Guidehouse

ComEd Fridge and Freezer Recycling Program Impact Evaluation Report

**Energy Efficiency / Demand Response Plan:
Program Year 2020 (CY2020)
(1/1/2020-12/31/2020)**

Prepared for:

ComEd

FINAL

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1. Introduction

This report presents the results of the impact evaluation of ComEd's calendar year (CY) 2020 Fridge and Freezer Recycling (FFR) Program. It summarizes the energy and demand impacts for the total program broken out by relevant measure and program structure details. The appendices provide the impact analysis methodology and details of the total resource cost (TRC) inputs. CY2020 covers January 1, 2020 through December 31, 2020. March 14, 2020 was the final date for which there was participation in the FFR Program.

2. Program Description

The FFR Program is a residential ComEd energy efficiency program. It is implemented by Recleim LLC and achieves energy savings through the retirement and recycling of older, inefficient refrigerators, freezers, dehumidifiers, and room air conditioners (ACs). The program offers free pickup and recycling services for older, working refrigerators and freezers, dehumidifiers and room air conditioners that households use as a second unit. Program savings are based on the accelerated removal, dismantling and recycling of these older, inefficient units. In exchange for participating in the program, ComEd pays participants a financial incentive for up to two recycled refrigerators or freezers. Operational room air conditioners and dehumidifiers units are also eligible for pick up and recycling, but they can only be picked up from sites where Recleim is already collecting a refrigerator and/or freezer. The primary objectives of the program are to decrease the retention of high energy use refrigerators and freezers and to deliver long-term energy savings. A secondary objective is to dispose of these older units in an environmentally safe manner. Note that FFR program implementation was paused in mid-March of 2020 due to the COVID-19 pandemic and will not be resumed in its current form. This program is named as Fridge Freezer Recycle Reward in the NTG spreadsheet.

The program had 5,763 participants in CY2020, contributing 6,477 recycled measures, as Table 2-1 and Figure 2-1 show. Refrigerators accounted for the largest share of appliances recycled at 84%, followed by freezers at 11%. Room ACs accounted for 5% and dehumidifiers represented only a small fraction of the appliances. The program included a limited number of small refrigerator units, which were excluded from this year's evaluation because they do not contribute to program savings[1].

Table 2-1. CY2020 Volumetric Findings Detail

Participation	Program-Reported No. of Units	Percentage of Total Units
Participants	5,763	-
Units by Measure Type	-	-
Refrigerators – Recycled	5,415	84%
Freezers – Recycled	720	11%
Room ACs – Recycled	320	5%
Dehumidifiers – Recycled	22	0.3%
Total Measures	6,477	100%

Note: The total measure count excludes 87 small unit refrigerators that were collected for recycling but have no associated claimed savings and therefore not presented in the table above.

Source: ComEd tracking data and evaluation team analysis

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[1] Only small unit refrigerators collected at program events can be claimed for savings. There were no program events in CY2020 due to Covid-19. As a result, none of the small unit refrigerators collected in CY2020 are eligible to claim savings.

Figure 2-1. CY2020 Percentage of Measures Recycled by Type
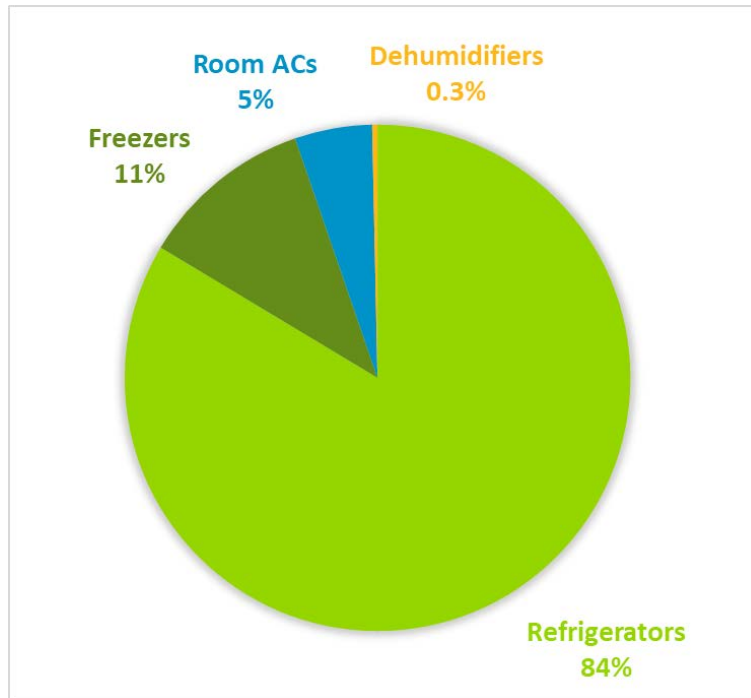
Source: ComEd tracking data and evaluation team analysis

3. Program Savings Detail

Table 3-1 summarizes the incremental electric energy and demand savings the FFR Program achieved in CY2020. The FFR Program did not claim any gas savings in CY2020. Overall, the evaluation showed verified gross energy savings of 5,363,298 kWh compared to ex ante savings of 5,485,651 kWh, resulting in a program gross realization rate of 0.98.

The differences between the ex ante and verified gross savings estimates were due to two discrepancies in the parameters used to calculate savings. The first discrepancy was based on differences in the part-use factor (PUF) used to calculate savings for refrigerators. The PUF is intended to account for those units not running throughout the entire year. Per the Illinois Statewide Technical Reference Manual (IL TRM v8.0), the savings calculations should use the most recent PUF participant survey results available at the start of CY2020, which were based on the results from the CY2018 evaluation where the refrigerator PUF was 0.89. However, on review, the evaluation team found that the tracking data used a PUF of 0.91. Applying the correct PUF value results in an energy savings realization rate of 0.98.

The second discrepancy for room ACs was due to differences in the efficiency of existing unit (EERexist in the tracking data) values. Per the IL TRM v8.0, the EERexist value should be 9.8; however, on review, the evaluation team found that the tracking data used an EERexist value of 7.7.

The FFR Program had overall program net energy savings of 2,220,808 kWh, which was based on the application of measure-specific deemed net-to-gross (NTG) ratios.

Table 3-1. CY2020 Total Annual Incremental Electric Savings

Savings Category	Energy Savings (kWh)	Summer Peak* Demand Savings (kW)
Electricity		
Ex Ante Gross Savings	5,485,651	NR
Program Gross Realization Rate	0.98	NA
Verified Gross Savings	5,363,298	734
Program Net-to-Gross Ratio (NTG)	Varies	Varies
Verified Net Savings	2,220,808	310
Converted from Gas		
Ex Ante Gross Savings	NA	NA
Program Gross Realization Rate	NA	NA
Verified Gross Savings	NA	NA
Program Net-to-Gross Ratio (NTG)	NA	NA
Verified Net Savings	NA	NA
Total Electric Plus Gas		
Ex Ante Gross Savings	5,485,651	NR
Program Gross Realization Rate	0.98	NA
Verified Gross Savings	5,363,298	734
Program Net-to-Gross Ratio (NTG)	Varies	Varies
Verified Net Savings	2,220,808	310

NR = not reported
NA = not applicable (refers to a piece of data that cannot be produced or does not apply)
*The coincident summer peak period is defined as 1:00 p.m.-5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August.
Source: ComEd tracking data and evaluation team analysis

4. Cumulative Persisting Annual Savings

Table 4-1 and Figure 4-1 show the measure-specific and total verified gross savings for the FFR Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2020. The electric CPAS across all measures installed in 2020 is 2,220,808 kWh (Table 4-1). No gas savings are associated with the FFR Program; as such, electric CPAS is equivalent to total CPAS. The historic rows in each table are the CPAS contribution back to CY2018.

Table 4-1. CY2020 Cumulative Persisting Annual Savings (CPAS) – Electric and Total

End Use Type	Research Category	EUL	CY2020 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings								
						2018	2019	2020	2021	2022	2023	2024	2025	2026
Appliances	Refrigerators - Recycled	6.5	4,724,187	0.40	12,282,886			1,889,675	1,889,675	1,889,675	1,889,675	1,889,675	1,889,675	944,837
Appliances	Freezers - Recycled	6.5	578,855	0.52	1,956,530			301,005	301,005	301,005	301,005	301,005	301,005	150,502
Appliances	Room ACs - Recycled	4.0	59,368	0.50	118,736			29,684	29,684	29,684	29,684			
Appliances	Dehumidifiers - Recycled	6.0	888	0.50	2,664			444	444	444	444	444	444	
CY2020 Program Total Electric Contribution to CPAS			5,363,298		14,360,817			2,220,808	2,220,808	2,220,808	2,220,808	2,191,124	2,191,124	1,095,340
Historic Program Total Electric Contribution to CPAS‡						21,697,981	42,076,308	42,076,308	42,076,308	41,897,704	41,652,496	41,652,496	31,555,637	-
Program Total Electric CPAS						21,697,981	42,076,308	44,297,115	44,297,115	44,118,511	43,873,303	43,843,619	33,746,761	1,095,340
CY2020 Program Incremental Expiring Electric Savings§									-	-	-	29,684	-	1,095,784
Historic Program Incremental Expiring Electric Savings‡§									-	-	178,604	245,208	-	10,096,859	31,555,637
Program Total Incremental Expiring Electric Savings§									-	-	178,604	245,208	29,684	10,096,859	32,651,421

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Appliances	Refrigerators - Recycled												
Appliances	Freezers - Recycled												
Appliances	Room ACs - Recycled												
Appliances	Dehumidifiers - Recycled												
CY2020 Program Total Electric Contribution to CPAS		-	-	-	-	-	-	-	-	-	-	-	-
Historic Program Total Electric Contribution to CPAS‡		-	-	-	-	-	-	-	-	-	-	-	-
Program Total Electric CPAS		-	-	-	-	-	-	-	-	-	-	-	-
CY2020 Program Incremental Expiring Electric Savings§	1,095,340	-	-	-	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Electric Savings‡		-	-	-	-	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Electric Savings§	1,095,340	-	-	-	-	-	-	-	-	-	-	-

Note: The green highlighted cell shows program total first-year electric savings. The gray cells are blank, indicating values irrelevant to the CY2020 contribution to CPAS.

*A deemed value. Source found on the Illinois Stakeholder Advisory Group (SAG) website here: https://www.ilsag.info/ntg_2020.

† Lifetime savings are the sum of CPAS savings through the effective useful life (EUL).

‡ Historical savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n

Source: Evaluation team analysis

Figure 4-1. CY2020 Cumulative Persisting Annual Savings
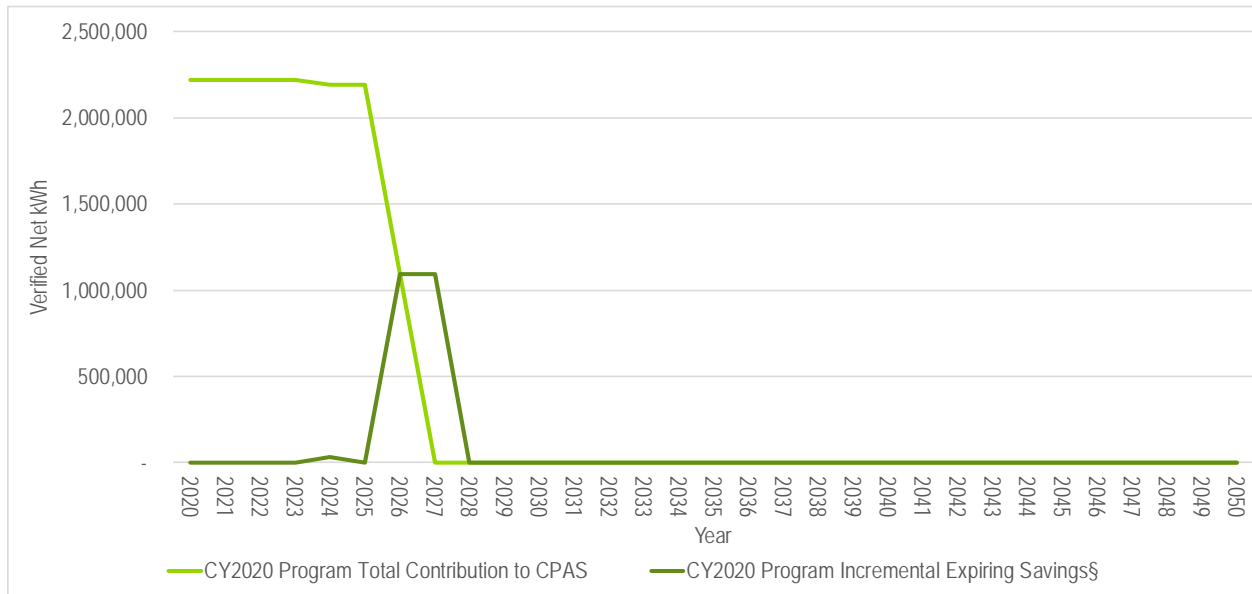
§Expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n + Expiring Savings Y_{n-1}.

Source: Evaluation team analysis

5. Program Savings by Measure

The CY2020 FFR Program included four measures representing different household appliances recycled through the program. Refrigerator and freezer recycling accounted for 99% of the total verified net savings, with 85% and 14%, respectively (see Figure 5-1). Other than the exclusion of small refrigerator units in this year's evaluation, the share of net savings is similar to previous years for the FFR Program. The ex ante gross and verified electric energy savings for the measures are presented in Table 5-1, followed by demand savings in Table 5-2.

Figure 5-1. CY2020 Verified Net Savings by Measure – Electric

Source: ComEd tracking data and evaluation team analysis

Table 5-1. CY2020 Energy Savings by Measure – Electric

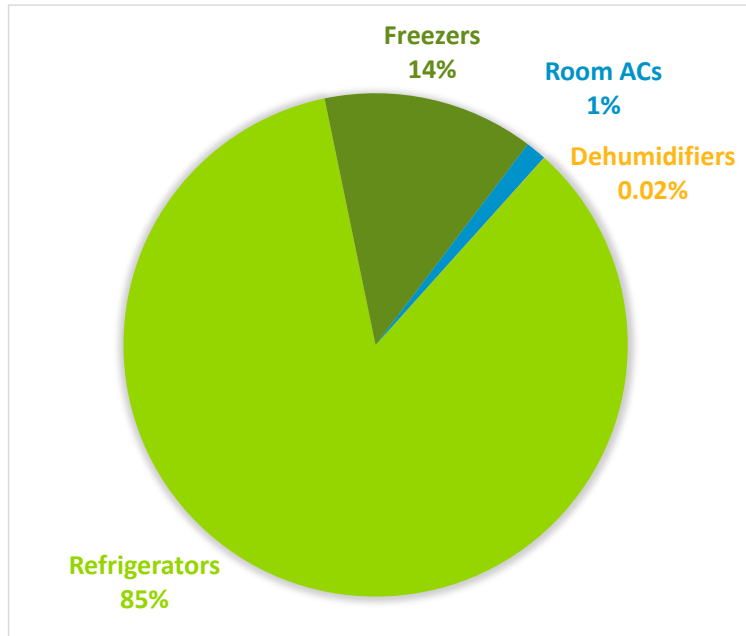| End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)	EUL (years)
Appliances	Refrigerators - Recycled	4,830,349	0.98	4,724,187	0.40	1,889,675	6.5
Appliances	Freezers - Recycled	578,855	1.00	578,855	0.52	301,005	6.5
Appliances	Room ACs - Recycled	75,559	0.79	59,368	0.50	29,684	4.0
Appliances	Dehumidifiers - Recycled	888	1.00	888	0.50	444	6.0
	Total	**5,485,651**	**0.98**	**5,363,298**	**NA**	**2,220,808**	**NA**

*A deemed value. Source found on the Illinois SAG website here: https://www.ilsag.info/ntg_2020.
Source: ComEd tracking data and evaluation team analysis

Table 5-2. CY2020 Summer Peak Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTG*	Verified Net Peak Demand Reduction (kW)
Appliances	Refrigerators - Recycled	NR	NA	582.6	0.40	233.0
Appliances	Freezers - Recycled	NR	NA	67.9	0.52	35.3
Appliances	Room ACs - Recycled	NR	NA	83.3	0.50	41.6
Appliances	Dehumidifiers - Recycled	NR	NA	0.2	0.50	0.1
	Total	**NR**	**NA**	**733.9**	**NA**	**310.1**

NR = not reported

NA = not applicable

*A deemed value. Source found on the Illinois SAG website here: https://www.ilsag.info/ntg_2020.

Source: ComEd tracking data and evaluation team analysis

6. Impact Analysis Findings and Recommendations

6.1 Impact Parameter Estimates

The evaluation team used the procedures specified in the IL TRM v8.0 to calculate the verified gross energy savings for the refrigerator, freezer, room AC, and dehumidifier measures. These procedures use equations to calculate the annual energy consumption associated with the different recycled appliances. Because these appliances are removed from the home, the annual consumption represents the program savings. These equations are shown in Appendix A, including the input parameters used by the evaluation, measurement, and verification team to calculate verified energy and peak demand savings. All the factors in the following regression equations are derived from pooled data from metering studies conducted by several Midwestern utilities, including one by the ComEd evaluation team in PY4. Table 6-1 lists the data sources for all factors used in the savings calculations.

Table 6-1. Savings Parameters Data Sources

Gross Savings Input Parameters	Measure Type	Units	Deemed or Evaluated?	Source*
Quantity	All Measures	Num. Rec. Units	Evaluated	Tracking Data
Unit Age	Rec. Ref. and Freezer	Years	Evaluated	Tracking Data
Pre-1990 Dummy Variable	Rec. Ref. and Freezer	Binary (1,0)	Evaluated	Tracking Data
Unit Size	Rec. Ref. and Freezer	Cu. Ft.	Evaluated	Tracking Data
Cooling Degree Days (CDD)	Rec. Ref. and Freezer	CDD 65	Deemed	IL TRM v8.0: Section 5.1.8
Heating Degree Days (HDD)	Rec. Ref. and Freezer	HDD 65	Deemed	IL TRM v8.0: Section 5.1.8
Primary Usage Dummy	Rec. Ref. and Freezer	Binary (1,0)	Evaluated	Tracking Data
Unconditioned Space	Rec. Ref. and Freezer	Binary (1,0)	Evaluated	Tracking Data
PUF	Rec. Ref. and Freezer	%	Deemed	IL TRM v8.0: Section 5.1.9
Chest Freezer	Rec. Freezer	Binary (1,0)	Evaluated	Tracking Data
Full Load Hours (FLH)	Rec. Room AC	Hours	Deemed	IL TRM v8.0: Section 5.1.9
BtuH	Rec. Room AC	Btu/H	Evaluated	Tracking Data
EERexist	Rec. Room AC	EER	Deemed	IL TRM v8.0: Section 5.1.9
Average Capacity	Rec. Dehumidifier	Pints/Day	Evaluated	Tracking Data

Gross Savings Input Parameters	Measure Type	Units	Deemed or Evaluated?	Source*
Hours	Rec. Dehumidifier	Hours	Deemed	Appliance Recycling Potential Measures Memo dated August 1, 2018
Efficiency (Eff)	Rec. Dehumidifier	liters/kWh	Evaluated	Tracking Data
Coincidence Factor (CF)	All Measures	Factor	Deemed	IL TRM v8.0: Section 5.1.8, Section 5.1.9, Appliance Recycling Potential Measures Memo dated August 1, 2018
NTG	Varies	%	Deemed	Illinois SAG Consensus
EUL	All Measures	Years	Deemed	IL TRM v8.0: Section 5.1.8, Section 5.1.9, Appliance Recycling Potential Measures Memo dated August 1, 2018

*TRM is the Illinois Statewide Technical Reference Manual version 8.0 from http://www.ilsag.info/technical-reference-manual.html. The NTG values can be found on the Illinois SAG website here: https://www.ilsag.info/ntg_2020.

6.2 Other Impact Findings and Recommendations

CY2020 represents the final year of the program. As a result, the evaluation team does not have any additional findings or recommendations to improve impact reporting for future program years.

Appendix A. Impact Analysis Methodology

A.1 Verified Gross Program Savings Analysis Approach

The evaluation team developed savings estimates for the full population of units collected in CY2020 to estimate CY2020 unit energy consumption (UEC). The ex post savings estimates of energy (kWh) savings rely on regression equations as specified in the IL TRM v8.0 for all measures. Gross energy savings are expressed in terms of full-year UECs. Refrigerator and freezer UEC estimates were made using a regression-based approach that models full-year energy savings as a function of unit characteristics (i.e., age, size, configuration, defrost mode, and unit location prior to being recycled). Room AC UEC estimates were made using full load hours (FLH), Btu per hour, and EER. Dehumidifier UEC estimates were made using unit capacity, run hours per year, and unit efficiency. The team also calculated gross peak demand (kW) savings according to the algorithm specified in the IL TRM v8.0. The coincidence factors in the TRM v8.0 were used with the regression equations to predict consumption on summer peak days.

Both energy (kWh) and peak demand (kW) savings estimates were made based on the characteristics of the population of units collected by the program during CY2020. In addition, gross energy savings estimates were adjusted by applying PUFs from the CY2018 evaluation.

A.1.1 Refrigerators

First-year energy savings from a recycled refrigerator are calculated based on Equation A-1, as found in the IL TRM v8.0, Section 5.1.8. After energy savings based on FLH have been computed, a PUF is then applied. This factor is based on the value from the most recent PUF participant survey results available at the start of the CY2020 program year—in this case, 0.89.

Equation A-1. Refrigerator Recycling Energy Savings Calculation

ΔkWh = [83.32 + (**Age** * 3.68) + (**Pre-1990** * 485.04) + (**Size** * 27.15) + (**Side-by-side** * 406.78) + (**Primary Usage** * 161.86) + (**CDD**/365.25 * **unconditioned** * 15.37) + (**HDD**/365.25 * **unconditioned** * -11.07)] * **Part-Use Factor**

Where:

Age	= Age of retired unit
Pre-1990	= 1 if manufactured pre-1990, else 0
Size	= Capacity (cubic feet) of retired unit
Side-by-side	= 1 if side-by-side, else 0
Primary Usage	= 1 if primary unit (in absence of the program), else 0
Unconditioned	= 1 if located in unconditioned space, else 0
CDD	= Cooling degree days[2]
HDD	= Heating degree days[3]
Part-Use Factor	= Accounts for units not running throughout the entire year (0.91)

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[2] Dependent on geographic location.

[3] Dependent on geographic location.

Table A-1 reports the average CY2020 values for each independent variable of the regression equation for refrigerators.

Table A-1. CY2020 Values for Independent Variables – Refrigerators

Independent Variable	Average Value	Source
Age (years)	27.3	CY2020 Tracking Data
Pre-1990	0.33	CY2020 Tracking Data
Size (Cubic Feet)	19.7	CY2020 Tracking Data
Side-by-side	0.31	CY2020 Tracking Data
Primary Unit	0.46	CY2020 Tracking Data
Unconditioned Space	0.65	CY2020 Tracking Data
CDD	835.6	CY2020 Tracking Data, TRM v. 8.0
HDD	6,351.0	CY2020 Tracking Data, TRM v. 8.0

Summer coincident peak demand savings from a recycled refrigerator are calculated based on Equation A-2, as found in the IL TRM v8.0, Section 5.1.8.

Equation A-2. Refrigerator Recycling Summer Coincident Peak Demand Savings Calculation

$$\Delta kW = \Delta kWh / 8{,}766 * CF$$

Where:

ΔkWh	= Energy savings as calculated in Equation A-1
CF	= 1.081 (Coincident factor defined as summer kW/average kW)

A.1.2 Freezers

First-year energy savings from a recycled freezer are calculated based on Equation A-3, as found in the IL TRM v8.0, Section 5.1.8. After energy savings based on FLH have been computed, a PUF is then applied. This factor is based on the value from the most recent PUF participant survey results available at the start of the CY2020 program year—in this case, 0.86 from the CY2018 evaluation.

Equation A-3. Freezer Recycling Energy Savings Calculation

ΔkWh = [132.12 + (**Age** * 12.13) + (**Pre-1990** * 156.18) + (**Size** * 31.84) + (**Chest** * -19.71) + (**CDD** * **unconditioned** * 9.78) + (**HDD** * **unconditioned** * -12.75)] * **Part-Use Factor**

Where:

Age	= Age of retired unit
Pre-1990	= 1 if manufactured pre-1990, else 0
Size	= Capacity (cubic feet) of retired unit
Chest	= 1 if chest freezer, else 0
Unconditioned	= 1 if located in unconditioned space, else 0

CDD	= Cooling degree days[4]	
HDD	= Heating degree days[5]	
Part-Use Factor	= Accounts for units not running throughout the entire year (0.86)	

Table A-2 reports the average CY2020 values for each independent variable of the regression equation for freezers.

Table A-2. CY2020 Values for Independent Variables – Freezers

Independent Variable	Average Value	Source
Age (years)	30.1	CY2020 Tracking Data
Pre-1990	0.45	CY2020 Tracking Data
Size (Cubic Feet)	15.7	CY2020 Tracking Data
Chest	0.26	CY2020 Tracking Data
CDD	834.3	CY2020 Tracking Data, TRM v. 8.0
HDD	6,356.0	CY2020 Tracking Data, TRM v. 8.0

Summer coincident peak demand savings from a recycled freezer are calculated based on Equation A-4, as found in the IL TRM v8.0, Section 5.1.8.

Equation A-4. Freezer Recycling Summer Coincident Peak Demand Savings Calculation

$$\Delta kW = \Delta kWh / 8{,}766 * CF$$

Where:

ΔkWh	= Energy savings as calculated in Equation A-3
CF	= 1.028 (Coincident factor defined as summer kW/average kW)

A.1.3 Room Air Conditioners

Room AC gross energy savings are estimated using the algorithm specified in the IL TRM v8.0 and shown in Equation A-5.

Equation A-5. Room AC Recycling Energy Savings Calculation

$$\Delta kWh = (FLH_{RoomAC} * BtuH * (1/EERexist)) / 1{,}000$$

Where:

FLH_{RoomAC}	= Full load hours of room air conditioning unit (dependent on location)
BtuH	= Unit capacity of retired unit (if unknown assume 8,500)
EERexist	= Efficiency of the existing unit (9.8)

Summer coincident peak demand savings from a recycled room AC are calculated based on Equation A-6, as found in the IL TRM v8.0, Section 5.1.9.

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[4] Dependent on geographic location.

[5] Dependent on geographic location.

Equation A-6. Room AC Recycling Summer Coincident Peak Demand Savings Calculation

$$\Delta kW = ((\textbf{BtuH} * 1/\textbf{EERexist})/1{,}000) * \textbf{CF}$$

Where:

BtuH = Unit capacity of retired unit (if unknown assume 8,500)

EERexist = Efficiency of the existing unit (9.8)

CF = Summer peak coincidence factor (0.3)

A.1.4 Dehumidifiers

Dehumidifier gross energy savings are estimated based on algorithms in the IL TRM v8.0, Section 5.1.3, which defines the savings of installing an ENERGY STAR dehumidifier in place of an existing unit with Equation A-7.

Equation A-7. Dehumidifier Replacement Energy Savings Calculation

$$\Delta kWh = (\textbf{Avg Capacity} / 24) * 0.473 * \textbf{Hours} * (1 / \textbf{Base Eff} - 1 / \textbf{EStar Eff})$$

Where:

Avg Capacity = Average capacity of the unit (pints/day)

Hours = 1,632 hours

Base Eff = Baseline efficiency of the existing unit (liters/kWh)

EStar Eff = ENERGY STAR efficiency of the newly purchased and installed unit (liters/kWh)

Equation A-7 can be modified to define the gross energy savings of a recycled dehumidifier, as shown in Equation A-8.

Equation A-8. Dehumidifier Recycling Energy Savings Calculation

$$\Delta kWh = (\textbf{Avg Capacity} / 24) * 0.473 * \textbf{Hours} * (1 / \textbf{Eff})$$

Where:

Avg Capacity = Average capacity of the unit (pints/day)

Hours = 1,632 hours

Eff = Efficiency of the recycled dehumidifier (liters/kWh)

Summer coincident peak demand savings from a recycled dehumidifier are calculated based on Equation A-9, as found in the IL TRM v8.0, Section 5.1.3.

Equation A-9. Dehumidifier Recycling Summer Coincident Peak Demand Savings Calculation

$$\Delta kW = \Delta kWh / \textbf{Hours} * \textbf{CF}$$

Where:

ΔkWh = Energy savings as calculated in Equation A-8

Hours = 1,632 hours

CF = Summer peak coincidence factor (0.37)

A.2 Verified Net Program Savings Analysis Approach

The evaluation team calculated verified net energy and demand (coincident peak and overall) savings by multiplying the verified gross savings estimates by an NTG ratio. In CY2020, the NTG ratio estimates used to calculate the net verified savings were based on past evaluation research and approved through the Illinois SAG consensus process.

Appendix B. Total Resource Cost Detail

Table B-1 shows the TRC cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. Additional required cost data (e.g., measure costs, program-level incentive and non-incentive costs) is not included in this table and will be provided to the evaluation team later.

Table B-1. Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Gross Electric Energy Savings (kWh)	Gross Peak Demand Reduction (kW)	Gross Gas Savings (Therms)	Gross Secondary Savings due to Water Reduction (kWh)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (kW)	NTG (Therms)	Net Electric Energy Savings (kWh)	Net Peak Demand Reduction (kW)	Net Gas Savings (Therms)	Net Secondary Savings due to Water Reduction (kWh)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Appliances	Refrigerators - Recycled	Units	5,415	6.50	NO	4,724,187	582.6	NA	NA	NA	NA	0.40	0.40	NA	1,889,675	233.0	NA	NA	NA	NA
Appliances	Freezers - Recycled	Units	720	6.50	NO	578,855	67.9	NA	NA	NA	NA	0.52	0.52	NA	301,005	35.3	NA	NA	NA	NA
Appliances	Room ACs - Recycled	Units	320	4.00	NO	59,368	83.3	NA	NA	NA	NA	0.50	0.50	NA	29,684	41.6	NA	NA	NA	NA
Appliances	Dehumidifiers - Recycled	Units	22	6.00	NO	888	0.2	NA	NA	NA	NA	0.50	0.50	NA	444	0.1	NA	NA	NA	NA
	Total			6.47		5,363,298	734	NA	NA	NA	NA	NA	NA	NA	2,220,808	310	NA	NA	NA	NA

*The total of the EUL column is the weighted average measure life (WAML) and is calculated as the sum product of EUL and gross measure savings divided by total program savings.

† Early replacement (ER) measures are flagged as YES; otherwise a NO is indicated in the column.

NA = not applicable

Source: ComEd tracking data and evaluation team analysis