Guidehouse

ComEd Cost-Effectiveness Analysis

CY2024 Report

Energy Efficiency/Demand Response Plan:
Program Year 2024 (CY2024)
(1/1/2024-12/31/2024)

Prepared for:

ComEd

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1. Overview

As part of ComEd's energy efficiency program evaluation for calendar year 2024 (CY2024), Guidehouse determined program- and portfolio-level cost-effectiveness using the utility cost test (UCT) and the Illinois total resource cost (TRC) test. This analysis included quantifying the program, measure, and portfolio costs for implementing the energy efficiency programs, along with the benefits derived from these investments. This report contains TRC values with and without Societal non-energy impacts (Societal NEIs). The following sections include the results of the cost-effectiveness analysis for each program in ComEd's portfolio and includes a detailed breakdown of all the costs and benefits included in the analysis.

The savings numbers and results included in this report are reflective of only ComEd's Energy Efficiency Portfolio Standard (EEPS) programs For programs that are jointly implemented by ComEd and one or more Illinois gas utilities (including Nicor Gas, Peoples Gas [PG], and North Shore Gas [NSG]), only ComEd's portion of the program savings and costs are included in this report.[1] The combined joint TRC and UCT values for these programs will be shared in a separate memo.

The Illinois TRC test is defined in the Illinois Power Agency Act (see 20 ILCS 3855/1-10) as follows:[2]

> *"Total resource cost test" or "TRC test" means a standard that is met if, for an investment in energy efficiency or demand-response measures, the benefit-cost ratio is greater than one. The benefit-cost ratio is the ratio of the net present value of the total benefits of the program to the net present value of the total costs as calculated over the lifetime of the measures. A total resource cost test compares the sum of avoided electric utility costs, representing the benefits that accrue to the system and the participant in the delivery of those efficiency measures and including avoided costs associated with reduced use of natural gas or other fuels, avoided costs associated with reduced water consumption, and avoided costs associated with reduced operation and maintenance costs, as well as other quantifiable societal benefits, to the sum of all incremental costs of end-use measures that are implemented due to the program (including both utility and participant contributions), plus costs to administer, deliver, and evaluate each demand-side program, to quantify the net savings obtained by substituting the demand-side program for supply resources. In calculating avoided costs of power and energy that an electric utility would otherwise have had to acquire; reasonable estimates shall be included of financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases. In discounting future societal costs and benefits for the purpose of calculating net present values, a societal discount rate based on actual, long-term Treasury bond yields should be used. Notwithstanding anything to the contrary, the TRC test shall not include or consider a calculation of market price suppression effects or demand reduction induced price effects.*

The Illinois TRC test differs from traditional TRC tests due to its requirement to include a reasonable estimate of the financial costs associated with future regulations and legislation on the

[1] For programs that are jointly offered by ComEd and gas utilities, the therm savings claimed by ComEd are included in this analysis.

[2] See Section 1-10 Definitions of the Illinois Power Agency Act: http://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=2934&ChapterID=5

emissions of greenhouse gases (GHG) and the use of the societal discount rate. These differences add a benefit to investments in efficiency programs that are typically included in the societal cost test in other jurisdictions.

Table 1-1 summarizes the CY2024 TRC and UCT values for all EEPS programs in ComEd's CY2024 portfolio. Overall, the CY2024 portfolio aggregate TRCs and UCTs show the portfolio was cost-effective, with aggregate TRC values of 4.88 (with Societal NEIs) and 2.83 (without Societal NEIs), and a UCT value of 2.02.

Table 1-1. Summary of CY2024 TRC and UCT Values for ComEd Programs

Program	Illinois TRC Test (With Societal NEIs)	Illinois TRC Test (Without Societal NEIs)	UCT
ASI kWh Purchase	4.67	2.94	4.02
Behavior - Res/IE	7.83	3.77	2.42
Contractor/Midstream Rebates	6.24	2.19	1.57
Electric Home New Construction	1.87	0.86	0.85
Multifamily Upgrades	1.75	1.03	0.74
New Construction - IE	2.11	1.16	1.26
Product Distribution	13.38	6.82	5.27
Retail/Online	11.37	7.65	10.12
Single Family Upgrades	1.03	0.73	0.62
Whole Home Electric	1.07	0.42	0.25
Residential & Income Eligible Total*	**6.79**	**4.12**	**3.75**
Behavior Bus/Pub	4.26	1.75	0.91
EMS - Small Business - Pilot	0.27	0.12	0.07
Incentives	4.78	2.96	1.65
Midstream/Upstream	10.11	5.45	4.62
New Construction - Bus/Pub	2.15	1.30	1.98
Small Business	4.98	2.73	1.47
Targeted Systems	3.12	1.47	0.89
Business & Public Sector Total*	**5.05**	**2.83**	**1.67**
Voltage Optimization	1.94	0.95	0.58
Portfolio Total without IE & with VO*	**4.72**	**2.74**	**1.87**
Portfolio Total with IE & without VO*	**5.40**	**3.16**	**2.32**
Portfolio Total without IE, VO*	**5.42**	**3.18**	**2.24**
Portfolio Total with IE & VO*	**4.88**	**2.83**	**2.02**

Notes: This table contains only ComEd programs. In CY2024, ComEd purchased kilowatt-hour savings from Nicor Gas' Air Sealing and Insulation (ASI) offering. ComEd's purchase of therms from the Nicor ASI program is not a ComEd program, but the savings and TRC results are counted in ComEd's residential sector.
*The TRC and UCT values are calculated using the sum of all the offerings' benefits and costs. Values are rounded to 2 digits.
Source: Guidehouse analysis

Both the Residential and Business sectors achieved TRC cost-effectiveness in CY2024. While performance remained strong across the portfolio, changes were seen on both the cost and benefits side of the equation. More details are provided in the Findings section at the end of this report.

- TRC costs increased about 16% from CY2023[3] to CY2024. Program-level administrative costs were the main driver, increasing from $164M to $200M while program-level incremental costs grew from $310M to $360M year-over-year.

- TRC benefits increased significantly in CY2024, leading to a jump in TRC and UCT scores in both the residential and business sectors. The largest increase came from Fossil Fuel Avoided Costs, which grew from $96M in CY2023 to $329M in CY2024 and Societal NEIs, which grew from $467M to $1,322M; these increases are due to both increased savings and an updated evaluation methodology described below which captured a wider scope of impacts.

- Income-Eligible programs remained a positive contributor to portfolio TRC scores. With IE, the portfolio TRC ratio was 4.88 with NEI included, and 2.83 without NEI. Without IE, the portfolio TRC was 4.72 with NEI included and 2.74 without NEI.

1.1 Illinois Total Resource Cost Equation

Guidehouse used Equation 1 to calculate the Illinois TRC.

Equation 1. Illinois TRC

$$BCR_{ILTRC} = B_{ILTRC} / C_{ILTRC}$$

Where:

BCR_{ILTRC} = Benefit-cost ratio of the Illinois TRC test
B_{ILTRC} = Present value of benefits of an Illinois program or portfolio
C_{ILTRC} = Present value of costs of an Illinois program or portfolio

The evaluation team calculated the benefits of the Illinois TRC using Equation 2.

Equation 2. Illinois TRC Benefits

$$B_{ILTRC} = \sum_{t=1}^{N} \frac{UAEP_t + UATD_t + UAA_t + EB_t + RC + \text{S NEI}}{(1+d)^{t-1}} + \sum_{t=1}^{N} \frac{UAC_{at}}{(1+d)^{t-1}}$$

Guidehouse calculated the costs of the Illinois TRC using Equation 3.

Equation 3. Illinois TRC Costs

$$C_{ILTRC} = \sum_{t=1}^{N} \frac{PNIC_t + IMCN_t + UIC_t}{(1+d)^{t-1}}$$

Where benefits are defined as:

UAEPt = Utility avoided electric and capacity production costs in year t

[3] https://www.ilsag.info/wp-content/uploads/ComEd-Cost-Effectiveness-Analysis-CY2023-Report-2024-06-28-Final.pdf

UATDt = Utility avoided transmission and distribution (T&D) costs in year t
UAAt = Utility avoided ancillary costs in year t
EBt = Environmental benefits in year t
UACat = Utility avoided supply costs for the alternate fuel in year t
RC = Net present value (NPV) of replacement costs of baseline bulbs
S NEI = NPV societal NEI benefit

And costs are defined as:

PNICt = Program non-incentive costs in year t
IMCNt = Net incremental costs in year t
UICt = Utility increased supply costs in year t

And:

d = Societal discount rate

The Illinois TRC test allows utilities to account for the NPV of the avoided cost of purchasing shorter lifetime bulbs, which accrue to program participants because of the significantly longer lifetimes of efficient LED light bulbs. In general, the avoided cost per bulb is determined by comparing the estimated useful life of efficient and baseline bulbs to determine the number of baseline bulb purchases that are avoided. Based on the average purchase price of baseline bulbs, NPV is determined by discounting the value of these avoided purchases over the course of the lifetime of the efficient bulb. Illinois Technical Reference Manual version 12.0 (IL TRM v12.0) provides deemed NPVs per bulb based on efficient bulb type, socket type (commercial or residential), and lumen range. These benefits were included in the program calculations.

Policy Manual Version 3.0[4] asserts that negative avoided costs (accrued through electrification or other impacts) be treated as increases in TRC costs rather than decreases in TRC benefits, as was previously treated. Additionally, electricity avoided cost impacts (energy and demand) are grouped to create a net cost change due to electricity. Net cost change is reported under electric cost changes while changes due to gas savings are incorporated in fossil fuel cost changes. These updates are reflected in the TRC ratios and report tables.

1.2 Utility Cost Test Equation

The Utility Cost Test (UCT) approaches cost-effectiveness from the perspective of the utility, in this case ComEd. The UCT determines whether the energy supply and capacity costs avoided by the utility exceed the overhead and cost outlays that the utility incurred to implement energy efficiency programs. The structure of the calculation is similar to the Illinois TRC with a few key changes. As the UCT is primarily focused on utility outlays, incentives paid by the utility to either participants or third-party implementers are included in the calculation in place of incremental or participant costs. Additionally, as non-energy benefits accrue to society rather than to the utility implementing energy efficiency programs, these benefits are not included in the UCT formula. The UCT, however, accounts for water benefits defined in IL TRM v12.0.

[4] https://www.ilsag.info/wp-content/uploads/IL_EE_Policy_Manual_Version_3.0_Final_11-3-2023.pdf

Using the equation terms previously defined for the Illinois TRC equation, Equation 4 shows the UCT equation.

Equation 4. UCT

$$BCR_{UCT} = B_{UCT} / C_{UCT}$$

Where:

BCR_{UCT} = Benefit-cost ratio of the UCT
B_{UCT} = Present value of benefits to a utility of a program or portfolio
C_{UCT} = Present value of costs to a utility of a program or portfolio

The benefits of the UCT are calculated using Equation 5.

Equation 5. UCT Benefits

$$B_{UCT} = \sum_{t=1}^{N} \frac{UAEP_t + UATD_t + UAA_t}{(1+d)^{t-1}} + \sum_{t=1}^{N} \frac{UAC_{at}}{(1+d)^{t-1}}$$

The costs of the UCT are calculated using Equation 6.

Equation 6. UCT Costs

$$C_{UCT} = \sum_{t=1}^{N} \frac{PNIC_t + UIC_t + PIN_t}{(1+d)^{t-1}}$$

Where the new term, PIN_t, is defined as the program incentives provided by the utility in year t.

Similar cost test changes from the final draft policy in Policy Manual Version 3.0 apply to the UCT as described in Section 1.1.

1.3 Cost-Effectiveness Data Requirements

Table 1-2 outlines the data points collected from different stakeholders to conduct cost-effectiveness analysis. The data is categorized into generic and program-specific categories.

Table 1-2. Data Points Needed to Conduct EEPS Cost-Effectiveness

Category	Data Point	Source
Generic	• Avoided Energy Costs ($/kWh) • Avoided Capacity Costs ($/kW) • Avoided T&D Electric ($/kWh) • Avoided Gas Production ($/therm)[5] • Avoided Water Costs ($/gallon) • Escalation Rates • Environmental Damages (GHG Adders) • Discount Rate	ComEd
Program Specific	• Participants/Measure Count • Verified Energy and Demand Savings • Realization Rate • Net-to-Gross Ratio • Measure Life • Incremental Measure Costs[6] • NPV Replacement Costs • Societal NEI Benefit	Guidehouse Evaluation of ComEd Reports
	• Non-Incentive Costs • Utility Incentive Costs • Direct Install Costs • Incremental Measure Costs	ComEd

Source: Guidehouse analysis

[5] From Nicor Gas and Peoples and North Shore Gas.

[6] Incremental measure costs come from program tracking data, program contractor invoices, and deemed value sources from IL TRM v12.0.

2. Summary of Results and Portfolio-Level Data Inputs

Table 2-1 summarizes the CY2024 cost-effectiveness analysis results by benefit and cost components relevant to each cost test for the portfolio without the inclusion of income eligible components, or voltage optimization. The results indicate that ComEd's CY2024 EEPS portfolio is cost-effective under both the UCT and the TRC tests for the Residential and Business sectors.

Table 2-1. Summary of ComEd CY2024 Residential and Business Sectors' Cost-Effectiveness Test Values ($ Thousands)

Data Point	UCT		Illinois TRC Test	
	UCT Benefits	UCT Costs	Illinois TRC Benefits	Illinois TRC Costs
Electricity Cost Changes	$509,712	$29	$509,712	$29
Fossil Fuel Cost Changes	$211,786	$15,081	$211,786	$15,081
Water Cost Changes	$27,631	N/A	$27,631	$0
Environmental Adder (GHGs)	N/A	N/A	$341,870	$9
Societal NEI Benefit	N/A	N/A	$861,162	$11
NPV Replacement Costs	N/A	N/A	$133,712	$0
Non-Incentive Costs	N/A	$121,534	N/A	$121,534
Incentive Costs	N/A	$198,414	N/A	N/A
Net Participant Costs	N/A	N/A	$0	$247,948
Present Value Totals (with Societal NEI)	$749,129	$335,058	$2,085,872	$384,612
Present Value Totals (without Societal NEI)	$749,129	$335,058	$1,224,710	$384,601
Ratio (with Societal NEI)	2.24		5.42	
Ratio (without Societal NEI)	2.24		3.18	

Note: All categories exclude income eligible and voltage optimization.
Source: Guidehouse analysis

On the cost side, net participant costs represent the largest component followed by the incentive costs of program implementation. For the UCT, the sum of all incentives provided is used in place of net participant costs. The sum of all incentives is less than the sum of all incremental costs.

2.1 Avoided Costs

As discussed in Section 1.3, avoided cost data is provided by ComEd and is typically updated annually. The definitions of each avoided cost data point used in the analysis and their respective sources are as follows:

- **Avoided Energy Costs ($/kWh):** Avoided electric production costs are those associated with purchasing energy from Pennsylvania-New Jersey-Maryland Interconnection (PJM).
- **Avoided Electric Capacity Costs ($/kW):** Avoided electric capacity costs are those associated with the construction of additional electricity generation facilities to meet peak

demand. Incremental reductions in the amount of electricity demand during peak hours can delay or eliminate the need to build additional generation. ComEd is a participant in the Reliability Pricing Model, which is PJM's forward capacity market.

- **Avoided T&D Electric ($/kW):** Avoided T&D costs are a benefit associated with not needing to build T&D infrastructure to meet demand at peak times.

- **Avoided Electric Ancillary ($/kWh):** Avoided ancillary is a benefit associated with avoided costs attributable to the Open Access Transmission Tariff that applies to utilities that participate in the PJM market.

- **Avoided Gas Costs ($/therm):** This value is from Nicor Gas, Peoples Gas, and North Shore Gas, and is used to account for gas interactive effects due to lighting.

- **Avoided Water Costs ($/gal):** This value accounts for savings associated with efficient water fixtures and clothes washers. The avoided water costs of $8.59/1,000 gallons (as provided by ComEd) was used for the analysis.

2.2 Non-Incentive Costs

Non-incentive costs are program administrator costs (related to energy efficiency) that are not otherwise classified as financial incentives paid to customers or incentives paid to third parties. In other words, non-incentive costs are equal to all program administrator costs minus incentives.

Examples of non-incentive costs include:

- Costs for overhead, labor, and materials required to develop, deliver, and administer functions related to the implementation of energy efficiency programs or portfolios such as rebate processing, measurement and verification (M&V), quality assurance, advertising and marketing, and customer relations

- Program administrator payment to a third party whose principal purpose is not to reduce the cost of the efficient measure to the customer

- Program administrator payment to a third party to cover the cost of services that are principally intended to be a form of marketing, as opposed to being truly necessary for any customer implementation of efficient measures

- Sales performance incentive fund formula (SPIFF) paid out to a third party

There are currently some performance-based programs where the third-party program implementer is paid an amount per kilowatt-hour that includes incentives and non-incentives. Guidehouse worked with ComEd to separate out the costs appropriately.

2.3 Incentives

Incentives[7] include financial incentives paid to customers plus incentives paid to third parties. Financial incentives paid to customers are payments[8] made by a program administrator directly to an end-use customer to encourage the customer to participate in an efficiency program and offset some or all the customer's costs to purchase and install a qualifying efficient measure, ultimately resulting in a reduction in the net price paid by the customer for the efficient measure. This rebate type of incentive is often referred to as a downstream incentive, which has the result that the net price to the customer of an energy efficiency program-sponsored measure is reduced by the amount of the incentive.

Incentives paid to third parties are payments made by a program administrator to a third party that is principally intended to reduce the net price to the customer of purchasing and installing a qualifying efficient measure. These incentives include payments made by a program administrator to service providers, manufacturers, wholesalers, distributors, contractors, builders, retailers, implementation contractors, or other non-customer stakeholders that are principally intended to defray the incremental cost to the customer of purchasing and installing an efficient measure. They also include payments made by a program administrator to an implementation contractor to cover the full cost of direct installation measures (materials and labor) for the portion not covered by the customer. Incentives paid to third parties also include payment by a program administrator to a third party to cover the full cost of study-based services (e.g., facility energy audits, energy surveys, energy assessments, retro-commissioning) that are truly necessary for a customer to implement efficient measures, as opposed to being principally a form of marketing. The portion of the payments covered by the customers are not included in the incentives paid to third parties.

2.4 Incremental Costs

Incremental costs are the difference between the cost of the efficient measure and the cost of the most relevant baseline measure that would have been installed (if any) in the absence of the efficiency program. Installation costs (material and labor) and operations and maintenance (O&M) costs are included if there is a difference between the efficient measure and the baseline measure. In cases where the efficient measure has a significantly shorter or longer life than the relevant baseline measure (e.g., LEDs versus halogens), the avoided baseline replacement measure costs are accounted for in the TRC analysis as a benefit. The incremental cost input in the TRC analysis is not reduced by the amount of incentives.

[7] Incentive definitions can be found in Section 8.4 TRC Costs of the Illinois Energy Efficiency Policy Manual Version 3.0. The Illinois TRC test requires that "all incremental costs of end use measures (including both utility and participant contributions)" should be reflected as costs in the TRC test calculation. As long as "all incremental costs of end-use measures" are included in the TRC test calculation, there is no need to add program administrator contribution costs (i.e., incentives) and participant contribution costs as separate components to the TRC test. However, program administrator contribution costs (i.e., incentives) are needed to calculate the Program Administrator Cost Test (PACT)/UCT because those are a component of the program administrator expenses. Most TRC modeling software requires users to input the incentives as a separate input in addition to providing all incremental costs such that the PACT/UCT can be calculated. For this reason, the separate incentives input in the TRC model is not used when calculating the TRC test because these costs are already reflected in the incremental cost input, and if the model were to use both the incentives input and the incremental cost input, it would result in double counting of costs in the TRC analysis.

[8] Payments include non-measure items of value that would be treated as transfer payments, e.g., gift cards.

Examples of incremental cost calculations include:

- The incremental cost for an efficient measure that is installed in new construction or is being purchased at the time of natural installation, investment, or replacement is the additional cost incurred to purchase an efficient measure over and above the cost of the baseline or standard (i.e., less efficient) measure (including any incremental installation, replacement, or O&M costs if there is a difference between the efficient measure and baseline measure).

- For a retrofit measure where the efficiency program caused the customer to update their existing equipment, facility, or processes, where the customer would not have otherwise made a purchase, the appropriate baseline is zero expenditure and the incremental cost is the full cost of the new retrofit measure (including installation costs).

- For the early replacement of a functioning measure with a new efficient measure, where the customer would not have otherwise made a purchase for several years, the appropriate baseline is a dual baseline that begins as the existing measure and shifts to the new standard measure after the expected remaining useful life of the existing measure ends. The incremental cost is the full cost of the new efficient measure (including installation costs) being purchased to replace a still-functioning measure less the present value of the assumed deferred replacement cost of replacing the existing measure with a new baseline measure at the end of the existing measure's life.

- For study-based services that are truly necessary for a customer to implement efficient measures, as opposed to being principally intended to be a form of marketing, the incremental cost is the full cost of the study-based service.

2.5 Discount Rate

Guidehouse applied the discount rate to determine the present value of the cumulative benefits (e.g., avoided electric production, capacity, T&D, and ancillary) that accrue over the life of the measures included in each program. The discount rate should reflect the societal discount rate as defined in the legislation to be the actual, long-term treasury bond yields. The societal discount rate of 2.40% is used to calculate the TRC and UCT values.

2.6 Line Losses

Line losses were incorporated in the calculation of the benefits. The energy and demand savings calculated by the evaluation are estimated at the customer or meter level. The savings that are accrued to ComEd ratepayers are those at the generator level and so the estimated savings are increased by the line losses within ComEd's T&D network. Guidehouse calculated total benefits using the energy line losses of 10.07% and the peak line losses of 10.66% as provided by ComEd.

2.7 Miscellaneous EEPS Portfolio Costs

In addition to costs allocated directly to energy efficiency programs, the cost-effectiveness analysis included portfolio-level costs that are not directly incurred by specific programs. These

costs may include administrative, R&D, outreach, advertising, evaluation, M&V, legal, and other expenses. As statutory cost-effectiveness is measured at the portfolio level, ComEd does not allocate these costs to individual programs. Table 2-2 outlines the portfolio-level costs included in the analysis.

Table 2-2. Breakdown of Portfolio-Level Costs

Portfolio-Level Cost Component	Value ($)
M&V	$8,390,062
R&D	$7,196,231
Market Development	$5,148,628
Legal	$22,387
Tracking System	$998,194
Labor (Non-Program-Specific)	$5,060,348
General Program Costs	$6,985,393
General Business Sector Costs	$798,923
Residential Outreach	$3,689,762
Business Outreach	$11,322,160
Income Eligible Outreach	$300,461
General Education & Awareness	$5,517,138
Total	**$55,429,688**

Source: Guidehouse analysis of ComEd data

2.8 Societal NEIs

Societal NEIs occur when energy efficiency programs reduce electricity generated from fossil fuels, which reduces emissions including $PM_{2.5}$, SO_2, NO_x, and CO_2. This reduction in emissions causes reduced adverse health impacts, which are monetizable. The Societal NEIs were incorporated in the CY2024 analysis for the TRC values only. As discussed in previous sections, this report provides TRC results both with and without NEIs included.

Guidehouse quantified and monetized these Societal NEIs using the U.S. Environmental Protection Agency (EPA) AVoided Emissions and geneRation Tool (AVERT) and CO–Benefits Risk Assessment (COBRA) Health Impacts Screening and Mapping Tool. The EPA updated COBRA in 2024 to estimate changes in annual ambient concentrations of both particulate matter ($PM_{2.5}$) and ozone. In previous years, COBRA only estimated the health impacts of $PM_{2.5}$. The COBRA update included additional health incidents (Hospital Admissions related to Alzheimer's and Parkinson's Disease, Incidence of Stroke and Lung Cancer, and Hay Fever/Rhinitis).

3. Program-Specific Data

Table 3--1 and Table 3-2 summarize the CY2024 cost-effectiveness calculations and results for each program. These tables include the value of each benefit and cost component for each program and EEPS totals for each sector (e.g., residential & income eligible [IE] and business). For programs jointly implemented by ComEd and one or more Illinois gas utility, the table includes only the electric portion of the program savings (unless ComEd claims the gas savings) and cost-benefit calculations.

Table 3-3 summarizes the CY2024 ComEd Electrification Measures' energy consumption, savings, and costs (total cost, total utility cost, average cost, average utility cost).

Table 3--1. ComEd Program-Level Benefits, Costs, and Illinois TRC without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL TRC Test (NPV replacement cost as benefit)				
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement Costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes‡	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement Costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL TRC Benefits (w/o NEI)	IL TRC Costs (w/o NEI)	IL TRC Test Net Benefits (w/o NEI)	IL TRC Test (w/NEI)	IL TRC Test (w/o NEI)
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(q)= a+b+c+d+f+g	(r) = h+i+j+k+m+n+p	(s) = q-r	(t) = (q+e)/(r+l)	(u) = q / r
ASI kWh Purchase	$1,005	$0	$0	$441	$850	$0	$0	$0	$0	$0	$0	$0	$0	$250	$0	$241	$1,446	$491	$955	4.67	2.94
Behavior - Res/IE	$15,633	$0	$0	$8,729	$26,225	$0	$0	$0	$0	$0	$0	$0	$0	$6,457	$0	$0	$24,362	$6,457	$17,904	7.83	3.77
Contractor/Midstream Rebates	$14,210	$4,949	$0	$11,020	$55,823	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$9,747	$11,332	$30,179	$13,777	$16,401	6.24	2.19
Electric Home New Construction	$411	$381	$52	$375	$1,430	$0	$0	$5	$0	$0	$6	$7	$0	$903	$80	$498	$1,219	$1,412	($194)	1.87	0.86
Multifamily Upgrades	$19,461	$6,855	$2,318	$13,204	$29,888	$258	$0	$0	$530	$0	$0	$0	$0	$12,234	$26,145	$28,301	$42,095	$41,066	$1,029	1.75	1.03
New Construction - IE	$3,109	$2,128	$751	$2,518	$7,211	$249	$0	$13	$84	$0	$13	$18	$0	$2,687	$1,986	$4,741	$8,755	$7,538	$1,218	2.11	1.16
Product Distribution	$82,476	$1,807	$10,943	$55,576	$161,111	$16,533	$0	$0	$1,539	$0	$0	$0	$0	$3,988	$12,552	$19,027	$167,335	$24,553	$142,781	13.38	6.82
Retail/Online	$158,406	$284,731	$25,123	$132,492	$303,324	$23,708	$0	$21	$9,770	$0	$0	$0	$0	$13,470	$22,988	$58,315	$624,459	$81,576	$542,883	11.37	7.65
Single Family Upgrades	$7,604	$11,204	$1,904	$4,267	$10,355	$392	$0	$0	$460	$0	$0	$0	$0	$8,777	$24,109	$25,344	$25,372	$34,580	($9,209)	1.03	0.73
Whole Home Electric	$1,898	$603	$10	$1,740	$6,524	$1	$0	$86	$0	$0	$22	$26	$0	$2,432	$7,488	$7,488	$4,252	$10,028	($5,776)	1.07	0.42
Res & IE Total*	**$304,213**	**$312,656**	**$41,100**	**$230,361**	**$602,740**	**$41,141**	**$0**	**$126**	**$12,383**	**$0**	**$41**	**$51**	**$0**	**$57,634**	**$105,095**	**$155,286**	**$929,472**	**$225,469**	**$704,002**	**6.79**	**4.12**
Assessments	$0 $0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,431	$0	$0	$0	$1,431	($1,431)	0	0
Behavior Bus/Pub	$8,748	$0	$0	$8,047	$24,101	$0	$0	$0	$0	$0	$0	$0	$0	$7,063	$2,546	$2,546	$16,795	$9,609	$7,185	4.26	1.75
EMS - Small Business - Pilot	$24	$0	$0	$25	$59	$0	$0	$0	$0	$0	$0	$0	$0	$353	$0	$45	$49	$397	($348)	0.27	0.12
Incentives	$122,991	$14,695	$0	$75,798	$185,336	$86,803	$0	$3	$8,360	$0	$3	$4	$0	$14,467	$60,779	$78,759	$300,288	$101,592	$198,696	4.78	2.96
Midstream/Upstream	$111,572	$0	$67	$68,737	$175,264	$24,305	$0	$0	$0	$0	$0	$0	$0	$3,955	$20,202	$33,615	$204,681	$37,570	$167,111	10.11	5.45
New Construction - Bus/Pub	$3,823	$205	$2,335	$2,655	$5,588	$0	$0	$0	$0	$0	$0	$0	$0	$2,171	$1,050	$4,747	$9,018	$6,917	$2,100	2.15	1.3
Small Business	$122,965	$900	$89	$73,792	$182,430	$23,163	$0	$0	$6,462	$0	$0	$0	$0	$10,491	$67,252	$64,105	$220,909	$81,059	$139,850	4.98	2.73
Targeted Systems	$26,174	$238	$0	$18,920	$51,115	$0	$0	$0	$0	$0	$0	$0	$0	$9,701	$20,092	$21,235	$45,332	$30,936	$14,396	3.12	1.47
Business & Public Sector Total*	**$396,297**	**$16,038**	**$2,491**	**$247,972**	**$624,194**	**$134,272**	**$0**	**$3**	**$14,822**	**$0**	**$3**	**$4**	**$0**	**$61,753**	**$171,921**	**$205,052**	**$797,070**	**$281,633**	**$515,438**	**5.05**	**2.83**
Voltage Optimization	$56,309	$0	$0	$35,532	$95,542	$0	$0	$0	$0	$0	$0	$0	$0	$96,699	$0	$0	$91,841	$96,699	($4,858)	1.94	0.95
Portfolio Total without IE & with VO*‡	**$566,021**	**$211,786**	**$27,631**	**$377,402**	**$956,705**	**$133,712**	**$0**	**$29**	**$15,081**	**$0**	**$9**	**$11**	**$0**	**$218,233**	**$198,414**	**$247,948**	**$1,316,551**	**$481,301**	**$835,251**	**4.72**	**2.74**
Portfolio Total with IE & without VO*‡	**$700,511**	**$328,694**	**$43,591**	**$478,333**	**$1,226,934**	**$175,413**	**$0**	**$129**	**$27,205**	**$0**	**$44**	**$55**	**$0**	**$158,705**	**$277,016**	**$360,338**	**$1,726,542**	**$546,421**	**$1,180,122**	**5.40**	**3.16**
Portfolio Total without IE & VO*‡	**$509,712**	**$211,786**	**$27,631**	**$341,870**	**$861,162**	**$133,712**	**$0**	**$29**	**$15,081**	**$0**	**$9**	**$11**	**$0**	**$121,534**	**$198,414**	**$247,948**	**$1,224,710**	**$384,601**	**$840,109**	**5.42**	**3.18**
Portfolio Total with IE & VO*‡	**$756,820**	**$328,694**	**$43,591**	**$513,865**	**$1,322,476**	**$175,413**	**$0**	**$129**	**$27,205**	**$0**	**$44**	**$55**	**$0**	**$255,404**	**$277,016**	**$360,338**	**$1,818,383**	**$643,120**	**$1,175,264**	**4.88**	**2.83**

*The TRC and UCT values are calculated using the sum of all the offerings' benefits and costs. Totals include portfolio and sector level non-incentive costs from Table 2-2.
‡Gas heating penalties from energy efficiency measures designed to save electricity are being calculated as part of the overall fossil fuel cost changes.
Source: Guidehouse analysis

Table 3-2. ComEd Program-Level Benefits, Costs, and UCT without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL Utility Cost Test (UCT)			
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL UCT Benefits	IL UCT Costs	IL UCT Test Net Benefits	IL UCT Test
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(v) = a+b+c	(w) = h+i+n+o	(x) = v-w	(y) = v/w
ASI kWh Purchase	$1,005	$0	$0	$441	$850	$0	$0	$0	$0	$0	$0	$0	$0	$250	$0	$241	$1,005	$250	$755	4.02
Behavior - Res/IE	$15,633	$0	$0	$8,729	$26,225	$0	$0	$0	$0	$0	$0	$0	$0	$6,457	$0	$0	$15,633	$6,457	$9,176	2.42
Contractor/Midstream Rebates	$14,210	$4,949	$0	$11,020	$55,823	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$9,747	$11,332	$19,159	$12,193	$6,966	1.57
Electric Home New Construction	$411	$381	$52	$375	$1,430	$0	$0	$5	$0	$0	$6	$7	$0	$903	$80	$498	$844	$988	($144)	0.85
Multifamily Upgrades	$19,461	$6,855	$2,318	$13,204	$29,888	$258	$0	$0	$530	$0	$0	$0	$0	$12,234	$26,145	$28,301	$28,634	$38,910	($10,276)	0.74
New Construction - IE	$3,109	$2,128	$751	$2,518	$7,211	$249	$0	$13	$84	$0	$13	$18	$0	$2,687	$1,986	$4,741	$5,988	$4,770	$1,218	1.26
Product Distribution	$82,476	$1,807	$10,943	$55,576	$161,111	$16,533	$0	$0	$1,539	$0	$0	$0	$0	$3,988	$12,552	$19,027	$95,225	$18,079	$77,146	5.27
Retail/Online	$158,406	$284,731	$25,123	$132,492	$303,324	$23,708	$0	$21	$9,770	$0	$0	$0	$0	$13,470	$22,988	$58,315	$468,259	$46,249	$422,011	10.12
Single Family Upgrades	$7,604	$11,204	$1,904	$4,267	$10,355	$392	$0	$0	$460	$0	$0	$0	$0	$8,777	$24,109	$25,344	$20,712	$33,345	($12,633)	0.62
Whole Home Electric	$1,898	$603	$10	$1,740	$6,524	$1	$0	$86	$0	$0	$22	$26	$0	$2,432	$7,488	$7,488	$2,510	$10,006	($7,496)	0.25
Res & IE Total*	**$304,213**	**$312,656**	**$41,100**	**$230,361**	**$602,740**	**$41,141**	**$0**	**$126**	**$12,383**	**$0**	**$41**	**$51**	**$0**	**$57,634**	**$105,095**	**$155,286**	**$657,970**	**$175,237**	**$482,733**	**3.75**
Assessments	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,431	$0	$0	$0	$1,431	($1,431)	0.00
Behavior Bus/Pub	$8,748	$0	$0	$8,047	$24,101	$0	$0	$0	$0	$0	$0	$0	$0	$7,063	$2,546	$2,546	$8,748	$9,609	($862)	0.91
EMS - Small Business - Pilot	$24	$0	$0	$25	$59	$0	$0	$0	$0	$0	$0	$0	$0	$353	$0	$45	$24	$353	($328)	0.07
Incentives	$122,991	$14,695	$0	$75,798	$185,336	$86,803	$0	$3	$8,360	$0	$3	$4	$0	$14,467	$60,779	$78,759	$137,686	$83,608	$54,078	1.65
Midstream/Upstream	$111,572	$0	$67	$68,737	$175,264	$24,305	$0	$0	$0	$0	$0	$0	$0	$3,955	$20,202	$33,615	$111,639	$24,157	$87,482	4.62
New Construction - Bus/Pub	$3,823	$205	$2,335	$2,655	$5,888	$0	$0	$0	$0	$0	$0	$0	$0	$2,171	$1,050	$4,747	$6,362	$3,221	$3,142	1.98
Small Business	$122,965	$900	$89	$73,792	$182,430	$23,163	$0	$0	$6,462	$0	$0	$0	$0	$10,491	$67,252	$64,105	$123,955	$84,205	$39,750	1.47
Targeted Systems	$26,174	$238	$0	$18,920	$51,115	$0	$0	$0	$0	$0	$0	$0	$0	$9,701	$20,092	$21,235	$26,412	$29,794	($3,382)	0.89
Business & Public Sector Total*	**$396,297**	**$16,038**	**$2,491**	**$247,972**	**$624,194**	**$134,272**	**$0**	**$3**	**$14,822**	**$0**	**$3**	**$4**	**$0**	**$61,753**	**$171,921**	**$205,052**	**$414,827**	**$248,499**	**$166,327**	**1.67**
Voltage Optimization	$56,309	$0	$0	$35,532	$95,542	$0	$0	$0	$0	$0	$0	$0	$0	$96,699	$0	$0	$56,309	$96,699	($40,390)	0.58
Portfolio Total without IE & with VO*‡	**$566,021**	**$211,786**	**$27,631**	**$377,402**	**$956,705**	**$133,712**	**$0**	**$29**	**$15,081**	**$0**	**$9**	**$11**	**$0**	**$218,233**	**$198,414**	**$247,948**	**$805,438**	**$431,757**	**$373,680**	**1.87**
Portfolio Total with IE & without VO*‡	**$700,511**	**$328,694**	**$43,591**	**$478,333**	**$1,226,934**	**$175,413**	**$0**	**$129**	**$27,205**	**$0**	**$44**	**$55**	**$0**	**$158,705**	**$277,016**	**$360,338**	**$1,072,797**	**$463,055**	**$609,742**	**2.32**
Portfolio Total without IE & VO*‡	**$509,712**	**$211,786**	**$27,631**	**$341,870**	**$861,162**	**$133,712**	**$0**	**$29**	**$15,081**	**$0**	**$9**	**$11**	**$0**	**$121,534**	**$198,414**	**$247,948**	**$749,129**	**$335,058**	**$414,070**	**2.24**
Portfolio Total with IE & VO*‡	**$756,820**	**$328,694**	**$43,591**	**$513,865**	**$1,322,476**	**$175,413**	**$0**	**$129**	**$27,205**	**$0**	**$44**	**$55**	**$0**	**$255,404**	**$277,016**	**$360,338**	**$1,129,106**	**$559,754**	**$569,352**	**2.02**

*The TRC and UCT values are calculated using the sum of all the offerings' benefits and costs. Totals include portfolio and sector level non-incentive costs from Table 2-2.
‡Gas heating penalties from energy efficiency measures designed to save electricity are being calculated as part of the overall fossil fuel cost changes.
Source: Guidehouse analysis

Table 3-3. ComEd Electrification Measure Costs

Program	Component	IE	End Use Type	Savings Category	Quantity	Increase in Electricity Consumption (kWh)	Average Increase in Electricity Consumption (kWh)	Decrease in Gas Consumption (therms)	Average Decrease in Gas Consumption (therms)	Decrease in Gas Consumption (kWh)	Net Change in Electricity Consumption (kWh)	Ex Ante Gross Savings (kWh)	Program Gross Realization Rate	Verified Gross Savings (kWh)	Program Net-to-Gross Ratio (NTG)	Verified Net Savings (kWh)	EUL	Total Cost	Total Utility Cost	Average Cost	Average Utility Cost
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Ground Source Heat Pump - Electrification (Income Eligible)	2	9,621	5,064	1,843	970	54,016	44,395	42,287	1.16	49,129	0.93	45,690	25.0	$134,221	$1,566	$70,643	$824
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Ground Source Heat Pump - Electrification - DAC (Income Eligible)	0	692	3,459	112	562	3,294	2,602	2,773	1.00	2,773	1.00	2,773	25.0	$14,129	$139	$70,643	$694
Whole Home Electric	SF	TRUE	Other	Custom Measure: Fireplace - Electrification - DAC	4	818	205	313	78	9,174	8,356	10,437	0.80	8,341	1.00	8,341	20.0	$8,298	$8,298	$2,074	$2,075
Whole Home Electric	SF	TRUE	Other	Custom Measure: Fireplace - Electrification	3	614	205	234	78	6,858	6,244	6,245	1.00	6,245	1.00	6,245	20.0	$6,212	$6,213	$2,071	$2,071
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Midstream ASHP - Electrification (Income Eligible)	284	3,072,369	10,805	237,313	835	6,955,633	3,883,264	3,883,264	1.00	3,883,264	0.93	3,611,436	16.0	$509,354	$509,354	$1,791	$1,791
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Midstream ASHP - Electrification - DAC (Income Eligible)	35	333,115	9,553	26,737	767	783,669	450,555	450,555	1.00	450,555	1.00	450,555	16.0	$59,098	$59,098	$1,695	$1,695
New Construction - IE	Affordable Housing New Construction	TRUE	HVAC	VRF	99	608,187	6,143	117,295	1,185	3,437,903	2,829,715	2,816,747	1.00	2,829,715	1.00	2,829,715	16.0	$0	$0	$0	$0
Retail/Online	Income Eligible Retail	TRUE	Appliances	Electric Clothes Dryer EEE DAC IE	4	-201	-50	4	1	1,056	1,257	934	1.35	1,257	1.00	1,257	16.0	$556	$556	$139	$139
Retail/Online	Income Eligible Retail	TRUE	Appliances	Electric Clothes Dryer EEE IE	8	-336	-42	6	1	1,764	2,100	1,868	1.12	2,100	1.00	2,100	16.0	$1,249	$1,249	$156	$156
Retail/Online	Income Eligible Retail	TRUE	Appliances	Heat Pump Dryer EEE DAC IE	16	-1,183	-74	21	1	6,210	7,393	5,421	1.36	7,393	1.00	7,393	16.0	$2,432	$2,432	$152	$152
Retail/Online	Income Eligible Retail	TRUE	Appliances	Heat Pump Dryer EEE IE	21	-1,684	-80	30	1	8,839	10,523	7,551	1.39	10,523	1.00	10,523	16.0	$7,661	$7,661	$365	$365
Retail/Online	Income Eligible Retail	TRUE	Appliances	Induction Cooktop EEE DAC IE	9	999	111	11	1	3,350	1,881	1,881	1.00	1,881	1.00	1,881	16.0	$8,626	$8,626	$958	$958
Retail/Online	Income Eligible Retail	TRUE	Appliances	Induction Cooktop EEE IE	30	3,502	117	39	1	11,419	6,377	6,269	1.02	6,377	1.00	6,377	16.0	$30,018	$30,018	$1,001	$1,001
Whole Home Electric	SF	TRUE	HVAC	Ductless Heat Pump - Electrification - DAC	2	12,569	6,285	1,729	865	50,674	38,105	38,094	1.00	38,094	1.00	38,094	16.0	$37,897	$37,899	$18,949	$18,950
Whole Home Electric	SF	TRUE	HVAC	Ductless Heat Pump - Electrification	2	10,265	5,133	1,490	745	43,669	33,404	32,975	1.01	33,417	1.00	33,417	16.0	$33,244	$33,246	$16,622	$16,623
Whole Home Electric	MF	TRUE	HVAC	Ductless Heat Pump - Electrification - DAC	8	47,613	5,952	6,346	793	185,991	138,378	138,366	1.00	138,366	1.00	138,366	16.0	$137,650	$137,658	$17,206	$17,207
Whole Home Electric	SF	TRUE	HVAC	Air Source Heat Pump - Electrification - DAC	87	920,036	10,575	100,220	1,152	2,937,280	2,017,244	1,998,555	1.01	2,017,255	1.00	2,017,255	16.0	$2,006,820	$2,006,935	$23,067	$23,068
Whole Home Electric	SF	TRUE	HVAC	Air Source Heat Pump - Electrification	34	383,313	11,274	42,861	1,261	1,256,184	872,871	847,925	1.03	872,859	1.00	872,859	16.0	$868,343	$868,394	$25,540	$25,541
Whole Home Electric	MF	TRUE	HVAC	Air Source Heat Pump - Electrification - DAC	3	26,899	8,966	2,549	850	74,707	47,808	47,523	1.01	47,810	1.00	47,810	16.0	$47,563	$47,565	$15,854	$15,855
Whole Home Electric	MF	TRUE	HVAC	Air Source Heat Pump - Electrification	244	1,061,297	4,350	121,074	496	3,548,476	2,487,179	2,462,733	1.01	2,487,193	1.00	2,487,193	16.0	$2,474,331	$2,474,469	$10,141	$10,141
Whole Home Electric	SF	TRUE	Appliances	Clothes Dryer - Electrification - DAC	74	42,838	579	1,845	25	54,074	11,236	11,229	1.00	11,229	1.00	11,229	16.0	$11,174	$11,172	$151	$151
Whole Home Electric	SF	TRUE	Appliances	Clothes Dryer - Electrification	30	16,721	557	732	24	21,454	4,733	4,727	1.00	4,727	1.00	4,727	16.0	$4,704	$4,703	$157	$157
Whole Home Electric	MF	TRUE	Appliances	Clothes Dryer - Electrification - DAC	2	1,022	511	50	25	1,465	443	439	1.00	439	1.00	439	16.0	$437	$437	$218	$218
Whole Home Electric	MF	TRUE	Appliances	Clothes Dryer - Electrification	16	7,474	467	399	25	11,694	4,220	4,216	1.00	4,216	1.00	4,216	16.0	$4,194	$4,194	$262	$262
Whole Home Electric	SF	TRUE	Appliances	Cooktop - Electrification - DAC	79	20,781	263	1,605	20	47,040	26,259	26,256	1.00	26,268	1.00	26,268	16.0	$26,133	$26,133	$331	$331
Whole Home Electric	SF	TRUE	Appliances	Cooktop - Electrification	31	8,246	266	635	20	18,611	10,365	10,350	1.00	10,350	1.00	10,350	16.0	$10,298	$10,297	$332	$332
Whole Home Electric	MF	TRUE	Appliances	Cooktop - Electrification - DAC	9	2,543	283	192	21	5,627	3,084	3,052	1.01	3,075	1.00	3,075	16.0	$3,059	$3,059	$340	$340
New Construction - IE	Affordable Housing New Construction	TRUE	HVAC	Ducted Heat Pump	68	348,466	5,125	35,640	524	1,044,611	696,145	695,053	1.00	696,145	1.00	696,145	15.8	$33,691	$33,691	$495	$495
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Midstream DMSHP - Electrification (Income Eligible)	70	226,449	3,244	29,244	419	857,153	630,704	630,704	1.00	630,704	0.93	586,554	15.0	$82,727	$82,727	$1,185	$1,185
Contractor/Midstream Rebates	Midstream	TRUE	HVAC	Midstream DMSHP - Electrification - DAC (Income Eligible)	15	53,327	3,591	6,691	451	196,119	142,792	142,792	1.00	142,792	1.00	142,792	15.0	$18,730	$18,730	$1,261	$1,261
Midstream/Upstream	Instant Discounts	TRUE	HVAC	ASHP HVAC EEE IE	0	3,787	8,607	36	81	10,444	6,657			6,657	0.80	5,326	15.0	$5,157	$594	$11,721	$1,350
Midstream/Upstream	Instant Discounts	TRUE	HVAC	ASHP HVAC DAC EEE IE	3	14,607	5,774	120	47	35,086	20,479			20,479	1.00	20,479	15.0	$15,865	$1,827	$6,271	$722
Midstream/Upstream	Instant Discounts	TRUE	HVAC	MSHP HVAC EEE IE	2	15,008	6,202	152	63	44,466	29,458			29,458	0.80	23,566	15.0	$22,821	$2,628	$9,430	$1,086
Midstream/Upstream	Instant Discounts	TRUE	HVAC	MSHP HVAC DAC EEE IE	0	2,599	5,250	28	56	8,170	5,572			5,572	1.00	5,572	15.0	$4,316	$497	$8,720	$1,004
Midstream/Upstream	Instant Discounts	TRUE	Other	Fork Truck EEE IE	22	1,016,676	46,359	12,413	566	3,638,105	2,621,429			2,621,429	0.80	2,097,143	15.0	$511,048	$233,840	$23,303	$10,663
New Construction - IE	Affordable Housing New Construction	TRUE	HVAC	Ductless Heat Pump	44	62,402	1,418	5,533	126	162,164	99,762	99,762	1.00	99,762	1.00	99,762	15.0	$21,800	$21,800	$495	$495

Program	Component	IE	End Use Type	Savings Category	Quantity	Increase in Electricity Consumption (kWh)	Average Increase in Electricity Consumption (kWh)	Decrease in Gas Consumption (therms)	Average Decrease in Gas Consumption (therms)	Decrease in Gas Consumption (kWh)	Net Change in Electricity Consumption (kWh)	Ex Ante Gross Savings (kWh)	Program Gross Realization Rate	Verified Gross Savings (kWh)	Program Net-to-Gross Ratio (NTG)	Verified Net Savings (kWh)	EUL	Total Cost	Total Utility Cost	Average Cost	Average Utility Cost
Whole Home Electric	SF	TRUE	Hot Water	Heat Pump Water Heater - Electrification - DAC	81	72,204	891	14,794	183	433,587	361,383	383,482	0.94	361,396	1.00	361,396	15.0	$359,527	$359,547	$4,439	$4,439
Whole Home Electric	SF	TRUE	Hot Water	Heat Pump Water Heater - Electrification	32	33,685	1,053	6,844	214	200,586	166,901	170,005	0.98	166,902	1.00	166,902	15.0	$166,038	$166,048	$5,189	$5,189
Whole Home Electric	MF	TRUE	Hot Water	Heat Pump Water Heater - Electrification - DAC	2	3,610	1,805	796	398	23,329	19,719	19,712	1.00	19,712	1.00	19,712	15.0	$19,610	$19,611	$9,805	$9,805
Whole Home Electric	MF	TRUE	Hot Water	Heat Pump Water Heater - Electrification	16	10,098	631	2,237	140	65,563	55,465	55,475	1.00	55,475	1.00	55,475	15.0	$55,187	$55,191	$3,449	$3,449
Whole Home Electric	MF	TRUE	Hot Water	Electric Water Heater - Electrification - DAC	3	8,163	2,721	386	129	11,313	3,150	3,644	0.87	3,155	1.00	3,155	13.3	$3,139	$3,139	$1,046	$1,046
New Construction - IE	Affordable Housing New Construction	TRUE	Appliances	Electric Dryers	115	73,132	636	3,453	30	101,206	28,074	19,480	1.44	28,074	1.00	28,074	11.1	$15,824	$15,824	$138	$138
New Construction - IE	Affordable Housing New Construction	TRUE	HVAC	PTHP	353	348,086	986	44,709	127	1,310,407	962,321	962,321	1.00	962,321	1.00	962,321	8.0	$1,469,955	$1,469,955	$4,164	$4,164
Contractor/Midstream Rebates	Midstream	FALSE	HVAC	Ground Source Heat Pump - Electrification (Non - Income Eligible)	17	86,589	5,064	16,586	970	486,146	399,557	380,580	1.16	442,164	0.93	411,212	25.0	$57,997	$57,997	$3,392	$3,392
Contractor/Midstream Rebates	Midstream	FALSE	HVAC	Ground Source Heat Pump - Electrification - DAC (Non - Income Eligible)	2	6,226	3,459	1,012	562	29,647	23,421	24,954	1.00	24,954	1.00	24,954	25.0	$3,273	$3,273	$1,818	$1,818
Contractor/Midstream Rebates	Midstream	FALSE	HVAC	Midstream ASHP - Electrification (Non - Income Eligible)	2,559	27,651,319	10,805	2,135,814	835	62,600,696	34,949,377	34,949,377	1.00	34,949,377	0.93	32,502,921	16.0	$4,584,186	$4,584,186	$1,791	$1,791
Contractor/Midstream Rebates	Midstream	FALSE	HVAC	Midstream ASHP - Electrification - DAC (Non - Income Eligible)	314	2,998,031	9,553	240,635	767	7,053,024	4,054,993	4,054,993	1.00	4,054,993	1.00	4,054,993	16.0	$531,879	$531,879	$1,695	$1,695
Electric Homes New Construction	EHNC	FALSE	HVAC	Ductless Mini Split Heat Pumps (DAC)	17	168,371	9,904	16,662	980	494,989	326,618	465,751	0.70	326,475	1.00	326,475	16.0	$17,314	$17,314	$1,018	$1,018
Electric Homes New Construction	EHNC	FALSE	HVAC	Ductless Mini Split Heat Pumps	9	96,212	10,690	9,521	1,058	282,847	186,635	266,143	0.70	186,557	0.80	149,246	16.0	$9,166	$9,166	$1,018	$1,018
Electric Homes New Construction	EHNC	FALSE	HVAC	Central Air Source Heat Pumps (DAC)	12	164,231	13,686	13,662	1,139	405,324	241,093	276,651	0.87	240,980	1.00	240,980	16.0	$12,222	$12,222	$1,018	$1,018
Electric Homes New Construction	EHNC	FALSE	HVAC	Central Air Source Heat Pumps	6	93,846	15,641	7,807	1,301	231,618	137,772	158,087	0.87	137,703	0.80	110,162	16.0	$6,111	$6,111	$1,018	$1,018
Electric Homes New Construction	EHNC	FALSE	Appliances	Efficient Appliances-Electrification (DAC)	25	15,454	618	730	29	21,382	5,928	5,916	1.00	5,916	1.00	5,916	16.0	$297	$297	$12	$12
Electric Homes New Construction	EHNC	FALSE	Appliances	Efficient Appliances-Electrification	13	8,831	679	417	32	12,214	3,383	3,380	1.00	3,380	0.80	2,704	16.0	$170	$170	$13	$13
Retail/Online	Appliane Rebates	FALSE	Appliances	Electric Clothes Dryer EEE DAC MR	10	-376	-38	7	1	1,972	2,348	2,335	1.01	2,348	1.00	2,348	16.0	$1,391	$1,391	$139	$139
Retail/Online	Appliane Rebates	FALSE	Appliances	Electric Clothes Dryer EEE MR	118	-4,395	-37	79	1	23,075	27,471	27,558	1.00	27,471	0.80	21,977	16.0	$18,420	$18,420	$156	$156
Retail/Online	Appliane Rebates	FALSE	Appliances	Heat Pump Dryer EEE DAC MR	34	-2,529	-74	45	1	13,275	15,804	12,030	1.31	15,804	1.00	15,804	16.0	$5,168	$5,168	$152	$152
Retail/Online	Appliane Rebates	FALSE	Appliances	Heat Pump Dryer EEE MR	265	-20,062	-76	359	1	105,324	125,386	98,216	1.28	125,386	0.80	100,308	16.0	$96,672	$96,672	$365	$365
Retail/Online	Appliane Rebates	FALSE	Appliances	Induction Cooktop EEE DAC MR	63	6,993	111	80	1	23,450	13,165	13,165	1.00	13,165	1.00	13,165	16.0	$60,382	$60,382	$958	$958
Retail/Online	Appliane Rebates	FALSE	Appliances	Induction Cooktop EEE MR	337	37,750	112	430	1	125,941	70,636	70,421	1.00	70,636	0.80	56,509	16.0	$337,207	$337,207	$1,001	$1,001
Retail/Online	ESRPP	FALSE	Appliances	Induction Cooktops - Electrification	136	15,049	111	1,722	13	50,463	35,414			35,414	1.00	35,414	16.0	$135,658	$135,658	$1,001	$1,001
Electric Homes New Construction	EHNC	FALSE	Hot Water	High-Performance Water Heating Equipment-Electrification (DAC)	28	41,050	1,466	7,858	281	233,999	192,949	189,211	1.02	192,872	1.00	192,872	15.0	$82,820	$82,820	$2,958	$2,958
Electric Homes New Construction	EHNC	FALSE	Hot Water	High-Performance Water Heating Equipment-Electrification	16	23,457	1,466	4,490	281	133,705	110,248	108,121	1.02	110,213	0.80	88,170	15.0	$25,579	$25,579	$1,599	$1,599
Incentives	Custom	FALSE	Other	Other (Electrification)	1	23,681	23,681	1,144	1,144	33,534	9,853	9,859	1.01	9,979	0.56	5,588	15.0	$1,943	$2,546	$1,943	$2,546
Midstream/Upstream	Instant Discounts	FALSE	HVAC	ASHP HVAC EEE	4	34,082	8,607	321	81	93,998	59,915	69,304	0.86	59,915	0.80	47,932	15.0	$46,416	$5,345	$11,721	$1,350
Midstream/Upstream	Instant Discounts	FALSE	HVAC	ASHP HVAC DAC EEE	23	131,463	5,774	1,077	47	315,776	184,312	214,347	0.86	184,312	1.00	184,312	15.0	$142,786	$16,441	$6,271	$722
Midstream/Upstream	Instant Discounts	FALSE	HVAC	MSHP HVAC EEE	22	135,076	6,202	1,365	63	400,195	265,119	322,129	0.82	265,119	0.80	212,095	15.0	$205,388	$23,649	$9,430	$1,086
Midstream/Upstream	Instant Discounts	FALSE	HVAC	MSHP HVAC DAC EEE	4	23,388	5,250	251	56	73,533	50,145	60,920	0.82	50,145	1.00	50,145	15.0	$38,847	$4,473	$8,720	$1,004
Midstream/Upstream	Instant Discounts	FALSE	Other	Fork Truck EEE	148	7,274,609	49,299	88,820	602	26,031,691	18,757,081	26,213,534	0.72	18,757,081	0.80	15,005,665	15.0	$3,656,693	$1,673,191	$24,781	$11,339
Total	**-**	**-**	**-**	**-**	**6,145**	**47,888,775**	**367,118**	**3,379,654**	**24,603**	**126,960,257**	**79,048,625**	**84,042,081**	**0.94**	**79,097,241**	**0.91**	**71,815,825**	**15.7**	**$19,331,121**	**$16,498,580**		

Source: Guidehouse analysis

Table 3-4. ComEd Program-Level Electrification Benefits, Costs, and Illinois TRC without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL Total Resource Cost (TRC) Test (NPV replacement cost as benefit)				
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL TRC Benefits (w/o NEI)	IL TRC Costs (w/o NEI)	IL TRC Test Net Benefits (w/o NEI)	IL TRC Test (w/NEI)	IL TRC Test (w/o NEI)
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(q)=a+b+c+d+f+g	(r) = h+i+j+k+m+n+p	(s) = q-r	(t) = (q+e)/(r+l)	(u) = r / s
Contractor/Midstream Rebates	$6,028	$4,742	$0	$4,341	$38,885	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$3,579	$0	$15,111	$2,446	$12,666	22.08	6.18
Electric Homes New Construction	$228	$381	$0	$232	$1,095	$0	$0	$5	$0	$0	$6	$7	$0	$903	$48	$103	$841	$1,018	($176)	1.89	0.83
Incentives	$0	$0	$0	$0	$5	$0	$0	$3	$0	$0	$3	$4	$0	$14,467	($3)	$3	$0	$14,476	($14,476)	0.00	0.00
Midstream/Upstream	$5,109	$0	$0	$5,166	$20,577	$6,231	$0	$0	$0	$0	$0	$0	$0	$3,955	$1,521	$4,367	$16,506	$8,322	$8,184	4.46	1.98
New Construction - IE	$1,200	$1,247	$0	$1,207	$4,284	$0	$0	$13	$0	$0	$13	$18	$0	$2,687	$1,018	$325	$3,654	$3,038	$616	2.60	1.20
Retail/Online	$93	$17	$0	$103	$272	$0	$0	$21	$0	$0	$0	$0	$0	$0	$17	$615	$213	$636	($424)	0.76	0.33
Whole Home Electric	$1,328	$603	$0	$1,330	$5,527	$0	$0	$22	$0	$0	$22	$26	$0	$2,432	$5,549	$6,284	$3,261	$8,760	($5,498)	1.00	0.37
Sector-Level Admin Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Portfolio Total	**$13,986**	**$6,990**	**$0**	**$12,380**	**$70,645**	**$6,231**	**$0**	**$64**	**$0**	**$0**	**$44**	**$55**	**$0**	**$26,889**	**$11,729**	**$11,697**	**$39,586**	**$38,695**	**$891**	**2.84**	**1.02**

Source: Guidehouse analysis

Table 3-5. ComEd Program-Level Electrification Benefits, Costs, and UCT without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL Utility Cost Test (UCT)			
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL UCT Benefits	IL UCT Costs	IL UCT Test Net Benefits	IL UCT Test
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(v) = a+b+c	(w) = h+i+n+o	(x) = v-w	(y) = v/w
Contractor/Midstream Rebates	$6,028	$4,742	$0	$4,341	$38,885	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$3,579	$0	$10,770	$6,025	$4,745	1.79
Electric Homes New Construction	$228	$381	$0	$232	$1,095	$0	$0	$5	$0	$0	$6	$7	$0	$903	$48	$103	$609	$957	($348)	0.64
Incentives	$0	$0	$0	$0	$5	$0	$0	$3	$0	$0	$3	$4	$0	$14,467	($3)	$3	$0	$14,466	($14,466)	0.00
Midstream/Upstream	$5,109	$0	$0	$5,166	$20,577	$6,231	$0	$0	$0	$0	$0	$0	$0	$0	$3,955	$1,521	$4,367	$5,109	$5,476	($366)	0.93
New Construction - IE	$1,200	$1,247	$0	$1,207	$4,284	$0	$0	$13	$0	$0	$13	$18	$0	$2,687	$1,018	$325	$2,447	$3,718	($1,272)	0.66
Retail/Online	$93	$17	$0	$103	$272	$0	$0	$21	$0	$0	$0	$0	$0	$0	$0	$17	$615	$109	$38	$71	2.87
Whole Home Electric	$1,328	$603	$0	$1,330	$5,527	$0	$0	$22	$0	$0	$22	$26	$0	$2,432	$5,549	$6,284	$1,931	$8,003	($6,072)	0.24
Sector-Level Admin Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Portfolio Total	**$13,986**	**$6,990**	**$0**	**$12,380**	**$70,645**	**$6,231**	**$0**	**$64**	**$0**	**$0**	**$44**	**$55**	**$0**	**$26,889**	**$11,729**	**$11,697**	**$20,975**	**$38,683**	**($17,708)**	**0.54**

Source: Guidehouse analysis

Table 3-6. ComEd Program-Level Income Eligible Benefits, Costs, and Illinois TRC without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL Total Resource Cost (TRC) Test (NPV replacement cost as benefit)				
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL TRC Benefits (w/o NEI)	IL TRC Costs (w/o NEI)	IL TRC Test Net Benefits (w/o NEI)	IL TRC Test (w/NEI)	IL TRC Test (w/o NEI)
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(q)=a+b+c+d+f+g	(r) = h+i+j+k+m+n+p	(s) = q-r	(t) = (q+e)/(r+l)	(u) = r / s
Contractor/Midstream Rebates	$603	$474	$0	$434	$3,888	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$358	$0	$1,511	$2,446	($934)	2.21	0.62
Midstream/Upstream	$509	$0	$0	$517	$2,058	$560	$0	$0	$0	$0	$0	$0	$0	$3,955	$152	$415	$1,586	$4,370	($2,784)	0.83	0.36
Multifamily Upgrades	$17,733	$6,855	$2,225	$11,992	$26,304	$258	$0	$0	$321	$0	$0	$0	$0	$12,234	$21,356	$24,190	$39,062	$36,745	$2,317	1.78	1.06
New Construction - IE	$3,109	$2,128	$751	$2,518	$7,211	$249	$0	$13	$84	$0	$13	$18	$0	$2,687	$1,986	$4,741	$8,755	$7,538	$1,218	2.11	1.16
Product Distribution	$81,251	$1,807	$8,229	$54,722	$158,875	$16,533	$0	$0	$1,490	$0	$0	$0	$0	$3,988	$12,363	$17,203	$162,542	$22,682	$139,860	14.17	7.17
Retail/Online	$78,372	$94,405	$3,807	$60,443	$151,025	$23,708	$0	$0	$9,769	$0	$0	$0	$0	$353	$12,088	$34,074	$260,736	$44,196	$216,540	9.32	5.90
Single-Family Upgrades	$7,322	$10,638	$938	$4,098	$9,886	$392	$0	$0	$460	$0	$0	$0	$0	$8,777	$22,811	$24,278	$23,388	$33,514	($10,126)	0.99	0.70
Whole Home Electric	$1,898	$603	$10	$1,740	$6,524	$1	$0	$86	$0	$0	$22	$26	$0	$2,432	$7,488	$7,488	$4,252	$10,028	($5,776)	1.07	0.42
Sector-Level Admin Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$300	N/A	N/A	N/A	$300	N/A	N/A	N/A
Portfolio Total	**$190,799**	**$116,909**	**$15,960**	**$136,463**	**$365,772**	**$41,701**	**$0**	**$100**	**$12,124**	**$0**	**$35**	**$44**	**$0**	**$37,171**	**$78,602**	**$112,390**	**$501,832**	**$161,819**	**$340,013**	**5.37**	**3.10**

Source: Guidehouse analysis

Table 3-7. ComEd Program-Level Income Eligible Benefits, Costs, and UCT without Gas Data from Joint Programs ($ Thousands)

Program	Benefits							Costs									IL Utility Cost Test (UCT)			
	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Incremental Costs (Net)	Electricity Cost Changes	Fossil Fuel Cost Changes	Water Cost Changes	Environmental Adder (GHGs)	Societal NEI	NPV Replacement costs	Non-Incentive Costs	Incentive Costs	Incremental Costs (Net)	IL UCT Benefits	IL UCT Costs	IL UCT Test Net Benefits	IL UCT Test
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	(v) = a+b+c	(w) = h+i+n+o	(x) = v-w	(y) = v/w
Contractor/Midstream Rebates	$603	$474	$0	$434	$3,888	$0	$0	$0	$0	$0	$0	$0	$0	$2,446	$358	$0	$1,077	$2,803	($1,726)	0.38
Midstream/Upstream	$509	$0	$0	$517	$2,058	$560	$0	$0	$0	$0	$0	$0	$0	$3,955	$152	$415	$509	$4,107	($3,598)	0.12
Multifamily Upgrades	$17,733	$6,855	$2,225	$11,992	$26,304	$258	$0	$0	$321	$0	$0	$0	$0	$12,234	$21,356	$24,190	$26,813	$33,910	($7,098)	0.79
New Construction - IE	$3,109	$2,128	$751	$2,518	$7,211	$249	$0	$13	$84	$0	$13	$18	$0	$2,687	$1,986	$4,741	$5,988	$4,770	$1,218	1.26
Product Distribution	$81,251	$1,807	$8,229	$54,722	$158,875	$16,533	$0	$0	$1,490	$0	$0	$0	$0	$3,988	$12,363	$17,203	$91,287	$17,842	$73,445	5.12
Retail/Online	$78,372	$94,405	$3,807	$60,443	$151,025	$23,708	$0	$0	$9,769	$0	$0	$0	$0	$353	$12,088	$34,074	$176,585	$22,210	$154,375	7.95
Single-Family Upgrades	$7,322	$10,638	$938	$4,098	$9,886	$392	$0	$0	$460	$0	$0	$0	$0	$8,777	$22,811	$24,278	$18,898	$32,047	($13,149)	0.59
Whole Home Electric	$1,898	$603	$10	$1,740	$6,524	$1	$0	$86	$0	$0	$22	$26	$0	$2,432	$7,488	$7,488	$2,510	$10,006	($7,496)	0.25
Sector-Level Admin Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$300	N/A	N/A	N/A	$300	N/A	N/A
Portfolio Total	**$190,799**	**$116,909**	**$15,960**	**$136,463**	**$365,772**	**$41,701**	**$0**	**$100**	**$12,124**	**$0**	**$35**	**$44**	**$0**	**$37,171**	**$78,602**	**$112,390**	**$323,668**	**$127,996**	**$195,671**	**2.53**

Source: Guidehouse analysis

3.1 Incremental and Actual Measure Costs

The guidance from the IL TRM and Illinois Energy Efficiency Policy Manual indicate that it is appropriate to use actual measure-specific costs in the analysis. As a result, Guidehouse compiled the actual cost information from implementer invoices and the program tracking data provided by ComEd and identified any missing information. The team sourced incremental measure costs from IL TRM v12.0 and different workpapers provided by the implementation contractor.

While conducting the cost review, Guidehouse found instances where the program tracking data and the incremental cost value from the reference sources do not align due to differing definitions of program unit and then made appropriate assumptions to account for these differences. Guidehouse also included O&M costs when there was a difference between the efficient measure and the baseline measure based on the guidance provided in IL TRM v12.0. Where the efficient measure has a significantly shorter or longer life than the relevant baseline measure (e.g., LEDs versus halogens), Guidehouse used the avoided baseline replacement measure costs in the TRC analysis. The incremental cost input in the TRC analysis was not reduced by the amount of incentives. Some of the methodologies used to estimate the measure costs for different programs are listed below:

- **Custom, Industrial Systems, and Retro-Commissioning:** Guidehouse analyzed a sample of all the projects to determine if the actual measure cost or an incremental cost should be used for each project. Based on this analysis, the team developed a $/kWh value that was applied to the entire population of measures installed as a part of this program.
- **Prescriptive Programs (Small Business, Standard, Single Family Upgrades, etc.):** Guidehouse researched the incremental measure cost data from IL TRM v12.0, tracking data, and program invoices. For joint programs, only the ComEd portion of the costs were included.
- **Contractor/Midstream Rebates:** The early replacement HVAC measures installed as a part of this program were treated based on the guidance provided in IL TRM v12.0. The full installation cost subtracted by the NPV deferred future replacement costs was calculated for the analysis.
- **Product Distribution Program (and other similar programs):** Guidehouse used the per measure cost in each kit to perform the analysis.
- **New Construction – IE:** Guidehouse researched the incremental measure cost data from IL TRM v12.0 and cost data from TRMs in surrounding jurisdictions.
- **Non-Residential New Construction:** Guidehouse calculated the measure cost based on ASHRAE Standard 90.1 2019-Illinois[9] assuming similar cost to one code cycle improvement.

[9] https://www.energycodes.gov/sites/default/files/2021-07/Cost-effectiveness_of_ASHRAE_Standard_90-1-2019-Illinois.pdf

3.2 Data Sources and Assumptions

The analysis used the following sources to compile the relevant data:

- **Program tracking data and evaluation reports** to compile program-level savings, quantity, and realization rate values
- **IL TRM v12.0** to compile measure life and incremental cost data
- **Project invoices** to compile actual cost data (if available)
- **Project-level costs**, including utility incentives and non-incentive costs provided by ComEd

Table 3-4 provides the sources and assumptions for the measure costs by program.

Table 3-4. CY2024 Program Cost Data Sources and Assumptions

Program	Component	Data Source	Note
ASI kWh Purchase	ASI kWh Purchase	ComEd Electrification Cost Data	Used total IMC $/kWh of ASI from ComEd Electrification Cost data sheet
Behavior - Res/IE	Behavior - Res-IE	NA	There are no incentives or measure costs, only program administration costs.
Contractor/ Midstream Rebates	Midstream	IL TRM v12.0 & ComEd Electrification Cost Data	IL TRM v12.0 deemed values and cost from ComEd Electrification Cost data were used for the analysis.
Electric Homes New Construction	EHNC	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Multifamily Upgrades	IHWAP	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Multifamily Upgrades	MCA	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Multifamily Upgrades	MFLI	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Multifamily Upgrades	Public Housing	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs.
Multifamily Upgrades	Strategic Energy Management	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs.
New Construction - IE	Affordable Housing New Construction	ComEd	Guidehouse used an average of the Incremental Capital Cost per project derived from TRM v12.0 costs.
Product Distribution	Elementary Ed	Tracking Data and Project Invoices	Implementer invoices were used to obtain the ComEd allocated costs of joint measures, which were then applied to the incremental costs for each measure within the kits.

Program	Component	Data Source	Note
Product Distribution	Food Bank	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs.
Product Distribution	IE Kits	Tracking Data and Project Invoices	Implementer invoices were used to obtain the ComEd allocated costs of joint measures, which were then applied to the incremental costs for each measure within the kits.
Retail/Online	Appliance Rebates	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Retail/Online	ComEd Marketplace	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Retail/Online	ESRPP	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Retail/Online	Income Eligible Retail	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Retail/Online	Lighting	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Retail/Online	MR Lighting	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Single-Family Upgrades	HEA	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Single-Family Upgrades	IE	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Single-Family Upgrades	IHWAP	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Single-Family Upgrades	MR	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Single-Family Upgrades	SAP	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Single-Family Upgrades	SFLI	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Whole Home Electric	MF	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs. Guidehouse found these incentive amounts accounted for the ComEd allocated costs of joint measures.
Whole Home Electric	SF	ComEd Provided Data Files	Guidehouse assumed the Total EEE Incentive Cost should equal the measure costs. Guidehouse brought out specific costs of measures grouped together using a percentage of savings.
Behavior Bus/Pub	Strategic Energy Management	Tracking Data	Guidehouse assumed measure cost equals incentives.

Program	Component	Data Source	Note
EMS - Small Business - Pilot	EMS for Small Business	Tracking Data and Workpapers	Guidehouse leveraged similar measure costs for EMS measures and the workpaper from the Incentives Program.
Incentives	Custom	ComEd Project Files	Sample of project files, total $/kWh
Incentives	Standard	RI resource workpapers	The workpapers provided reference for incremental measure cost. Guidehouse made assumptions regarding unit definition based on program data.
Incentives	Street Lighting	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Midstream/Upstream	CFS	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
Midstream/Upstream	Instant Discounts	IL TRM v12.0	IL TRM v12.0 deemed values were used for the analysis.
New Construction - Bus/Pub	Non-Residential New Construction	CY2024 Data	IL TRM v12.0 deemed values were used for individual measures, which were aggregated to the project level for sampled projects.
Small Business	Small Business	Tracking Data	Guidehouse assumed the program tracking data incentive amounts should equal measure costs.
Targeted Systems	Industrial Systems	Tracking Data	Sample of project files, total $/kWh
Targeted Systems	Retro Commissioning (RCx)	ComEd Project Files	Sample of project files, total $/kWh
Targeted Systems	Virtual Commissioning (VCx)	ComEd Project Files	Sample of project files, total $/kWh
Voltage Optimization	VO	Project Files	Total costs obtained from ComEd provided documentation.

Source: Guidehouse analysis

3.3 Findings

Guidehouse performed a bottom-up analysis for each program in ComEd's CY2024 portfolio and offers the following findings:

- **Finding 1.** Portfolio TRC (excluding NEIs) increased significantly to 2.83, up from 2.05 in CY2023. When including NEI, the TRC rose from 2.90 to 4.88. This year-over-year (YoY) improvement was largely driven by increased electric, fossil, and societal benefits, resulting from increased lifetime savings; the portfolio accumulated over 22.6B kWh in electric verified net lifetime savings this year, up from 17.2B kWh in CY2023.

- **Finding 2.** TRC costs increased from CY2023 to CY2024, going from $552M to $643M. While program-level incentive costs stayed relatively consistent year-over-year at ~$270M, portfolio administrative costs increased from $213M to $255M in CY2024.
- **Finding 3.** TRC benefits increased significantly in CY2024, leading to the jump in TRC and UCT scores in both the residential and business sectors. The largest benefits increase came from Electricity Avoided Costs, which grew from $595M in CY2023 to $757M in CY2024, Fossil Avoided Costs, which grew from $96M to $329M, and Societal NEIs, which grew from $467M to $1,322M.
- **Finding 4.** When including NEIs, all programs achieved TRC cost-effectiveness in CY2024. However, when looking at the TRC without NEIs, Electric Homes New Construction, Whole Home Electric, and Single Family Upgrades came up short with TRC ratios of 0.86, 0.42, and 0.73 respectively. Several other programs came short of UCT cost effectiveness,

including Behavior Bus/Pub (0.91), Multifamily Upgrades (0.74), Electric Homes New Construction (0.85), Targeted systems (0.89) and Single-Family Upgrades (0.62).

- **Finding 5.** The Retail/Online program saw the largest year-over-year benefits increase of any program, reaching over $624M in TRC benefits in CY2024. This was largely driven by nearly $285M in fossil fuel benefits, resulting from the 41 million Therms of first-year gas savings achieved by the program. Overall growth of the program was enhanced by the addition of the ESRPP component in CY2024, which contributed 4.85 GWh of net first-year savings.

- **Finding 6.** Cost effectiveness for many programs including Product Distribution and Retail/Online continues to be driven largely by lighting measures which can accumulate significant energy savings at low cost. Additionally, shell measures such as spray foam and insulation and water-saving measures such as showerheads were able to take advantage of additional TRC benefit streams such as societal and water, and low customer incremental costs to achieve high TRC outcomes.

- **Finding 7.** Income-Eligible programs contributed to an increase in portfolio TRC scores, rising from 4.72 to 4.88 with NEIs. When excluding NEI, Portfolio TRC similarly increases from 2.74 when excluding Income-Eligible programs to 2.83 when including Income-Eligible programs. Overall, the IE portions of relevant programs contribute more than $323M in direct utility benefits to ComEd's CY2024 portfolio.

- **Finding 8.** Emissions and societal benefits played an outsized role in TRC growth in CY2024. Emissions benefits grew from $378M to $513M, and Societal from $467M to $1,322M; together, these two benefit streams make up over 58% of portfolio TRC benefits.

- **Finding 9.** CY2024 societal benefits have increased by 185% from CY2023, this is due to COBRA updates in 2024 by the EPA to estimate changes in annual ambient concentrations of both particulate matter ($PM_{2.5}$) and ozone. In previous years COBRA only estimated the health impacts of $PM_{2.5}$. The COBRA update included additional health incidents (Hospital Admissions related to Alzheimer's and Parkinson's Disease, Incidence of Stroke and Lung Cancer, and Hay Fever/Rhinitis).

- **Finding 10**. Electrification measures overall had a TRC (with NEI) value of 2.84. In certain cases, like Contractor/Midstream Rebates and Electric Homes New Construction, electrification measures increased the TRC value of their respective programs because of the prevalence of societal NEIs but in most cases electrification had downward influence on the TRC value, despite most programs being individually cost-effective. Evaluation methodology for electrification measures was refined in CY2024; benefit calculations now include the decrease in fossil fuel consumption as a benefit, and the resulting increase in electric usage as a negative cost. This update helped contribute to a significant increase in fossil fuel avoided costs in PY2024.