



# ComEd Bidgely Pilot Combined Evaluation Report

**Energy Efficiency / Demand Response Plan:  
Plan Year 9 (PY9)**

**Presented to  
ComEd**

March 5, 2019

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## 1. INTRODUCTION

This report combines the key deliverables from the evaluation of the Bidgely Pilot Program for PY9. Each of these deliverables were drafted, reviewed and finalized during the course of the PY9 evaluation.

**APPENDIX A. COMED BIDGELY PILOT EVALUATION REPORT 2018-08-16 FINAL**



# ComEd Bidgely Pilot Evaluation Report

Energy Efficiency / Demand Response Plan:  
Plan Year 9 (PY9)

Presented to  
Commonwealth Edison Company

**FINAL**

*August 16, 2018*

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## 1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's PY9 Bidgely Pilot. It provides a summary of the energy and demand impacts for the program in total and broken out by level of engagement. Appendix 1 presents the impact analysis methodology and Appendix 2 shows detailed results. PY9 covers June 1, 2016 through December 31, 2017.

## 2. PROGRAM DESCRIPTION

The Bidgely pilot combines energy usage information and digital messages to help customers save energy. The pilot included 1,218 residential participants who chose to opt-in.<sup>1</sup> All of them received energy usage information in hourly, daily, and monthly increments; disaggregation of usage into heating load, cooling load, pool pump load (if applicable), and always on load<sup>2,3</sup>; tips and recommendations to reduce consumption; and the ability to see actual and projected spend for the current billing cycle. Thirty-six of the pilot participants also received a HomeBeat Home Area Network (HAN) device that allowed them to see their usage in real-time.<sup>4</sup> Bidgely participants had relatively low average daily use (17 kWh) compared to other similar ComEd EE programs. For comparison, participant average daily usage in PY9 in Home Energy Report program waves ranged from 18 to 57 kWh.<sup>5</sup>

## 3. PROGRAM SAVINGS

Table 3-1 summarizes the incremental energy savings the Bidgely pilot achieved in PY9. This program specifically focused on energy savings, and demand savings were not estimated by either the program or the evaluation. In addition, the type of analysis the evaluation used estimates net savings and no further net-to-gross (NTG) adjustment is necessary. Because of this, there is neither an ex ante estimate of gross savings nor a gross realization rate.

**Table 3-1. PY9 Total Annual Incremental Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	NA	NA	NA
Program Gross Realization Rate	NA	NA	NA
Verified Gross Savings	NA	NA	NA
Program Net-to-Gross Ratio (NTGR)*	NA	NA	NA
Verified Net Savings†	99,586	NA	NA

Source: ComEd data, Bidgely Data, and Navigant team analysis.

\* This type of analysis estimates net savings, no further NTG adjustment is necessary.

† This value is after the uplift adjustment.

<sup>1</sup> The pilot was specifically targeted to avoid overlap with participants in ComEd's Home Energy Report program.

<sup>2</sup> Bidgely described "Always On" as the base load in a participant's home, made up of appliances and consumer devices that are either always plugged in or are used very intermittently such as TV, cable box, phone chargers, PCs, gaming consoles, etc.

<sup>3</sup> One-hundred percent itemization, which disaggregated 100% of usage, was launched on July 17, 2017 and applied only to participants without the HAN device. Some disaggregation was available before this date but this is when 100% of usage became disaggregated.

<sup>4</sup> The HomeBeat devices were installed between February and September of 2017.

<sup>5</sup> Navigant, 2018, *ComEd Home Energy Report Program Evaluation Report Plan Year 9*.

Navigant conducted an uplift analysis<sup>6</sup> but did not find evidence that the Bidgely pilot increased participation in other programs. Therefore, the uplift adjustment was zero kWh. The details of the uplift analysis are shown in Section 6.4.

Navigant did not receive an ex ante savings estimate and as such was unable to calculate a program realization rate.

#### 4. PROGRAM SAVINGS BY MEASURE

The Bidgely pilot only has a single measure, behavioral savings from the web and app. In PY9, the measure life for the pilot was one year. Detailed savings broken down by engagement are presented in Section 6.

#### 5. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

Navigant estimated savings for 1,218 participants. Total PY9 verified savings were 99,586 kWh.

**Finding 1.** The Bidgely pilot saved an average of 1.1% of participant energy use. Participants in the pilot averaged 17 kWh of daily use in PY9. The savings are similar, in percentage terms, to the savings achieved by waves in the Home Energy Report program with similar usage.<sup>7</sup>

**Finding 2.** Both individual instances and discrete months of participants logging into the Bidgely app are associated with increased energy savings. Of the two criteria, logging into the app in a new month is associated with almost 10 times more savings than one additional log in. Additional analysis shows that customers who logged in at least twice saved an average of 1.84% while customers who logged in at least five times saved an average of 2.83% and customers who logged in at least 20 times saved an average of 5.72%.

**Recommendation 1.** Bidgely should encourage participants to access the app in multiple months through time to drive the highest savings.

**Finding 3.** Participants tend to access the Bidgely solution via the website more than through the mobile app. The savings estimates suggest that visiting via the web may have generated higher savings than mobile; however, the difference between the two estimates was not statistically significant.

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<sup>6</sup> Only uplift in PY9 was analyzed; as the program started in PY9 a legacy uplift calculation was not applicable.

<sup>7</sup> Navigant. 2018. *ComEd Home Energy Report Program Evaluation Report*. Presented to Commonwealth Edison Company.

[http://ilsagfiles.org/SAG\\_files/Evaluation\\_Documents/ComEd/ComEd\\_EPY9\\_Evaluation\\_Reports\\_Final/ComEd\\_PY9\\_HER\\_Report\\_2018-04-10.pdf](http://ilsagfiles.org/SAG_files/Evaluation_Documents/ComEd/ComEd_EPY9_Evaluation_Reports_Final/ComEd_PY9_HER_Report_2018-04-10.pdf)

## 6. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

### 6.1 Detailed Data Cleaning

In preparation for impact analysis, Navigant combined and cleaned data provided by ComEd and Bidgely. The pre-cleaned and pre-matched dataset included 1,218 participants and 296,776 controls.<sup>8</sup> Navigant removed customers and data points from the analysis in the steps identified in Table 6-1. After cleaning and matching, the dataset comprised 1,194 participants and 1,099 controls.

**Table 6-1. Site and Observation Attrition Due to Data Cleaning**

Data Cleaning Step	Customers		Observations		Customer % Change		Observation % Change	
	Treatment	Control	Treatment	Control	Treatment	Control	Treatment	Control
Original Raw Data	1,218	296,776	42,045	19,224,507	NA	NA	NA	NA
Subset to bills ending before 12/31/2017	1,218	251,201	41,020	8,232,390	0.0%	-15.4%	-2.4%	-57.2%
Remove duplicate bills	1,218	251,201	41,020	7,984,505	0.0%	0.0%	0.0%	-3.0%
Remove observations with negative usage	1,218	251,167	41,020	7,972,325	0.0%	0.0%	0.0%	-0.2%
Flatten bills*	1,218	251,167	40,013	7,747,547	0.0%	0.0%	-2.5%	-2.8%
Exclude outliers†	1,218	251,144	40,013	7,743,478	0.0%	0.0%	0.0%	-0.1%
Remove accounts missing more than 4 records in the pre-period	1,213	1,117	39,924	42,609	-0.4%	-99.6%	-0.2%	-99.4%
Subset to a 12-month pre-period for each customer	1,213	1,117	30,933	31,210	0.0%	0.0%	-22.5%	-26.8%
Remove participants who logged in before the start of PY9	1,194	1,099	30,314	30,578	-1.6%	-1.6%	-2.0%	-2.0%

Source: ComEd data, Bidgely Data, and Navigant team analysis.

\* This involves combining bills that end in the same month to create a dataset suitable for analysis.

† Outliers are defined as observations with average daily usage more than one order of magnitude from the median usage.

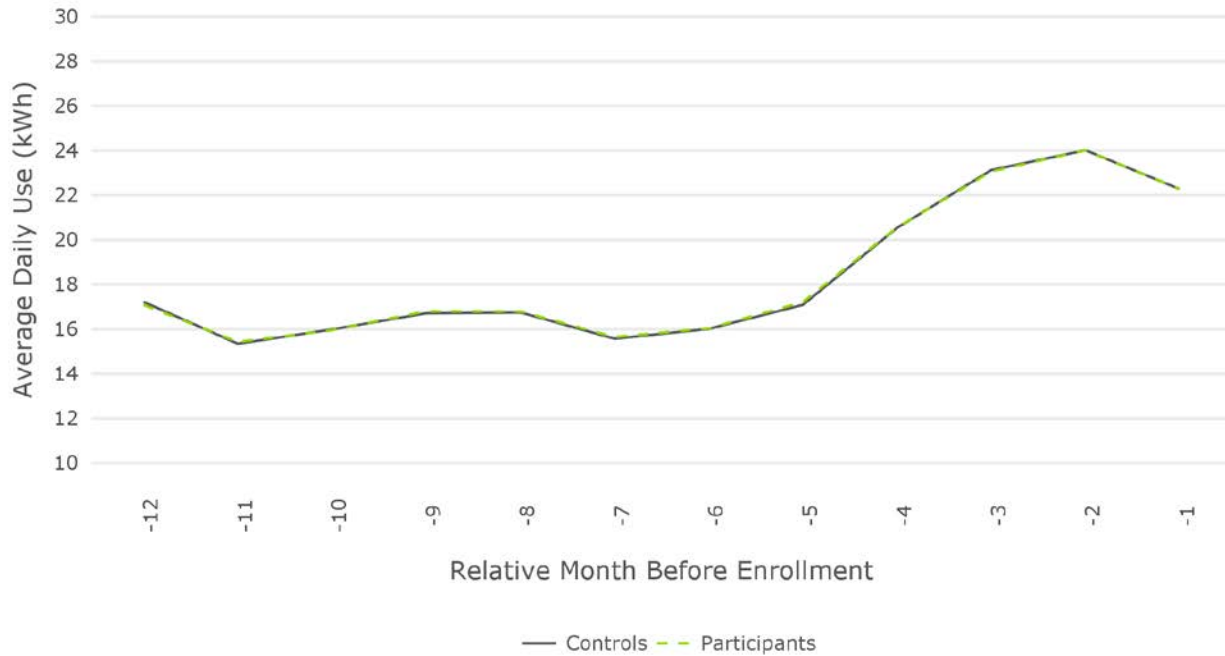
### 6.2 Matching Approach

Navigant selected matches based on participant and potential control energy usage during the 12-month period before program enrollment. For purposes of matching, enrollment occurred when a participant first logged into the Bidgely solution. Matching periods varied as participants had different enrollment dates.

Match quality is denoted by the Euclidean distance between a participant and potential controls over the matching period through the sum of squared differences. The non-participant with the shortest Euclidean distance relative to the participant's usage across the 12 months prior to enrollment was chosen as the matched control; matching was done with replacement. Figure 6-1 provides visual verification that participants and controls had similar average usage during the matching period.

<sup>8</sup> Controls were taken from the control customers in the Home Energy Report program.

Figure 6-1. Pre-Period Participant and Control Usage Comparison



Source: ComEd data, Bidgely Data, and Navigant team analysis.

### 6.3 Regression Methodology

The Lagged Dependable Variable (LDV) model controls for non-treatment differences in energy use between participants and controls via a lagged energy explanatory variable. This model frames energy use in calendar month *t* of the post-program period as a function of both the treatment variable and energy use in the same calendar month of the pre-program period. The underlying logic is that systematic differences between participants and controls will be reflected in differences in their past energy use, which is highly correlated with their current energy use. Each of the regression models Navigant estimated in PY9 used this LDV model.

Equation 6-1 provides the specification used to estimate overall annual program savings where the coefficient  $\beta_1$  identifies average daily kWh savings.

#### Equation 6-1. LDV Annual Program Savings Model

$$ADU_{kt} = \beta_1 Treatment_k + \sum_j \beta_{2j} Month_{jt} + \sum_j \beta_{3j} Month_{jt} \cdot ADUlag_{kt} + \epsilon_{kt}$$

Where:

- $ADU_{kt}$  is average daily usage in kWh by household *k* in bill period *t*
- $Month_{jt}$  is a binary variable taking a value of 1 when *j* = *t* and 0 otherwise<sup>9</sup>
- $Treatment_k$  is a binary variable taking a value of 0 if household *k* is assigned to the control group, and 1 if assigned to the treatment group
- $ADUlag_{kt}$  is household *k*'s energy use in the same calendar month of the pre-program year as the calendar month of month *t*

<sup>9</sup> In other words, if there are *T* post-program months, there are *T* monthly dummy variables in the model, with the dummy variable  $Month_{jt}$  the only one to take a value of 1 at time *t*. These are, in other words, monthly fixed effects.

$\varepsilon_{kt}$  is the cluster-robust error term for household  $k$  during billing cycle  $t$ ; cluster-robust errors account for heteroskedasticity and autocorrelation at the household level<sup>10</sup>

To further explore savings, Navigant also estimated several variants on Equation 6-1. The variants estimated savings by month of the program and by level of engagement with the Bidgely solution.

Equation 6-2 provides the specification to estimate monthly program savings where all variables are as defined in Equation 6-1. The set of coefficients  $\beta_{1j}$  is the estimate of the program’s average daily kWh savings by month.

### Equation 6-2. LDV Monthly Program Savings Model

$$ADU_{kt} = \sum_j \beta_{1j} Month_{jt} \cdot Treatment_{kt} + \sum_j \beta_{2j} Month_{jt} + \sum_j \beta_{3j} Month_{jt} \cdot ADUlag_{kt} + \varepsilon_{kt}$$

In addition to program savings, Navigant also estimated energy savings according to whether participants accessed the solution via the website or mobile app. Equation 6-3, shows the specification for this model. The coefficients  $\beta_3$  and  $\beta_4$  estimate average daily kWh savings associated with accessing the pilot via the Bidgely website or mobile app, respectively.

### Equation 6-3. LDV Savings by Device Model

$$ADU_{kt} = \sum_j \beta_{1j} Month_{jt} + \sum_j \beta_{2j} Month_{jt} \cdot ADUlag_{kt} + \beta_3 Web\_Usage_k + \beta_4 Mobile\_Usage_k + \varepsilon_{kt}$$

Where:

$Web\_usage_k$  is a binary variable taking a value of 1 when household  $k$  accessed the app via the website  
 $Mobile\_usage_k$  is a binary variable taking a value of 1 when household  $k$  accessed the app via a mobile device<sup>11</sup>

and all other variables are as defined in Equation 6-1.

Navigant ran a fourth model to estimate savings according to the total number of times a participant logged into the Bidgely solution. Equation 6-4 shows the specification for that model; the coefficient  $\beta_3$  is the estimate of average daily kWh savings related to each individual login.<sup>12</sup>

### Equation 6-4. LDV Savings by Logins Model

$$ADU_{kt} = \sum_j \beta_{1j} Month_{jt} + \sum_j \beta_{2j} Month_{jt} \cdot ADUlag_{kt} + \beta_3 Acct\_Logins_k + \varepsilon_{kt}$$

Where:

$Acct\_Logins_k$  is the number of times household  $k$  logged into the Bidgely solution in PY9 and all other variables are as defined in Equation 6-1.

<sup>10</sup> Ordinary Least Squares (OLS) regression models assume that the data are homoskedastic and not autocorrelated. If either of these assumptions is violated, the resulting standard errors of the parameter estimates are incorrect (usually underestimated). A random variable is heteroskedastic when the variance is not constant. A random variable is autocorrelated when the error term in one period is correlated with the error terms in at least some of the previous periods.

<sup>11</sup> It is possible for both  $Web\_usage_k$  and  $Mobile\_usage_k$  to be one for customers who accessed the pilot through both platforms.

<sup>12</sup> Multiplying this coefficient by the number of logins for a given participant gives that participant’s estimated savings.

Finally, Navigant ran a fifth model to estimate savings according to the number of unique months a participant logged into the Bidgely solution.<sup>13</sup> Equation 6-5 shows the specification for that model, where coefficient  $\beta_4$  is the estimate of average daily kWh savings related to the number of months an individual logged into the solution (after controlling for the total number of logins which is captured in  $\beta_3$ ).<sup>14</sup>

**Equation 6-5. LDV Savings by Monthly Logins Model**

$$ADU_{kt} = \sum_j \beta_{1j} Month_{jt} + \sum_j \beta_{2j} Month_{jt} \cdot ADUlag_{kt} + \beta_{3k} Acct\_Logins_k + \beta_4 Acct\_Mo\_Logs_k + \epsilon_{kt}$$

Where:

$Acct\_Mo\_Logs_k$  is the number of distinct months household  $k$  logged into the Bidgely solution in PY9

All other variables are as defined in Equation 6-1 and Equation 6-4.

**6.4 Accounting for Uplift in Other Energy Efficiency Programs**

If participation rates in other EE programs are the same for Bidgely treatment and control groups, the savings estimates from the regression analyses are already “net” of savings from other programs as this indicates the Bidgely program does not increase or decrease participation in other EE programs. However, if the Bidgely program affects participation rates in other EE programs, then savings across all programs are lower than indicated by the simple summation of savings in the Bidgely and EE programs. For instance, if the Bidgely program increases participation in other EE programs, the increase in savings may be allocated to either the Bidgely program or the EE program, but cannot be allocated to both programs simultaneously.<sup>15</sup> Note that when the Bidgely program decreases participation in other programs there is no issue of double-counting and thus no adjustment to the savings total is made.

Data permitting, Navigant uses a difference-in-difference (DID) statistic to estimate uplift in other EE programs. To calculate the DID statistic, the change in the participation rate in another EE program between PY9 and the pre-program year for the control group is subtracted from the same change for the treatment group. For instance, if the rate of participation in an EE program during PY9 is five percent for the treatment group and three percent for the control group, and the rate of participation during the pre-period is two percent for the treatment group and one percent for the control group, then the rate of uplift due to the Bidgely program is one percent, as reflected in Equation 6-6.

**Equation 6-6. DID Statistic Calculation**

$$\begin{aligned} & (PY8 \text{ treatment group participation} - \text{prePY treatment group participation}) \\ & - (PY8 \text{ control group participation} - \text{prePY control group participation}) \\ & = \text{DID statistic} \\ & (5\% - 2\%) - (3\% - 1\%) = 1\% \end{aligned}$$

The DID statistic generates an unbiased estimate of uplift when the baseline average rate of participation is the same for the treatment and control groups, or when they are different due only to differences

<sup>13</sup> This refers to logins that occurred in distinct months. For example, logging into the app on July 1<sup>st</sup> and July 31<sup>st</sup> would only constitute logging in in one month, but logging in on July 31<sup>st</sup> and August 1<sup>st</sup> would constitute logging in in two unique months. This variable is meant to capture repeated usage of the app through time as opposed to just total number of logins. It is possible that logging into the app 12 times in one month is very different, in terms of savings, than logging in to the app once per month in 12 distinct months.

<sup>14</sup> Multiplying this coefficient by the number of distinct month logins for a given participant gives that participant’s estimated savings.

<sup>15</sup> It is not possible to avoid double counting of savings generated by programs for which tracking data are not available, such as upstream lighting programs.

between the two groups in time-invariant factors, such as the residence’s square footage. For PY9 the DID statistic was adjusted to account for the differing lengths of the pre and post periods since PY9 was 19 months.

Note that no adjustments were made for negative uplift (i.e. cases where the Bidgely pilot decreased participation in other programs). Additionally, Navigant only considered uplift in PY9 as there was no legacy uplift because PY9 was the pilot’s first year.

Navigant examined the uplift associated with four EE programs: the Fridge and Freezer Recycling (FFR) program, the Home Energy Assessment (HEA) program, and the Home Energy Rebates (Rebate) program.<sup>16</sup> The FFR program achieves energy savings through retirement and recycling of older, inefficient refrigerators, freezers, and room air conditioners. The HEA program is offered jointly with the local gas utilities and achieves savings by providing direct installation of low-cost efficiency measures for single family homes, such as CFLs and low-flow showerheads. The Rebate program offers weatherization and incentives to residential customers to encourage customer purchases of higher efficiency heating, ventilating, and air-conditioning (HVAC) equipment. Table 6-2 shows estimates for PY9 uplift.

**Table 6-2. Estimates of PY9 Uplift for Bidgely Program**

	FFR	HEA	Rebate
Median program savings (annual kWh per participant)	902	549	201
Number of treatment customers	1,194	1,194	1,194
Treatment rate of participation, PY9	3%	1%	1%
Change in rate of treatment participation from pre-program year	-1%	-2%	-6%
Number of control customers	1,194	1,194	1,194
Control rate of participation, PY9	1%	1%	0%
Change in rate of control participation from pre-program year	-1%	0%	-2%
DID or POD statistic	0%	-2%	-4%
Participant uplift	-2	-22	-53
Statistically significant at the 90% confidence level?	No	Yes	Yes
Savings attributable to other programs (kWh)	-1,805	-12,114	-10,720
Percentage change in EE program participation rate for participants	-6%	-61%	-80%

Source: ComEd data, Bidgely Data, and Navigant team analysis.

## 7. APPENDIX 2: IMPACT ANALYSIS DETAIL

Navigant evaluated Bidgely pilot energy savings from several perspectives including overall, by month, by access type, and by how frequently and when a participant logged into the solution. This section of the report provides those savings results along with several plots to help visualize the impacts.

### 7.1 Regression Outputs

Table 7-1 shows the regression output for the Bidgely pilot annual savings model (see Equation 6-1). Full regression output for the other models are available upon request.

<sup>16</sup> Note that by design there was no overlap between the Bidgely program and the Home Energy Report program. There was also no overlap with the Multi-Family Energy Savings Program as Bidgely was only offered to single-family homes.

**Table 7-1. Overall Savings Regression Output**

Variable	Coefficient	Standard Error	T-Statistic	P-Value
treatment	-0.19	0.11	-1.74	0.08
yrmo201608	-1.38	3.25	-0.43	0.67
yrmo201609	3.17	0.72	4.43	0.00
yrmo201610	1.64	0.29	5.64	0.00
yrmo201611	1.52	0.28	5.39	0.00
yrmo201612	1.02	0.45	2.28	0.02
yrmo201701	1.45	0.51	2.86	0.00
yrmo201702	1.75	0.29	6.07	0.00
yrmo201703	1.87	0.32	5.90	0.00
yrmo201704	1.00	0.30	3.36	0.00
yrmo201705	1.45	0.21	6.80	0.00
yrmo201706	1.96	0.23	8.41	0.00
yrmo201707	1.74	0.30	5.82	0.00
yrmo201708	0.60	0.36	1.69	0.09
yrmo201709	1.17	0.30	3.85	0.00
yrmo201710	3.42	0.29	11.61	0.00
yrmo201711	1.69	0.30	5.67	0.00
yrmo201712	2.10	0.34	6.24	0.00
yrmo201608:avgdailykwh_pre	1.16	0.12	9.55	0.00
yrmo201609:avgdailykwh_pre	0.99	0.04	27.97	0.00
yrmo201610:avgdailykwh_pre	0.97	0.02	43.40	0.00
yrmo201611:avgdailykwh_pre	0.89	0.02	40.54	0.00
yrmo201612:avgdailykwh_pre	0.99	0.03	30.70	0.00
yrmo201701:avgdailykwh_pre	0.96	0.03	30.48	0.00
yrmo201702:avgdailykwh_pre	0.85	0.02	42.92	0.00
yrmo201703:avgdailykwh_pre	0.87	0.02	35.92	0.00
yrmo201704:avgdailykwh_pre	0.93	0.02	38.95	0.00
yrmo201705:avgdailykwh_pre	0.90	0.02	48.71	0.00
yrmo201706:avgdailykwh_pre	0.82	0.01	56.37	0.00
yrmo201707:avgdailykwh_pre	0.84	0.01	61.63	0.00
yrmo201708:avgdailykwh_pre	0.75	0.01	52.53	0.00
yrmo201709:avgdailykwh_pre	0.72	0.01	48.98	0.00
yrmo201710:avgdailykwh_pre	0.99	0.02	44.53	0.00
yrmo201711:avgdailykwh_pre	0.95	0.02	39.15	0.00
yrmo201712:avgdailykwh_pre	0.89	0.02	37.90	0.00

Source: ComEd data, Bidgely Data, and Navigant team analysis.



### 7.2 Monthly Energy Savings

Figure 7-1 shows monthly savings along with 90% confidence bounds. Most of the monthly savings values were not statistically significant from zero (indicated by the confidence bound crossing zero), likely because of the small sample size. The monthly savings do not show strong trends although there is some evidence that savings were higher in July and August 2017, just after the launch of 100% itemization in the disaggregation.

Figure 7-1. Monthly Program Savings

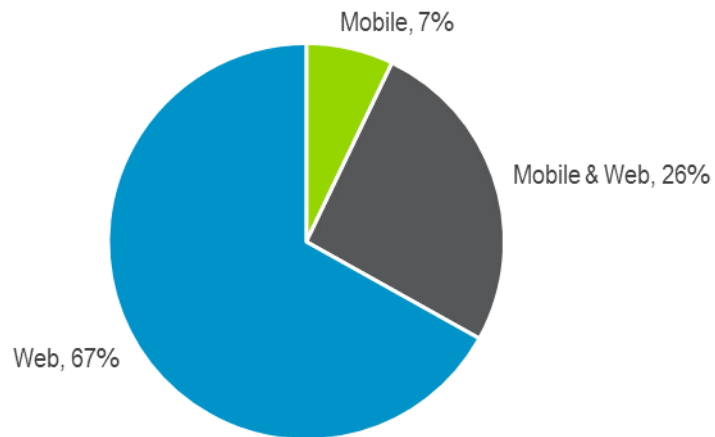


Source: ComEd data, Bidgely Data, and Navigant team analysis.

### 7.3 Energy Savings by Access Type

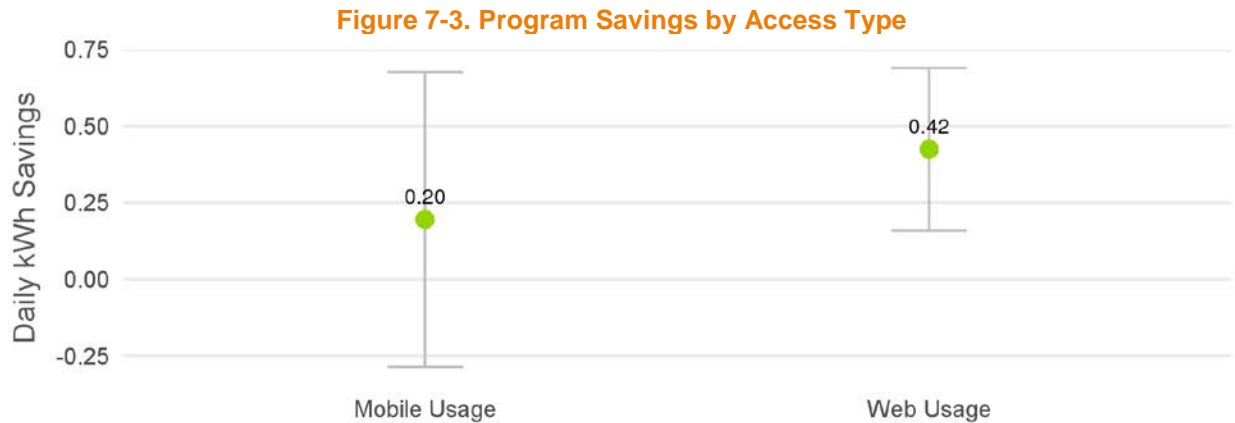
Bidgely participants could access the solution via the website or a mobile device. Participants could access the pilot through either a web portal or a mobile app. Figure 7-2 shows the breakdown of how many participants utilized each access type. On average, participants visited the app or web fourteen times; however, the distribution was heavily right-skewed with a median of only three visits per participant. Approximately one-third of participants only visited the app or web one time.

Figure 7-2. Number of Participants by Login Method



Source: ComEd data, Bidgely Data, and Navigant team analysis.

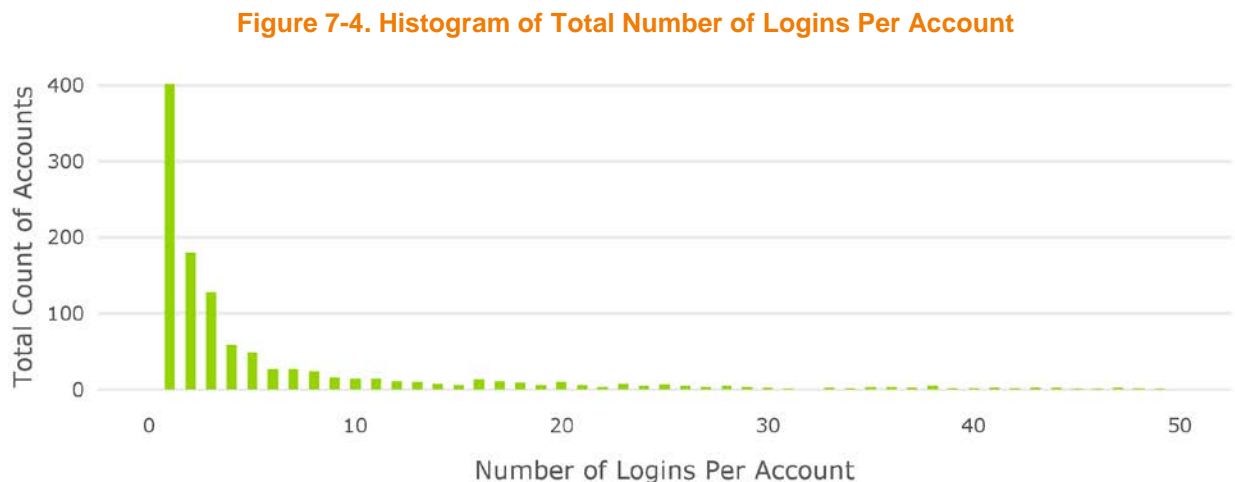
Each time a participant logged into the solution, Bidgely tracked whether the visit was by web or mobile,<sup>17</sup> which allowed Navigant to estimate the relationship between energy savings and access type. Figure 7-3 shows savings associated with web and mobile usage along with 90 percent confidence intervals. This figure shows that the point estimate of savings from web access was higher than mobile, however the two estimates are not statistically different at the 90% confidence level.



Source: ComEd data, Bidgely Data, and Navigant team analysis.

### 7.4 Energy Savings by Frequency of Logins

Navigant estimated Bidgely program savings according to the number of individual instances and the number of discrete months participants logged into the solution. Figure 7-4 shows a histogram of the total number of logins per account; most users logged in between one and five times. Figure 7-5 shows a histogram of number of unique months the user accessed their account; most users logged in in between one and five distinct months.



Source: ComEd data, Bidgely Data, and Navigant team analysis.  
 Note: The x-axis was truncated at 50 logins, without truncation the histogram goes to approximately 1000 logins.

<sup>17</sup> Participants could access the Bidgely solution via both the web and mobile devices.

Figure 7-5. Histogram of Number of Distinct Month Logins Per Account



Source: ComEd data, Bidgely Data, and Navigant team analysis.

Table 7-2 shows the savings associated with one additional login (at any time) and Table 7-3 shows the savings associated with logging in in one additional distinct month (after accounting for the total number of logins). The savings associated with logging in in one additional unique month are considerably higher than those associated with just one additional login. These results suggest that keeping customers engaged through time is more important than getting them to engage a lot in a short period of time (for example, right after they enroll).

Table 7-2. Savings by Total Number of Logins

Savings Type	Daily Energy Savings Per Account Per Login (kWh)	Annualized Energy Savings Per Account Per Login (kWh)
One Additional Login	0.005	1.8

Source: ComEd data, Bidgely Data, and Navigant team analysis.

Note: These savings come from the model shown in Equation 6-4.

Table 7-3. Savings by Number of Distinct Month Logins

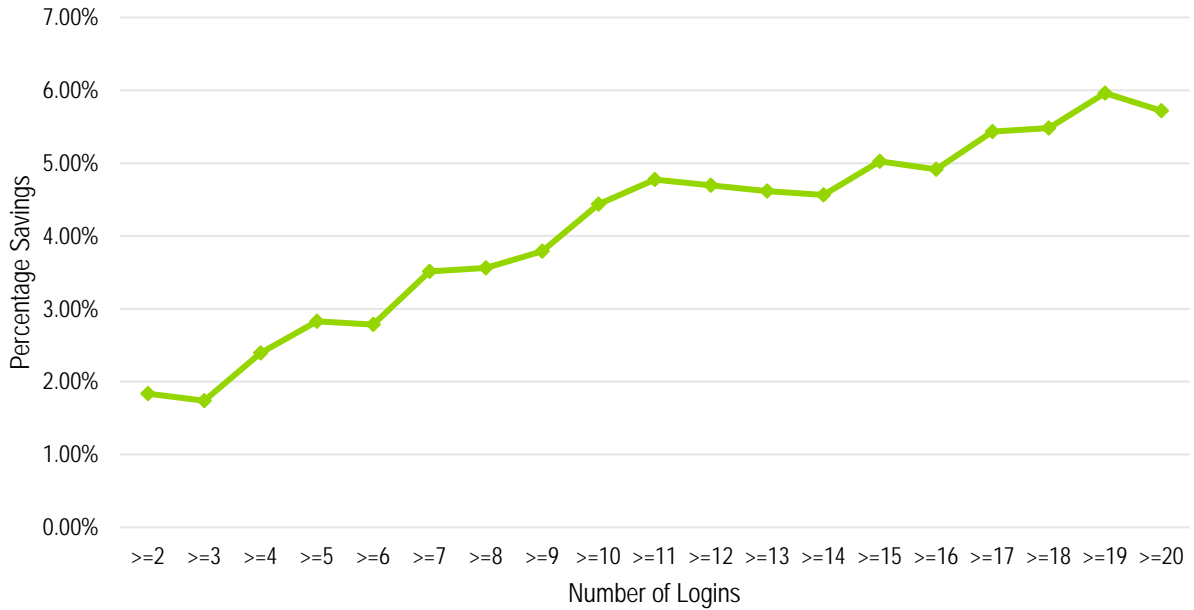
Savings Type	Daily Energy Savings Per Account Per Login (kWh)	Annualized Energy Savings Per Account Per Login (kWh)
One Additional Unique Month	0.044	16.06
One Additional Login	0.003	1.10

Source: ComEd data, Bidgely Data, and Navigant team analysis.

Note: These savings come from the model shown in Equation 6-5.

Navigant ran models on subsets of customers with at least two logins up to at least 20 logins. The savings for each subgroup are shown in Figure 7-6. This figure clearly shows that savings increase as customers have more logins. However, this is not a causal analysis; it could be that the customers who remain engaged and continue to log in to the platform would save more even if they had logged in less.

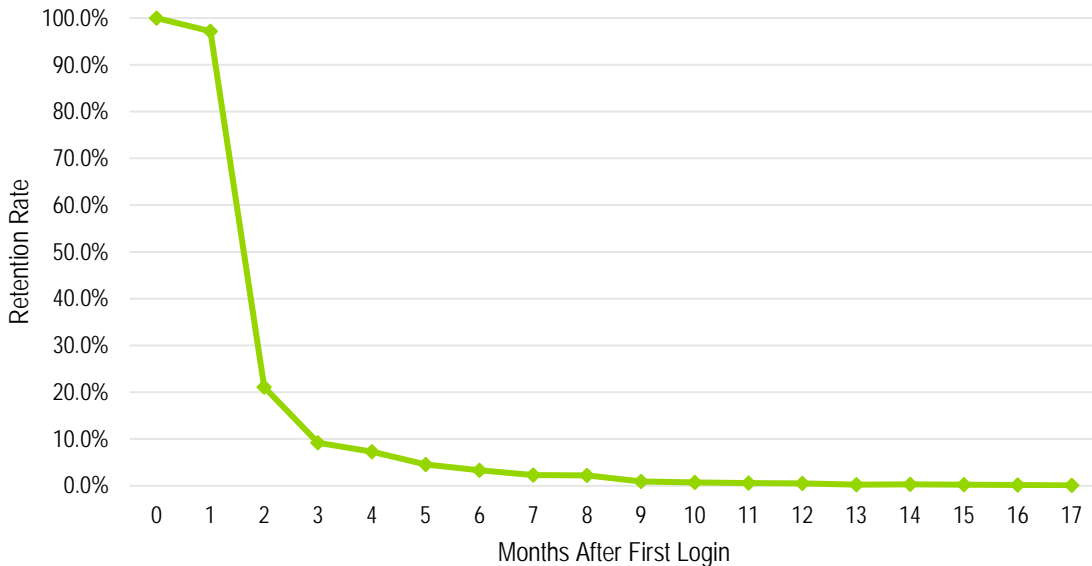
Figure 7-6. Savings for Customers with at least X Logins



Source: ComEd data, Bidgely Data, and Navigant team analysis.

Navigant calculated the program retention rate in each month after the initial login by calculating how many customers visited the platform each month after their initial login. The retention rates over the entirety of the program (17 months) are shown in Figure 7-7.

Figure 7-7. Retention Rate



Source: ComEd data, Bidgely Data, and Navigant team analysis.

### 8. APPENDIX 3. TRC DETAIL

Table 8-1 shows the savings detail for the Total Resource Cost (TRC) cost-effectiveness analysis. This TRC variable table only includes cost-effectiveness analysis inputs available at the time of finalizing this PY9 impact report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to evaluation at a later date. Further, detail in this table (e.g., EULs) other than final PY9 savings and program data are subject to change and are not final.

**Table 8-1. TRC Detail**

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (kWh)	Ex Ante Gross Peak Demand Reduction (kW)	Verified Net Savings (kWh)	Verified Gross Peak Demand Reduction (kW)
Behavioral	NA	Household	1,218	1	NA	NA	99,586	NA

Source: ComEd data, Bidgely Data, and Navigant team analysis.

**APPENDIX B. COMED BIDGELY AMI IMPACT MEMO 2019-02-06 FINAL**

**To:** Vince Gutierrez (ComEd)  
**CC:** Mark Milby (ComEd)  
**From:** Carly Olig, Will Sierzchula, Dustin Kunkel (Navigant)  
**Date:** February 6, 2019  
**Re:** ComEd Bidgely AMI Analysis Memo

## INTRODUCTION

This memo presents impact results from ComEd's PY9<sup>1</sup> Bidgely Pilot using AMI data. It complements the existing impact report<sup>2</sup> in that the AMI data allowed Navigant to determine how energy savings varied on a daily, as opposed to monthly basis. This more granular usage data specifically let Navigant analyze the relationship between customer engagement and program savings.

The following summarizes Navigant's key findings from the Bidgely AMI analysis:

**Finding 1.** Heavily engaged users showed substantially higher levels of savings than average participants. Individuals with more than 50 cumulative Bidgely logins saved 3.37 kWh daily, compared to 0.16 kWh averaged across all participants. However, there were only approximately 70 of these accounts, so their high savings rate did not raise the overall program savings to a similar level.

**Finding 2.** The days since login analysis showed two distinct trends. Firstly, the most engaged customers, as indicated by those with 0, 1, or 2 days since logging in, were associated with high, but steadily decreasing savings. Secondly, for customers who took more than a week to log into the application, daily savings dropped off sharply from 0.81 kWh to 0.37 kWh.

**Recommendation 1.** To increase program savings, Bidgely and ComEd could strive to get customers to logon on a daily or at least weekly basis.

**Finding 3.** The Bidgely Pilot had higher savings during its initial ramp-up period from June 2016 through December 2016 than during the period with AMI data (January 2017 – December 2017).

**Finding 4.** About half of the participants did not log in after the first six months of the program.

## PROGRAM DESCRIPTION

The Bidgely Pilot combined usage information and digital messages to help customers save energy. The pilot included 1,218 residential participants who opted-in to the program.<sup>3</sup> These participants received energy usage information in hourly, daily, and monthly increments; disaggregation of usage into heating

<sup>1</sup> PY9 covered June 1, 2016 through December 31, 2017

<sup>2</sup> Navigant, 2018. *ComEd Bidgely Pilot Evaluation Report*. Presented to Commonwealth Edison Company.

[http://ilsagfiles.org/SAG\\_files/Evaluation\\_Documents/Draft%20Reports%20for%20Comment/ComEd\\_EPY9\\_Draft\\_Reports/ComEd\\_PY9\\_Bidgely\\_Report\\_Draft\\_2018-06-19.pdf](http://ilsagfiles.org/SAG_files/Evaluation_Documents/Draft%20Reports%20for%20Comment/ComEd_EPY9_Draft_Reports/ComEd_PY9_Bidgely_Report_Draft_2018-06-19.pdf)

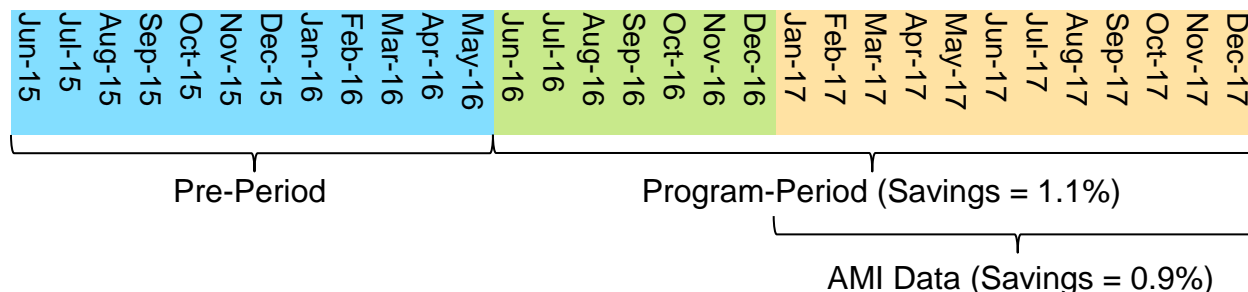
<sup>3</sup> The pilot was specifically targeted to avoid overlap with participants in ComEd's Home Energy Report program.

load, cooling load, pool pump load (if applicable), and always on load<sup>4,5</sup>; tips and recommendations to reduce consumption; and the ability to see actual and projected spending for the current billing cycle.

Bidgely participants had relatively low average daily use (17 kWh) compared to other behavioral ComEd energy efficiency (EE) programs. For comparison, participant average daily usage in PY9 Home Energy Report program waves ranged from 18 to 57 kWh.<sup>6</sup>

Figure 1 below identifies the impact analysis timeline. ComEd provided monthly billing data for the pre-period and AMI data for 2017. Navigant was not able to conduct a daily savings analysis from June 2016 through December 2016. Since the entire program period had a higher savings rate (1.1%) than the period with AMI data (0.9%), Navigant concluded that Bidgely participants had a higher savings rate during the program’s first six months, before Navigant received AMI data.

**Figure 1. Program Timeline**



Source: Navigant analysis

## METHODOLOGY

### Data Cleaning

In preparation for impact analysis, Navigant combined and cleaned data provided by ComEd and Bidgely. Navigant removed customers and data points from the analysis in the steps identified in Table 1. After cleaning and matching, the dataset comprised 1,082 participants and 993 controls.<sup>7</sup> Navigant did not receive AMI data for some controls during the program period, which is why data cleaning dropped about 100 accounts in the comparison group in the second cleaning step.

<sup>4</sup> Bidgely described “Always On” as the base load in a participant’s home, made up of appliances and consumer devices that are either always plugged in or are used very intermittently such as TV, cable box, phone chargers, PCs, gaming consoles, etc.

<sup>5</sup> One-hundred percent itemization, which disaggregated 100% of usage, was launched on July 17, 2017 and applied only to participants without the HAN device. Some disaggregation was available before this date but this is when 100% of usage became disaggregated.

<sup>6</sup> Navigant, 2018, *ComEd Home Energy Report Program Evaluation Report Plan Year 9*.

<sup>7</sup> These participant and control numbers are smaller than those from the program’s monthly billing analysis, because Navigant did not include customers that only had usage between June and December 2016 because they did not have AMI data.



**Table 1. Evaluation Report Data Cleaning**

Data Cleaning Step	Customers		Observations	
	Treatment	Control	Treatment	Control
Raw Interval data	1,208	1,091	832,273	665,178
Drop dates after 2017-12-31	1,208	993	453,312	335,096
Drop channel 2 observations*	1,208	993	452,265	335,096
Drop customer-days missing >5 interval values	1,208	993	452,258	335,048
Aggregate multiple meters to customer	1,208	993	452,258	334,713
Drop participants whose match was removed	1,083	993	405,848	334,713
Drop observations without lag usage	1,082	993	399,495	332,879

\* Channel 2 signified when accounts provided energy to the grid, as opposed to just receiving it.

Source: ComEd AMI data and Navigant team analysis.

## Matching

This analysis used the same comparison group as the PY9 impact evaluation report. Navigant developed that comparison group using Euclidian distance in monthly usage between each participant and a group of potential controls. Additional detail about this matching method is available in the impact report.<sup>8</sup>

## Regression

Similar to the PY9 Bidgely impact report, Navigant used a lagged dependent variable model to estimate energy savings. Details about that model can be found in that impact report.<sup>9</sup> However, to determine the relationship between program savings and participant engagement, Navigant estimated slightly different models. Equation 1, Equation 2, and Equation 3 provide model specifications for Navigant's analysis of days since login, total logins, and cumulative logins, respectively.

### Equation 1. Days Since Login

$$kwh_{kd} = \beta_1 Participant_k + \sum_J^{12} \beta_2 Month_{jd} + \beta_3 ADUlag_{kd} + \beta_4 Weekend_d + \beta_5 Participant_k * DaysSinceLogin_{kd} + \epsilon_{kd}$$

### Equation 2. Total Logins

$$kwh_{kd} = \beta_1 Participant_k + \sum_J^{12} \beta_2 Month_{jd} + \beta_3 ADUlag_{kd} + \beta_4 Weekend_d + \beta_5 Participant_k * TotalLogin_k + \epsilon_{kd}$$

### Equation 3. Cumulative Logins

$$kwh_{kd} = \beta_1 Participant_k + \sum_J^{12} \beta_2 Month_{jd} + \beta_3 ADUlag_{kd} + \beta_4 Weekend_d + \beta_5 Participant_k * CumuLogins_{kd} + \epsilon_{kd}$$

<sup>8</sup> Navigant, 2018. *ComEd Bidgely Pilot Evaluation Report*. Presented to Commonwealth Edison Company. [http://ilsagfiles.org/SAG\\_files/Evaluation\\_Documents/Draft%20Reports%20for%20Comment/ComEd\\_EPY9\\_Draft\\_Reports/ComEd\\_PY9\\_Bidgely\\_Report\\_Draft\\_2018-06-19.pdf](http://ilsagfiles.org/SAG_files/Evaluation_Documents/Draft%20Reports%20for%20Comment/ComEd_EPY9_Draft_Reports/ComEd_PY9_Bidgely_Report_Draft_2018-06-19.pdf)

<sup>9</sup> *Ibid.*

Where:

$kwh_{kd}$	is daily usage in kWh by household $k$ on day $d$
$Participant_k$	is a binary variable taking a value of 1 when household $k$ is a Bidgely participant and 0 otherwise
$Month_{jd}$	is a binary variable taking a value of 1 when day $d$ is in month $j$ and 0 otherwise
$ADUlag_{kd}$	is household $k$ 's average daily energy use of the same calendar month in the pre-program year as calendar month of day $d$
$Weekend_d$	is a binary variable taking a value of 1 when day $d$ is a Saturday or Sunday and 0 otherwise
$DaysSinceLogin_{kd}$	is a categorical variable representing the number of days since household $k$ 's last login as of day $d$ . We interact this with $Participant$ as it only applies to participants
$TotalLogin_k$	is a categorical variable representing a participant's total number of logins during the <b>entire program-period</b> . <sup>10</sup> We interact this with $Participant$ as it only applies to participants
$CumuLogins_{kd}$	is the number of cumulative logins by household $k$ as of day $d$ . We interact this with $Participant$ as it only applies to participants
$\epsilon_{kd}$	is the cluster-robust error term for household $k$ during day $d$

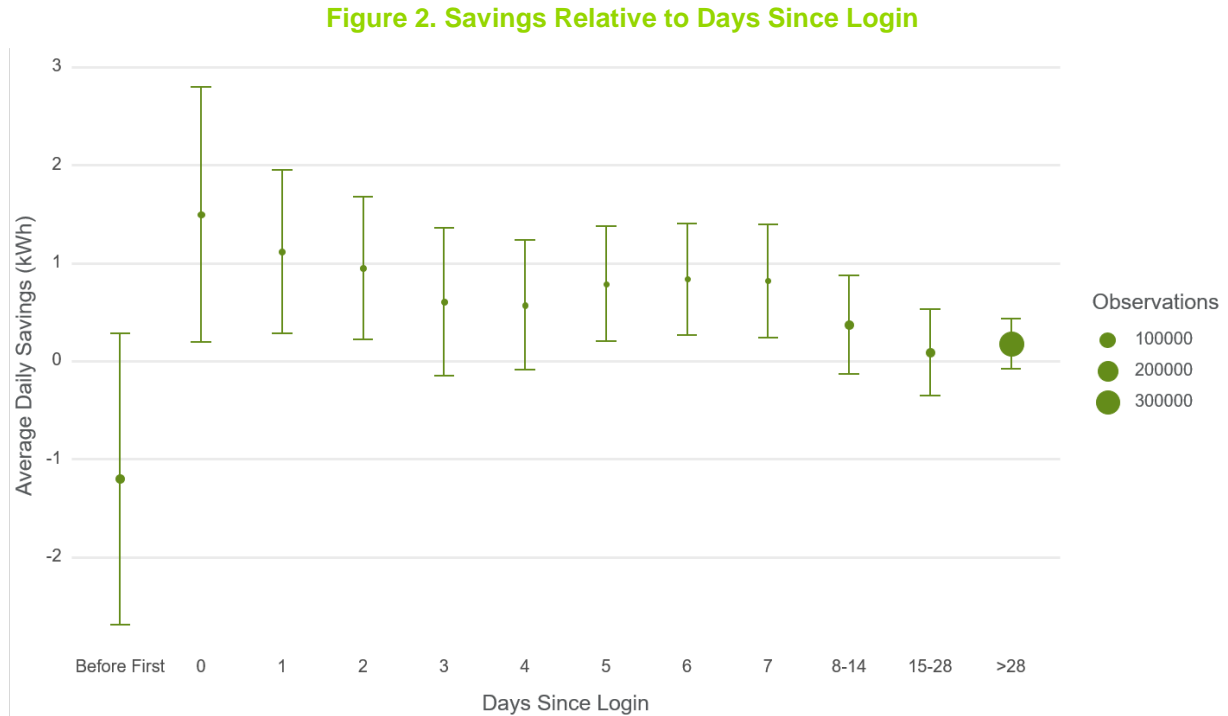
## IMPACT ANALYSIS

This section provides results regarding the relationship between customer engagement with the Bidgely application and energy savings. AMI data allowed Navigant to tease out program impacts at the daily level, which would not have been possible using monthly billing data. In the plots below, the size of the dot indicates the number of customers associated with that result. For example, Figure 2 shows that almost 500 participants only had 1 total login, whereas about 100 participants had 10 or more total logins.

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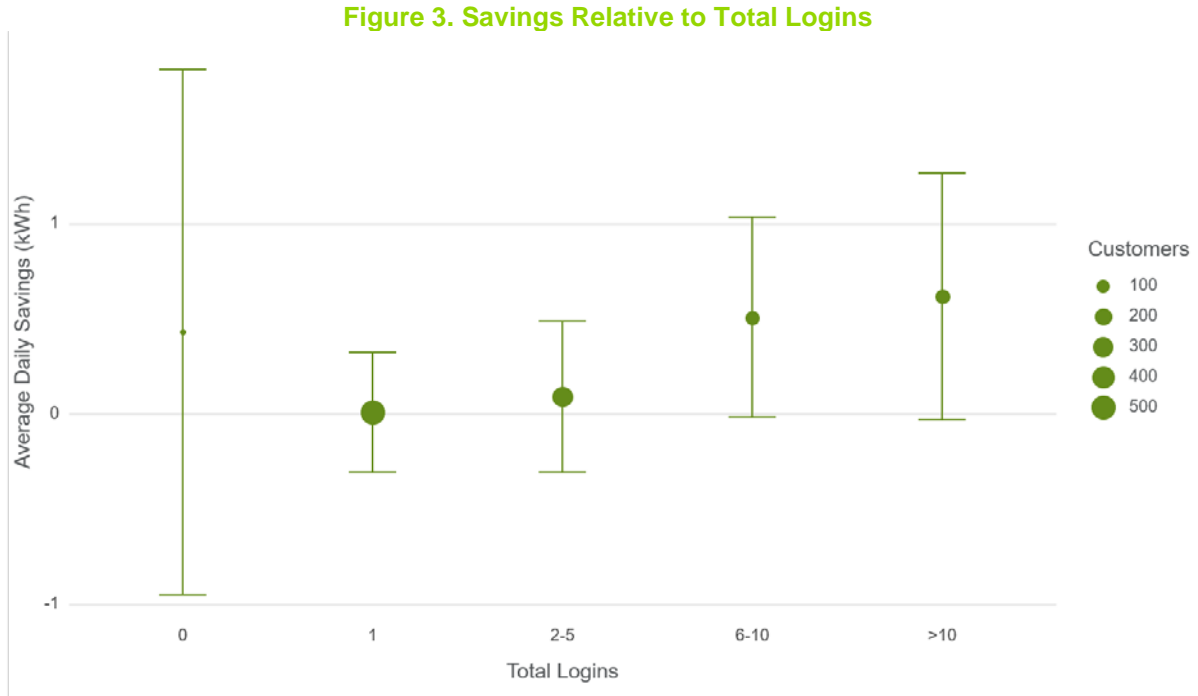
<sup>10</sup> That is, the full program period from June 2016 through December 2017, not just the period with AMI data.

Figure 2 provides the relationship between program savings and days since a customer logged into the Bidgely app. It illustrates a decline in savings among the most engaged customers – those with 0, 1, and 2 days since logging in. This suggests the most frequent usage is associated with relatively high but steadily decreasing levels of savings. This plot also indicates daily savings steeply decreased from 0.81 kWh to 0.37 kWh after one week of not logging into the app.



Note: The Before First figure on the horizontal axis indicates account-days prior to the account's first login to the Bidgely app. This includes all days for accounts that never logged in.  
Source: Navigant analysis

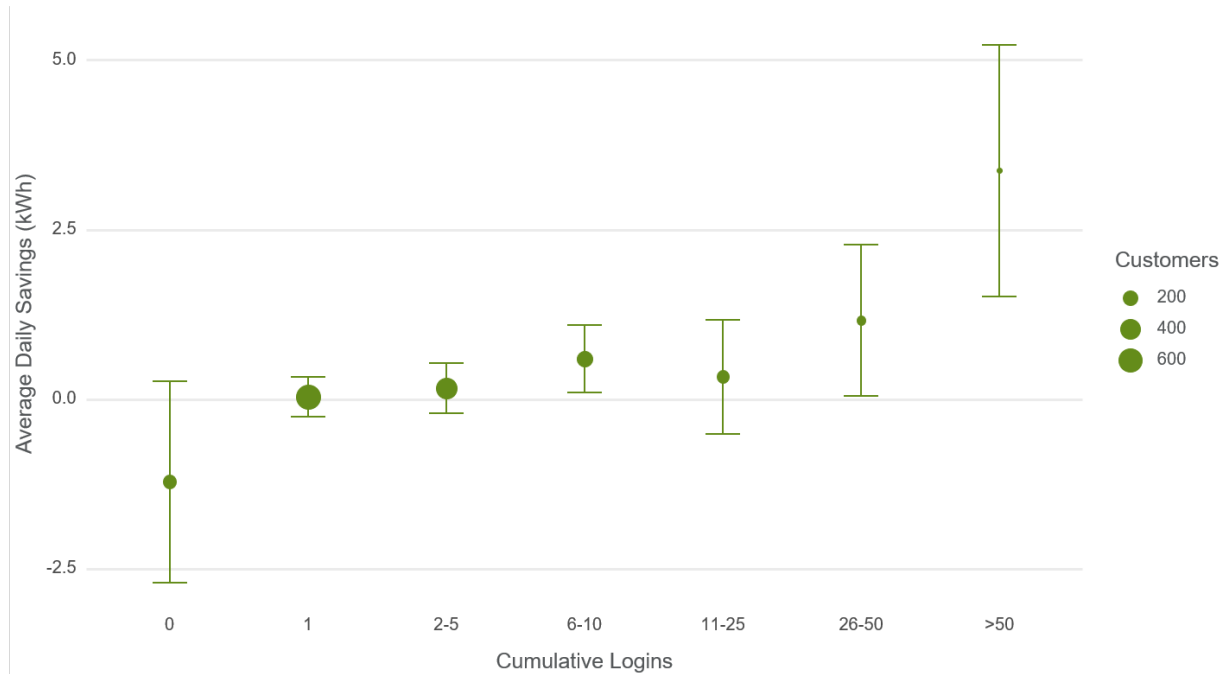
Figure 3 shows customer savings relative to total logins. Customers with a greater number of total logins were associated with increased levels of savings. There was a relatively large jump in daily savings associated with customers logging in more than five times, from 0.09 kWh to 0.51 kWh. However, the majority of customers logged in five or fewer times, with a small number never logging in at all.



Source: Navigant analysis

Figure 4 shows the relationship between cumulative logins and energy savings. Among the three customer engagement metrics Navigant analyzed, cumulative logins were associated with the greatest savings. Participants with more than 50 cumulative logins had daily savings rates more than 30 times higher than the average rate across all participants (3.37 kWh vs. 0.09 kWh). Participants with 26-50 logins were also correlated with relatively high daily savings (1.16 kWh), relative to average participants.

**Figure 4. Savings Relative to Cumulative Logins**



Source: Navigant analysis

The figures above provide different perspectives on customer engagement, but they consistently illustrate that more engaged participants, whether based on cumulative logins or login frequency, were correlated with higher savings rates. While some results appear to show contradictory impacts, in fact they relate to different perspectives on customer engagement. For example, customers with zero total logins in Figure 3 identifies accounts that never logged into the app. This is a small set of customers and does not provide much explanatory power regarding Program impacts. However, the Before First logins in Figure 2 and zero cumulative logins in Figure 4 indicate low savings rates for customers not engaged in the Program, which is consistent with Navigant's overall analysis. These plots also show that the majority of customers were relatively unengaged and associated with low savings values.

**APPENDIX C. COMED BIDGELY END OF PILOT ONLINE SURVEY RESULTS 2018-06-28 FINAL**

**To:** Vince Gutierrez (ComEd)  
**CC:** Randy Gunn, Jeff Erickson (Navigant); Jennifer Morris (ICC Staff)  
**From:** Carly Olig, Trace O’Rorke, Nicole DelSasso (Navigant)  
**Date:** 6/28/2018  
**Re:** ComEd PY9 Bidgely End of Pilot Online Survey Results

## INTRODUCTION AND METHODOLOGY

This memo outlines results from an end of pilot survey conducted for ComEd’s Bidgely pilot. The research objectives of the survey were to measure satisfaction with ComEd, the pilot, and the Bidgely solution; gauge customer belief in the accuracy of their disaggregated data; assess customer interactions with and perceptions of the program; and determine what actions participants took in response to the information they received. The median length of time that respondents took to complete the survey was 7.4 minutes. Question formats included: score from zero to ten, discrete choice, open-ended, and one unique ranking question.

The survey was fielded online through Navigant’s Qualtrics platform with an email invitation between May 10<sup>th</sup> and May 17<sup>th</sup>, 2018<sup>1</sup>; this was one to two weeks after the pilot concluded at the end of April 2018. Certain questions were only asked if the customer could see their usage in real time; these instances are noted in figure captions.

Table 1 shows the number of responses and the response rate by survey completion status. The survey analysis includes completed and partially completed surveys.<sup>2</sup> In total, 110 customers responded to part or all of the survey<sup>3</sup> leading to a response rate of 9.2%.

**Table 1. Response Summary**

Completion Status	Response count	Emails Delivered	Response Rate
Complete	93	-	-
Partially Complete	17	-	-
Did Not Start	9	-	-
Total	119	-	-
<b>Total Valid*</b>	<b>110</b>	<b>1,202<sup>†</sup></b>	<b>9.2%</b>

\* Valid response count includes only “Complete” and “Partially Complete” categories.

† In total, 1,224 emails were delivered but 22 were deemed invalid based on bounce backs.

Source: Navigant analysis

## KEY FINDINGS AND RECOMMENDATIONS

The following summarizes Navigant’s key findings and recommendations from this survey.

<sup>1</sup> All customers who ever joined the program (regardless of when or how engaged they were) were sent a survey invite.

<sup>2</sup> That is, customers who answered all of the survey questions and those who left the survey partway through without finishing all of the questions. We also had a small number of customers (9) who followed the survey link in the email but did not actually start the survey by answering any questions.

<sup>3</sup> Note that since a number of partially complete survey responses were used, the response count (N) may vary slightly from question to question. The Ns are indicated for each figure.

**Finding 1.** Fifty-three percent of respondents rated their likelihood to participate in a similar program in the future a 10 out of 10. Additionally, 64% of respondents rated their likelihood to recommend this type of program to friends or family an 8 or higher out of 10.

**Recommendation 1.** This suggests that there is an appetite for similar programs in the future and that customers like receiving daily or real-time usage information and usage disaggregation.

**Finding 2.** The majority (64%) of respondents who indicated that the Bidgely program improved their satisfaction with ComEd cited an improved understanding of their usage as the primary reason.

**Finding 3.** The Bidgely HomeBeat web and mobile app are effective at encouraging awareness of and reduction in energy use. Fifty-six percent of respondents indicated that their participation caused them to take action to save energy. When asked to rate the program's effect on their awareness of their energy use, 65% rated this at 8 or higher out of 10.

**Finding 4.** Sixty-one percent of respondents reported scores of 8 or greater on the 0 to 10 scale for their satisfaction with the ability to see their hourly data. For daily and monthly data, this share was larger at 66%. Conversely, the areas of lowest satisfaction were with the mobile application and the website, with only 39% and 43% reporting scores of 8 or greater, respectively.

**Recommendation 2.** Based on respondent feedback, in the future, ComEd should focus on reliability and ease-of-use of the platform.

**Finding 5.** Respondents generally rated the accuracy of usage information positively. Across the categories of usage information asked about, nearly one-third of customers ranked the accuracy of each type of usage information a 10 out of 10 and another approximately 15% of each rated a 9 out of 10.

**Finding 6.** Almost half of all respondents (49%) reported a desire to save energy as the number one reason for participation in the program. The second most popular reason was the opportunity to see a breakdown of usage across their appliances.

**Finding 7.** Some respondents (approximately 8%) indicated they felt that the app was a waste of time, either for reasons of inaccurate information or irrelevancy.

**Recommendation 3.** Based on respondent feedback, in the future, ComEd should focus on helping customers understand and interpret the usage data they are seeing.

**Recommendation 4.** For similar programs in the future, marketing should be targeted towards segments that are interested in technologies and granular data as other customers may not find the program relevant or useful.

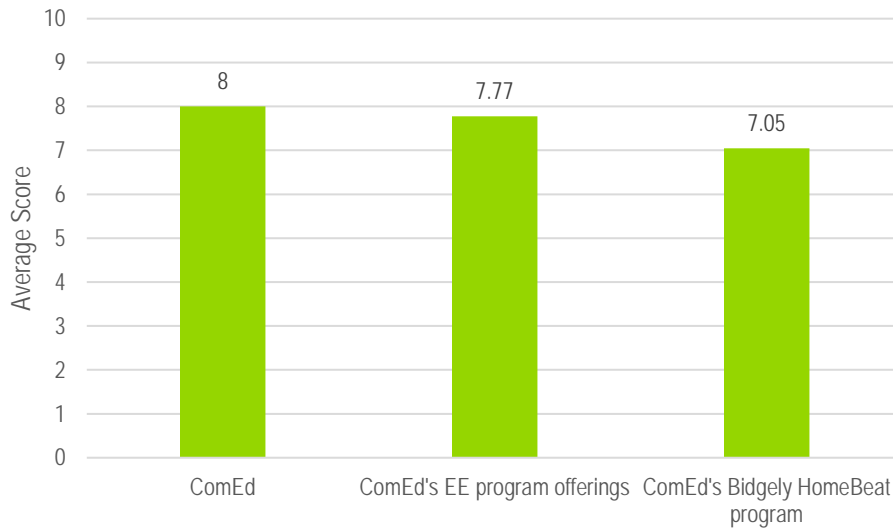
## RESULTS

### Satisfaction

Overall satisfaction with ComEd in general, ComEd's energy efficiency program offerings in general, and ComEd's Bidgely HomeBeat program were very positive. As shown in Figure 1, average satisfaction scores fell between 7 and 8 in each category. Satisfaction with the Bidgely HomeBeat program had the largest share of scores under 5 out of 10 (17.3%); this was higher than the share for the other two categories, which had less than four percent of scores under 5 each.



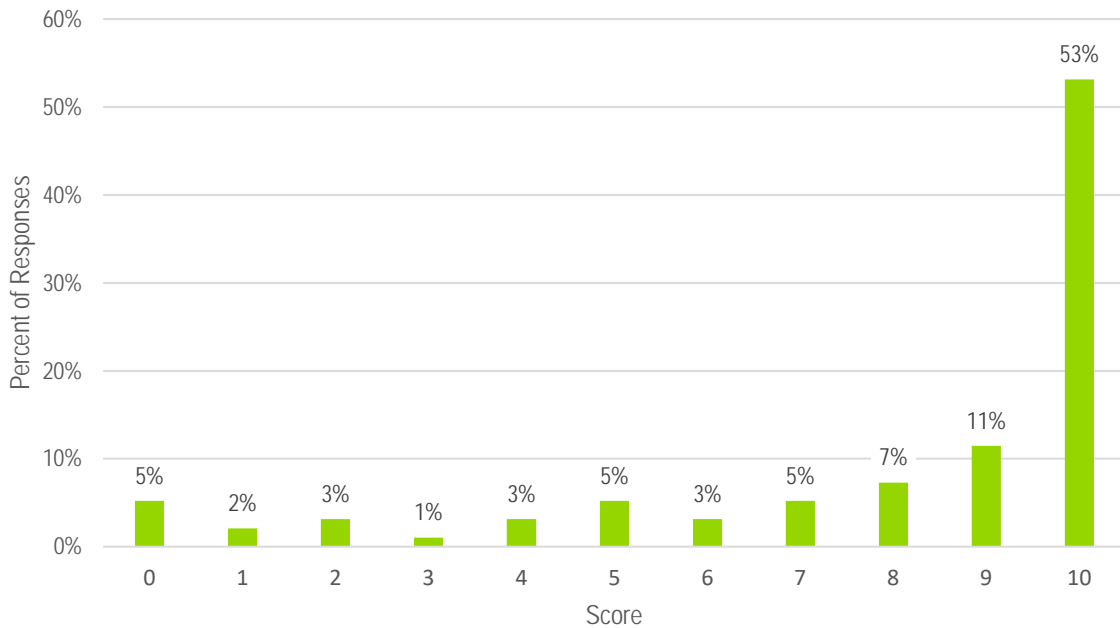
**Figure 1. Satisfaction with ComEd and Program Overall\***



\* N = 110 for all three questions  
 Source: Navigant analysis

Respondents were also asked about their likelihood to participate in a similar program at a later date. As shown in Figure 2, on a scale of 0 to 10, 53% of respondents indicated that they would be highly likely to participate by giving a perfect 10 rating. Notably, responses to the other satisfaction questions detailed in this section vary amongst those who rated this a 10, suggesting that people do have an interest in improved program offerings or accessibility even if they disliked certain aspects of this pilot.

**Figure 2. Likelihood to Participate in a Similar ComEd Program in the Future**

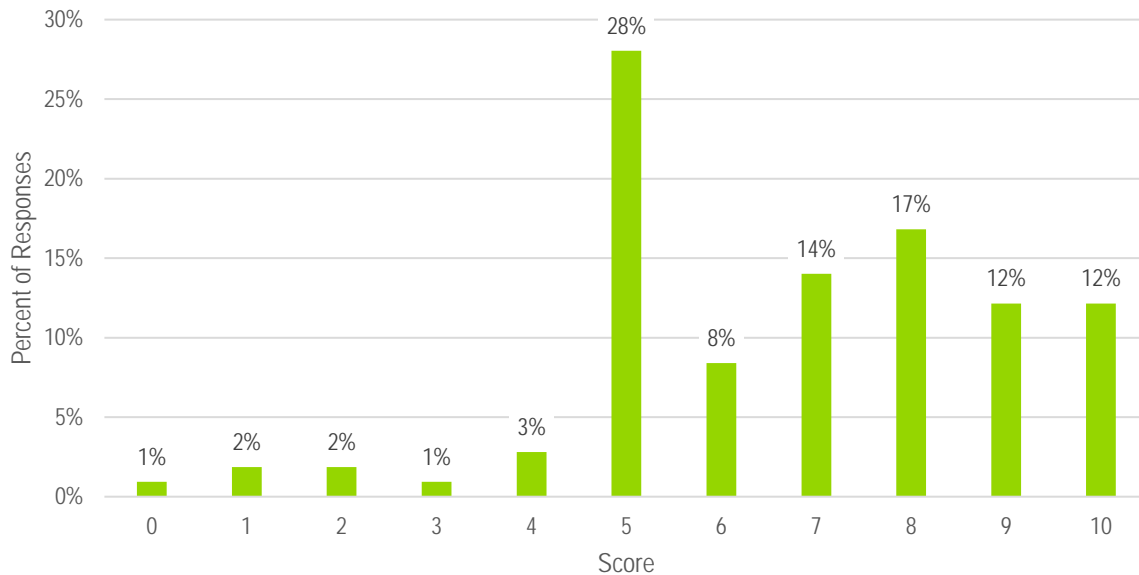


\* N = 96  
 Source: Navigant analysis

Additionally, respondents were asked to rate their likelihood of recommending the Bidgely HomeBeat program to friends and family with 64% rating their likelihood 8 or better out of 10, with an overall average score of 7.25 out of 10.

Survey respondents also rated how their satisfaction with ComEd changed as a direct result of their experience in the Bidgely HomeBeat program on a scale of 0 to 10. A score under 5 indicated a decrease in satisfaction with ComEd, a score of 5 indicated no change, and a score over 5 indicated an increase in satisfaction with ComEd. The percentage distribution of these ratings is displayed in Figure 3. Respondents overwhelmingly reported that they are more satisfied with ComEd due to their experience in the Bidgely HomeBeat program (63%). A minority (9%) reported becoming less satisfied as a result of the program, while 28% reported no change.

**Figure 3. Change in Satisfaction with ComEd from Bidgely HomeBeat**



\* N = 107

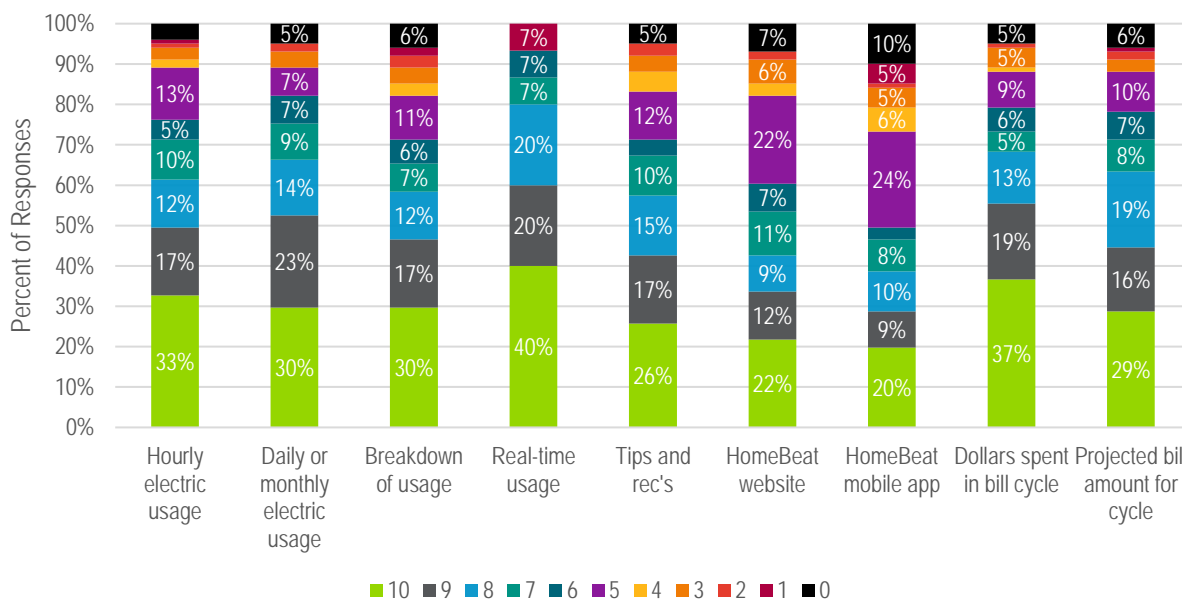
Source: Navigant analysis

Customers who reported a change for better or for worse in their satisfaction with ComEd were asked to elaborate. The most common reason given for an increase in customer satisfaction was the ability to view the breakdown of usage, leading to a greater understanding of usage overall as compared to prior to the program. Additionally, some customers detailed having had a good experience with representatives, as well as the program helping with cost savings. These responses demonstrate that there is both value in and customer engagement with the information that the Bidgely HomeBeat program provides.

Conversely, those who reported a decrease in their satisfaction as a direct result of the program voiced a discontent with the whole or a part of the program itself. It is difficult to draw meaningful conclusions from the small pool who reported a decrease, so overall satisfaction with the program is best gauged by satisfaction with its individual aspects.

Figure 4 details specific categories of the Bidgely HomeBeat solution on which customers were asked to report their level of satisfaction and shows the ratings breakdown of scores from 0 (very dissatisfied) to 10 (very satisfied) for each. Customers reported the highest satisfaction with the ability to see daily and monthly usage data (66% rated this feature at least an 8) and the ability to see real-time usage data (61% above 8). Satisfaction was lowest with the website and mobile app themselves (43% and 39% above 8, respectively).

Figure 4. Satisfaction with Program Components



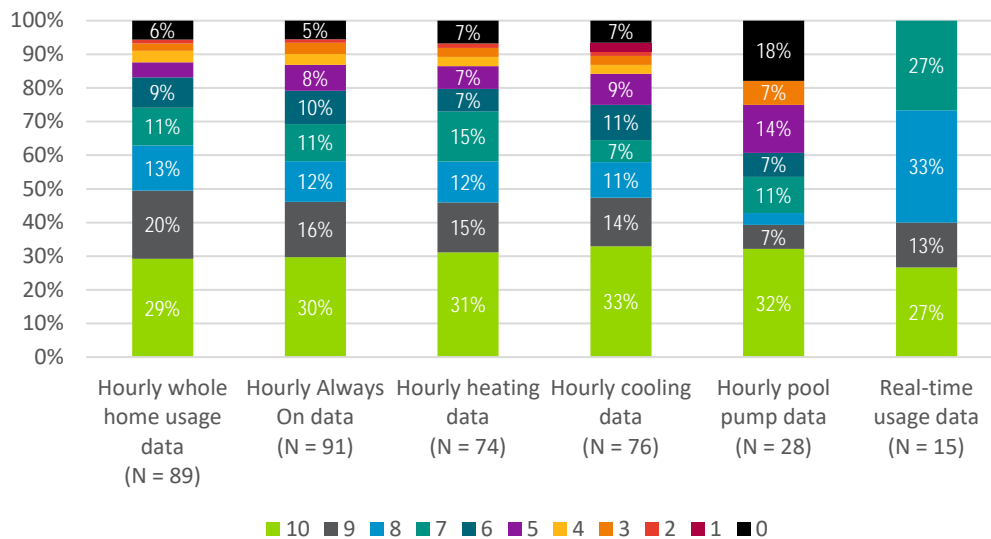
\* N = 107 for all questions, with one exception. Satisfaction with ability to see real-time usage was only asked to the subset of customers who had access to their real-time data (N = 15).  
 Source: Navigant analysis

For further elaboration on possible causes of dissatisfaction, anybody who reported a score of 4 or below for a particular feature was prompted to clarify the reason behind their displeasure. Respondents mostly claimed a general lack of usefulness for the platforms, with most claiming inaccuracy of information (particularly usage information), a lack of actionable or helpful information (this also came through in the comments on the tips and recommendations), or issues with application access or functionality (in particular, the mobile app was cited as unreliable with poor execution). Improving the ease-of-use and functionality of future similar platforms should expand the reach of the program to those who currently find it inaccessible.

There was also a minority of dissatisfied respondents that claimed that the program features were useless, or that the program itself was too difficult to continue using. Since certain demographics of customers may find hourly or daily usage data and bill projections to be personally irrelevant or inherently untrustworthy, Navigant suggests any additional app roll out to be marketed more towards those segments both interested in using technologies like this as well as looking at more granular usage data. To this point, respondents who had the ability to see their real-time usage data generally reported higher-than-average satisfaction, suggesting that these might be the type of data- or tech-oriented customers that the program is most suited for. Notably, these customers reported the tips and recommendations to be less relevant to them on average.

Respondents were also asked about their perception of the accuracy of usage data provided to them on a scale from 0 (completely inaccurate) to 10 (very accurate). As demonstrated in Figure 5, the majority of customers gave preferable ratings on the accuracy of each category of usage data, and the distribution of scores was generally similar across the categories. Nearly one-third of customers ranked the accuracy of each type of usage information a 10 out of 10 and another approximately 15% rated it a 9.

**Figure 5. Accuracy Ratings of Usage Information Received**



Source: Navigant analysis

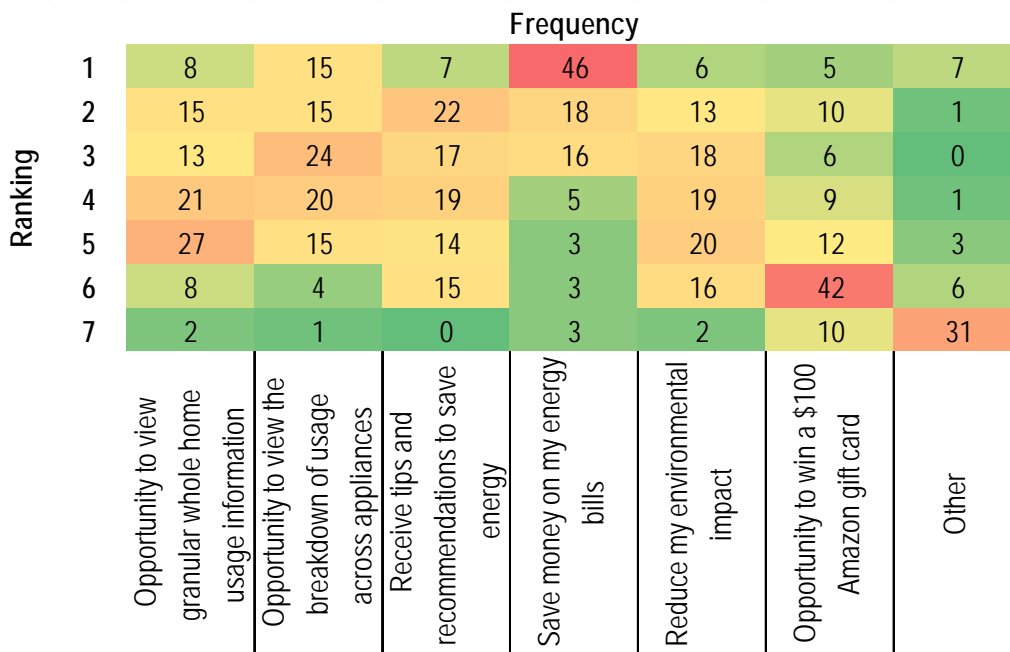
Respondents who gave an accuracy rating below 5 were prompted to explain their perception of the information and suggest ways to improve their confidence in its accuracy. Customers stated that the information was either difficult to comprehend or that they were experiencing discrepancies in usage between their ComEd bills and their Bidgely reports. Suggestions for improvement were very customer specific, from requesting better explanatory power of the Bidgely tool to help understand what they are seeing. Providing tutorials to help customers understand patterns in daily and real-time usage could help customers interpret the data they are seeing. Additionally, explanations of how this data differs from billing data could be useful.

## Interactions and Perceptions

Navigant designed some survey questions to explore how customers found out about the Bidgely tool as well as how they used it. The majority learned of the program either via email (47%) or direct mail (27%), with very few finding out from word-of-mouth or other means. A decent portion (20%) could not recall how they learned of the program.

When asked to rank their reasons for participating in the program out of a set list of options, just under half (49%) chose reducing their energy bill spending as their number one reason. The opportunity to see the breakdown of usage across appliances and the ability to receive tips and recommendations to save energy were the second and third most popular reasons for participating respectively. Figure 6 shows a heatmap of respondent rankings, where green colored squares are the less popular and red squares are the more popular ranking choices. The boxes in the heatmap indicate how many customers selected each reason for participating as each rank; for example, in the first box in the upper left-hand corner 8 respondents ranked “Opportunity to view granular whole home usage information” as their number 1 reason for participating. Notably, few respondents who selected “Other” in their rankings gave a specific reason, but those who did voiced that their participation was due to an interest in new technology like smart meters and usage monitoring applications.

**Figure 6. Reasons for Program Participation, Heatmap of Rankings**



\* N = 94. "Other" has fewer than 94 responses since it was an optional selection.  
 Source: Navigant analysis

Supporting the heatmap, Table 2 shows the average ranking for each option. A lower ranking indicates a more important reason (reasons for participating were ranked by importance from 1 to 7). To reiterate: saving money, viewing disaggregated usage, and receiving energy saving tips and recommendations were the top three reasons for participating, by average ranking.

**Table 2. Reasons for Program Participation, Average Ranking**

Average Ranking	Description text
2.17	Save money on my energy bills
3.22	Opportunity to view the breakdown of usage across appliances
3.6	Receive tips and recommendations to save energy
3.81	Opportunity to view granular whole home usage information
3.96	Reduce my environmental impact
4.9	Opportunity to win a \$100 Amazon gift card
5.73	Other (please specify)

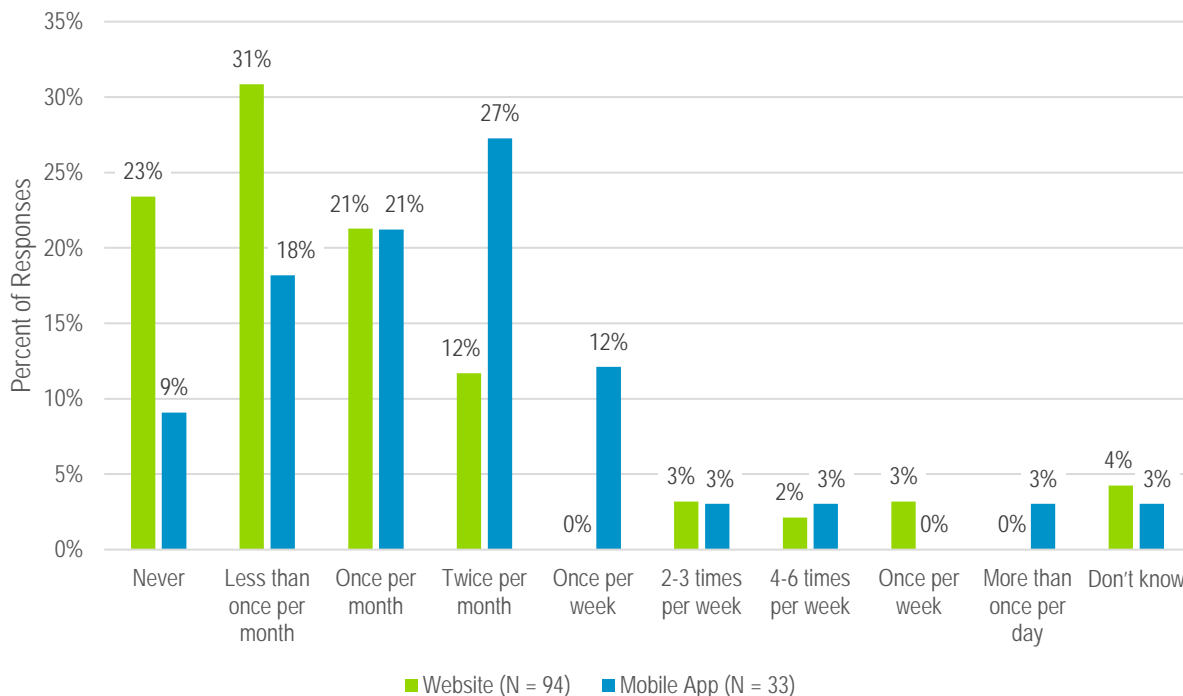
Source: Navigant analysis

Figure 7 shows the distribution of respondents' reported frequency of visits to the Bidgely HomeBeat website and mobile app. Overall, respondents who downloaded the app (35% of respondents<sup>4</sup>) visited it more frequently than those using the website. In total, 72% of respondents who downloaded the app

<sup>4</sup> This aligns well with what we saw in the actual login data where 35% of participants were shown as using the mobile app. For more details see the PY9 Bidgely impact report: Navigant. 2018. *ComEd Bidgely Pilot Evaluation Report*. Presented to Commonwealth Edison Company. *Finalization forthcoming*.

visited it at least once per month, compared to 45% of customers who visited the website at least once per month. Notably, almost one-quarter (23%) said they never visited the website.<sup>5</sup>

**Figure 7. Frequency of Website or Mobile App Visits**



Source: Navigant analysis

Respondents who visited the website or app at least once per month were asked why they continued to visit. Typically, they said they wanted to view their overall and disaggregated usage because they were interested in either usage monitoring or cost savings.

## Actions and Energy Awareness

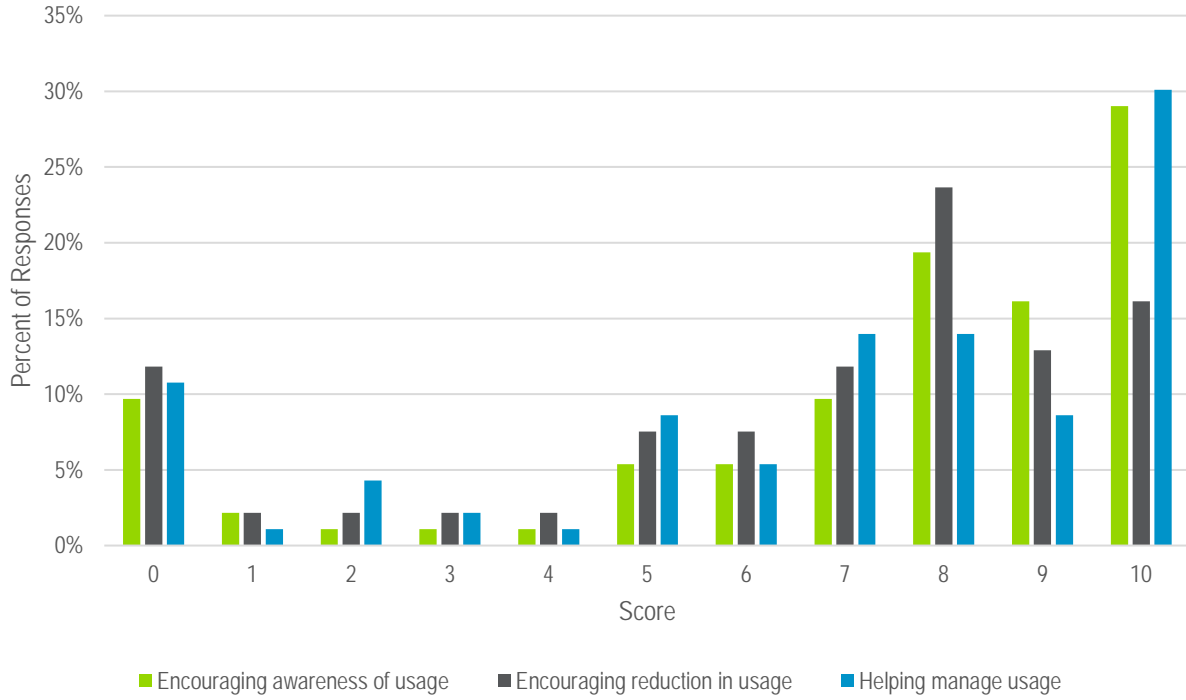
In order to gauge the reach of the Bidgely HomeBeat program, Navigant asked respondents a few questions to determine actions that customers took based on the information provided. Fifty-six percent of respondents reported that the program caused them to take new actions to save on energy in their homes. Actions taken in response to the information provided were: (a) installing LED bulbs, (b) unplugging or turning off specific devices, (c) better managing current devices and appliances, and (d) developing new habits and a general mindfulness regarding how much energy they are using and when they are using it.

Using the 0 to 10 scale, respondents were asked how well the program encouraged their household members to become more aware of their energy use. Scores were quite high with 80% of the respondents giving a score of 6 or greater and 65% scoring 8 or greater. As a follow up, respondents were also asked if they thought that the program caused them to use less energy than they would have used otherwise. For this question, 72% of the respondents gave scores of 6 or greater and 53% gave 8 or greater. Finally, customers were asked how well the program helped them in better managing their

<sup>5</sup> This aligns well with what we saw in the actual login data where the mean visits per customer (to website or app) was 14, but the median was 3 and one-third of participants only visited the website or app once. For more details see the PY9 Bidgely impact report: Navigant. 2018. *ComEd Bidgely Pilot Evaluation Report*. Presented to Commonwealth Edison Company. *Finalization forthcoming*.

usage. The average score for helpfulness in usage management came in at 6.8 out of 10. Figure 8 shows response distributions for all three questions.

**Figure 8. Energy Usage Awareness, Reduction, and Management**



\* N = 93

Source: Navigant analysis