



Desktop Power Management Program PY6 Evaluation Report

Final

**Energy Efficiency / Demand Response Plan:
Plan Year 6
(6/1/2013-5/31/2014)**

**Presented to
Commonwealth Edison Company**

March 2, 2015

Prepared by:

**Chelsea Lamar
Navigant**

www.navigant.com



Submitted to:

ComEd
Three Lincoln Centre
Oakbrook Terrace, IL 60181

Submitted by:

Navigant Consulting, Inc.
30 S. Wacker Drive, Suite 3100
Chicago, IL 60606

Contact:

Randy Gunn, Managing Director
312.583.5714
Randy.Gunn@Navigant.com

Jeff Erickson, Director
608.497.2322
Jeff.Erickson@Navigant.com

Acknowledgements

This report has benefited strongly from the contributions of

Rob Neumann
312.583.2176
Rob.Neumann@Navigant.com

Charles Ampong
608.497.2336
Charles.Ampong@Navigant.com

Disclaimer: This report was prepared by Navigant Consulting, Inc. ("Navigant") for ComEd based upon information provided by ComEd and from other sources. Use of this report by any other party for whatever purpose should not, and does not, absolve such party from using due diligence in verifying the report's contents. Neither Navigant nor any of its subsidiaries or affiliates assumes any liability or duty of care to such parties, and hereby disclaims any such liability.

Table of Contents

- E. Executive Summary 1**
 - E.1. Program Savings 1
 - E.2. Program Savings by Channel and Measure 1
 - E.3. Impact Estimate Parameters for Future Use..... 2
 - E.4. Program Volumetric Detail..... 2
 - E.5. Results Summary 3
 - E.6. Key Findings and Recommendations..... 3
- 1 Introduction 5**
 - 1.1 Program Description..... 5
 - 1.2 Evaluation Objectives 5
 - 1.2.1 Impact Questions 5
 - 1.2.2 Process Questions 5
- 2 Evaluation Approach..... 6**
 - 2.1 Overview of Data Collection Activities..... 6
 - 2.2 Verified Savings Parameters..... 7
 - 2.2.1 Verified Gross Program Savings Analysis Approach..... 8
 - 2.2.2 Verified Net Program Savings Analysis Approach 8
 - 2.3 Process Evaluation 10
- 3 Gross Impact Evaluation 11**
 - 3.1 Program Volumetric Findings..... 11
 - 3.2 Gross Program Impact Parameter Estimates..... 12
 - 3.3 Verified Gross Program Impact Results..... 14
- 4 Net Impact Evaluation 17**
 - 4.1 Free Ridership, Participant Interviews..... 17
 - 4.2 Free Ridership, Participant Self-Report..... 17
 - 4.3 Spillover, Participant Interviews..... 17
- 5 Process Evaluation 19**
- 6 Findings and Recommendations 20**
- 7 Appendix 21**
 - 7.1 Participant Survey..... 21

List of Figures and Tables

Figures:

Figure 3-1. Number of Measures Installed by Type 12
 Figure 3-2. Verified Gross Savings by Measure (kWh) 16

Tables:

Table E-1. PY6 Total Program Electric Savings 1
 Table E-2. PY6 Program Results by Measure 2
 Table E-3. Impact Estimate Parameters for Future Use 2
 Table E-4. PY6 Volumetric Findings Detail 2
 Table E-5. PY6 Results Summary 3
 Table 2-1. Primary Data Collection Activities 6
 Table 2-2. Additional Resources 6
 Table 2-3. Verified Savings Parameter Data Sources 8
 Table 3-1. PY6 Volumetric Findings Detail 11
 Table 3-2. Power Management Settings and Unit Savings 13
 Table 3-3. Average Savings per Desktop, Secondary Research 13
 Table 3-4. Verified Gross Savings Parameters 14
 Table 3-5. PY6 Verified Gross Impact Savings Estimates by Measure Type 15
 Table 4-1. PY6 Verified Net Impact Savings Estimates by Measure Type 18
 Table 5-1. Qualitative Participant Survey Responses 19

E. Executive Summary

This report presents a summary of the findings and results from the evaluation of the Program Year 6 (PY6) Desktop Power Management Program. The Desktop Power Management Program was offered by ComEd for the first time in Program Year 5 (PY5) and will not be offered beyond PY6. The implementation contractor is CLEAResult. The program provides rebates for installations of computer power management software. This program was offered to both private and 3 public sector entities for part of PY6 through the public sector partnership with DCEO. ComEd provided incentives for all projects and the resulting savings will count towards ComEd’s goals.

There were three major changes within the program from PY5 to PY6 which may have contributed to additional participation: (1) adding laptops as a technology eligible for software rebate, (2) creating a public sector pilot partnership with the Illinois Department of Commerce and Economic Opportunity (DCEO) for a limited number of projects, and (3) co-branding marketing materials with ComEd.

E.1. Program Savings

For PY6, the program had 10 participants and distributed incentives for software to 8,619 desktops and 2,557 laptops. Table E-1. summarizes the electricity savings from the Desktop Power Management Program. The program had one additional project underway in PY6, but it was not completed within PY6. That project included installation of software on 5,523 desktops and 2,503 laptops; however, even though the evaluation team determined that program influence existed for that project, the participant had not implemented any power management settings for this project. The participant reported that they will be implemented Winter-Spring of 2014-2015 and this project may be considered in PY7 in another ComEd program or as a part of spillover research. Based on future deemed savings numbers recommended by Navigant, this project could result in additional savings of 1,229,750 kWh.

Table E-1. PY6 Total Program Electric Savings

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	2,673,463	NA	N/A
Verified Gross Savings	2,347,781	873	180
Verified Net Savings	2,241,834	834	172

Source: ComEd tracking data and Navigant team analysis.

E.2. Program Savings by Channel and Measure

The following table outlines program savings by measure.

Table E-2. PY6 Program Results by Measure

Research Category	Ex Ante Gross Savings (kWh)	Ex-Ante Gross Peak Demand Reduction (kW)	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	NTGR [‡]	Verified Net Savings (kWh)	Verified Net Peak Demand Reduction (kW)
Savings, Desktops	2,514,162	NA	2,203,614	169	88%	0.95	2,104,172	161
Savings, Laptops	159,301	NA	144,168	11	91%	0.95	137,662	10
Total	2,673,463	NA	2,347,781	180	88%	0.95	2,241,834	172

Source: ComEd tracking data and Navigant team analysis.

[‡] Based on evaluation research findings.

E.3. Impact Estimate Parameters for Future Use

During PY6, the evaluation team conducted research on various parameters used in impact calculations. The evaluation team conducted primary research to determine a NTG value and recommends using the value if a similar program is offered in the future. The evaluation research resulted in a NTG of 0.95¹.

Table E-3. Impact Estimate Parameters for Future Use

Parameter	Value	Data Source
NTG	0.95	Evaluation Research
kWh Savings, Desktops	200	Evaluation Research
kWh Savings, Laptops	50	Evaluation Research

Source: Evaluation Analysis

E.4. Program Volumetric Detail

The program had 10 participants in PY6 and distributed incentives for software to 8,619 desktops and 2,557 laptops (not counting the one that finished in PY7), as shown in the following table.

Table E-4. PY6 Volumetric Findings Detail

Participation Metric	Quantity
Participants	10
Total Desktops	8619
Total Laptops	2557
Installed Projects	11,176

Source: ComEd tracking data and Navigant team analysis.

¹If SAG deems this measure in similar programs, Navigant recommends also taking into account additional net-to-gross research from other service territories, since this program had very few participants (e.g., small sample).

E.5. Results Summary

The following table summarizes the key metrics from PY6.

Table E-5. PY6 Results Summary

Participation Metric	Units	PY6
Net Savings	kWh	2,241,834
Net Peak Demand Reduction	kW	172
Gross Savings	kWh	2,347,781
Gross Peak Demand Reduction	kW	180
Program Realization Rate	%	88%
Program NTG Ratio †	#	0.95
Desktops Installations	#	8619
Laptop Installations	#	2557
Participating Customers	#	10

Source: ComEd tracking data and Navigant team analysis.

† Based on evaluation research

E.6. Key Findings and Recommendations

The following provides insight into key program findings and recommendations.² The program did not obtain the projected savings outlined in the program’s Scope of Work (the participation and energy savings goals was to distribute 54,347 units and achieve gross savings of 15,852,885 kWh). All program participants were very satisfied with the program.

Program Participation

Finding 1. The program had 10 participants, distributing software to a total of 11,176 computers.

Verified Gross Savings and Realization Rate

Finding 2. The program achieved verified gross savings of 2,347,781 kWh (*which is 15% of the planned gross savings of 15,852,885 kWh*) and verified gross peak demand savings of 180 kW.

Net to Gross Ratio

Finding 3. The NTG ratio submitted by the implementer of 0.8 for desktops and 0.6 for laptops is likely too conservative. Through evaluation research, the NTG was calculated at 0.95.

Recommendation 1. Navigant recommends deeming the NTG ratio at 0.95 for future similar programs based on the participant self-report data gathered this year.¹

² Numbered findings and recommendations in this section are the same as those found in the Findings and Recommendations section of the evaluation report for ease of reference between each section.

Ex-Ante Savings and Project File Review

Finding 4. Based on additional research into actual savings from this type of software, as well as claimed savings in other states, the evaluation found that the implementer work paper energy savings estimates of 291.7 kWh for desktops and 62.3 kWh for laptops are likely too high. This is mainly due the assumptions from ENERGY STAR (the main source of the calculation) which calculates savings (1) using aggressive power management settings and (2) assuming computers with power management software are not ENERGY STAR qualified. Through project verification, Navigant found that the actual power management settings were not as aggressive as assumed by ENERGY STAR and some desktops and laptops were ENERGY STAR qualified.

Recommendation 2a. Navigant recommends a more conservative savings value, specifically 200 kWh per desktop and 50 kWh per laptops, to be used in the future which would use less aggressive power management settings and assumes a percent of desktops and laptops to be ENERGY STAR qualified.

Recommendation 2b. Navigant recommends ComEd and future implementers provide recommendations and guidelines to participants on the most efficient power management settings.

Verified Net Savings.

Finding 5. The program achieved verified net savings of 2,241,834 kWh and verified net demand savings of 172 kW.

Process Evaluation

Finding 6. Participants are satisfied with program with an overall satisfaction rating of 4.9 on a 5 point scale.

1 Introduction

1.1 Program Description

The Desktop Power Management Program provides rebates for qualifying installations of desktop power management software, which at the network level, controls the internal power settings of both desktop central processing units (CPU) and monitors. CLEAResult started implementing this program in EPY5. Rebate amounts have changed over the course of the program from \$8 to \$12 to \$15 for each eligible desktop computer, not to exceed the price of the software. The rebate increases were attempts to increase participation.³ In PY6, Laptop rebates were also offered at \$5 per eligible laptop. The program required that the software be installed on computers that (1) have not previously installed enterprise-managed power management software, (2) allow centralized control and override of desktop power management settings, and (3) have the capability to produce energy savings and system reports.

In addition, the program required a Program Participation Agreement (PPA) to be completed in full, signed by the participant, and submitted to the program prior to the date of purchase of software or installation. This PPA asked the customer to certify they did not currently have software installed and also asked likelihood and influence questions, which were used in the NTG calculation. After the customer was pre-approved using the PPA, the customer would either (A) work with a vendor to install the software and then apply for the rebate or (B) work with a vendor who offered an instant rebate. After the software was installed, CLEAResult required that each participant provide a network printout that includes (1) the number of computers controlled by the software and (2) the current power management settings.

1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for PY6:

1.2.1 Impact Questions

1. What are the gross impacts from the program?
2. What are the net impacts from the program?
3. Did the program meet its energy savings goals?

1.2.2 Process Questions

A limited process evaluation was conducted for this program that focused on customer satisfaction with the program.

³ The PY5 participant received \$8.50/unit, which was the software license cost they paid.

2 Evaluation Approach

The verified gross savings were based on a review of the program tracking data, project documentation, participant interviews and literature review. The net savings were calculated using a NTG ratio calculated using information obtained through the participant interviews and the PPA.

2.1 Overview of Data Collection Activities

The data used to evaluate this program consisted of the program tracking dataset, project documentation for the completed project (PPA, application, network printout), secondary research, and informational calls with the CLEAResult program managers. Table 2-1 presents the primary data collection activities.

Table 2-1. Primary Data Collection Activities

What	Who	Target Completes	Completes Achieved	When	Comments
Program Tracking Database	Participants	10	10	October – November 2014	Source of Information for Verified Gross Analysis
Telephone Survey	Participants	10	4	November 2014	Used for NTG analysis

Table 2-2. Additional Resources

Reference Source	Author	Application	Gross Impacts	Process
ENERGY STAR Power Management Software Calculator	ENERGY STAR	Impact Analysis	X	
Surveyor Consumption Report	Southern California Edison	Demand Savings Calculations	X	
Work Paper WPSCNROE0003 Revision 1, Power Management Software for Networked Computers.	Southern California Edison	Impact Analysis Research	X	
Surveyor Network Energy Manager: Market Progress Evaluation Report, No. 2 (Northwest Energy Efficiency Alliance report #E05-136).	Quantec LLC	Impact Analysis Research	X	
Regional Technical Forum.	NW Council	Impact Analysis Research	X	
Energy Consumption by Office and Telecommunications Equipment in Commercial Buildings Volume II: Energy Savings Potentials	TIAX LLC	Impact Analysis Research	X	
Work paper – Network Desktop Computer Power Management Software	Resource Solutions Group (now CLEAResult)	Impact Analysis Research	X	

2.2 Verified Savings Parameters

The desktop management software measure is not included in the Illinois TRM v2.0⁴. Navigant submitted a desktop management software measure to be considered for inclusion in Version 4 of the TRM (*which is not final at this time*). Verified Gross and Net Savings resulting from the PY6 Program were calculated using the following algorithms:

Monitor Savings

$$\begin{aligned} &= \left((Watts_{active} * Hours_{active} + Watts_{sleep} * Hours_{sleep} + Watts_{off} * Hours_{off}) \right. \\ &\quad \left. - (Watts_{active} * Hours_{activePM} + Watts_{sleep} * Hours_{sleepPM} + Watts_{off} * Hours_{offPM}) \right) \\ &\quad / 1000 \end{aligned}$$

Desktop/Laptop Savings

$$\begin{aligned} &= \left((Watts_{active} * Hours_{active} + Watts_{sleep} * Hours_{sleep} + Watts_{off} * Hours_{off}) \right. \\ &\quad \left. - (Watts_{active} * Hours_{activePM} + Watts_{sleep} * Hours_{sleepPM} + Watts_{off} * Hours_{offPM}) \right) \\ &\quad / 1000 \end{aligned}$$

Where:

- $Watts_{active}$ = Power Draw in watts used by applicable desktop/laptop/monitor in full power state or Active state
- $Watts_{sleep}$ = Power Draw in watts used by applicable desktop/laptop/monitor sleep state
- $Watts_{off}$ = Power Draw in watts used by applicable desktop/laptop/monitor off state
- $Hours_{active}$ = Average hours which the applicable desktop/laptop/monitor is in active state prior to installation of desktop management software
- $Hours_{sleep}$ = Average hours which the applicable desktop/laptop/monitor is in sleep state prior to installation of desktop management software
- $Hours_{active}$ = Average hours which the applicable desktop/laptop/monitor is in off state prior to installation of desktop management software
- $Hours_{activePM}$ = Average hours which the applicable desktop/laptop/monitor is in active state after installation of desktop management software
- $Hours_{sleepPM}$ = Average hours which the applicable desktop/laptop/monitor is in active state after installation of desktop management software
- $Hours_{offPM}$ = Average hours which the applicable desktop/laptop/monitor is in active state after installation of desktop management software

The “Watts” variable values change based on (1) type of computer on which the software was installed (desktop or laptop), and (2) whether the computer is ENERGY STAR qualified. The “Hours” variable values change based on computer power management settings. Table 2-3 presents the parameters that were used in the verified gross and net savings calculations and indicates which were examined through evaluation activities and which were deemed.

⁴ <http://www.ilsag.info/technical-reference-manual.html>

Table 2-3. Verified Savings Parameter Data Sources

Gross Savings Input Parameters	Data Source	Deemed or Evaluated?
Evaluated Engineering Algorithm Inputs	Multiple	Evaluated
Realization Rate	Project Files and Evaluated Engineering Algorithms	Evaluated
NTG	Participant Survey and PPA	Evaluated

2.2.1 Verified Gross Program Savings Analysis Approach

Navigant calculated the gross program impacts using inputs from ENERGY STAR Computer Power Management Calculator with an adjustment (described in more detail in Section 3) based on TIAX LLC report as referenced in Table 2-2. There was only one type of measure for PY6 electric savings, but savings varied based upon power management settings, ENERGY STAR qualification, and type of computer (desktop or laptop).

2.2.2 Verified Net Program Savings Analysis Approach

Verified net energy and demand savings were calculated by multiplying the verified gross savings estimates by a net-to-gross ratio (NTGR).

NTG research methods in PY6 combine results from the participant telephone interview and self-report data (obtained from the PPA). The self-reported information from the PPA was used where participant interview information was not available.

2.2.2.1 Free-Ridership

Likelihood and program influence scores were averaged to obtain a free-ridership score. Navigant obtained these scores from participant telephone surveys and self-report data from the PPA when the participant was not available for a telephone interview. The logic used in the telephone survey is below:

1. If the customer had not considered the measure prior to participating in the program, then the probability of free-ridership is estimated to be zero.
2. If the customer had plans to install the measures in the absence of the program, but indicated that the program accelerated their decision by more than two years, then the probability of free-ridership is estimated to be zero.

If neither of the above criteria holds, then the responses to the following questions are used to calculate the probability of free-ridership:

Likelihood: On a 1 to 5 scale, with 1 being not at all likely and 5 being completely likely, how likely is it that you would have purchased and installed the same or similar computer power management software in your facility if you had not received an incentive from the program?

Program as Key Factor: On a scale of 1 to 5, where 1 is strongly disagree and 5 is strongly agree, how much do you agree with this statement: There may have been several reasons for my installation of computer power management software, but the program was a key factor in my decision to have the computer power management software installed.

The corresponding formula for calculating free-ridership is shown below (the 1-5 scale is translated as follows, 1=0, 2=2.5, 3=5, 4=7.5, 5=10):

$$\text{Free ridership} = [\text{Average (Likelihood, 10 - Program as Key Factor)}]/10$$

A consistency check would be asked for those participants who have inconsistency between responses (i.e., Likelihood Score = 4, 5 and Program as Key Factor = 4, 5 prompt ‘you were likely to install the computer power management software without the program but that differs from your response that the program was a key factor in your decision to have the computer power management software installed’ or Likelihood Score = 1, 2 and Program as Key Factor = 1, 2 prompt ‘you were not likely to install the computer power management software without the program but *that* differs from your response that that the program was not a key factor in your decision to have the computer power management software installed’).

Participant-reported answers to the following questions from the PPA were input into the above free-ridership algorithm to determine the NTG value when participant interview data was not available:

Likelihood: How likely would you be to install desktop power management software without the rebate offerings? [Not at all likely, Slightly likely, Moderately likely, Very likely, Completely likely]

Program as Key Factor: How likely would you be to install desktop power management software without the rebate offerings? [Not at all likely, Slightly likely, Moderately likely, Very likely, Completely likely]

2.2.2.2 *Spillover*

The telephone survey attempted to also quantify spillover. Spillover was calculated using the influence score based off the following question, which was applicable for energy efficient equipment installed without ComEd incentive:

Program Influence: On a scale of 1 to 5, where 1 means “no influence” and 5 means “greatly influenced,” how much influence did your participation in the Desktop Power Management program have on your decision to install additional energy efficiency measures or implement other activities?

The corresponding formula for calculating spillover is shown below (the 1-5 scale is translated as follows, 1=0, 2=2.5, 3=5, 4=7.5, 5=10)

$$\text{Spillover} = \text{Program Influence Score}/10$$



2.3 Process Evaluation

The process evaluation conducted for PY6 was limited to participant surveys.

3 Gross Impact Evaluation

This section describes the results from Navigant’s gross impact evaluation for the PY6 Desktop Power Management Program. A review of the program tracking system determined there were 10 participants with a total program ex ante gross energy savings of 2,673,463 kWh. Based on savings verification activities, the program achieved verified gross savings of 2,347,781 kWh resulting in a realization rate of 88%.

3.1 Program Volumetric Findings

Navigant’s review of the participant files and tracking data focused on the following: (1) validating participation numbers with rebate application and invoice, and (2) determining the current power management settings. As noted above, Navigant verified that there were 10 participants with completed projects in PY6, with software installation on 8,619 desktops and 2,557 laptops. The program had one additional project underway in PY6, but it was not completed within PY6. The evaluation team determined there was program influence in that project, but the applicant was unaware that the further interaction with CLEAResult was required. Furthermore, as of the conclusion of this evaluation, none of the power management settings for that project had been activated or implemented; thus, there are no savings to be counted. This project could be considered in another program in PY7 or in spillover research.

Key findings include:

1. Navigant’s review of the program documentation did not result in any adjustments to the number of computers and laptops installed for any individual project.
2. Navigant’s review of the current power management settings did find a variety of implemented settings for controlling both monitors and desktop (activating hibernation or stand-by mode after a range of 5 to 120 minutes or only overnight).

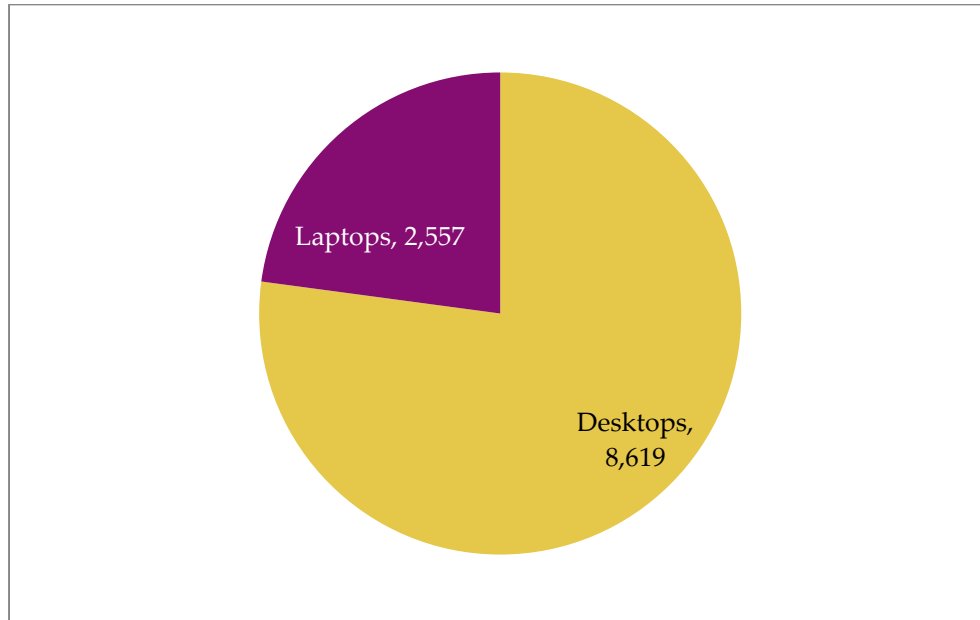
Volumetric findings are summarized in Table 3-1 and Figure 3-1 below.

Table 3-1. PY6 Volumetric Findings Detail

Volumetric Parameter	ComEd Total Participants or Measures Installed
Participants	10
Total Desktops	8,619
Total Laptops	2,557
Total Computers	11,176

Source: ComEd tracking data and Navigant team analysis.

Figure 3-1. Number of Measures Installed by Type



Source: Evaluation Analysis

3.2 Gross Program Impact Parameter Estimates

As described in Section 2, energy savings are estimated using the following formula:

$$Savings = \left((Watts_{active} * Hours_{active} + Watts_{sleep} * Hours_{sleep} + Watts_{off} * Hours_{off}) - (Watts_{active} * Hours_{activePM} + Watts_{sleep} * Hours_{sleepPM} + Watts_{off} * Hours_{offPM}) \right) / 1000$$

The evaluation team utilized the ENERGY STAR Computer Power Management Savings Calculator for inputs for “Watts” and “Hours”. The “Watts” input varied based on ENERGY STAR qualification and type of computer (desktop or laptop). The “Hours” input varied based on the computer power management software settings. The baseline assumption in the ENERGY STAR calculator is that none of the computers and monitors enter sleep mode. The evaluation team used the implementer submitted assumption that 25% (studies show range of 6-25%) baseline computers have power management settings enabled and 70% (studies show range of 60-70%) of baseline monitors have power management enabled (TIAX LLC). After this adjustment the evaluation team input actual power management settings into the calculator to determine “Hours” (which the calculator adjusted based on the power management settings inputs and a modeling study) and actual ENERGY STAR qualification to determine “Watts”. In those cases where it was unclear from the project files or participant interviews whether the computer was ENERGY STAR qualified, it was assumed it was not.

The evaluation team found large variability in documented savings from computer power management software. A list of values is found in Table 3-2 below along with power management settings.

Table 3-2. Power Management Settings and Unit Savings

Project Number	Monitor Setting (Stand-by Time in Minutes)	Desktop Setting (Stand-by Time in Minutes)	ENERGY STAR Qualified	Desktop Unit Savings
1	30	At Night	N	242.3
2	90	90	Y	162.9
3	30	At Night	N	242.3
4	20	120	N	243.9
5	5	10	N	296.2
6	15	30	N	274.0
7	15	30	N	274.0
8	30	120	N	242.3
9	10	45	Y	187.8
10	30	120	N	242.3
<i>Simple Average</i>				241.0

Source: Evaluation Analysis

The evaluation team also conducted research into documented savings from additional sources in order to verify validity of savings from the ENERGY STAR Computer Power Management Software Calculator. Savings per desktop computer from secondary research sources are shown in the table below (Table 3-3).

Table 3-3. Average Savings per Desktop, Secondary Research

Source	Savings
Puget Sound Energy	176
Regional Technical Forum	117
NEEA, produced by QUANTEC	165
Southern California Edison	330
Issaquah school district	253
Bateman school district	253
Portland Metro Govt	34
Queensborough Community College	317
Avista	85
TIAX 2004	245
<i>Simple Average</i>	198

Source: Evaluation Analysis

As shown, average savings from secondary research sources are less than ENERGY STAR Calculator predicted savings. Anecdotally, this variation could be due to a number of different factors, including type of computer (ENERGY STAR qualified or not), implemented power management savings, and behavior of participant prior to installation of software. Navigant recommends a more conservative savings value be used in the future to reflect the savings found in secondary research. Navigant submitted an update to the TRM v4.0 which deems savings for desktops at 200 kWh and laptops at 50 kWh based upon the research outlined above. Navigant also recommends providing guidelines or recommendations on proper energy management settings to participants for optimal energy savings. Table 3-4 shows verified gross savings parameters for PY6.

Table 3-4. Verified Gross Savings Parameters

Gross Savings Input Parameters	Value	Deemed or Evaluated?
Quantity	11,176	Evaluated
Measure Type and Eligibility	NA	Evaluated
Gross Savings per Unit, Sampled Deemed Measures	Varies	Evaluated
Verified Realization Rate on Ex-Ante Gross Savings	88%	Evaluated

Source: Evaluation Analysis

The peak demand savings were based on a study conducted by Southern California Edison which determined that the desktop computers operating with computer power management software, on average, used less power during peak periods by 20W. The evaluation team assumed average power draw for these desktop at 101W in accordance with ENERGY STAR guidelines and then used the ratio of average power draw for desktops to total power draw for each applicable type of computer (laptop, desktop, or ENERGY STAR qualified) multiplied by 20W to adjust savings.

The total demand savings are calculated by the reduction in total wattage from active to stand-by/off modes for each type of computer.

3.3 Verified Gross Program Impact Results

The resulting total program verified gross savings are shown in the following table (Table 3-5).

Table 3-5. PY6 Verified Gross Impact Savings Estimates by Measure Type

	Gross Energy Savings (kWh)	Gross Peak Demand Savings (kW)	Demand Savings (kW)
Desktop			
Ex-Ante Gross Savings	2,514,162	NA	NA
Verified Gross Realization Rate	88%	NA	NA
Verified Gross Savings	2,203,614	169	823
Laptop			
Ex-Ante Gross Savings	159,301	NA	NA
Verified Gross Realization Rate	91%	NA	NA
Verified Gross Savings	144,168	11	50
Total			
Ex-Ante Gross Savings	2,673,463	NA	NA
Verified Gross Realization Rate	88%	NA	NA
Verified Gross Savings	2,347,781	180	873

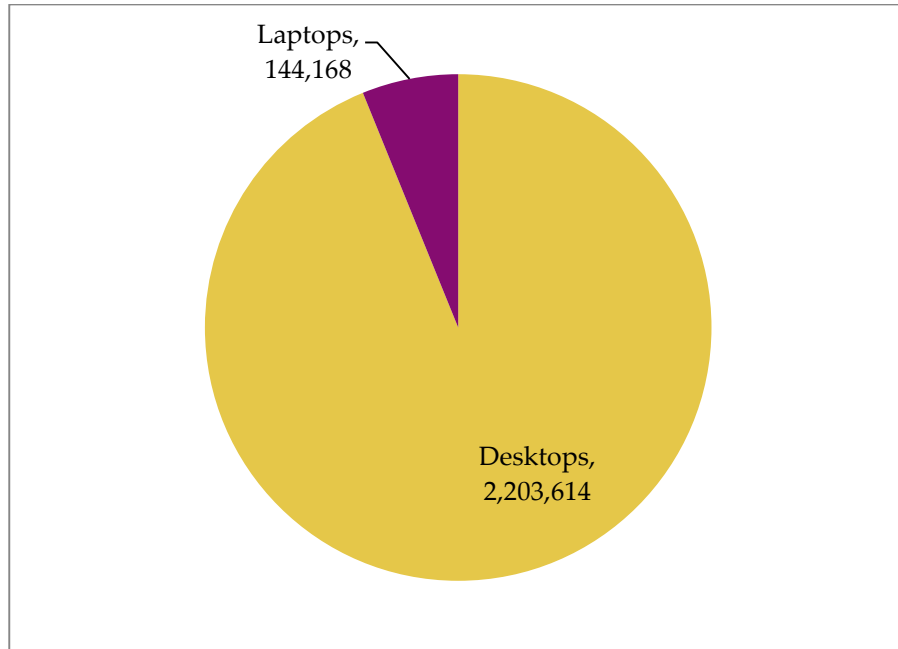
Source: Evaluation Team analysis.

As discussed above, the verified savings were less than ex-ante savings due to using actual power management settings and ENERGY STAR qualification in the energy savings calculations.

The implementer submitted work paper claims for laptop unit savings of 62.3 kWh. Navigant calculated the verified laptop savings using the same assumptions and source inputs as described in Section 3-2. Navigant recommends laptop savings be deemed at 50 kWh based on the secondary research cited above.

Figure 3-2, below, shows the relative distribution of gross energy savings by measure – desktops comprise the majority of the savings.

Figure 3-2. Verified Gross Savings by Measure (kWh)



Source: Evaluation Analysis

4 Net Impact Evaluation

Navigant determined the NTG value for this program using the answers from the participant survey for the four participants who responded to the survey and the Program Participation Agreement (PPA) questions for the remaining six participants. The evaluation team determined the NTG ratio to be 0.95 for both laptops and desktops. This resulted in overall verified net savings of 2,241,834, which is higher than the implementer calculated net savings of 2,106,911.

4.1 Free Ridership, Participant Interviews

There was little free ridership associated with the program. The free ridership calculated from the participant interviews were based on program as key factor (i.e. importance) scores (of the four participants, three rated the importance at 5 and one rated the importance at 4) and likelihood scores (of the four participants, two rated likelihood at 1, one rated likelihood at 3, and one rated likelihood at 2). The evaluation team did not see inconsistencies between answers and thus the consistency check was not used for any of the participants.

4.2 Free Ridership, Participant Self-Report

The free ridership calculated from the participant self-report scores were based on importance scores (of the six participants, five rated importance at 5 and one rated importance at 4) and likelihood scores (of the six participants, four rated likelihood at 1 and two rated likelihood at 2). The participant self-report scores were combined with the telephone survey scores to calculate an overall free ridership of 0.05.

4.3 Spillover, Participant Interviews

Overall, there was no spillover associated with the program. No program respondents indicated that the Desktop Power Management Program had influence on installation of additional energy efficiency equipment. One program respondent mentioned that he wouldn't have known about the software without the program, and for other participants, the rebate was the deciding factor. Often, the rebate covered close to the entire cost of the software, shortening the ROI, and creating a better business case.

SAG determined⁵ that the NTG value should be calculated by the EM&V team and applied retrospectively to calculate verified net savings. The evaluation team calculated verified net savings as shown in the following table.

⁵ Source: ComEd PY5-PY6 Proposal Comparisons with SAG.xls, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

Table 4-1. PY6 Verified Net Impact Savings Estimates by Measure Type

	Energy Savings (kWh)	Coincident Peak Demand Savings (kW)	Demand Savings (kW)
Ex-Ante PY6 Gross Savings	2,673,463	NA	NA
Realization Rate	88%	NA	NA
Verified Gross Savings	2,347,781	180	873
Free Ridership	0.05	0.05	0.05
Spillover	0	0	0
NTG	0.95	0.95	0.95
Verified Net Savings	2,241,834	172	834

Source: Evaluation Team analysis.

5 Process Evaluation

There was a limited process evaluation conducted for PY6 since the program will not be continuing into PY7. The participant survey results are presented in Table 5-1 below. There was one program satisfaction question asked in the participation survey which resulted in a satisfaction rating of 4.9 on a 5 point scale.

Table 5-1. Qualitative Participant Survey Responses

Process Question	Participant Answers
How did you first hear about the Desktop Power Management Rebate program	<ul style="list-style-type: none"> • Software Vendor • Implementer • Email from utility • Energy Auditor
What are the best ways of reaching companies like yours to provide information about energy efficiency opportunities?	<ul style="list-style-type: none"> • Email (three participants gave this answer) • Direct mailing
Satisfaction rating and reason for satisfaction rating?	<ul style="list-style-type: none"> • The program allowed them to implement a solution that is providing value to organization through cost savings. Working with the team to get the rebate was straightforward and they were helpful. (Satisfaction Rating: 5) • Software seems to work very well and does it what they say it does. Pretty easy to use. Pretty painless applying for the rebate. (Satisfaction Rating: 4.5) • Positive interaction with implementer. (Satisfaction rating: 5) • Prompt processing and the people were responsive and helpful. (Satisfaction rating: 5)
Would you recommend the program?	<ul style="list-style-type: none"> • All four participants noted they would recommend the program
Type of Organization?	<ul style="list-style-type: none"> • All four participants were office buildings (of the remaining six participants who were unavailable to answer the survey, five are marked as schools and one as an office on the incentive application)

6 Findings and Recommendations

This section summarizes the key impact and process findings and recommendations. Overall, the program did not meet the scope of work goals to distribute 54,347 units and achieve gross savings of 15,852,885 kWh. There was a limited process evaluation conducted, but without findings which explore the reason for the difference between the projected and actual participation.

Program Participation

Finding 1. The program had 10 participants, distributing software to a total of 11,176 computers.

Verified Gross Savings and Realization Rate

Finding 2. The program achieved verified gross savings of 2,347,781 kWh and verified gross demand savings of 180 kW.

Net to Gross Ratio

Finding 3. The NTG ratio submitted by the implementer of 0.8 for desktops and 0.6 for laptops is likely too conservative. Through evaluation research, the NTG was calculated at 0.95.

Recommendation 1. Navigant recommends deeming the NTG ratio at 0.95 for future similar programs based on the participant self-report data gathered this year.¹

Ex-Ante Savings and Project File Review

Finding 4. Based on additional research into actual savings from this type of software, as well as claimed savings in other states, the evaluation analysis determined that the work paper energy savings estimates of 291.7 kWh for desktops and 62.3 kWh for laptops are likely too high. This is mainly due the assumptions from ENERGY STAR (the main source of the calculation) which calculates savings (1) using aggressive power management settings and (2) assuming computers with power management software are not ENERGY STAR qualified. Through project verification, Navigant found that the actual power management settings were not as aggressive as assumed by ENERGY STAR and some desktops and laptops were ENERGY STAR qualified.

Recommendation 2a. Navigant recommends a more conservative savings value, specifically 200 kWh per desktop and 50 kWh per laptops, to be used in the future which would use less aggressive power management settings and assumes a percent of desktops and laptops to be ENERGY STAR qualified.

Recommendation 2b. Navigant recommends ComEd and future implementers provide recommendations and guidelines to participants on the most efficient power management settings.

Verified Net Savings.

Finding 5. The program achieved verified net savings of 2,241,834 kWh and verified net demand savings of 172 kW.

Process Evaluation

Finding 6. Participants are satisfied with program with an overall satisfaction rating of 4.9 on a 5 point scale.

7 Appendix

7.1 Participant Survey

Third Party Desktop Power Management Rebate Program PY6 Participant Survey

Introduction

Hello, this is ____ from Navigant Consulting calling regarding your company's participation in the Desktop Power Management program. May I please speak with <contact>?

Our records show that your company participated in the Desktop Power Management program in which computer power management software was installed at your business, and we are calling to conduct a follow-up study about your company's participation in this program. I was told you're the person most knowledgeable about this project. Is this correct? [If not, ask to be transferred]

This survey will take about 15 minutes. Is now a good time? [If no, schedule call-back]

<i>Topic</i>	<i>Topic Objective</i>	<i>Numbers</i>
Participant Confirmation Detail	Confirm site contact and measures installed	1-2
Marketing and Outreach	Determine effectiveness of program marketing	3-8
Net-to-Gross Battery	Determine free-ridership and spillover	9-28
Program Satisfaction	Assess participants satisfaction with various aspects of the program	29-31
Firmographics	Ascertain general information on the company	32-34

Participant Confirmation Detail

1. I understand that you had computer management software installed on or about [date]. Does that sound right?
 - a. Yes
 - b. No
 - c. Other

2. [Insert information from project files here and confirm data points]
 - a. Number of laptops installed
 - b. Number of desktops installed
 - c. Type of monitor

Marketing and Outreach

3. How did you first hear about the Desktop Power Management program [probe if needed, event, program representative, software vendor]?
4. Do you recall seeing or receiving any marketing materials or other information for the Desktop Power Management Rebate program [probe if needed, phone call, eblast, flyer, online]?
5. What are the best ways of reaching companies like yours to provide information about energy efficiency opportunities? [Probe if necessary, phone call, email, bill inserts, key account manager, tv/online/radio advertisements, etc.]
6. Before I ask you specific questions about your decision, please tell me in your own words why you decided to have the computer power management software installed at your organization?
7. Before learning about the Desktop Power Management Program, had you ever had computer power management software installed at your organization in Illinois?
 - a. If yes, continue to Q8
 - b. If no/don't know, continue to Q9
8. Did this previously installed computer power management software have reporting capability and remote scheduling?
 - a. If yes, continue to Q9
 - b. If no/don't know, continue to Q10
9. Did you receive an incentive or another form of utility or government financial support for installing this previous software [if needed, probe for name of software, if operational at time of participation]?

Net-to-Gross Battery

10. When you first heard about the rebate available for computer power management software, had you already considered purchasing this type of software?
 - a. If yes/don't know, continue to Q11
 - b. If no, go to spillover section
11. Had you already began researching information about computer power management software to aid in your purchase decision?
 - a. If yes, continue to Q12
 - b. If no/don't know, continue to Q13
12. Had you already narrowed down your selection decision on the computer management software to one or two products you were planning to purchase prior to finding out about the available rebate?

- a. If yes, skip to Q14
 - b. If no/don't know, continue to Q13
13. Why hadn't you installed computer management software prior to learning about the rebate?
14. Did the program influence you to have the computer power management software installed **earlier** than you otherwise would have (said another way, did you install the software **earlier** based upon the program)?
- a. If yes, continue, to Q15
 - b. If no/don't know, skip to Q16
15. How much later would you have **installed** the computer power management software if you hadn't participated in the program?
- a. Within six months
 - b. More than six months, but less than a year later
 - c. More than a year, but less than two years later
 - d. More than two years later
16. On a 1 to 5 scale, with 1 being not at all likely and 5 being completely likely, how likely is it that you would have purchased and installed the same or similar computer power management software in your facility if you had not received an incentive from the program?
17. On a scale of 1 to 5, where 1 is strongly disagree and 5 is strongly agree, how much do you agree with this statement: There may have been several reasons for my installation of computer power management software, but the program was a key factor in my decision to have the computer power management software installed.

Consistency Check & Resolution

Question 18 will be asked to those respondents who have inconsistency between responses for Q16 and Q17 (i.e., Q16 = 4, 5 and Q17 = 4, 5 or Q16 = 1, 2 and Q17 = 1, 2)

{If Q16 = 4, 5 and Q17 = 4, 5, ask Q18 using 'you were likely to install the computer power management software without the program but that differs from your response that the program was a key factor in your decision to have the computer power management software installed'}

{If Q16 = 1, 2 and Q17 = 1, 2, ask Q18, using 'you were not likely to install the computer power management software without the program but *that* differs from your response that that the program was not a key factor in your decision to have the computer power management software installed'}

18. Let me make sure I understand you. Earlier, you said [use inconsistency from above]. Please tell me in your own words what influence, if any, the program had on your decision to install the computer power management software at the time you did?

Spillover

19. Since your participation in the Desktop Power Management program, have you done any of the following?
 - a. Installed any additional energy efficient equipment or implemented any activities at this facility that received incentives from ComEd [if yes, proceed to Q20, if no/don't know, skip to Q29]
 - b. Installed any additional energy efficient equipment or implemented any activities that received incentives from another utility or government program [if yes, proceed to Q23 and probe for organization, if no/don't know, skip to Q29]
 - c. Installed any additional energy efficient equipment or implemented any activities at this facility that did NOT receive incentives from ComEd or another utility or government program [if yes proceed to Q26, if no/don't know go to Q29]

20. If yes (*you did receive an incentive*), what type of energy efficient equipment did you install or activities did you implement *that did that receive incentives from ComEd*? Did you install:
 - a. Lighting
 - b. Cooling
 - c. Motors
 - d. Refrigeration
 - e. Compressed Air
 - f. Something else (specify)

21. On a scale of 1 to 5, where 1 means "no influence" and 5 means "greatly influenced," how much influence did your participation in the Desktop Power Management Program have on your decision to install any additional energy efficiency measures or conduct activities that improved energy efficiency through ComEd?[If Q21=4, 5; ask Q22, if Q19b is yes, ask Q23, if Q19c is yes ask Q26, or else go to Q29]

22. How did the Desktop Power Management program influence your decision to make these additional changes?

[Ask if Q19b is yes]

23. What type of energy efficient equipment did you install or activities *that did receive incentives from another organization*? Did you install...
 - a. Lighting
 - b. Cooling
 - c. Motors
 - d. Refrigeration
 - e. Compressed Air
 - f. Something else (specify)

24. On a scale of 1 to 5, where 1 means “no influence” and 5 means “greatly influenced,” how much influence did your participation in the Desktop Power Management program have on your decision to install additional energy efficiency measures or implement other activities? [If Q24=4, 5; ask Q25, if Q19c is yes ask Q26, or else go to Q29]
25. How did the Desktop Power Management program influence your decision to make these additional changes?

[Ask if Q19c is yes]

26. What type of energy efficient equipment did you install or activities *that you did that DID NOT receive incentives from ComEd or another organization?* Did you install...
 - g. Lighting
 - h. Cooling
 - i. Motors
 - j. Refrigeration
 - k. Compressed Air
 - l. Something else (specify)
27. On a scale of 1 to 5, where 1 means “no influence” and 5 means “greatly influenced,” how much influence did your participation in the Desktop Power Management program have on your decision to install additional energy efficiency measures or implement other activities?

[Ask if Q27= 4, 5; or else go to Q29]

28. How did the Desktop Power Management program influence your decision to make these additional changes?

Program Satisfaction

29. On a scale of 1 to 5, where 1 is very dissatisfied and 5 is very satisfied, how would you rate your satisfaction with the program?
30. Why did you rate it this way?
31. Based on your experience, would you recommend the Desktop Power Management program to your peers inside or outside of your organization?

Firmographics

32. What is the business type of this facility?
 - a. College/university
 - b. Heavy industry
 - c. Hotel/Motel
 - d. K-12 School
 - e. Light industry

- f. Medical
- g. Office
- h. Retail/Service
- i. Warehouse/Distribution
- j. Other, specify
- k. Don't know

33. Which of the following best describes your organization? This facility is

- l. My company's only location
- m. One of several locations owned by my company
- n. The headquarters location of a company with several locations
- o. Don't know

34. In comparison to other organizations in your industry, would you describe your company as

- p. A small company
- q. A medium-sized company
- r. A large company

Those are all of the questions I have. Thank you very much for your participation!