are provided by the Utilities, those that are a result of evaluation activities, and those from multiple sources.

[14] Available at: http://www.ilsag.info/evaluation-documents.html
[15] Department_of_Commerce_Public_Sector_CS_Programs_EPY8_GPY5_Draft.docx
[16] Department_of_Commerce_Public_Sector_CS_NC_Programs_EPY7-GPY4_Final.pdf
[17] DCEO_STEP_Program_EPY7_GPY4_Final_Report.pdf
[18] Department_of_Commerce_Public_Sector_Retro-Commissioning_EPY7_GPY4_Final.pdf
[19] DCEO_K-12_Energy_Efficiency_EPY7_GPY4_Final_REVISED_10-04-16
[20] The TRM NTG section recommends a NTG ratio of 1.00 for the low-income (income-eligible) sector per Attachment A: Illinois Statewide Net-to-Gross Methodologies, Section 4.

Table 7-4. Data Points Needed to Conduct the Illinois TRC Test

Category	Data Point	Source for EPY8-9 and GPY5-6
Generic	• Avoided Natural Gas Costs • Avoided Electric Costs • Line Losses (gas and electric) • Escalation Rates	ComEd, Ameren Illinois Companies, Nicor Gas, Peoples Gas, North Shore Gas
Generic	• Discount Rate • Non-Energy Benefits (NEBs) Adder • Greenhouse Gas (GHG) Adder	Illinois TRM v6 Section 3.9 and Illinois Energy Efficiency Stakeholders Advisory Group Agreement
Program and Sector-Specific (Public Sector, Income Qualified Sector, and Market Transformation)	• Verified Energy and Demand Savings • Realization Rate • Net to Gross Ratio	DCEO Program Tracking Data, DCEO Draft and Final Evaluation Reports, Navigant and Opinion Dynamics analysis
	• Non-Incentive Costs	Navigant derived non-incentive costs from overall program costs supplied by DCEO by calculating cost ratios using ADM EPY7/GPY4 results. Ratios of non-incentive cost to program costs were calculated for EPY7/GPY4 by utility and sector (Public Sector, Income Qualified, Market Transformation). The ratios were applied to EPY8/GPY5 and EPY9/GPY6 program costs by utility and sector. Portfolio non-program costs from DCEO were added by year and utility.
	• Incremental Measure Costs	Navigant derived net incremental measure costs by calculating cost ratios per kWh or therm using ADM EPY7/GPY4 results. Ratios of net incremental costs to net savings were calculated for EPY7/GPY4 by utility and sector (Public Sector, Income Qualified, Market Transformation). The ratios were applied to EPY8/GPY5 and EPY9/GPY6 net energy savings by utility and sector.
	• Measure Life	Navigant derived weighted-average effective measure life by utility and sector using ADM EPY7/GPY4 results. Utility-specific sector-level measure lives from EPY7/GPY4 were weighted by sector-level energy savings for each utility and program year for EPY8/GPY5 and EPY9/GPY6 to calculate a portfolio-level effective measure life by utility and program year.

Source: Navigant

In Section 4, Navigant reported the program spending information we were able to compile based on information that was provided to us. Our impact evaluation activities as part of this work did not include measure-level evaluation for all programs:

- Program tracking databases did not include detail allowing us to determine average program measure lives or incremental measure costs.
- In many cases, program tracking data also did not include incentive information.
- While program expenditures provided here are as complete as the data provided to us allows, we do not have the typical breakouts of program spending that would be provided as part of an ex-post cost-effectiveness evaluation (inclusive of DCEO staff costs, program administration costs, etc.). Instead, all we typically have is a single number (or some cases, project-level expenditures sourced from a program tracking database, which typically are not representative of all program spending).

As a result, we were unable to conduct cost effectiveness testing at a measure level. We were able to leverage detailed data produced by ADM for EPY7/GPY4 to resolve gaps in the data for later years and estimate cost effectiveness inputs by sector (Public Sector, Income Qualified Sector, Market Transformation), by utility, and by program year. Although the methodology is approximate, we conclude that the DCEO programs were cost effective for each utility portfolio over the three-year plan cycle, and for the State of Illinois overall, based on the Illinois TRC test.

7.2.4 Reporting

The evaluation team provides this report, which summarizes DCEO program activities for the period of June 1, 2014 through May 31, 2017 in table format with brief descriptions of results from the abridged impact evaluation activities for EPY9/GPY6. Where data is available, the evaluation team also reports on electric (kWh) and gas (therm) saving and actual expenditures compared to ICC authorization.