



ComEd Heat Pump Water Heater Pilot Impact Evaluation Report

Energy Efficiency/Demand Response Plan:
Program Year 2022 (CY2022)
(1/1/2022-12/31/2022)

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FINAL

March 27, 2023

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Introduction

This report presents the results of the impact evaluation of the Heat Pump Water Heater Pilot program for the program year from January 1 to December 31, 2022 (CY2022). The pilot is designed to provide a simple solution to residential customers interested in replacing a lower efficiency natural gas or electric hot water heater with an electric heat pump water heater. The pilot was launched to increase market shares of heat pump water heaters through incentives within the ComEd territory. The goal of this pilot was to assess to feasibility of the technology in a colder climate, understand the market actors, and address supply chain issues.

Program Savings Detail

Table 1 summarizes the incremental energy and demand savings the Heat Pump Water Heater Pilot achieved in CY2022. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs.¹ The electrification savings are those resulting from fuel switching measures.²

Table 1. Total Annual Incremental Electric Savings - Total

| Savings Category | Units | Ex Ante Gross Savings* | Program Gross Realization Rate | Verified Gross Savings* | Program Net-to-Gross Ratio (NTG) | CY2020 Net Carryover Savings | CY2021 Net Carryover Savings | Verified Net Savings |
|--|-------|------------------------|--------------------------------|-------------------------|----------------------------------|------------------------------|------------------------------|----------------------|
| Electric Energy Savings - Direct† | kWh | 16,583 | 0.84 | 13,941 | 0.80 | | | 11,153 |
| Electric Energy Savings - Converted from Gas§ | kWh | 0 | | -255 | 0.80 | | | -204 |
| Electric Energy Savings - Indirect from Fuel Switching (through Electrification) | kWh | 524 | 32.48 | 17,036 | 0.80 | | | 13,629 |
| Total Electric Energy Savings# | kWh | 17,107 | 1.80 | 30,723 | 0.80 | | | 24,578 |
| Secondary Water Savings | kWh | 0 | | 0 | 0.80 | | | 0 |
| Summer Peak** Demand Savings | kW | 0 | | 1 | 0.80 | | | 1 |

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

* Ex ante and verified gross savings exclude gross carryover savings from CY2020 and CY2021.

† The “Verified Net Savings” in row one (Electric Energy Savings - Direct) includes net carryover savings from CY2020 and CY2021 (excludes carryover savings as they do not apply to this program).

‡ The Electric Energy Savings - Direct includes primary kWh savings from efficient measures (includes efficiency savings from fuel switching measures but excludes the fuel switching savings), secondary kWh savings from wastewater treatment, and electric heating penalties.

§ Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation team will determine which gas savings will be converted to kWh and counted toward ComEd’s electric savings goal while producing the portfolio-wide Summary Report.

|| Electrification savings from fuel switching measures excluding direct efficiency savings calculated from net electric savings from an increase in kWh consumption and decrease in gas consumption from fuel switching (kWh equivalent).

Total Electric Energy Savings is the sum of the Electric Energy Savings - Direct, the Electric Energy Savings

¹ The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-25) of the Illinois Public Utilities Act, “In no event shall more than 10% of each year’s applicable annual total savings requirement as defined in paragraph (7.5) of subsection (g) of this Section be met through savings of fuels other than electricity.”

² The evaluation team will determine which electrification savings from fuel switching will be counted toward ComEd’s electric savings goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-27) of the Illinois Public Utilities Act, “In no event shall electrification savings counted toward each year’s applicable annual total savings requirement, as defined in paragraph (7.5) of subsection (g) of this Section, be greater than 5% per year for each year from 2022 through 2025.”

Converted from Gas, and the Electrification Savings from fuel switching.

*† The Peak Demand Savings are savings occurring at coincident Summer Peak period, defined as 1:00 p.m. - 5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August. This definition is in accordance with PJM requirement.

- The program-level NTG values are calculated as verified net/verified gross. The program-level analysis typically used measure-level deemed NTG values, which are listed here: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

Source: *Evaluation team analysis*

Cumulative Persistent Annual Savings

Tables 2 to 4 show the cumulative persisting annual savings (CPAS) for the measures installed in CY2022. Table 2 shows the electric CPAS across all measures installed in 2022. Table 3 shows the gas contribution to CPAS (converted to equivalent electricity). Table 4 shows the combined savings.

Table 2. CPAS – Electric

| Savings Category | Verified Gross Savings (kWh) | Lifetime Net Savings (kWh)† | CPAS Verified Net kWh Savings | | | | | | | | | | |
|---|------------------------------|-----------------------------|-------------------------------|------|------|------|--------|--------|--------|--------|--------|--------|--------|
| | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| CY2022 Program Total Contribution to CPAS | 30,978 | 371,733 | | | | | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 |
| Historic Program Total Contribution to CPAS‡ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total CPAS | 30,978 | 371,733 | 0 | 0 | 0 | 0 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 |
| CY2022 Program Incremental Expiring Savings§ | | | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Historic Program Incremental Expiring Savings | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Savings# | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |

| Savings Category | Verified Gross Savings (kWh) | Lifetime Net Savings (kWh)† | CPAS Verified Net kWh Savings | | | | | | | | | | | |
|---|------------------------------|-----------------------------|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|---|
| | | | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | |
| CY2022 Program Total Contribution to CPAS | 30,978 | 371,733 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 0 | 0 | 0 |
| Historic Program Total Contribution to CPAS‡ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total CPAS | 30,978 | 371,733 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 24,782 | 0 | 0 | 0 |
| CY2022 Program Incremental Expiring Savings§ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24,782 | 0 | 0 |
| Historic Program Incremental Expiring Savings | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Savings# | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24,782 | 0 | 0 |

* The program-level NTG values are calculated as verified net/verified gross. The program-level analysis typically used measure-level deemed NTG values, which are listed here: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historical savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

|| Historic incremental expiring savings are equal to Historic CPAS Yn-1 – Historic CPAS Yn.

Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.

Source: Evaluation team analysis

Table 3. CPAS – Gas

| Savings Category | Verified Gross Savings (Therms) | Lifetime Net Savings (Therms)† | CPAS Verified Net Therms Savings | | | | | | | | | | |
|---|---------------------------------|--------------------------------|----------------------------------|------|------|------|------|------|------|------|------|------|------|
| | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| CY2022 Program Total Gas Contribution to CPAS (Therms) | -9 | -104 | | | | | -7 | -7 | -7 | -7 | -7 | -7 | -7 |
| CY2022 Program Total Gas Contribution to CPAS (kWh Equivalent)‡ | -255 | -3,056 | | | | | -204 | -204 | -204 | -204 | -204 | -204 | -204 |
| Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Gas CPAS (kWh Equivalent) | -255 | -3,056 | 0 | 0 | 0 | 0 | -204 | -204 | -204 | -204 | -204 | -204 | -204 |
| CY2022 Program Incremental Expiring Gas Savings (Therms) | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| CY2022 Program Incremental Expiring Gas Savings (kWh Equivalent) | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Historic Program Incremental Expiring Gas Savings (kWh Equivalent)# | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Gas Savings (kWh Equivalent)*† | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| Savings Category | Verified Gross Savings (Therms) | Lifetime Net Savings (Therms)† | CPAS Verified Net Therms Savings | | | | | | | | | | | |
|---|---------------------------------|--------------------------------|----------------------------------|------|------|------|------|------|------|------|------|------|------|---|
| | | | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | |
| CY2022 Program Total Gas Contribution to CPAS (Therms) | -9 | -104 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | -7 | 0 | 0 | 0 |
| CY2022 Program Total Gas Contribution to CPAS (kWh Equivalent)‡ | -255 | -3,056 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | 0 | 0 | 0 |
| Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Gas CPAS (kWh Equivalent) | -255 | -3,056 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | -204 | 0 | 0 | 0 |
| CY2022 Program Incremental Expiring Gas Savings (Therms) | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -7 | 0 | 0 |
| CY2022 Program Incremental Expiring Gas Savings (kWh Equivalent) | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -204 | 0 | 0 |
| Historic Program Incremental Expiring Gas Savings (kWh Equivalent)# | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Gas Savings (kWh Equivalent)*† | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -204 | 0 | 0 |

* The program-level NTG values are calculated as verified net/verified gross. The program-level analysis typically used measure-level deemed NTG values, which are listed here: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.

§ Historical savings go back to CY2018.

|| Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

Historic incremental expiring savings are equal to Historic CPAS Yn-1 – Historic CPAS Yn.

*† Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.

Source: Evaluation team analysis

Table 4. CPAS – Total

| Savings Category | Verified Gross Savings (kWh) | Lifetime Net Savings (kWh)† | CPAS Verified Net kWh Savings | | | | | | | | | | |
|---|------------------------------|-----------------------------|-------------------------------|------|------|------|--------|--------|--------|--------|--------|--------|--------|
| | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| CY2022 Program Total Contribution to CPAS | 30,723 | 368,677 | | | | | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 |
| Historic Program Total Contribution to CPAS‡ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total CPAS | 30,723 | 368,677 | 0 | 0 | 0 | 0 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 |
| CY2022 Program Incremental Expiring Savings§ | | | | | | | | | 0 | 0 | 0 | 0 | 0 |
| Historic Program Incremental Expiring Savings | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Savings# | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 |

| Savings Category | Verified Gross Savings (kWh) | Lifetime Net Savings (kWh)† | CPAS Verified Net kWh Savings | | | | | | | | | | | |
|---|------------------------------|-----------------------------|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|---|
| | | | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | |
| CY2022 Program Total Contribution to CPAS | 30,723 | 368,677 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 0 | 0 | 0 |
| Historic Program Total Contribution to CPAS‡ | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total CPAS | 30,723 | 368,677 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 24,578 | 0 | 0 | 0 |
| CY2022 Program Incremental Expiring Savings§ | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24,578 | 0 | 0 |
| Historic Program Incremental Expiring Savings | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Program Total Incremental Expiring Savings# | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24,578 | 0 | 0 |

* The program-level NTG values are calculated as verified net/verified gross. The program-level analysis typically used measure-level deemed NTG values, which are listed here: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Historical savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Yn-1 - CPAS Yn.

|| Historic incremental expiring savings are equal to Historic CPAS Yn-1 – Historic CPAS Yn.

Program total incremental expiring savings are equal to current year total incremental expiring savings plus historic total incremental expiring savings.

Source: Evaluation team analysis