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MEMORANDUM

**To: Jennifer Hinman, Illinois Commerce Commission
David Nichols, ComEd**

From: Randy Gunn, Jeff Erickson, and Kevin Grabner, Navigant

Date: May 13, 2011

**Re: Additional Details on Net-to-Gross Ratios for the PY2 ComEd Business
Prescriptive Program**

As requested by Illinois Commerce Commission staff, this memo provides additional details regarding the results of the PY2 net-to-gross survey conducted of ComEd's PY2 Prescriptive Program participants. Specifically, this memo provides net-to-gross ratios at the end-use level for the PY2 Prescriptive Program population, and the composition by business type and measure type of net-to-gross ratios for sampled participants.

Net-to-Gross Methodology and Reporting in the PY2 Evaluation

The net-to-gross methodology used for the ComEd Business Prescriptive Program is described in detail in the PY2 Business Prescriptive Program Evaluation report. In summary, free ridership was assessed using a customer self-report approach following a framework that was developed for evaluating net savings of California's 2006-2008 nonresidential energy efficiency programs. This method calculates free-ridership using data collected during participant phone surveys. The net-to-gross assessment involves asking up to 27 questions, many of which are complex.

A key aspect in the implementation of the survey with ComEd Prescriptive participants is that the net-to-gross battery of questions is asked only once to each respondent regarding the end-use category of the measures that make up the majority of their total ex ante project savings. Participants may install several individual measures within one project, and multiple end-uses (lighting, HVAC, refrigeration, or motors) may be part of the project. We concluded that it would not be feasible to repeat the net-to-gross battery for multiple measures, primarily because it would make the survey much too long. The net-to-gross survey begins:

"I'd now like to ask a few questions about the <ENDUSE> you installed through the program."

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Given the survey methodology, we can estimate a net-to-gross ratio for the program population across all end uses, and for individual end-uses addressed in the survey. The PY2 evaluation provided a mean net-to-gross ratio for the total program population as results provided in Table 3-8, as shown below.

Table 3-8. NTG Ratio and Relative Precision at 90% Confidence Level

Sample Strata	Population (N=1739)	NTG Interviews (n=90)	NTG Sample (n=114)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	63	23	23	33.5%	5%	0.73	0.77	0.81
2	239	36	38	34.2%	5%	0.72	0.76	0.80
3	1437	31	53	32.3%	8%	0.63	0.68	0.73
Total	1739	90	114	100.0%	6%	0.69	0.74	0.78

Net-to-Gross Estimates at the End-Use Level for the PY2 Prescriptive Program

As a result of the ICC request, we have estimated and report below similar findings for the two end-uses that had survey respondents in PY2: lighting and HVAC (includes HVAC equipment and HVAC variable speed drives “VSDs”). Participants installing refrigeration and motors were not reached by the survey.

Lighting End-Use NTG Ratio and Relative Precision at 90% Confidence Level

Sample Strata	Lighting Population (N=1492)	NTG Interviews (n=81)	NTG Sample (n=105)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
1	63	23	23	35.0%	5%	0.76	0.80	0.84
2	225	31	33	35.3%	5%	0.73	0.77	0.82
3	1204	27	49	29.7%	8%	0.63	0.68	0.73
Total	1492	81	105	100.0%	6%	0.71	0.75	0.80

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HVAC End-Use NTG Ratio and Relative Precision at 90% Confidence Level

HVAC Population (N=159)	NTG Interviews (n=9)	NTG Sample (n=9)	Sample kWh Wgts.	Relative Precision ± %	Low	NTGR Mean	High
159	9	9	100.0%	18%	0.56	0.69	0.82

As expected, given that lighting dominates the program, NTG results for lighting and all end-uses combined are quite similar. The NTG ratio for the HVAC end use is lower than the program mean for all end-uses, but the relative precision of our HVAC estimate is lower.

Detailed Reporting on Net-to-Gross Ratios for the Sample of Survey Respondents

Although we cannot report statistically significant net-to-gross ratios for the population at the measure level beyond what we show above, we can report the composition of measures and business types for the sample of participants that we reached through the phone survey, along with the net-to-gross ratios for those participants. In the table below, we report the net-to-gross values for respondents whose projects included a specific measure type by weighting the respondent level NTG ratio by ex ante energy savings for the specific measure. One caveat, illustrated by lighting, is that respondents may have multiple lighting measure types installed in the project, but the survey asked only about “lighting” measures in total. The dominant measure in the project (for example a facility wide T8 lamp and ballast retrofit) may be driving the participant responses more than minor measures (a couple exit signs added). Therefore, in presenting the results, we sorted the table from largest impact to smallest and caution against over-interpretation. The sample sizes for most measures are too small to be able to draw the conclusion that the measure-specific NTG is significantly different from the population value. The HVAC end-use NTG of 0.69 in the table above includes HVAC VSDs (NTG=0.71) and HVAC equipment (NTG=0.39).

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Measure-type Composition of Net-to-Gross Respondents

Measure Type	NTG Sample Ex Ante kWh Savings	NTG Sample Ex Ante kW Savings	NTG Sample Measure Count	Ex Ante Sample kWh Weighted NTGR
New T5/T8 Fixture	31,183,500	7,300	80	0.78
Occupancy Sensors	4,995,398	1,125	38	0.77
Delamp 4' with or w/o reflector	2,191,047	424	37	0.81
HP T8 (4') and ballast	1,582,082	306	41	0.73
HVAC VSDs	1,188,914	108	15	0.71
Kitchen Hood DCV	1,121,500	190	2	0.70
Reduced Wattage T8 (4') Lamp Only	807,182	184	2	0.46
HW CFL	711,228	94	3	0.43
Reduced Wattage T8 (4') and Ballast	528,615	117	12	0.79
2' Lamp and Ballast	220,480	31	9	0.77
Metal Halides	211,179	45	2	0.77
Delamp 8' with reflector	88,896	21	3	0.59
Exit Signs	54,378	7	10	0.81
3' Lamp and Ballast	36,601	4	2	0.74
HVAC Equipment	29,286	14	4	0.39
4' U Tube T8 and Ballast	8,362	2	9	0.79
Reduced Wattage T8 (8') and Ballast	6,302	1	3	0.93
Induction Lighting	5,750	1	1	0.57
Total	44,970,699	9,975	273	

For the business type breakdown, we weighted the respondent's net-to-gross scores by project-level ex ante energy savings in the sample group for each business type reached in the survey.

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Business Type Composition of Net-to-Gross Respondents

Business Type	NTG Sample Ex Ante kWh Savings	NTG Sample Ex Ante kW Savings	Unique NTG Survey Respondents	NTG Sample Measure Count	Ex Ante Sample kWh Weighted NTGR
Light Industry	18,057,879	4,393	30	82	0.83
Heavy Industry	10,860,841	2,616	11	34	0.73
Warehouse	7,208,669	1,500	16	30	0.71
Miscellaneous	3,049,232	507	10	51	0.74
Medical	2,248,821	264	4	14	0.68
Office	1,241,002	244	9	27	0.67
Hotel/Motel	1,121,500	190	2	2	0.70
Retail/Service	981,166	220	7	27	0.64
College / University	201,590	42	1	6	0.33
Total	44,970,699	9,975	90	273	

We caution against drawing too-firm conclusions regarding each value shown in these results, however, a few values are notable. At the business type level, light industry is both a large contributor to program savings and provided a NTG ratio higher than the program mean value. At the opposite end, the seven respondents in the retail and service industry had a lower than average NTG ratio.

Among individual measures, new T8/T5 fixtures and occupancy sensors were both associated with projects that had NTG ratios higher than the program mean. At the other end of the scale, projects that included reduced wattage T8 lamps only and hardwired CFL fixtures had quite low net-to-gross ratios, and were a significant contributor to ex ante savings. The data does not help us determine whether the characteristics of these two measures result in high free-ridership, or whether there were other, customer-specific factors that caused these projects to have low NTG ratios.