



May 31, 2023

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Post Office Box 30221
Lansing, MI 48909

RE: MPSC Case No. U-21312 – In the matter of the application of CONSUMERS ENERGY COMPANY for authority to reconcile its 2022 Energy Waste Reduction Plan Costs associated with the Plan approved in Case No. U-20875.

Dear Ms. Felice:

Enclosed for electronic filing in the above-captioned case, please find the **Application and Testimony and Exhibits of Consumers Energy Company Witnesses Lynne McCollum, Nathaniel S. Carver, Amy C. Ellsworth, Jeremiah J. Kraft, Svitlana Lykhytska, Hubert W. Miller, III, Allison M. Reis, R. Kenneth Skinner, and Trenton T. Taylor.**

This is a paperless filing and is therefore being filed only in PDF. Also included is a Proof of Service showing electronic service upon the persons included in Attachment 1.

Sincerely,

Theresa A.G. Staley
Phone: 517-788-0677
Email: theresa.staley@cmsenergy.com

cc: Persons per Attachment 1 to Proof of Service

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

APPLICATION

Consumers Energy Company (“Consumers Energy” or the “Company”) requests that the Michigan Public Service Commission (“MPSC” or the “Commission”) review and approve the Company’s implementation of its 2022 Energy Waste Reduction (“EWR”) Plan and find that the Company has complied with the energy savings targets imposed by 2008 PA 295, as amended by 2016 PA 342; MCL 460.1001 *et seq.* (“Act 295”), and approve the reconciliation of Consumers Energy’s 2022 EWR Plan with the surcharges collected during that period. The Company also requests that the Commission determine that the Company has earned the financial performance incentive payment set forth in Act 295 for 2021. In support of this Application, Consumers Energy states as follows:

1. Consumers Energy is, among other things, engaged as a public utility in the business of generating, purchasing, distributing, and selling electricity to approximately 1.9 million retail customers and natural gas to approximately 1.8 million retail customers in the state of Michigan. The retail electric and natural gas systems of Consumers Energy are operated as a single utility system.

2. Consumers Energy’s retail electric and natural gas business is subject to the jurisdiction of the Commission pursuant to various provisions of 1909 PA 106, as amended, MCL

460.551 *et seq.*, 1919 PA 419, as amended, MCL 460.51 *et seq.*, and 1939 PA 3, as amended, MCL 460.1, *et seq.*, as well as other applicable law. Pursuant to these statutory provisions, the Commission has jurisdiction to regulate Consumers Energy’s retail electric and natural gas rates.

3. On October 6, 2008, the “Clean, Renewable, and Efficient Energy Act,” Act 295, was enacted into law. Act 295 required Consumers Energy, as well as other electric and natural gas providers, to file proposed Energy Optimization Plans with the Commission for review and approval. MCL 460.1071; MCL 460.1073. 2016 PA 342 (“Act 342”) made certain amendments to Act 295, and became effective on April 20, 2017. Act 342 uses the term “Energy Waste Reduction” instead of “Energy Optimization” to characterize energy efficiency programs. Section 71(2) of Act 342 provides that Energy Optimization plans under Act 295 remain in effect, subject to any amendments, as EWR Plans. The overall goal of these plans is to reduce the future costs of providing electric and natural gas service to customers. According to Act 295, EWR Plans must: (i) propose a set of programs that will meet energy savings targets established by Act 295; (ii) include offerings for each customer class, including low-income residential; (iii) specify necessary funding levels; (iv) propose cost recovery mechanisms that will allow recovery of EWR Plan costs; (v) demonstrate that the EWR programs, excluding program offerings to low-income residential customers, will be cost effective; and (vi) provide for the practical and effective administration of the proposed programs. Act 295 also provides that the Commission may authorize a financial performance incentive for exceeding the EWR performance standard. MCL 460.1075.

4. On August 2, 2021, Consumers Energy filed an Application in Case No. U-20875 requesting approval of its EWR Plan review pursuant to Act 295 and as directed by the Commission. The Commission issued an Order in Case No. U-20875 on March 17, 2022,

approving a Settlement Agreement which approved Consumers Energy's EWR Plan. This EWR reconciliation proceeding concerns the year 2022 and is subject to the Case No. U-20875 EWR Plan.

5. In an Order dated December 21, 2022, in Case No. U-21311 et al., the Commission directed Consumers Energy to file its 2022 EWR reconciliation by May 31, 2023.

6. As demonstrated by the attached testimony and exhibits of Company witnesses, which are incorporated herein by reference, Consumers Energy successfully implemented the Company's 2022 electric and natural gas EWR Plan. As demonstrated in the attached testimony of Company witness Lynne McCollum, the Company has reasonably and prudently administered its 2022 EWR Plan in compliance with Public Act 295 of 2008 ("Act 295") (as amended by Public Act 342 of 2016 ("Act 342")), and met (exceeded) its electric and natural gas energy savings targets for 2022 as certified by independent third parties also testifying in this proceeding. The Company's EWR Plan was cost-effective, as measured by the Utility System Resource Cost Test, and the Company's 2022 EWR performance has earned a financial performance incentive payment for both its electric and natural gas results as described more fully in the accompanying testimony.

7. Consumers Energy has also included a proposal for collection of the electric financial performance incentive and natural gas financial performance incentive as described by the accompanying testimony of Company witness Hubert W. Miller, III. Consumers Energy also proposes to convert 177,991 EWR Credits into Renewable Energy Credits in 2022 for use in meeting the renewable energy requirements under Act 295.

8. This Application is supported by the testimony and exhibits of Company witnesses McCollum (2022 EWR Results, Annual Report, EWR Credits, carbon reduction, pilots; and evaluation measurement, and verification activities and reports); Miller (EWR surcharge revenue,

adjusted EWR surcharges, proposed mechanism for collecting financial performance incentive payments, and tariff updates); Svitlana Lykhytska (accounting/Generally Accepted Accounting Principles); Trenton T. Taylor (program investments and financial performance incentive,); R. Kenneth Skinner (program cost effectiveness); Allison M. Reis (residential portfolio); Nathaniel S. Carver (business portfolio); Amy C. Ellsworth (residential certification); and Jeremiah J. Kraft (business certification).

9. As explained in the accompanying testimony of Ms. Lykhytska, the EWR financial performance incentive revenue is classified as an alternative revenue program according to Accounting Standards Codification (“ASC”) 980-605-25. In order to meet the criteria for alternative revenue recognition, the revenues must be collected within 24 months following the end of the annual period in which they are recognized. The 2022 EWR financial performance incentive revenue was recognized on Consumers Energy’s books in December 2022. Therefore, in order to comply with the 24-month collection requirement of ASC 980-605-25, the 2021 EWR financial performance incentive is required to be fully collected by December 31, 2024.

WHEREFORE, Consumers Energy Company respectfully requests the Michigan Public Service Commission to:

- A. Determine that the Company’s 2022 EWR Plan reconciliation is reasonable and prudent and meets all relevant requirements under Act 295;
- B. Approve the collection of a financial performance incentive payment for both the natural gas and electric EWR Plan, the collection of which is to be completed by December 31, 2024, in order to comply with the requirements of ASC 980-605-25;
- C. Approve the EWR surcharge mechanism described in the Company’s testimony;

D. Approve the conversion of 177,991 EWR Credits into Renewable Energy Credits in 2022 for use in meeting the Company's renewable energy requirements under Act 295; and

E. Grant such other and further relief as may be lawful and appropriate.

Respectfully submitted,

CONSUMERS ENERGY COMPANY



Dated: May 31, 2023

By:

Lauren Youngdahl Snyder
Vice President of Customer Experience
Consumers Energy Company



Theresa A. G. Staley (P56998)
Gary A. Gensch, Jr. (P66912)
One Energy Plaza
Jackson, Michigan 49201
Attorneys for Consumers Energy Company
(517) 788-0698

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VERIFICATION

Lauren Youngdahl Snyder, being first duly sworn, deposes and says that she is the Vice President of Customer Experience of Consumers Energy Company; that she has executed the foregoing Application for and on behalf of Consumers Energy Company; that she has read the foregoing Application and is familiar with the contents thereof; that the facts contained therein are true, to the best of her knowledge and belief and that she is duly authorized to execute such Application on behalf of Consumers Energy Company.



Dated: May 31, 2023

By:

Lauren Youngdahl Snyder
Vice President of Customer Experience
Consumers Energy Company

STATE OF MICHIGAN
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DIRECT TESTIMONY

OF

LYNNE MCCOLLUM

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Lynne McCollum, and my business address is One Energy Plaza, Jackson,
3 Michigan 49201.

4 **Q. Please review your educational background.**

5 A. I earned a bachelor's degree from Sacramento State University and a paralegal degree from
6 MTI Department of Procedural Law in Sacramento, California.

7 **Q. Please describe your business and professional experience.**

8 A. I worked for 10 years in health care program management before accepting a Medicaid
9 Eligibility Analyst position with the State of Michigan in 1998. In 2002, I joined the State
10 of Michigan Office on Aging as a Department Specialist responsible for the administration
11 of legal services, elder abuse prevention, and the Medicaid Medicare Assistance Program.
12 In 2013, I accepted a position with Consumers Energy Company ("Consumers Energy" or
13 the "Company") as a paralegal in the Legal department, providing support for both
14 regulatory and litigation matters. In 2018, I joined the Energy Waste Reduction ("EWR")
15 department as a regulatory analyst, initially to support the Company's DR regulatory cases.
16 In 2019, my role was expanded to include regulatory support for the Company's EWR and
17 Voluntary Green Pricing programs. In April 2021, I was promoted to my current role of
18 Strategic Consultant Specialist responsible for development of the Company's EWR
19 regulatory filings.

20 **Q. Have you previously testified before the Michigan Public Service Commission**
21 **("MPSC" or the "Commission")?**

22 A. Yes. I previously testified before the MPSC in Consumers Energy's 2020 EWR
23 Reconciliation Case, Case No. U-20865.

LYNNE MCCOLLUM
DIRECT TESTIMONY

Q. Please explain the purpose of your direct testimony in this proceeding.

A. The purpose of my direct testimony is:

- To demonstrate that Consumers Energy has reasonably and prudently administered its 2022 EWR Plan in compliance with Public Act 295 of 2008 (“Act 295”) (as amended by Public Act 342 of 2016 (“Act 342”));
- To demonstrate that the Company has met (exceeded), as independently certified, its 2022 electric and natural gas statutory energy savings targets as required by Act 295;
- To demonstrate that the Company’s 2022 electric and natural gas EWR program portfolios each achieved a benefit-cost ratio greater than 1.0, as independently certified, using the Utility System Resource Cost Test (“UCT”) as required by Act 295;
- To demonstrate that the Company’s 2022 EWR Plan performance met the financial incentive requirements approved by the Commission in its March 17, 2022 Order in Case No. U-20875;
- To provide an overview of the Company’s 2022 EWR Pilot Program;
- To demonstrate compliance with the Case No. U-20875 Settlement Agreement; and
- To present an inventory of the program evaluation studies conducted by Consumers Energy for the 2022 program year in accordance with the Commission’s directive on page 9 of its March 28, 2017 Order in Case Nos. U-18260, et al.

Q. Are you sponsoring any exhibits with your direct testimony?

A. Yes. I am sponsoring the following exhibits:

Exhibits	Description
A-1 (LM-1)	2022 EWR Annual Report;
A-2 (LM-2)	Calculation of Annual Energy Savings Targets;
A-3 (LM-3)	2022 Program Savings and Investment Summary;
A-4 (LM-4)	2022 Electric and Gas EWR Performance Metrics;
A-5 (LM-5)	2022 Electric and Gas EWR Financial Incentive;

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 A-6 (LM-6) 2022 Electric Energy Waste Reduction (EWR)
2 Credits; and

3 A-7 (LM-7) 2022 Program Evaluation Report List.

4 **Q. Have these exhibits been prepared by you or under your supervision?**

5 A. Yes.

6 **Q. What other Company witnesses are presenting direct testimony in this proceeding?**

7 A. The following Company witnesses will be presenting direct testimony:

- 8 • Amy C. Ellsworth is providing direct testimony and exhibits to certify the 2022
9 performance of the Company's EWR residential programs;
- 10 • Hubert W. Miller III is testifying to the proposed changes in surcharges used to
11 recover the 2022 financial incentive, which includes any over- or
12 under-recovery of the 2020 financial incentive collected during 2022;
- 13 • Trenton T. Taylor is testifying to the 2022 calendar year EWR program
14 expenses;
- 15 • Jeremiah J. Kraft is providing testimony and exhibits to certify the 2022
16 performance of the Company's EWR business programs;
- 17 • Nathaniel S. Carver is testifying to the 2022 performance of the EWR business
18 programs;
- 19 • Svitlana Lykhytska is testifying to the 2022 booked EWR program expenses in
20 the Company's general ledger, reconciliation of the 2020 financial incentive
21 collected in 2022, and the Generally Accepted Accounting Principle rules
22 associated with the accounting of the financial incentive;
- 23 • Allison M. Reis is testifying to the 2022 performance of the EWR residential
24 programs; and
- 25 • R. Kenneth Skinner is testifying to the cost-effectiveness of the Company's
26 2022 EWR portfolio.

27 **Q. Please describe the contents of Exhibit A-1 (LM-1).**

28 A. Exhibit A-1 (LM-1) is the 2022 EWR Annual Report. It is a comprehensive report showing
29 the performance of the Company's EWR portfolio in 2022. In particular, the report
30 includes participation levels, investment, energy savings, and cost-effectiveness results for

LYNNE MCCOLLUM
DIRECT TESTIMONY

each of the Company's residential and business programs. In addition, the report also includes the historical investment and energy savings achieved for each program along with several other key milestones and achievements; and descriptions of the Company's 2022 business and residential pilots including the Income Qualified Health and Safety pilot

Q. In the Commission's March 17, 2022 Order in Case No. U-21204 et al., the Company was required to include annual MW and estimated carbon reductions resulting from EWR programs in the Company's annual EWR report. Does Exhibit A-1 (LM-1) provide this information?

A. Yes. Exhibit A-1 (LM-1) includes estimated EWR annual carbon reductions on page 2 and certified MW achievements in Appendix Table 4-5.

Q. Were there changes to the Company's EWR Portfolio in 2022 as compared to the 2022 EWR Plan approved in Case No. U-20875?

A. Yes. In the Company's approved 2022-2025 EWR Plan, the Company included the Energy Dashboard as a proposed residential program. However, upon further evaluation, the Energy Dashboard was implemented as an education and awareness activity rather than as a residential program as planned. Additionally, the Company included shared savings as part of total 2022 residential and business savings achievement. Shared savings are defined as unclaimed gas or electric savings from EWR-related work that generates both electric and gas savings at premises where a utility only provides single fuel service. The shared savings included in this filing represent savings created by DTE Energy Company ("DTE") (originating utility) in areas where Consumers Energy and DTE have overlapping service territory. Detail about shared savings methodology and attributed savings is provided in the testimonies of Company witnesses Ellsworth and Kraft.

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Did the Company meet the statutory electric energy savings target for 2022 set forth**
2 **in Act 295?**

3 A. Yes, the Company exceeded the statutory electric energy savings target of 315,780 MWh
4 shown in Exhibit A-2 (LM-2), page 1, line 4. The Company reduced energy waste in 2022
5 by 651,661 MWh as shown in Exhibit A-3 (LM-3), page 1, line 32, column (c).

6 **Q. Did the Company meet the statutory natural gas energy savings target for 2022 set**
7 **forth in Act 295?**

8 A. Yes, the Company exceeded the statutory gas energy savings target of 2,130,573 Mcf
9 shown in Exhibit A-2 (LM-2), page 2, line 6. The Company reduced energy waste in 2022
10 by 3,174,283 Mcf as shown in Exhibit A-3 (LM-3), page 2, line 32, column (c).

11 **Q. Did the Company make any adjustments to its 2022 gas energy savings target?**

12 A. Yes. Pursuant to the Commission's March 17, 2022 Order in Case No. U-20875 (and
13 March 5, 2020 Order in Case No. U-20372), the Company included a downward
14 adjustment to remove natural gas sales to electric generation customers from the total
15 weather-adjusted prior year gas sales used to calculate its 2022 gas savings target as shown
16 on Exhibit A-2 (LM-2), page 2.

17 **Q. Please briefly describe the Company's evaluation, measurement, and verification**
18 **activities in 2022.**

19 A. The Company contracted with independent evaluation firms in 2022 to provide objective
20 assessments of its electric and natural gas energy efficiency programs based on
21 performance (including measurements of program participation, installation, and
22 persistence) and achieved energy and demand savings. In particular, the level of (i) energy
23 and demand savings, (ii) process efficacy, and (iii) market acceptance of its programs were

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DIRECT TESTIMONY

1 evaluated. The Company has or is in the process of completing 32 energy efficiency
2 program evaluation reports, memos, or presentations for the 2022 program year, including
3 the 2022 Residential and Commercial & Industrial (“C&I”) EWR Certification reports
4 sponsored by Company witnesses Ellsworth and Kraft, respectively. A listing of these
5 program evaluation deliverables is provided as Exhibit A-7 (LM-7). The full reports will
6 be filed in this case docket on August 31, 2023.

7 **Q. Has the Company’s 2022 electric and natural gas EWR program energy and demand**
8 **savings been certified?**

9 A. Yes. The Company asked The Cadmus Group (“Cadmus”) and TRC Companies (“TRC”)
10 to independently certify the performance of its EWR programs in 2022. Cadmus certified
11 the residential EWR programs, and TRC certified the business EWR programs. The
12 certified energy savings for the residential and business EWR programs, as well as energy
13 savings for pilots and Education & Awareness (“E&A”), are shown in Exhibit A-1 (LM-1),
14 Table 4-5.

15 **Q. Please briefly describe Cadmus’s qualifications for certifying the residential EWR**
16 **programs.**

17 A. In over two decades of working in the energy industry, Cadmus has conducted several
18 hundred process and impact program evaluations. Much of this work has involved
19 multi-year, multi-program projects. Cadmus team members have contributed to some of
20 the most widely used evaluation protocols, including the International Performance
21 Measurement and Verification Protocols, the National Action Plan for Energy Efficiency
22 Evaluation Guidelines, and the California Evaluation Protocols. Cadmus staff has testified
23 before several state regulatory agencies and legislatures on issues of energy efficiency

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 program design, implementation, and evaluation. The detail and results of Cadmus's
2 evaluation are included in the direct testimony and exhibits of Company witness Ellsworth.

3 **Q. Please briefly describe TRC's qualifications for certifying the business EWR**
4 **programs.**

5 A. TRC includes several of the most reputable evaluation, research, and engineering firms in
6 the energy industry. For well over a decade, all of the firms on the evaluation team have
7 conducted independent impact, process, and engineering analyses for utilities and
8 regulatory commissions throughout the United States. Evaluation team members have
9 specific experience in evaluating the unique needs of the business energy efficiency
10 programs. The detail and results of TRC's evaluation are included in the direct testimony
11 and exhibits of Company witness Kraft.

12 **Q. Please explain how the deemed energy savings for pilots were calculated.**

13 A. The deemed energy savings for pilots are calculated based on the percent of pilot funding
14 and the energy savings delivered for that year. In 2022, the Company invested 6.62%
15 (\$12.51 million divided by \$188.98 million) of its electric budget in pilot programs and
16 delivered electric program energy savings of 594,061 MWh (excluding energy savings
17 from Pilots, E&A, and Self-Direct). The resulting deemed energy savings for the electric
18 pilots was 35,644 MWh (6.0% of 594,061 MWh). Similarly, the deemed gas pilot energy
19 savings of 143,767 Mcf was calculated based on the Company investing 4.89%
20 (\$4.11 million divided by \$84.13 million) of its gas budget in pilot programs and delivered
21 gas program energy savings of 2,942,248 Mcf (excluding energy savings from Pilots and
22 E&A).

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Please explain how the deemed energy savings for E&A were calculated.**

2 A. The deemed energy savings for E&A are calculated based on the percent of education
3 funding and the energy savings delivered for that year. In 2022, the Company invested
4 3.60% (\$6.81 million divided by \$188.98 million) of its electric budget in E&A and
5 delivered electric program energy savings of 594,061 MWh. The resulting deemed energy
6 savings for the electric E&A was 17,822 MWh (3% of 594,061 MWh). Similarly, the
7 deemed gas E&A energy savings of 88,267 Mcf was calculated based on the Company
8 investing 3.72% (\$3.13 million divided by \$84.13 million) of its gas budget in E&A and
9 delivered gas program energy savings of 2,942,248 Mcf.

10 **Q. Did the Company achieve its 2022 electric energy savings target within the funding**
11 **level planned in Case No. U-20875?**

12 A. The Company's actual EWR program investment was \$188.98 million as shown on Exhibit
13 A-3 (LM-3), page 1, line 32, column (d), which was slightly above the planned amount of
14 \$186.99 million for 2022. This variance falls within the threshold of exceeding annual
15 investment by up to 6% of electric investment approved by the Commission in Case Nos.
16 U-20372 and U-20875.

17 **Q. Did the Company achieve its 2022 gas energy savings target within the funding level**
18 **planned in Case No. U-20875?**

19 A. The Company's actual EWR Program investment was \$84.13 million as shown on Exhibit
20 A-3 (LM-3), page 2, line 32, column (d), which was slightly lower than the planned amount
21 of \$84.23 million.

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Please explain why the actual electric and natural gas investments vary from the**
2 **planned investments shown in Exhibit A-3 (LM-3).**

3 A. Due to the large number of programs and timing of program expenses, it is not practically
4 possible to exactly match planned spending with actual spending. The variance between
5 EWR portfolio planned spending and actual spending is minimal when compared to the
6 total spending.

7 **Q. Please explain the variance in utility oversight between 2022 actual and approved**
8 **investment as shown on Exhibit A-3 (LM-3), pages 1 and 2, line 27.**

9 A. The variance between planned and actual utility oversight investment for electric service
10 and natural gas service reflects a shift in the presentation of utility administration
11 investment between the EWR Plan, Case No. U-20875, and this filing. In the Plan filing,
12 the Company included a portion of projected utility oversight investment at the program
13 level; however, this allocation does not align with the Company's accounting systems for
14 these costs. The Company corrected this misalignment in this filing, presenting all utility
15 oversight costs in the utility oversight line item as shown on Exhibit A-3 (LM-3), page 1,
16 line 27 (for electric service), and page 2, line 27 (for natural gas service).

17 **Q. Is the Company proposing to adjust the EWR Plan component of the surcharges in**
18 **this case to address any spending variances related to 2022 spending?**

19 A. No. It is not necessary to propose any surcharge adjustments at this time to the EWR Plan
20 component of the surcharges. The EWR Program is funded by surcharges that are leveled
21 over multiple years and re-evaluated with each EWR plan case filing. The next EWR Plan
22 will be filed in August of this year with new surcharges to take effect in 2024. It is,

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 therefore, unnecessary to adjust this component of the surcharges in this reconciliation
2 case.

3 **Q. Are the Company's electric and natural gas EWR programs considered**
4 **cost-effective?**

5 A. Yes. Company witness Skinner calculated the cost-effectiveness of the Company's EWR
6 portfolio based on the UCT. The UCT score for the electric EWR programs was 1.89, as
7 shown in Exhibit A-3 (LM-3), page 1, line 32, column (a). The UCT score for the gas
8 EWR programs was 1.81, as shown in Exhibit A-3 (LM-3), page 2, line 32, column (a).
9 As described in the testimony of Company witness Skinner, a UCT score above one is
10 considered cost effective.

11 **Q. Is the Company requesting recovery of a 2022 EWR financial incentive in this case?**

12 A. Yes. The Company has achieved the 2022 electric and gas performance metrics required
13 to earn the full financial incentive shown in Exhibit A-4 (LM-4). The Company
14 accomplished this through delivery of the first-year energy savings and lifetime energy
15 savings, which represents 80% of the performance metric. The Company achieved the
16 remaining 20% of the performance metric through meeting its performance incentive
17 targets for investment in its residential and Multifamily Income Qualified programs and
18 installation of targeted electric and natural gas measures for income-qualified customers.

19 **Q. Were these metric results certified by an independent third party?**

20 A. Yes. Cadmus and TRC certified the Company's performance metrics.

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Was the 2022 EWR financial incentive capped at the lower of net-benefit or percent**
2 **of investment?**

3 A. The annual financial incentive shown in Exhibit A-5 (LM-5), page 1, line 4, was capped
4 by the percent of investment for the electric and natural gas financial incentive.

5 **Q. How does the Company propose to recover the financial incentive?**

6 A. The Company proposes to recover the financial incentive as part of its monthly EWR
7 surcharges beginning with the January 2024 bill month.

8 **Q. How does the Company propose to use the EWR Credit excess achieved above the**
9 **statutory electric targets?**

10 A. As directed in Section 83 of Act 295, “[o]ne energy waste credit shall be granted to a
11 provider for each megawatt hour of annual incremental energy savings achieved through
12 energy waste reduction. . . . If a provider’s incremental energy savings in any year exceed
13 the applicable energy waste reduction standard, the associated energy waste reduction
14 credits may be carried forward and applied to the next year’s energy waste reduction
15 standard,” or may be “substituted, by an electric provider, for renewable energy credits
16 under section 28.” MCL 460.1083(1) and (3). As shown in Exhibit A-6 (LM-6), line 4,
17 the Company proposes to convert the EWR Credit excess totaling 177,991 MWh to
18 Renewable Energy Credits to be used to meet the Renewable Energy Credit Standard
19 requirement.

20 **Q. Did the Company coordinate with other utilities in the execution of its 2022 EWR**
21 **programs?**

22 A. Yes. During 2022, the Company worked with DTE and other utilities to improve the
23 effectiveness of its EWR programs. Ongoing communication and coordination with DTE

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 have been especially important in those areas where the companies' electric and natural
2 gas service territories overlap. The companies worked together to identify administrative
3 and implementation cost-savings opportunities, provide a consistent message, and manage
4 programs in a similar manner to reduce confusion and difficulty for customers and trade
5 allies.

6 **Q. What investment does the Company plan to make in its EWR programs for 2023?**

7 A. As approved in the 2022 – 2025 EWR Plan, Case No. U-20875, the Company plans to
8 invest \$194.99 million and \$89.79 million in its electric and natural gas EWR programs in
9 2023, respectively. These planned investments are included in Exhibit A-1 (LM-1),
10 Table 4-8.

11 **Q. Did the Company comply with all Case No. U-20875 Settlement Agreement 2022**
12 **reporting commitments?**

13 A. Yes. The Company included reporting for the following items in its 2022 EWR Annual
14 Report, Exhibit A-1 (LM-1), as directed per the Case No. U-20875 Settlement Agreement:
15 supplier diversity, workforce development, the residential All-Electric Home Pilot, the
16 residential Income Qualified Health and Safety Pilot, the business Refrigerant Pilot, and
17 the business program's Industrial Energy Management ("IEM") initiative. IEM is also
18 discussed in the testimony of Company witness Carver. Additionally, the Company held
19 a biannual update meeting with plan stakeholders on August 10, 2022.

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Did the Company complete all 2022 Flint Initiative, geographic targeting, and Income**
2 **Qualified Health and Safety Pilot activities outlined in the Case No. U-20875**
3 **Settlement Agreement?**

4 A. Yes. The Income Qualified program team met with stakeholders on five occasions between
5 June and October 2022 to review and seek input into program, reporting, and evaluation
6 design of these initiatives. The program team also shared information and project plans
7 with the EWR Low Income Workgroup on November 10, 2022.

8 **Q. Did the Company provide healthy building materials education and training for**
9 **Income Qualified and Home Performance with Energy Star energy auditor as**
10 **described in paragraph 19 of the Case No. U-20875 Settlement Agreement?**

11 A. Yes. The Company shared educational materials and supported healthy building materials
12 training for Income Qualified and Home Performance with Energy Star trade ally partners.
13 Additional information is included in Exhibit A-1 (LM-1).

14 **Q. Did the Company's EWR programs seek to understand and utilize investments made**
15 **available through the 2022 Inflation Reduction Act ("IRA") and the 2021**
16 **Infrastructure Investment and Jobs Act ("IIJA")?**

17 A. Yes. The IRA and IIJA represent significant investment in energy efficiency
18 programming. The Company's EWR program engaged in efforts to review and understand
19 these programs and to identify possible partnerships with organizations directly eligible for
20 funding. The program is also exploring opportunities to provide coordinated consumer
21 education to promote adoption of efficiency measures. In 2022, the EWR program team
22 supported several efforts related to energy efficiency and electrification funding for school
23 districts throughout Michigan. The program also engaged with the EWR Collaborative

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DIRECT TESTIMONY

1 and other partnerships working to ready Michigan efforts for this funding. The Company
2 will continue active engagement as the federal and state entities responsible for the IJA
3 and IRA programs release information and requests for proposals.

4 **Q. Please describe the Company's EWR Pilot Program.**

5 A. The EWR Pilot program pursues new initiatives and technology approaches that could
6 capture additional energy savings within the residential, small to medium-sized business
7 ("SMB"), and larger business, including C&I, customer segments. The intent of the EWR
8 pilot program is to research, design, test, and evaluate new programs and new program
9 concepts which can provide customer benefit, solve customer challenges, increase program
10 participation, and foster the next generation of clean energy technologies needed to support
11 the Company's EWR energy savings goals. Consumers Energy employs a life-cycle
12 management approach for pilots which enables the Company to be iterative and agile. The
13 Company learns from pilots and quickly adjusts or transitions them to the next phase,
14 whether by creating a new program, adding a new measure to an existing program, or
15 retiring the idea or tested concept.

16 **Q. How does the EWR program categorize pilots?**

17 A. In its February 4, 2021 Order in Case No. U-20645 ("Pilot Order"), the MPSC defined a
18 pilot as, "a limited duration experiment or program to determine the impact of a measure,
19 integrated solution, or new business relationship on one or more outcomes of
20 interest." Consumers Energy groups EWR pilots into three categories:

- 21 • Pilot Measure: New measures or delivery strategies (components) tested within
22 an existing program framework. If pilot measures prove beneficial for the EWR
23 portfolio, they are integrated into an existing program;
- 24 • Proof of Concept: Early stage, small-scale experiments to test the viability of
25 new measures or programs prior to full-scale pilot testing. Programs or
26 measures at a proof-of-concept stage may entail preliminary research prior to

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launching a pilot program. If successful, proof of concepts transition into pilot measures or programs; and

- Pilot Program: A test of a new concept outside of existing programs.

Q. Please describe the Company's 2022 residential EWR pilot programs.

A. The Company conducted the following residential EWR pilot programs in 2022. The residential pilot team also engaged in other pilot work related to exploration of new EWR measures and research to identify, develop, and assess new pilot concepts.

- **Super-Efficient, All-Electric New Homes** - Launched in 2020, the Super-Efficient, All-Electric New Homes Pilot aims to decarbonize residential buildings and assesses the potential of zero energy ready homes in Michigan.
- **Income Qualified Health and Safety** – While a residential EWR pilot program supported by pilot program investment, the Health and Safety pilot was administered through the Company's residential Income Qualified EWR Program consistent with the settlement agreements in Case Nos. U-20372 and U-20875.
- **Predictable Billing** – Initiated in 2021, this pilot is testing the use of a predictable bill to prevent increased energy consumption and realize energy savings.
- **My Energy Analyzer** – Designed in 2022 with pilot launch in early 2023, this pilot brings real-time usage through a mobile app.
- **MyHeat Aerial Thermal Imaging** – This pilot uses aerial thermal imaging to create heat loss maps for individual residential buildings and provide comparative data.
- **Non-Energy Benefits Study** (joint effort with the business pilot program) – A study of non-energy benefits alongside EWR benefits.
- **On-Bill Payments** (joint effort with the business pilot program) – A proof-of-concept pilot that aims to bring customers financing solutions to support EWR investment.

Q. What results were achieved for the Company's 2022 residential EWR Pilot program?

A. As shown in Exhibit A-1 (LM-1), Appendix, Table 4-5, residential pilot programs achieved deemed first-year savings of 9,166 MWh and 71,021 Mcf based on pilot investment of

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DIRECT TESTIMONY

1 \$5.03 million and \$2.66 million for electric and gas residential pilots, respectively. These
2 first-year savings equate to lifetime savings of 62,546 MWh and 779,738 Mcf.

3 **Q. Please describe the Company's 2022 business EWR Pilot program.**

4 A. The Company conducted the following business EWR pilot programs in 2022. As with
5 the residential pilot program, the business pilot team also engaged in other pilot work
6 related to exploration of new EWR measures and research to identify, develop, and assess
7 new pilot concepts.

- 8 • **Refrigerant Swap** – a technology demonstration developed to evaluate
9 upgrading/swapping R404a refrigerant due to its high global warming impact.
- 10 • **Local Government Benchmarking** - The Local Government Benchmarking
11 pilot seeks to serve communities' expressed interest to drive energy efficiency
12 in commercial buildings to support their broader sustainability goals.
- 13 • **Energy Pay for Performance** – Initiated in 2021, this pilot tests an alternative
14 incentive structure based on actual performance as opposed to standard
15 prescriptive measures.
- 16 • **Conditioned Based Maintenance** – this pilot tests a new subscription-based
17 model for SMB customers specific to rooftop HVAC units.
- 18 • **Refrigeration Optimization and Peak Shifting ("ROPS")** – Initiated in the
19 spring of 2022, the ROPS pilot seeks to address the high energy use of grocery
20 store refrigeration and whether energy savings can be realized with the help of
21 machine learning technology.
- 22 • **Refurbished Kitchen Equipment** – New in 2022, this pilot is testing the
23 ability for restaurant customers to achieve energy savings with the use of
24 refurbished equipment versus buying brand new equipment.

25 **Q. What results were achieved for the Company's 2022 business EWR Pilot programs?**

26 A. As shown in Exhibit A-1 (LM-1), Appendix, Table 4-5, the business EWR pilot program
27 achieved 26,478 MWh and 72,746 Mcf first year savings based on pilot investment of
28 \$7.48 million and \$1.45 million on electric and gas business pilots, respectively. These
29 first-year savings equate to lifetime savings of 338,434 MWh and 1,028,534 Mcf.

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DIRECT TESTIMONY

1 **Q. Were any Business and Residential EWR pilots discontinued in 2022?**

2 A. Yes, the Company discontinued the following three Residential EWR pilots and two
3 Business EWR pilots in 2022.

4 Residential:

- 5 • **Automated Design Assistance with Ekotrope** – This pilot was integrated into
6 the Super-Efficient, All-Electric New Homes pilot.
- 7 • **HomeWORKs Funding** – This pilot did not realize energy savings or customer
8 interest.
- 9 • **Real Estate Education & Outreach** – This pilot completed the final project
10 and is transitioning to the residential portfolio.

11 Business:

- 12 • **Telecommunications** – Learnings from this pilot were collected and
13 transitioned to the Company's program team.
- 14 • **Zero Net Energy** – The Company ended this pilot in the fall of 2022 as market
15 potential was too low to support a cost-effective permanent offering.

16 **Q. For each of the business and residential EWR pilots listed above, is there additional**
17 **information available in this EWR filing?**

18 A. Yes. Additional detail on the Company's 2022 EWR pilots is provided in the Pilot section
19 of the 2022 Annual EWR Report, Exhibit A-1 (LM-1). Also, all 2022 evaluation memos,
20 presentations, and reports listed on Exhibit A-7 (LM-7), including those related to pilot
21 efforts, will be filed in this case docket.

22 **Q. Is the Company planning to continue any 2022 pilots into 2023?**

23 A. At the time of this filing, the Company intends to continue all pilots described in my
24 testimony; however, the Company's agile pilot lifecycle approach may result in
25 earlier-than-planned transition, redesign, or discontinuation of those current pilot offerings.

LYNNE MCCOLLUM
DIRECT TESTIMONY

1 **Q. Does this conclude your direct testimony?**

2 **A. Yes.**

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBITS

OF

LYNNE MCCOLLUM

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023



CONSUMERS ENERGY

2022 Energy Waste Reduction Annual Report

Case No. U-21312
May 31, 2023



I give you kudos for your attention in providing this energy efficiency program to your customers and helping our environment in general. Thank you

This is a wonderful benefit, especially for seniors on a fixed income. I probably would have not gotten my furnace checked otherwise.

- Income Qualified Program Customers*

*Source: 2022 Consumers Energy Customer Satisfaction Survey

Table of Contents

Executive Summary

2022: The Consumers Energy Way – People, Planet, and Michigan’s Prosperity	1
Helping Michigan Save Energy	2
Helping Michigan’s Environment	2
Workforce Development and Diversity	3
Portfolio Summary	4

Residential Programs

Appliance Recycling	5
Consumers Energy Store.....	7
ENERGY STAR® Appliances.....	9
ENERGY STAR® Lighting	11
Home Energy Analysis.....	13
Home Energy Report.....	15
Home Performance with Energy STAR®	17
HVAC and Water Heating.....	19
Income Qualified Single Family	21
Income Qualified Multifamily	24
Insulation and Windows	26
New Home Construction.....	28
THINK! ENERGY®	30

Business Programs

Comprehensive Business Solutions Program	32
Small Business Solutions	35
Business Agriculture	37
Residential Agriculture.....	38
Market Rate Multifamily.....	39

Pilots

EWR Pilot Program.....	41
Residential Pilots.....	41
Joint Residential/Business Pilots.....	47
Business Pilots.....	48

Executive Summary

2022: The Consumers Energy Way *People, Planet, and Michigan's Prosperity*

For over 14 years, Consumers Energy has operated a comprehensive Energy Waste Reduction (EWR) Program as part of its strategic clean energy vision—exceeding statutory savings targets year after year and providing more than \$5.5 billion in customer savings since the program's inception. As evident in the Company's current Integrated Resource Plan, the Company continues to stand behind its commitment to a triple bottom line—People, Planet, and Michigan's Prosperity—with prudent and thoughtful EWR investment that continues to deliver value for the Company's customers while supporting Michigan's clean energy future. Learn more about the Company's Integrated Resource Plan to eliminate the use of coal by 2025, increase clean energy resources, and achieve net zero carbon emissions by visiting ConsumersEnergy.com/change.

The 2022 EWR program efforts described in this report resulted in the Company exceeding the 2022 program targets as approved in Michigan Public Service Commission (MPSC) Case No. U-20875 (Consumers Energy's 2022-2025 EWR Plan). Despite lingering COVID-19 pandemic supply chain delays, workforce challenges, mild winter weather, and further reduced savings from traditional lighting, the Company once again delivered on its aggressive EWR goals. The Company effectively engaged customers to participate in EWR solutions, providing direct energy savings to participants, benefit to all customers through overall energy savings of over 2% of electric and 1% of natural gas prior year sales, and avoided carbon dioxide emissions of 3.1 million tons.

In 2022, the Company expanded EWR product offerings through its Consumers Energy Store, expanded the income qualified health and safety pilot, and coordinated program outreach and marketing efforts with energy assistance programs that offer bill assistance to those at risk of shut-off. EWR program representatives participated in the MPSC's EWR low-income workgroup, the Energy Affordability and Accessibility Committee, and the EWR Collaborative, as well as broad Company efforts to assist in identifying collaborative EWR opportunities from the Inflation Reduction Act of 2022 (IRA) and the 2021 Infrastructure Investment and Jobs Act (IIJA), also called the Bipartisan Infrastructure Law. These critical efforts will continue through 2023.

2022 EWR program highlights include:

- Cost-effectively exceeded electric and gas statutory energy saving targets, delivering energy savings of 651,661 Wh and 3,174,283 Mcf.
- Exceeded electric and energy savings goals providing energy savings equal to 2.06% of electric and 1.10% of gas prior year sales resulting in the avoidance of 3.1 million tons of carbon dioxide emissions.
- Supported over 60 trade ally recruitment and training activities including in an Industry Upskilling: BPI-BA and Healthy Housing Principles training to 5 contractors in Flint.
- Delivered over 1000 in-person and webinar Think! Energy program sessions to high school, early elementary, and community centers.
- Served 133 single and 2004 multifamily customers through the Income Qualified Health and Safety pilot including 107 customers in arrears.

Helping Michigan Save Energy

In 2022, Consumers Energy continued its track record of exceeding statutory EWR targets, achieving:

- **206%** of statutory electric savings.
- **147%** of statutory gas savings.
- A Utility Cost Test (UCT) score of 1.86.

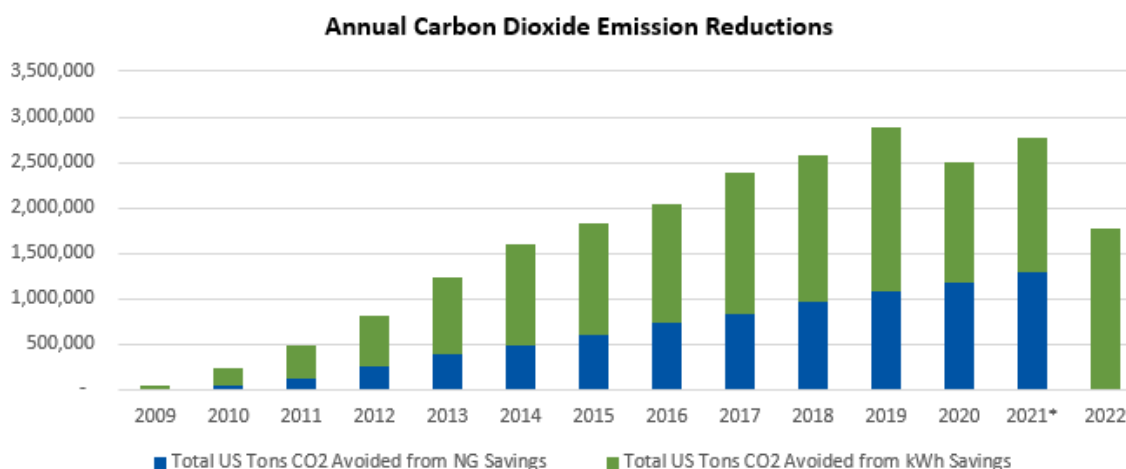
By doing this, the Company earned an incentive for both its electric and gas first year savings, lifetime savings, and supplemental targets.

Since 2009, EWR programs have delivered significant economic and social benefits to Michigan, including:

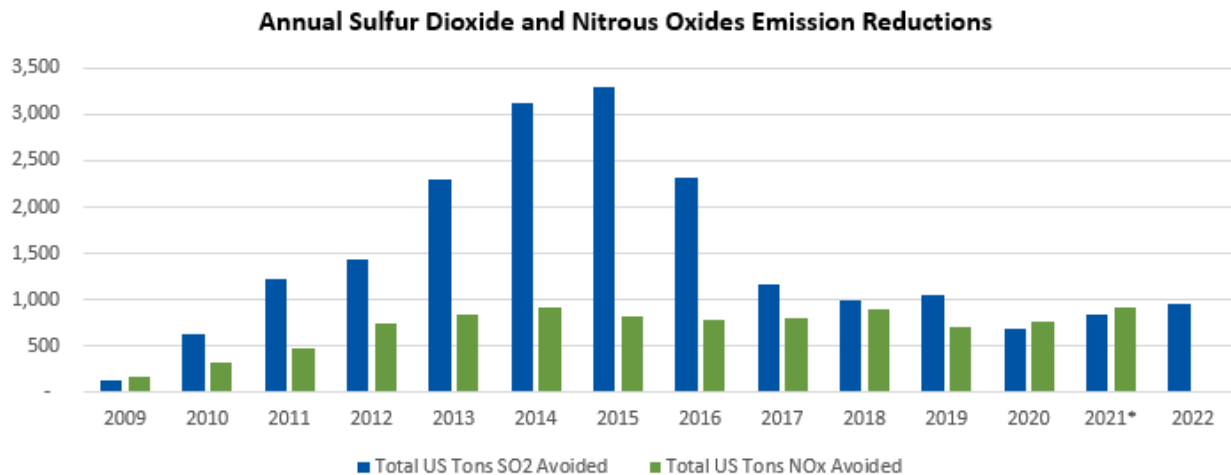
- Delivering EWR energy savings equivalent to supplying electricity to over **3.5 million** homes and natural gas to **1.8 million** homes for a year.
- Garnering participation in at least one EWR program from more than **1,113,299** residential and **138,662** business customers.
- Saving customers over **\$5.5 billion** on their energy bills.
- Creating or sustaining more than **6,900** Michigan jobs in 2022.
- Adding more than **\$5.8 billion** in net economic growth to the Michigan economy Increasing personal income by **over \$2.4 billion**.
- Helping nearly 200,000 low-income customers make their homes and apartments more energy efficient and affordable.

Helping Michigan's Environment

In addition to the economic and social benefits of EWR, Consumers Energy programs have yielded significant environmental benefits. Since 2009, reductions in carbon dioxide emission have grown to nearly 3.1 million tons per year and exceed 24.5 million tons cumulatively over that time.



Further, electric EWR savings have led to the reduction of 20,135 tons of sulfur dioxide and 9,196 thousand tons of nitrogen oxides. The figure below shows the annual reductions in those emissions in each year since 2009. It is notable that while energy savings have increased each year since 2009, the total emission reductions have leveled off or declined since 2015 as a result of Consumers Energy's efforts to substantially reduce emissions associated with electricity generation.



Workforce Development and Diversity

Consumers Energy values a diverse and robust trade ally network that offers opportunity for those entering the field and skill-building and training for existing contractors. In 2022, the EWR program workforce efforts included trade ally training and recruitment, testing a new comprehensive training and certification pathway for contractors in Flint, and providing healthy building materials resources. The EWR program conducted over 60 trade ally recruitment and training activities in 2022 with training provided in-person, via webinar or through lunch and learn sessions and series.

2022 Workforce Development highlights include:

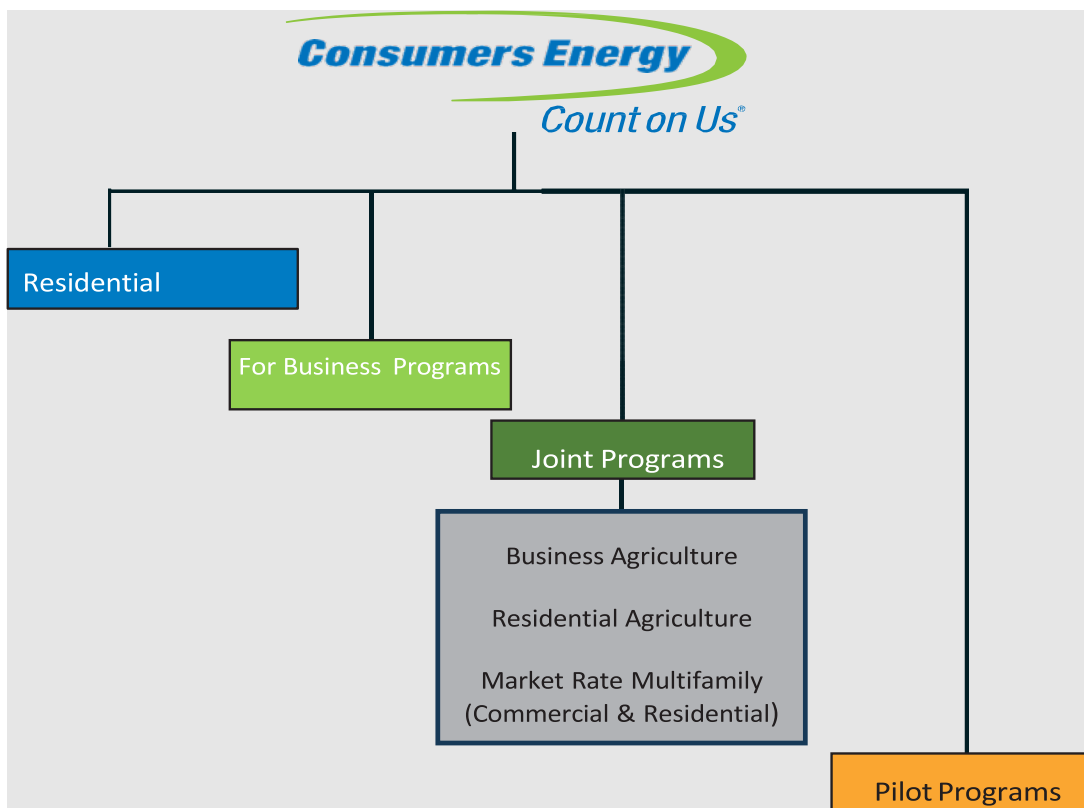
- In partnership with Walker Miller, conducted a new Industry upskilling initiative that provided Building Performance Institute (BPI) and Healthy Housing Principles training to 5 contractors in Flint.
- Development of a second training initiative through Walker Miller for six either un-or underemployed Flint residents to achieve the following certifications: OSHA 10, BPI Building Science Principles, BPI Building Analyst Technician, BPI Healthy Housing Principles, and BPI Building Analyst Professional. The program will pay students a wage of \$16/hour and provide a suite of wraparound services including free childcare and transportation cost subsidies.
- Housing Principles Certification for two Home Performance with Energy Star program contractors.
- Ongoing BPI Building analyst trainings throughout the year.
- A business trade ally program rollout with over 250 trade allies in attendance.
- 5 Trade ally orientations, 18 new trade ally trainings, and 3 trade ally refresher sessions.
- Building Operator Certification (BOC) online training.
- Business integrated lighting, indoor air quality, and efficient indoor agriculture webinars.
- Fundamentals of Compressed Air Systems, (Level 1) Training.
- Advanced Management of Compressed Air Systems, (Level 2) Training.
- Small Business Refrigeration Training (10 attendees).

The Company's EWR portfolio also continued to track diverse suppliers delivering program services. In 2022, 18 Diverse Suppliers supported the EWR portfolio representing over \$7.5 million of program spending. 2022 supplier classifications were: 18 Women-Owned, 4 African-American Owned, 1 Asian Owned, and 1 Native-American Owned with 6 suppliers with more than one classification. Five were also Michigan-based entities.

Portfolio Summary

The Company's EWR portfolio comprises a diverse collection of 14 residential and 3 primary business programs that target all major sectors, customer classes, and fuel types (gas, electric, and combination customers) and include offerings for low-income and small business customers. The agriculture and multifamily programs are presented as joint programs in this report as they are administered jointly with investment and savings attributed to the residential or business portfolio by customer class. For those Consumers Energy customers with only electric or only natural gas service, efforts were made to coordinate and align with other utilities so that customers could easily take advantage of efficiency program offerings across both fuel types, thereby producing an overall benefit for Michigan's EWR goals.

The EWR Portfolio also includes residential, business and joint pilot programs designed to research, test, and evaluate new measure and program concepts that can provide customer benefit, solve customer challenges, increase program participation, and foster the next generation of clean energy technologies needed to support the Company's energy savings goals.

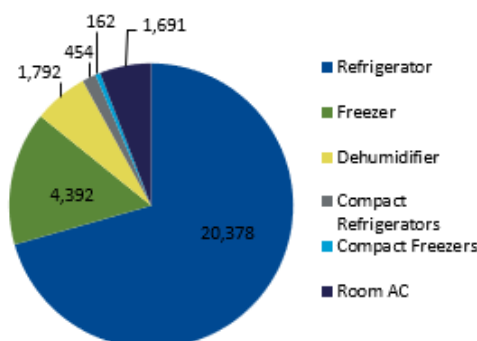


APPLIANCE RECYCLING

The Appliance Recycling program targeted customers with inefficient second refrigerators and freezers, providing the dual benefit of cutting energy use and keeping the appliances out of the used appliance market or a landfill. Consumers Energy provided appointment scheduling, appliance pickup, rebate processing, and recycling services. In 2022, the program expanded the retail program to 33 Home Depot stores across Consumers Energy's electric customer territory in Michigan, generating program awareness and directly contributing to over 200 large appliance collections. Customers were offered a \$50 rebate, free pickup and recycling of their old, operable, second refrigerators and freezers. Customers who recycled a refrigerator or freezer were also offered an additional \$15 rebate and free pickup and recycling of their old, operable window air conditioners, dehumidifiers, and small compact refrigerators. Customers continue to appreciate the non-contact collection option, in which appliances are collected outside of the customer's home, such as in a garage, on the porch or other external area, when preferred by the customer.

The Appliance Recycling program has made considerable impacts on the environment. For example, more than 95% of each recycled appliance has been transformed into new products with hazardous oils, toxins and chlorofluorocarbon gases safely disposed. Foam recovery is an additional step in the appliance recycling process, which safely disposes of appliance foam containing greenhouse gas emissions harmful to the environment. Since becoming a partner with EPA's Responsible Appliance Disposal (RAD) program in 2010, Consumers Energy has processed a total of 280,244 large units, achieving reduced carbon dioxide emissions equivalent to emissions from 298,630 homes' energy use for one year.

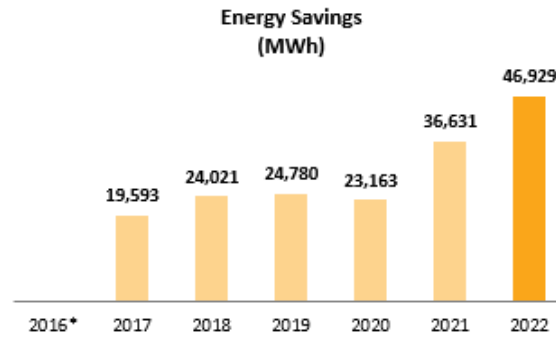
2022 Program Participation
Units Recycled



1 Refrigerator recycled is equivalent to:

- ◇ 1,1650 miles driven by a passenger vehicle in one year
- ◇ 721 pounds of coal burned
- ◇ 12.5% of a homes' electricity used for one year

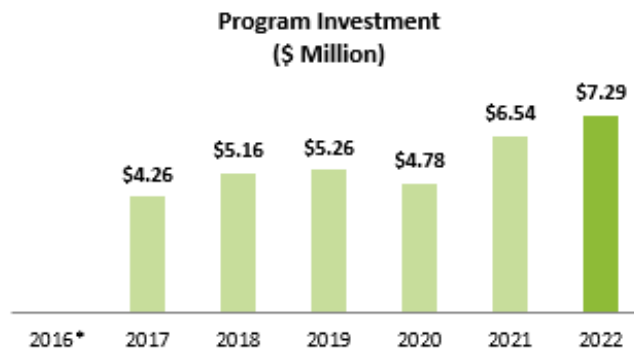
RESIDENTIAL SECTOR



*Program paused in 2016

In 2022, the program:

- Received an overall customer satisfaction score of 9.4 on a 10-point scale.
- Expanded the retail channel by increasing participation of Home Depot stores to 33.
- Collaborated with the ENERGY STAR Appliance program to cross promote programs and share in-store marketing materials.
- Provided appliance pick-ups, recycling, and rebate payments for 22,908 customers.
- Held 10 mini drop off events and 1 large event.



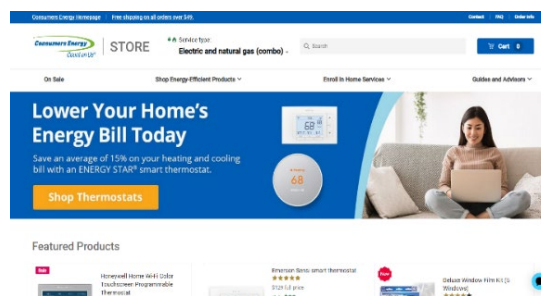
*Program paused in 2016

CONSUMERS ENERGY STORE

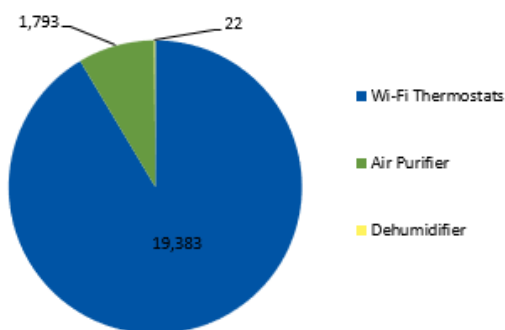
The residential Consumers Energy Store (also referred to as the online marketplace), allows participants to purchase energy-efficient products via a website for delivery to their home, including Wi-Fi-enabled thermostats, LED bulbs, dehumidifiers, room air conditioners, and air purifiers, and have the incentive applied automatically at the time of purchase.

In 2022, Consumers Energy expanded the list of products available through the Consumers Energy Store, adding showerheads, advanced power strips, faucet aerators, window insulation film kits, and electric vehicle chargers. In addition, Consumers Energy offered two measure giveaways—air purifiers during Earth Month in the spring and advanced power strips as a Black Friday promotion—when eligible customers purchased a thermostat. Consumers Energy continued coordination with several program promotions and outreach campaigns to encourage purchases of Wi-Fi-enabled thermostats, including cross promotion with the Smart Thermostat Program.

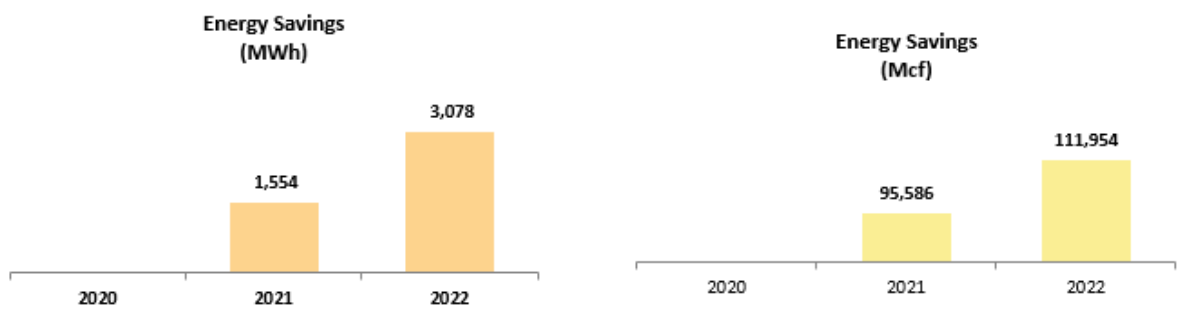
The Consumers Energy Store generated increased savings compared to 2021 and successfully diversified its measure mix. Savings for electric and natural gas increased by 100% and 26%, respectively, compared to 2021. Smart thermostats were the primary driver of product success, accounting for 48% of electric savings, 70% of natural gas savings, and 53% of all measures



2022 Program Participation - Rebates

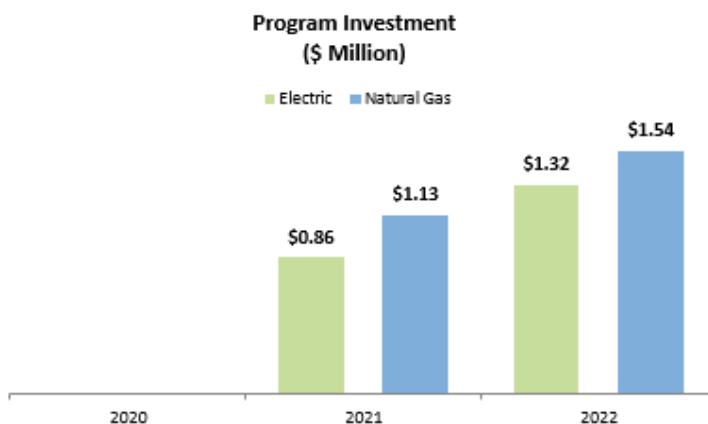


RESIDENTIAL SECTOR



In 2022, the program:

- Provided an additional 13,970 measures compared to 2021.
- Made considerable strides by diversifying the Consumers Energy Store's measure mix.
- Provided over \$2.2 million in electric and gas customer incentives.
- Achieved a customer satisfaction rating of 8.5 on a 10-point scale. Satisfaction was high for website usability, the purchase and shipping and delivery.
- Increased energy savings for electric and natural gas by 98% and 17%, respectively, compared to 2021.



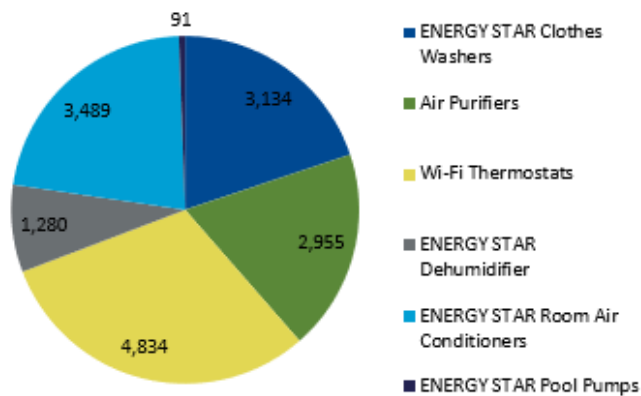
ENERGY STAR® APPLIANCES

The ENERGY STAR® Appliances program offered rebates on the purchase of qualifying ENERGY STAR home appliances and Wi-Fi thermostats. The program drove long-term energy savings by promoting energy-efficient clothes washers, room air conditioners, dehumidifiers, Wi-Fi thermostats, variable speed pool pumps, and air purifiers. Post-purchase rebates on ENERGY STAR certified clothes dryers, heat pump dryers, refrigerators, freezers, bathroom exhaust fans, and televisions were added in 2022. Showerhead and advanced power strip instant markdowns were also offered in select retail locations.

Customers were informed about program rebates and the benefits of ENERGY STAR qualified products through point-of-sale education in retail stores, strategic customer marketing, and the program field team and retail associate collaborative efforts. The program participated in yearly ENERGY STAR promotional efforts, including Earth Day, ENERGY STAR Day, holiday campaigns, and specific product promotions. In-store events resumed mid-year, allowing the program team to connect directly with customers as they shopped.

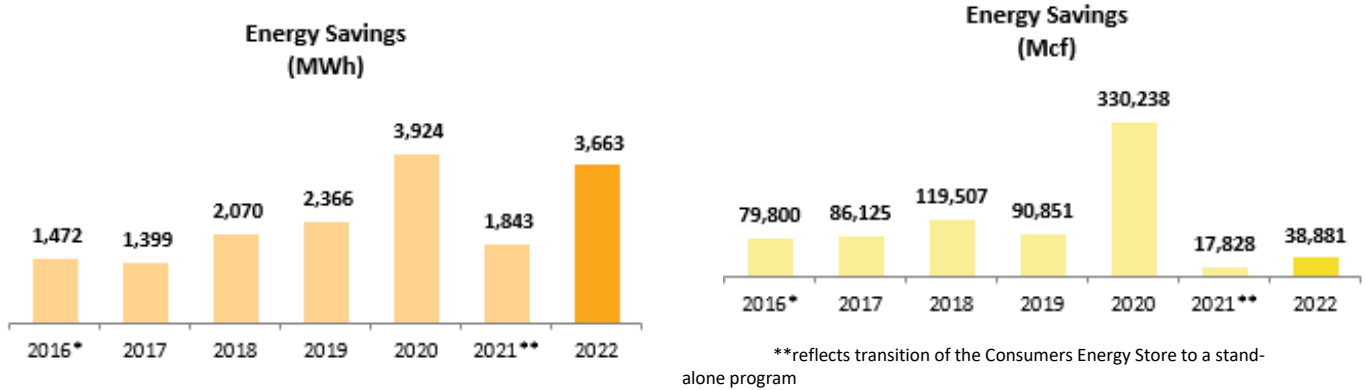
With continued focus on expanding product offerings and delivery channels, the instant rebate approach was expanded to include bathroom exhaust fans, room air conditioners, and advanced power strips. This channel saves customers time and drives adoption of energy and water efficient technologies.

2022 Program Participation Units Rebated



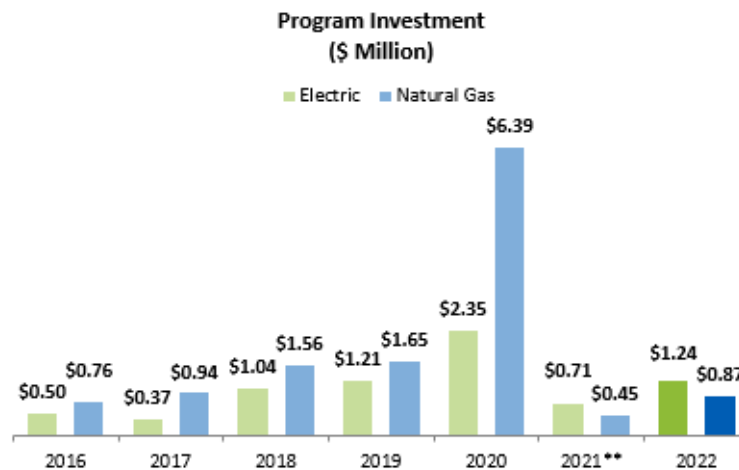
*Includes savings multipliers

RESIDENTIAL SECTOR



In 2022, the program:

- Processed and rebated 62,527 energy efficient measures, a 507% increase over 2021 participation.
- Achieved an all-time high customer satisfaction score of 8.6 on a 10-point scale for the third year in a row.
- Expanded instant rebates to include bathroom exhaust fans, room air conditioners and advanced power strips.



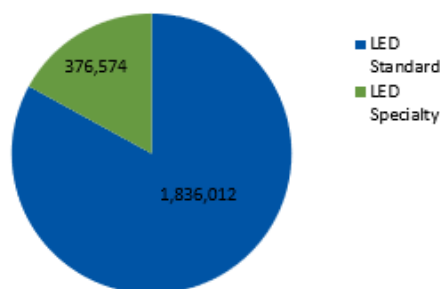
ENERGY STAR® LIGHTING

The ENERGY STAR® Lighting program provided incentives to build market share and use of ENERGY STAR LED bulbs for Consumers Energy residential customers. Delivery of the program involved working with retailers and LED manufacturers to reimburse retailers for discounting the cost of qualifying products on store shelves. Retail price volatility was significant for LED products in 2022, making utility rebates all the more valuable.

Over 350 unique ENERGY STAR® certified lighting products were incentivized in 2022, providing residential customers with multiple options in 250 retail locations. A new partnership was established with Menards, adding 12 locations.

In 2022, lighting sales achieved through the Consumers Energy Store were accounted for as part of the Energy Star Lighting program and continue to represent approximately 3% of sales. The opportunity to purchase ENERGY STAR® LED lighting online was leveraged and communicated to customers through a variety of marketing channels, including email, direct mail, and digital media, particularly around Earth Month, back to school, ENERGY STAR® day in October, and the holiday season.

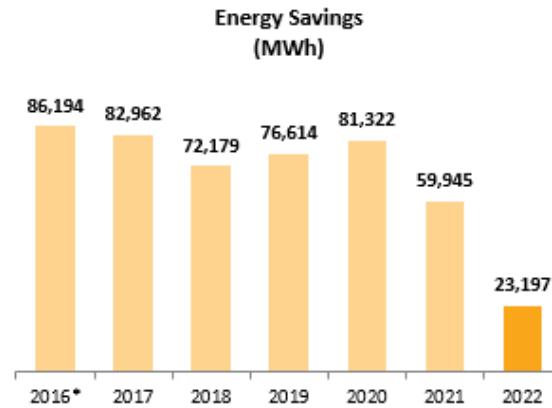
**2022 Program Participation
LED Bulbs Purchased**



In 2022, the Company continued to focus on underserved communities through a continued partnership with 69 Dollar Tree locations and 16 Habitat for Humanity ReStores. These relationships provided both the rural and low-income residential customer base with opportunities to purchase incentivized energy efficient ENERGY STAR® certified LEDs.

The Lighting program participated in Earth Month ENERGY STAR promotion through an Earth Day campaign which consisted of bill insert, digital media, and two program emails. The program also highlighted ENERGY STAR Day in October through a special "Energy Month" campaign that included two emails, a bill insert and a postcard directing customers to the Online Store to shop. The postcard included a special "ENERGYMONTH" promo code, and the campaign resulted in 13 redeemed promo codes and over 2,000 bulbs sold in October.

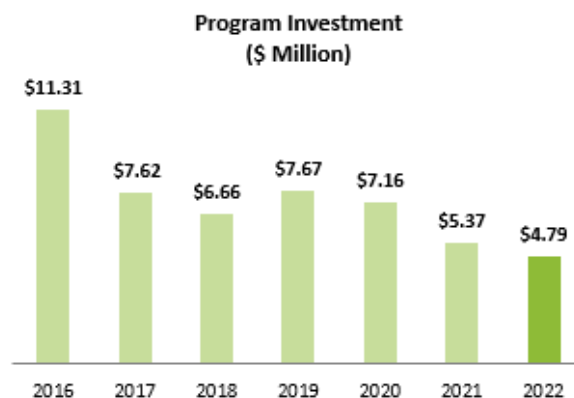
RESIDENTIAL SECTOR



*Includes savings multipliers

In 2022, the program:

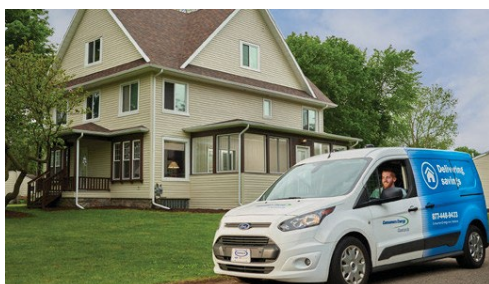
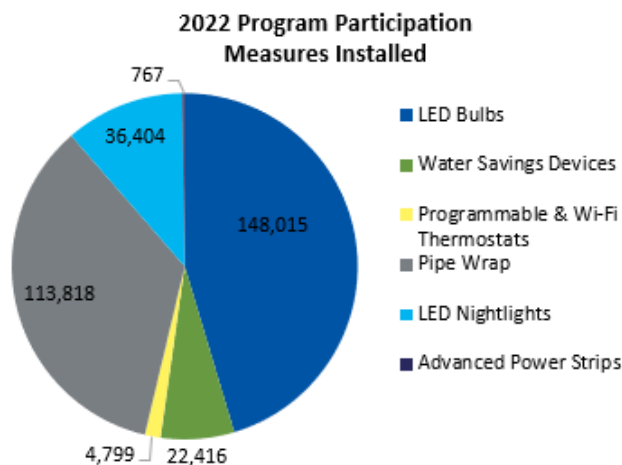
- Incentivized over 2.2 million bulbs, including over 376,000 specialty LED bulbs and fixtures.
- Established new partnerships with Menards, adding 12 new stores to the program.
- Participated in Earth Month ENERGY STAR® promotions.
- Highlighted ENERGY STAR® Day in October through a special "Energy Month" landing page on the Consumers Energy Store, a program email, direct mail postcard, and organic social media content.



HOME ENERGY ANALYSIS

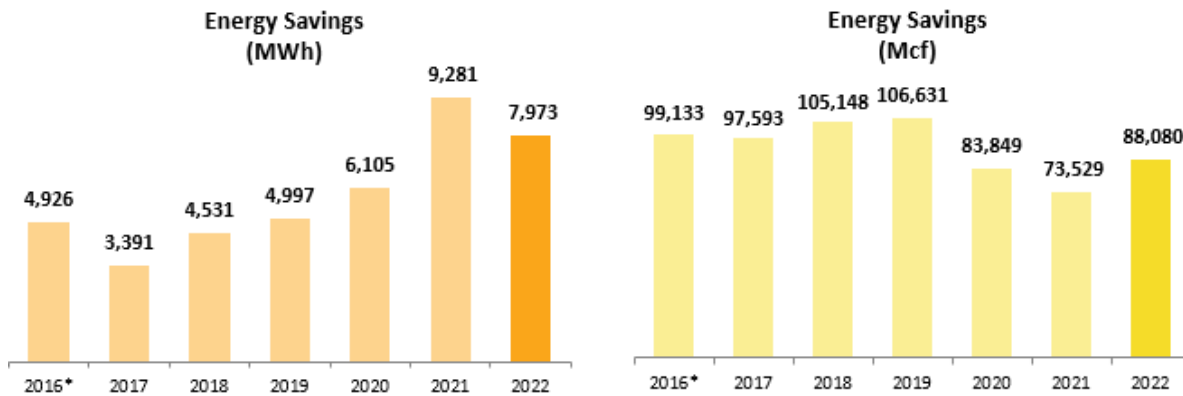
The Home Energy Analysis (HEA) program offered Michigan residents either a free in-home analysis or a virtual audit, performed by a trained analyst, and provided participating customers with a walk-through energy inspection of their home, direct installation of energy saving measures, and a customized summary report with energy saving tips and recommendations. Consumers Energy designed the HEA program to introduce its customers to energy efficiency, increase their awareness of additional EWR programs in Consumers Energy's residential portfolio, increase customer satisfaction with the company, and generate energy savings by providing a free introductory audit and installing free measures.

The analysts performed a visual inspection of the home, while entering findings into an intake tool to create a personalized report. Free and low-cost measures were installed including LED bulbs, programmable and Wi-Fi thermostats, water heater pipe insulation, and low-flow water devices. Further, the analysts discussed the personalized report with the customer, focusing on energy education and taking next steps to further make their home energy efficient. On average, participating customers received \$50 worth of energy-saving measures, which provided an estimated annual savings of up to \$150. Based on the findings of the in-home audit, Energy Advisors reached out to customers to recommend additional energy efficiency programs and offerings to help reduce their energy bills.



In 2022, The HEA program made several changes that improved the overall customer experience, including making the post audit report easier to read, and tailoring the messaging to an individual's needs. The program also added window kits and had periodic additions of "Bonus Measures" such as air purifiers, smart power strips, or \$15 for the Online store.

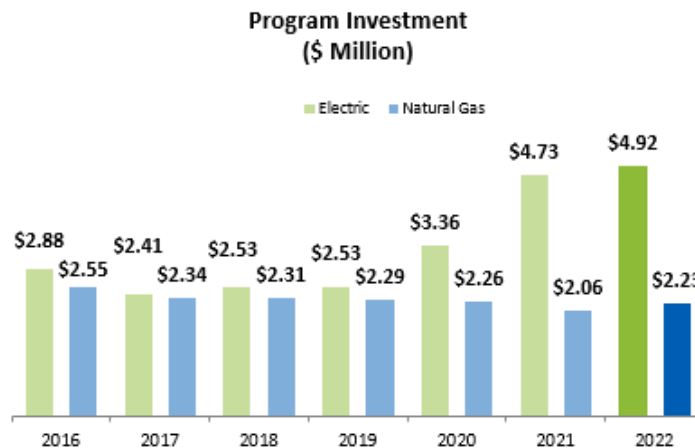
RESIDENTIAL SECTOR



*Includes savings multipliers

In 2022, the program:

- Achieved a customer satisfaction rating of 9.2 on a 10-point scale.
- Performed 20,263 in-home audits, and 4,105 virtual audits.
- Added window kits and periodic additions of “Bonus Measures” such as air purifiers, smart power strips, CO2 detectors or \$15 for the Online store.



HOME ENERGY REPORT

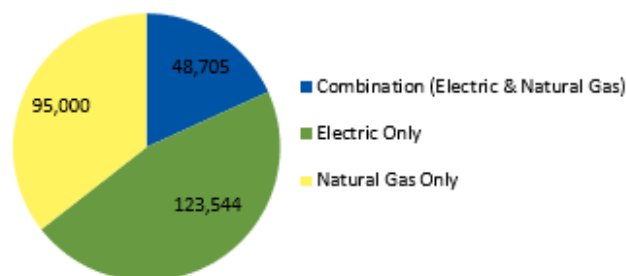
The Home Energy Report (HER) is a personalized outbound energy education and engagement solution that utilizes behavioral science to reduce residential customers' energy use. The HER educates customers on their usage habits and trends and leverages normative comparisons to nudge customers to increase their energy efficiency. HERs provide personalized ways to save, cross-promote Consumers Energy's other energy-saving programs, and show how energy is consumed throughout the home.

Behavioral science research has demonstrated that peer-based comparisons are highly motivating. The HER program employs this approach by comparing each participating residence's energy use with nearby homes of similar size, year built, and heating/cooling types. Two types of home comparison are shown: average household comparison and energy efficient household comparison. Participating customers receive targeted savings tips based on their energy-use patterns, housing characteristics, and demographics. Customers also receive energy efficiency program promotions based on the season and what programs are actively executing marketing campaigns.

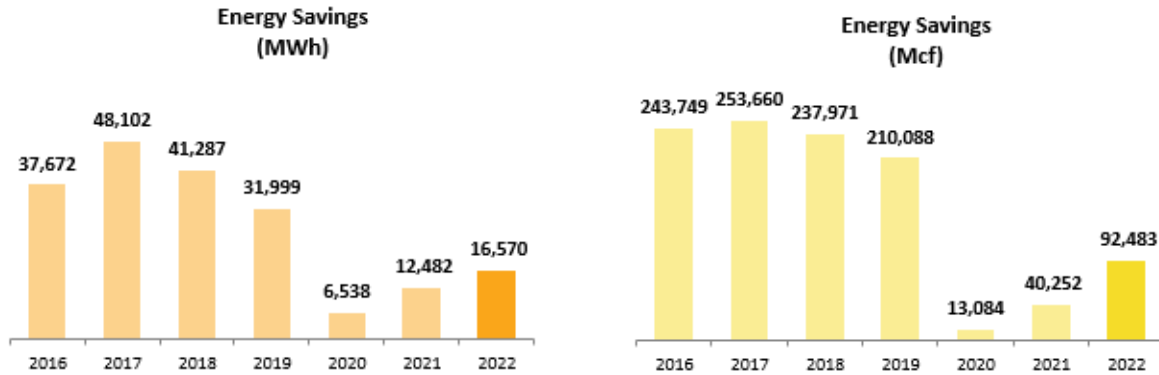
The HER program is organized around two concepts:

- Motivating customers to change their behavior by putting their energy use in context
- Providing personalized advice to capitalize on this motivation to use less energy and save money

**2022 Program Participation
Customer Type**



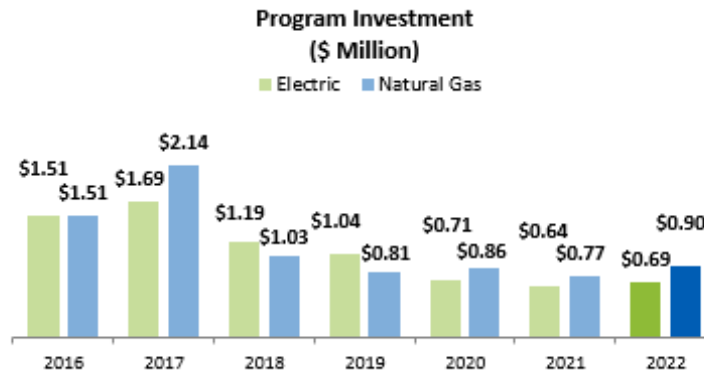
RESIDENTIAL SECTOR



* Program paused January through June 2020

In 2022, the program:

- Introduced a new wave of 30,000 electric customers to receive both digital and paper reports starting in January and a new wave of 95,000 eHER only natural gas customers to receive digital reports starting in August. This is the first time the program has implemented a digital-only wave of customers.
- Increased electric savings by 33% and gas savings by 130% compared to 2021.
- Conducted a customer experience survey that resulted in higher ratings for overall program experience, program Net promoter score, and Consumers Energy Net Promoter Score that were higher than the previous survey conducted in 2019.

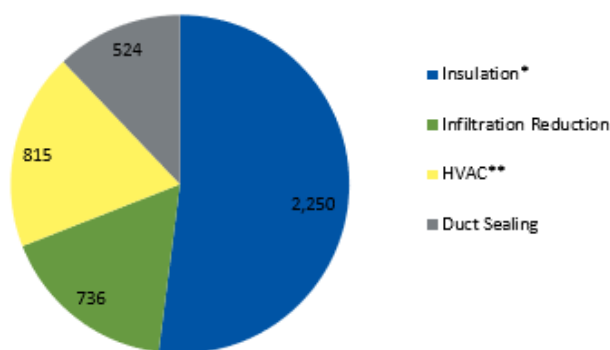


HOME PERFORMANCE WITH ENERGY STAR®

The Home Performance with ENERGY STAR® (HPwES) program provided long-term energy savings by helping customers analyze their energy use and make home improvements that considered the home as a complete system. These deep savings will be realized for years to come. Building Performance Institute (BPI) certified contractors offered Comprehensive Home Assessments that included diagnostic testing and inspection for health and safety issues and generated a report that informed the customer of energy savings, costs, and payback.

The HPwES program provided financial incentives for building shell improvements and energy-efficient heating and cooling equipment with tiered bonus rebates ranging from \$100 to \$700 available to customers who installed multiple measures. The program also utilized a bonus component for customers installing products from Michigan-based manufacturers. Contractors administered all required paperwork on behalf of the customer once improvements were completed, with customers receiving incentives in the form of a check or instant discount on the cost of the project.

2022 Installed Measures



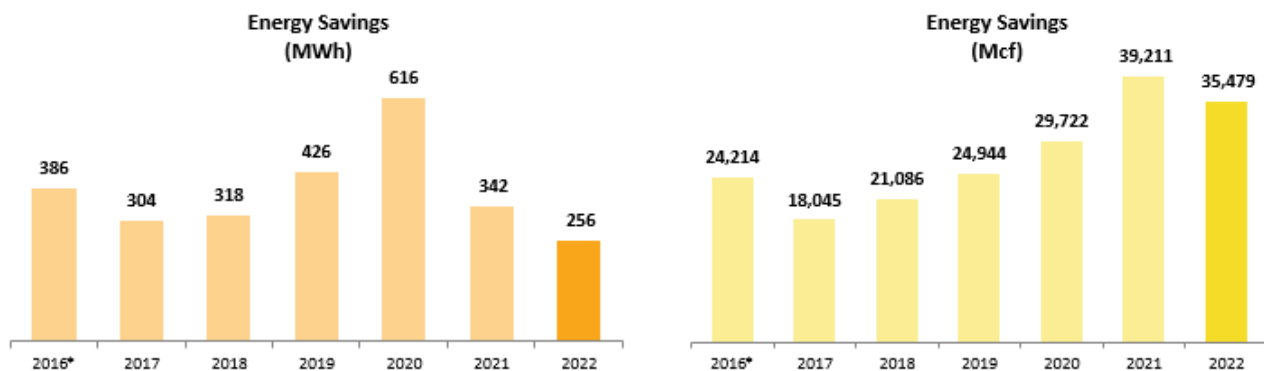
* Participating households. These measures are tracked per square foot.

** HVAC includes furnaces, boilers, and air conditioning.



In 2022, Consumers Energy was once again recognized as an ENERGY STAR® Partner of the Year - Sustained Excellence. This was the tenth year the Company received this extra designation, which is reserved for companies that demonstrate ongoing leadership across the ENERGY STAR® program, and the eleventh time since 2011 that the Company was named an Energy Star® Partner of the Year.

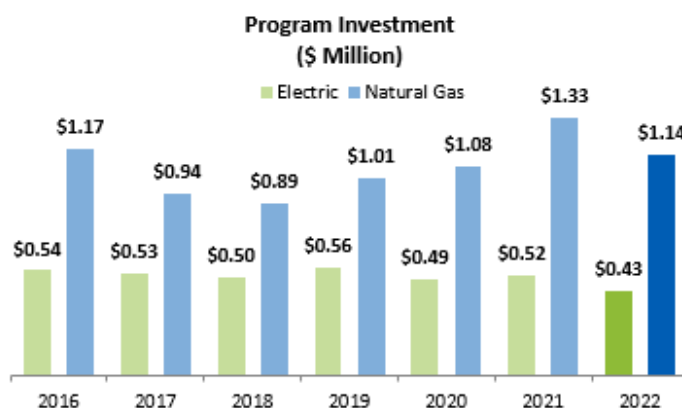
RESIDENTIAL SECTOR



*Includes savings multipliers

In 2022, the program:

- Incentivized 1,470 projects.
- Had five HPwES contractors qualify for the U.S. Department of Energy's "Century Club" designation, completing at least 100 projects.
- Provided education on Healthy Homes building materials to contractors in May 2022 through a Constant Contact digital bulletin.
- Supported BPI certification for two contractors and held ongoing BPI analyst trainings throughout the year.

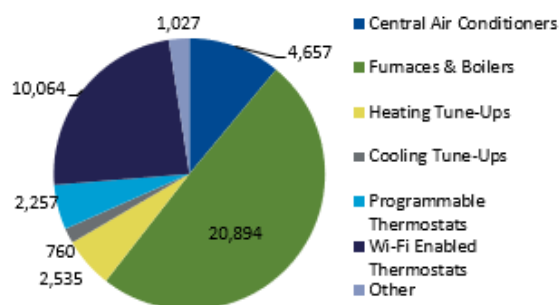


HVAC AND WATER HEATING

The Heating, Ventilation, and Air Conditioning (HVAC) program was designed to encourage residential customers to invest in high-efficiency heating, cooling, and water heating equipment.

A trade ally network of professional HVAC contractors assisted customers in determining the proper equipment for their home. The electric measures included high efficiency (15 SEER or greater) central air conditioning systems, high-efficiency heat pumps, ductless mini split systems, and cooling comprehensive tune-ups for central air conditioners. Natural gas measures included furnaces (95% AFUE and greater) and boilers (95% AFUE and greater), high-efficiency Energy Star certified storage gas water heaters, tankless (instantaneous) water heaters, and heating comprehensive tune-ups for air conditioners, furnaces and boilers. Combination measures included programmable thermostats and Wi-Fi thermostats.

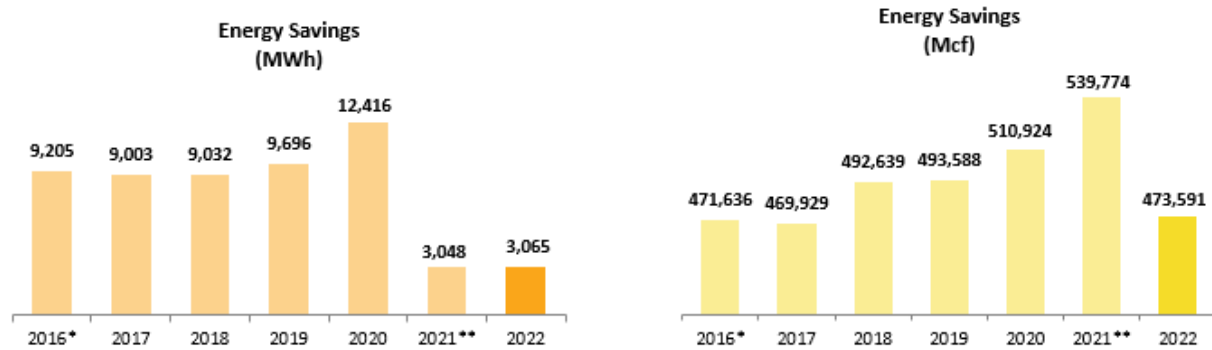
2022 Program Participation Rebates



For the past 9 years Consumers Energy has hosted the Excellence in Energy banquet, honoring top-performing participating contractors across four programs.



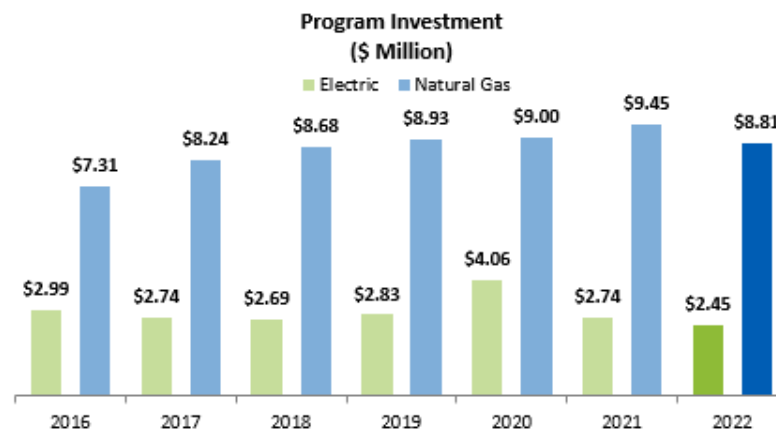
RESIDENTIAL SECTOR



*Includes savings multipliers
**ECM standard change

In 2022, the program:

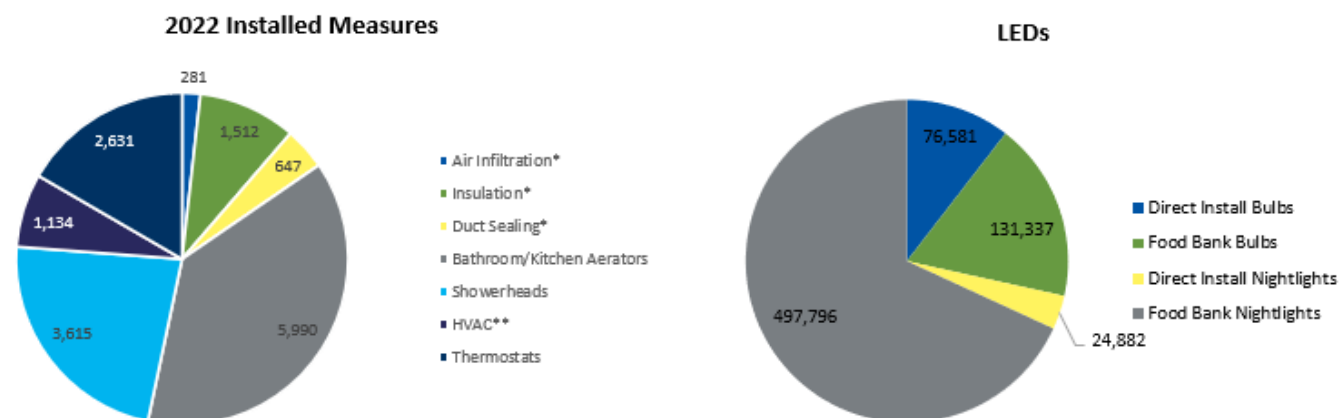
- Served 29,142 customers.
- Provided rebates totaling more than \$7.3 million (over \$104 million since program inception).
- Provided incentives at the distributor level totaling over \$495 million for 1,436 applications. This shift improves the customer experience by eliminating the installation application and rebate check process.
- Expanded customer rebate offerings through a new Midstream channel for qualified furnace and air conditioners Purchased wholesale through Lennox distributors.



INCOME QUALIFIED SINGLE FAMILY

The Income Qualified Energy Assistance program (also known as Helping Neighbors) is composed of several initiatives that deliver free energy efficiency products, services, and education to customers at or below 200% of the federal poverty level (250% for certain components) with the aim of delivering meaningful energy savings to financially vulnerable customers. The program offers a full range of eligible measures including insulation and air sealing, thermostats, HVAC equipment, and refrigerators, as well as energy kit care packages with virtual assessments.

The program uses direct outreach and education; however, the cornerstone of the Income Qualified single-family program is collaboration with community partner agencies. Program staff worked closely with nonprofits such as Community Action Agencies, Habitat for Humanity, and Community Development Block grantees to leverage existing state and federal funding to provide comprehensive assistance. The program's collaborative approach of engaging local agencies to fully leverage energy efficiency opportunities has provided more premium measures to customers. The program also works collaboratively with DTE's income qualified program to provide a seamless experience for customers in split territories.



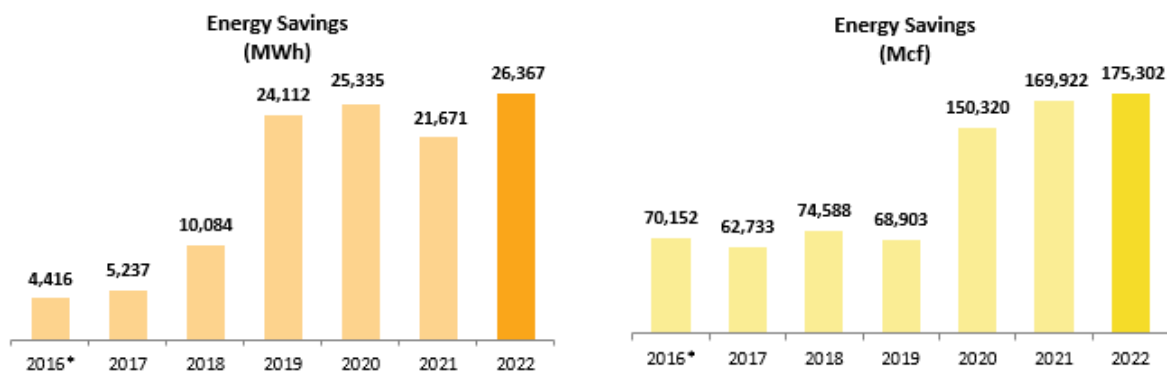
* Participating households. These measures are tracked per square foot.

** HVAC includes furnaces, boilers, and air conditioning.



In 2022, the Helping Neighbors program served 13,850 unique customers, assisting them in reducing their energy use. The program works collaboratively with community agency partners to optimize customer benefits and leverage EWR program investment.

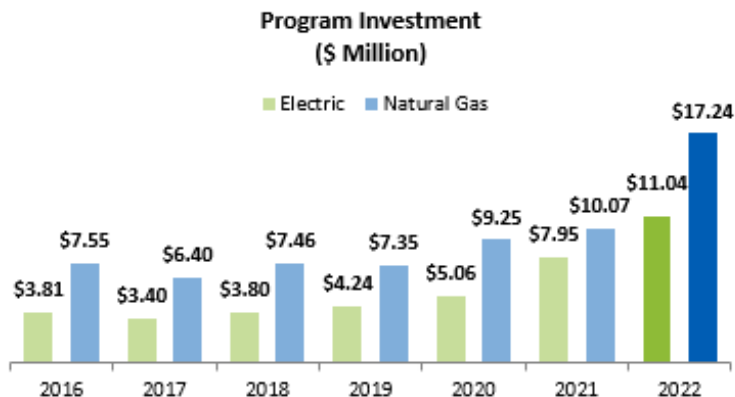
RESIDENTIAL SECTOR



* Includes savings multipliers

In 2022, the program:

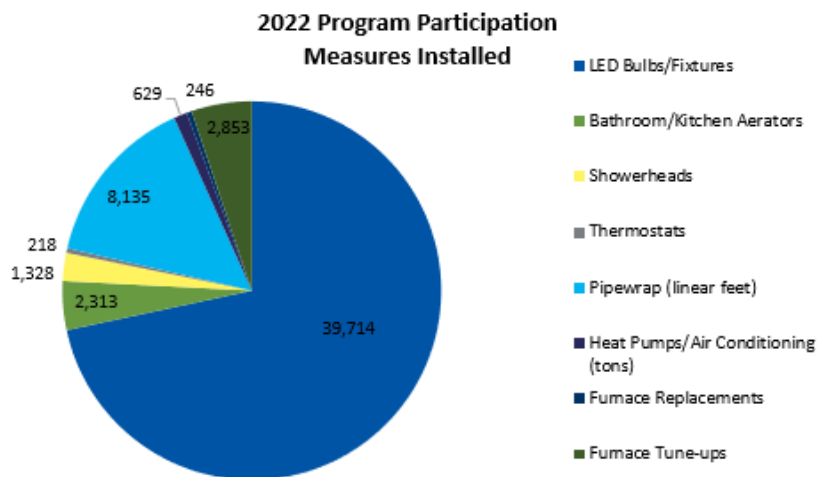
- Served 13,850 customers.
- Provided duct and air sealing upgrades along with other energy efficiency services to customers through the Manufactured Home Initiative.
- Achieved a customer satisfaction rating of 9.0 on a 10-point scale.
- Processed 1,379 applications for community-based organizations and nonprofit agency partner referrals.
- Installed more than 5,500 carbon monoxide alarms as part of the program's emphasis on carbon monoxide Safety.
- Expanded the Health and Safety Pilot effort designed to reduce EWR deferrals and better understand the impact of EWR intervention on air quality improvement and customer health.



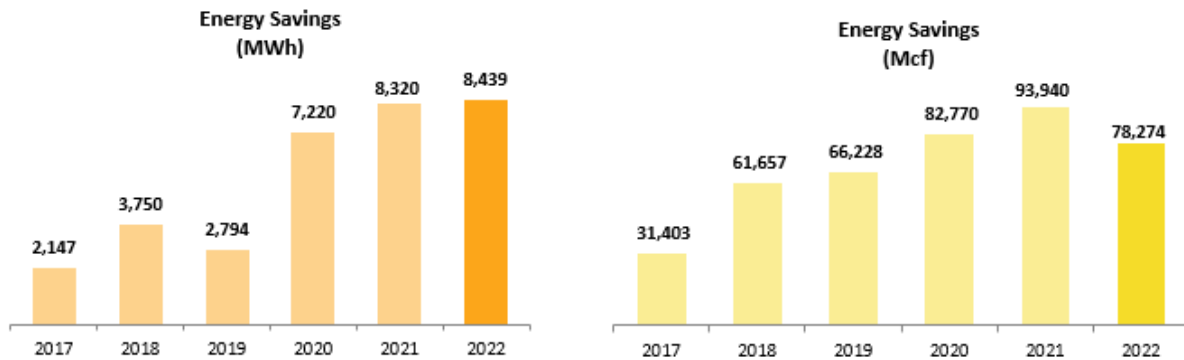
INCOME QUALIFIED MULTIFAMILY

This program was designed to offer income-qualified property owners a free, turnkey service for helping reduce energy use in common areas, as well as in tenant units. In addition to receiving direct installation of various energy-saving products, multifamily properties were also able to access prescriptive and custom incentives for installation of high-efficiency equipment in both common areas and tenant units. Through this program, income-qualified properties were eligible for higher incentives than market rate properties and also had access to unique program offerings like select appliance replacements and weatherization services.

This program assisted customers by coordinating direct installations, identifying energy saving opportunities, providing resources and trade ally assistance, and completing incentive applications on the customer's behalf. Program staff worked directly with property owners and managers to help them identify energy saving opportunities, and directed them to a program-approved trade ally for project implementation.



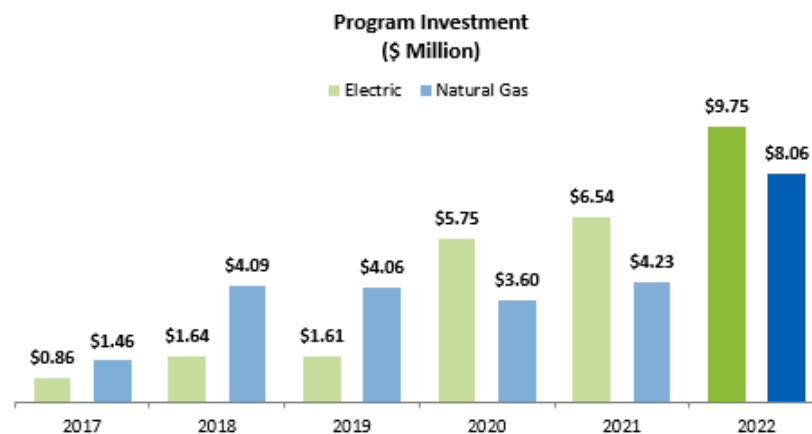
RESIDENTIAL SECTOR



Prior to 2017, investment was reported as part of the Market Rate Multifamily.

In 2022, the program:

- Provided over \$16.7 million in incentives to income-qualified customers.
- Installed 603 cold climate heat pumps.
- Installed measures in over 27,000 tenant units.
- Over 6,700 customers received window insulation kits.

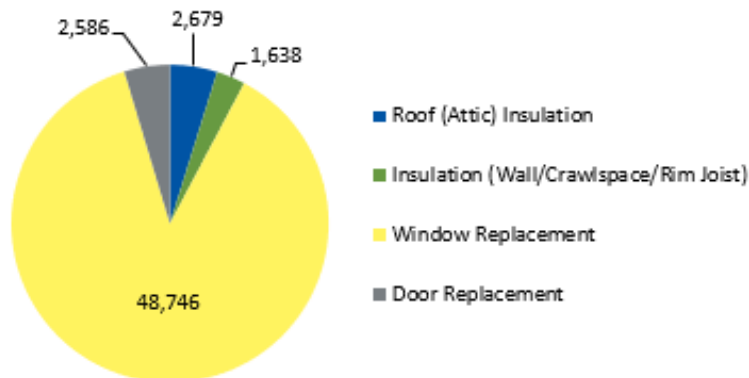


INSULATION AND WINDOWS

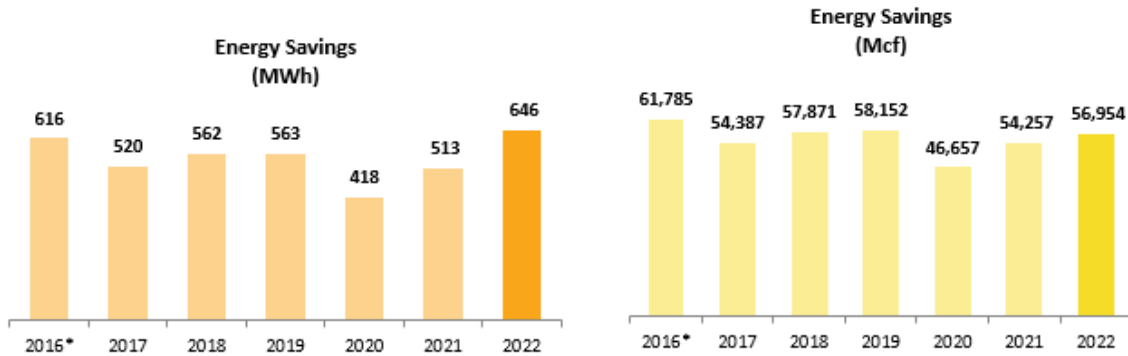
The Insulation and Windows (INWIN) program offered rebates for a variety of insulation measures and qualifying high-efficiency windows and patio doors. The program offered customers the ability to use the services of a contractor or to perform the improvements themselves.

The program raised awareness of the comfort and savings benefits associated with installing and/or upgrading insulation and energy-efficient windows and patio doors, provided information, and training and marketing support to participating contractors, and also offered a bonus program for customers that chose products from Michigan-based manufacturers.

2022 Program Participation Rebates



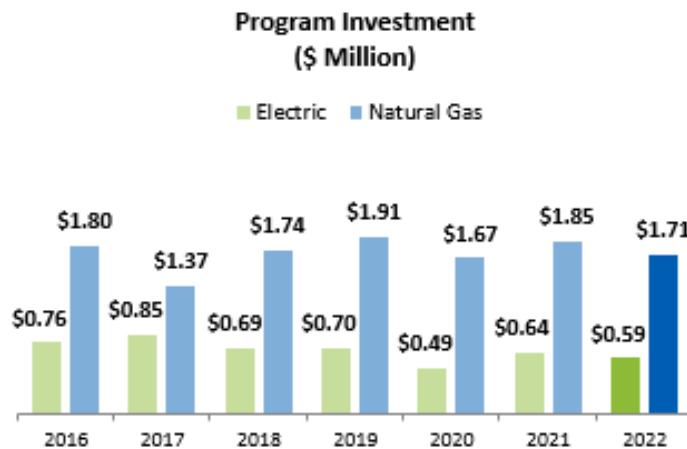
RESIDENTIAL SECTOR



* Includes savings multipliers

In 2022, the program:

- Continued collaboration with DTE's Insulation and Windows program team to streamline contractor outreach and education.
- Continued to increase communication with contractors by providing a quarterly newsletter.
- Provided rebates for 55,649 measures and processed more than 8,500 customer applications.
- Achieved an 8.8 rating on a 10-point scale in overall customer satisfaction while achieving a 9.4 rating for likelihood to recommend the program.



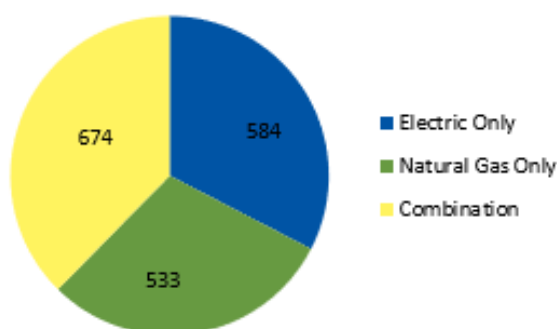
NEW HOME CONSTRUCTION

The New Home Construction program worked with builders and Home Energy Rating System (HERS)[®] raters to make energy-efficient, transformational changes in homebuilding. The program takes a whole-home approach, focusing on the home envelope throughout design and construction.

Builders work with certified HERS raters who provide the respective fuel summary comparison for energy savings calculations. The builder receives an incentive once a single-family home, duplex, or townhome has been ENERGY STAR[®] certified or reaches a HERS score of 56 or lower. Incentives vary by building type, customer fuel type, HERS score achieved, and ENERGY STAR[®] certification.

The program has a streamlined rebate application submission process via Ekotrope (HERS Rating Software), which reduces the administrative burden and automates the capture of home details and savings. Automated quality assurance and rebate processing allows homebuilders to receive expedited rebate checks.

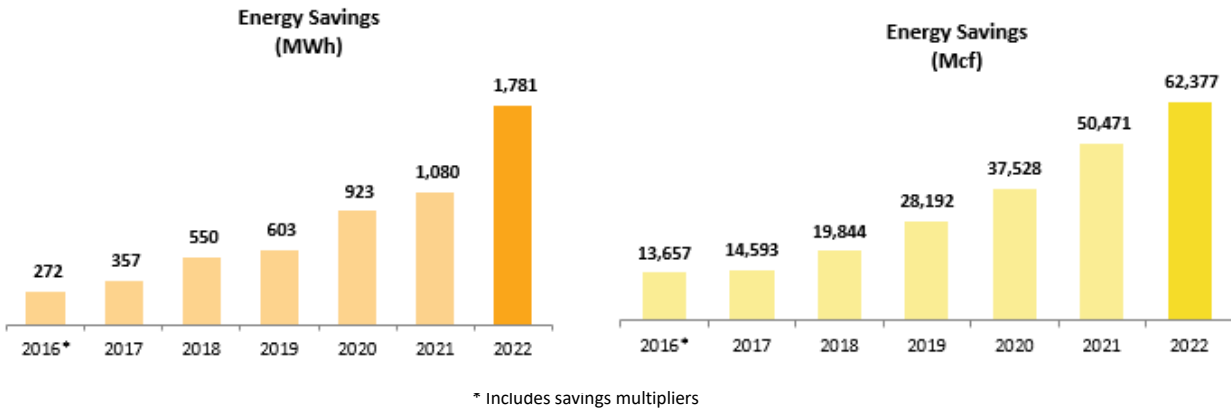
2022 Program Participation
Customer Type



The New Home Construction program approved a total of 1,791 new homes in 2022. The program was able to assist builders in taking that extra step to build to ENERGY STAR[®] standards, with 24 builders producing 440 ENERGY STAR[®] homes in 2022. By year-end, the program had 78 active builders and 19 raters. The program also added a HERS 57-59 as an entry-level incentive to engage with additional builders and help grow builders' energy efficiency awareness.

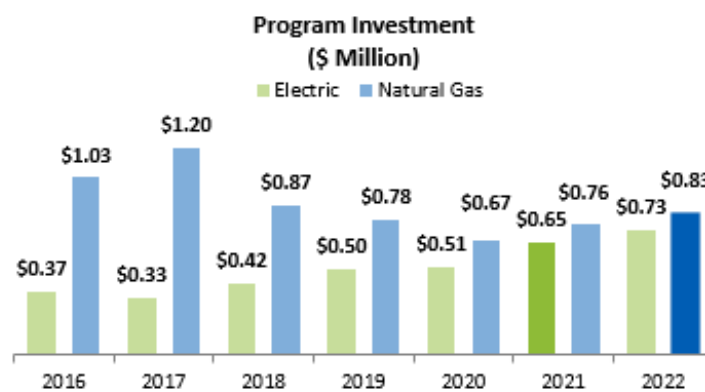


RESIDENTIAL SECTOR



In 2022, the program:

- Added 21 new builders, resulting in a total of 78 active builders participating in the program.
- Rebated 440 ENERGY STAR® Homes and 1,351 HERS homes across the Company's service territory.
- Paid an average of \$619 in rebates to builders per home.
- Received the Energy Star® Market Leader Award.



THINK! ENERGY®

The Think! Energy program, designed to support required classroom instruction on energy and natural resources, influenced students and their families to take actions to reduce their home energy use and increase efficiency. The primary objective was to develop a powerful culture of energy efficiency in students (grades 2-12), teachers, schools, and families throughout the service territory. The program offered the traditional Think! Energy Take Action program for grades 2 to 3 (Bright Kids), 4 to 6 (Take Action), and 7 to 12 (Innovation) along with education for the community and senior citizen groups (Community in Action/Energy Smart Seniors).

In 2022, the program was delivered with in-person presentations and several virtual options: webinars, recorded presentations, and an energy efficiency eLearning course. The program was delivered throughout the Company's combination electric and natural gas territory and in collaborations with DTE Energy, Lansing Board of Water & Light (BWL), Efficiency United, Lowell Light & Power, and SEMCO ENERGY Gas Company.

Following in-class or virtual energy efficiency presentations, participants received a take home kit filled with energy-efficient devices and educational materials. These activities raised awareness about how individual actions and low-cost measures can provide reductions in use of electricity, natural gas, and water in Michigan households.

In 2022, the program reached 558 schools, 11 senior day centers, and provided Think! Energy kits to 46,634 households across Michigan.



Bright Kids Kits

Included:

- LED Bulbs & Night Light
- Bathroom Aerators
- Window Insulation Kit



Take Action Take-Home Kits Included:

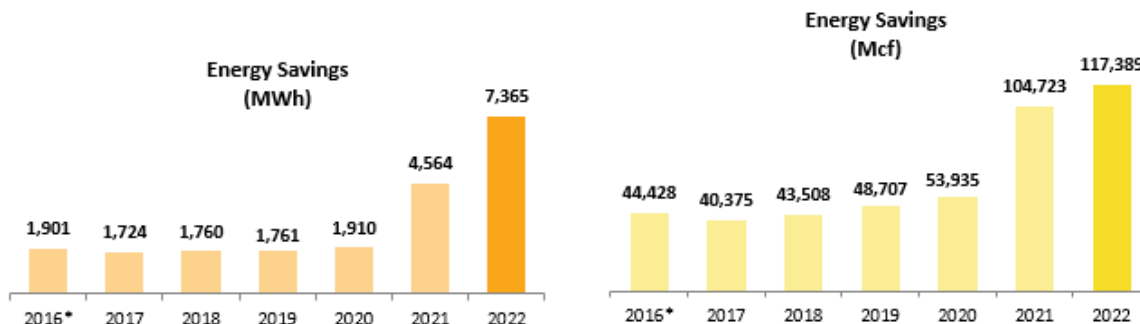
- Low Flow Showerhead
- LED Bulbs & Night Light
- Kitchen & Bathroom Aerators
- Shower Timer
- Light Switch Stickers
- Flow Test Bag
- Pipe Wrap



Innovation & Community Kits Included:

- LED PAR Bulbs
- Low Flow Showerhead
- Bathroom Aerator
- Shower Timer
- Flow Test Bag
- Pipe Wrap
- Window Insulation Kit
- Door Weatherstripping
- Advanced Power strip

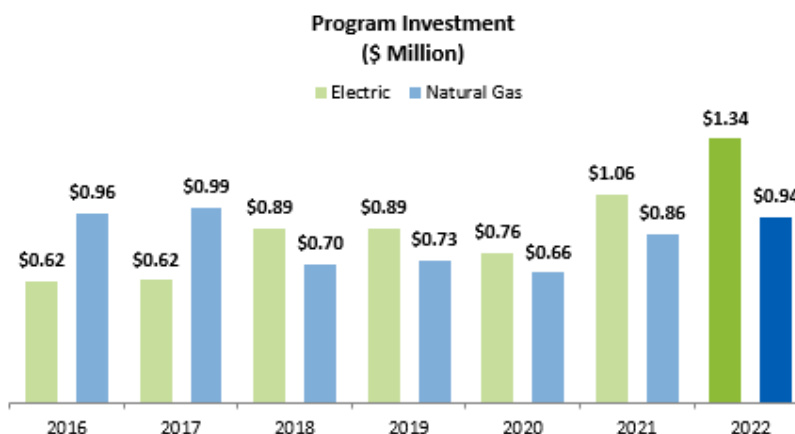
RESIDENTIAL SECTOR



* Includes savings multipliers

In 2022, the program:

- Added 7 new schools for a total of 558 schools participating in the program.
- Continued a high household satisfaction rate of 9.0 and achieved teacher satisfaction results of 9.5 on a 10-point scale.
- Continued with in-person and virtual presentation options, offering 857 in-person presentations and 144 webinars in addition to teacher-directed recorded presentations and e-learning courses.
- Added an LED task light as a teacher incentive gift to assess potential inclusion in 2023 kits.
- Expanded collaboration with DTE in the Comp'ny's electric territory by 1000 participants.
- Fully implemented the expanded the grade level (grades 2 to 3 and 7 through 12) and community offerings added to the program in late 2021.



COMPREHENSIVE BUSINESS SOLUTIONS PROGRAM

The Comprehensive Business Solutions Program, the largest program within the Company's business EWR portfolio, is composed of Prescriptive, Custom, and Segmented offerings.

Prescriptive Component

The Prescriptive component offered incentives to customers who purchased specific high-efficiency measures that delivered a predetermined level of deemed energy savings based upon the Michigan Energy Measures Database. Prescriptive rebate applications were completed by customers and trade allies. The program significantly increased demand for energy-efficient products by educating business customers and trade allies about energy and money-saving benefits. The prescriptive component was responsible for 224,833 MWh or 67.4% and 501,148 MCF or 46.8% of the Comprehensive Business Solutions program goal.

The prescriptive program continues to provide an easy avenue for customers to receive a discount at the point of purchase for eligible energy-efficient equipment through the Midstream Business Instant Discount Program (BIDP). In 2022, the program signed up 73 suppliers, with 195 locations offering energy-efficient lighting, HVAC, and food service products. The BIDP within the prescriptive component provided 540,699 MWh or 10% and 19,812 MCF or 2% of the Comprehensive Business Solutions program goal.

In 2022, the Prescriptive component:

- Achieved a 9.2 overall customer satisfaction score on a 10-point scale.
- Processed and paid 4,797 applications representing rebates totaling over \$45.8 million.

Custom Component

The Custom Component assisted larger commercial and industrial (C&I) customers with the analysis and selection of high-efficiency equipment or processes. This program approach identified more complex energy-saving projects with incentives based on a per kWh and/or per Mcf basis. The program team worked with customers and trade allies on prospective projects to help complete custom engineering calculations that assessed energy savings potential, payback horizon, project eligibility, and incentive amounts. The program provided customer outreach through energy advisors and Energy Solutions Managers, as well as technical assistance to identify more complex projects, particularly in the process improvement realm. The custom program was responsible for 570,715 Mcf or 53.2% of the Comprehensive Business Solution program's natural gas goal and 108,911 MWh or 32.6% of the Comprehensive Business Solution program's electric goal.

In 2022, the Custom program:

- Provided 14 customers with rebates of more than \$100,000 with 2 projects receiving over \$1M and the largest project receiving \$8M in incentives.
- Processed 59 applications representing rebates totaling \$16 million.

Segmented Offerings

Specialty programs target business customer segments and are designed to provide a holistic energy savings approach for participating customers. In 2021, four specialty programs were offered as a part of the Comprehensive Business Solutions EWR program.

Networking Lighting Controls

This initiative incentivized business customers to take a holistic approach to lighting retrofits by transforming the market from a “widget/gadget” approach to a systems approach of lighting improvements that produced deep energy savings. It provided education and incentives to complete projects using the latest technologies, while achieving the most comprehensive savings through integrated fixtures and controls. This program targeted large installations of these projects in sectors including, but not limited to, warehouse, cold storage, hospitals, higher education, manufacturing, and big box retail. In 2022, the program provided \$2.69M in incentives to 39 projects and achieved 11,445 MWh savings.

ENERGY STAR®

This initiative assisted organizations with identifying energy savings opportunities through benchmarking buildings at single or multiple locations, conducting energy efficiency assessments, generating a report based on the assessment findings and benchmarking data, and assisting customers through the ENERGY STAR® Certification process. The report outlines recommended energy-efficiency measures intended to achieve energy cost savings across facilities, provides examples of energy and environmental leadership actions, and raises public and corporate awareness of the benefits of energy efficiency. In 2022, 153 businesses were assisted in achieving Energy Star certification.

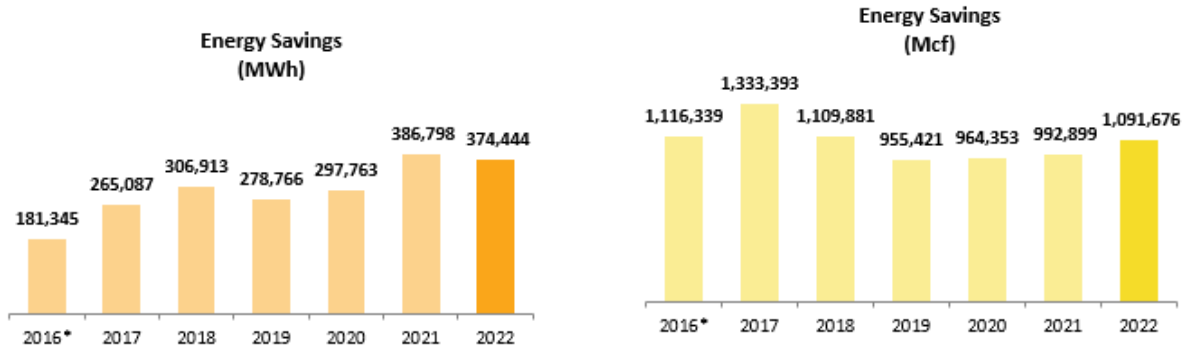
Industrial Energy

This initiative is designed to make industrial customers aware of the assistance and incentives that are available for their given energy processes, including but not limited to, steam, compressed air, water treatment, wastewater, and energy management. In the larger scheme, it also served to help industries integrate Energy Management Systems into continuous processes to help industrial customers reduce energy use and operations costs while improving process efficiency. In 2022, the program completed 42 ASHRAE Level I audits and 15 ASHRAE Level II audits. Additionally, the Company completed 8 injection molding Barrel insulation audits. In 2022, the IEM initiative served 42 customers through ASHRAE level 1 audits and 15 customers through ASHREA level II audits with an investment of \$411,000. These audits identified and delivered projects providing \$4.31M in incentives, 35,912 MWh and 13,000 Mcf in 2022, and will continue to deliver projects and savings in future years. The Company is continuing to assess options for expanding IEM efforts.

Smart Buildings

The Smart Buildings initiative identified energy savings opportunities for customers through benchmarking, assessment, and analytic strategies, using techniques similar to an initial building commissioning process. Several different program components were offered to customers to focus on retro-commissioning their facility system, including building benchmarking, building tune-up, defined actions, and whole building facility IT. Annual operating expenses are lowered by optimizing building management systems, and savings are achieved by implementing energy efficient operational changes and low-cost measures. The Smart Building initiative achieved energy savings of 8,221 MWh and 43,437 Mcf in 2022.

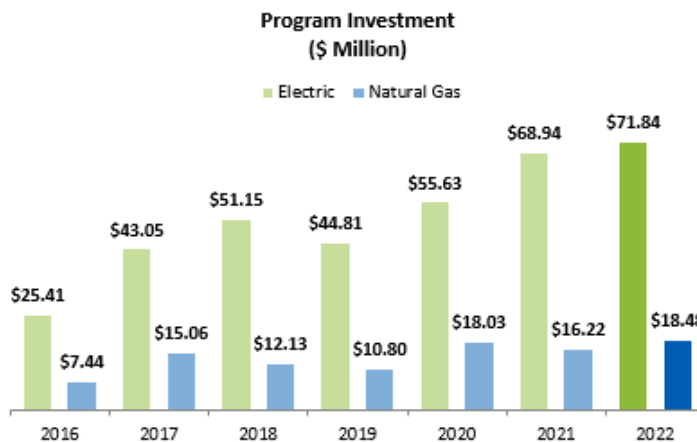
BUSINESS SECTOR



* Includes savings multipliers

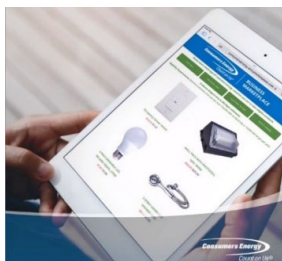
In 2022, the program:

- Received national recognition from the Association of Energy Services Professionals (AESP) for its groundbreaking program design and implementation - Commercial & Industrial. The Award was for the team's specific work in the compressed air nozzles that delivered 40,000 MWh in savings.
- Received the Utility of the Year award from Michigan Energy Efficiency Contractor Association (MEECA) for design and implementation.
- Since 2009, the program has helped Michigan businesses to complete 61,870 electric and natural gas energy efficient projects. These projects have saved 3.1 million MWh and 11.4 million Mcf – the equivalent of reducing CO2 emission generated by 450,000 homes' energy use for one year. The program staff holds a quarterly trade ally council meeting to listen to contractors' feedback and incorporate it into the program design.



SMALL BUSINESS SOLUTIONS

The Small Business Solutions program targeted small business customers, a critical customer segment that employs 1.9 million people in Michigan, according to the Small Business Association. As small business customers often lack the technical and financial resources necessary to participate in efficiency programs, the Small Business Solutions program offered focused solutions and highly discounted services to encourage and support EWR participation. The Small Business Solutions is comprised of three components: the Energy Efficiency Program, the Energy Assessment Program, and the Business Online Store (also known as the Business Marketplace).



Small Business Store (online marketplace)

The Small Business Store (online marketplace) offers a simple online, hassle-free experience with deeply discounted energy efficiency products, and free shipping. These products include, but are not limited to, LEDs, aerators, pre-rinse sprayers, air purifiers, pipe wrap, and other specialty lighting options. In 2022, 2,219 customers ordered over 21,000 products including 165 smart thermostats and 5,114 LED bulbs and specialty fixtures through the Small Business Store.

Energy Efficiency

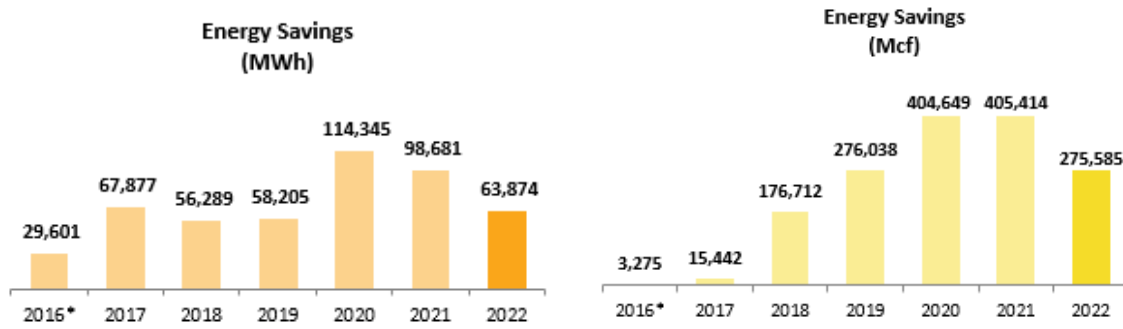
The Small Business Energy Efficiency Program is Consumer Energy's flagship "white glove" program developed to reduce the burden of participation by providing higher incentives than the Company's Comprehensive Business Solutions Program, with an average return on investment of 1.5 years. Customers simply pick a trade ally, who, in turn, handles all steps of participation, including providing a proposal, installation of products, and submittal of all necessary paperwork. In 2022, 767 applications were processed with an average savings per application of 21.7 MWh. The program also received a high customer satisfaction rating of 8.5 on a 10-point scale.



Energy Assessment

The Energy Assessment includes a complimentary on-site walk-through review of the customer's facility to identify savings opportunities, energy usage information, and provide recommendations by means of a final report for additional ways to improve energy efficiency. In addition, the customer can receive installation of free products such as smart and programmable thermostats, aerators, pre-rinse sprayers, showerheads, screw-in LEDs, smart strips, and pipe insulation, that can be valued up to \$500. In 2022, the Energy Assessment initiative conducted 12,068 on-site visits, providing installation of 1,501 smart thermostats, and delivered 4,350 electric kits and 2,102 power strips.

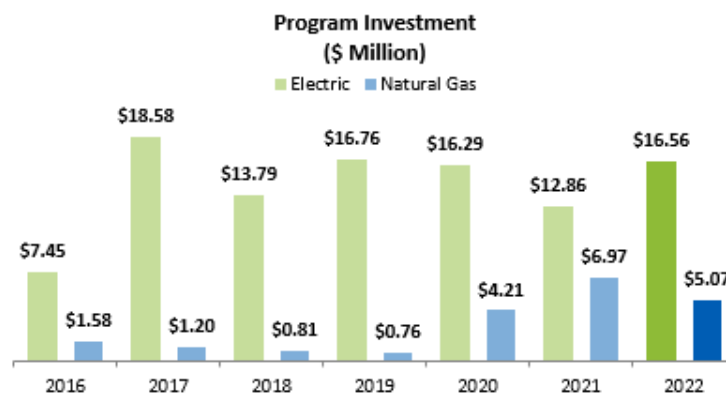
BUSINESS SECTOR



* Includes savings multipliers

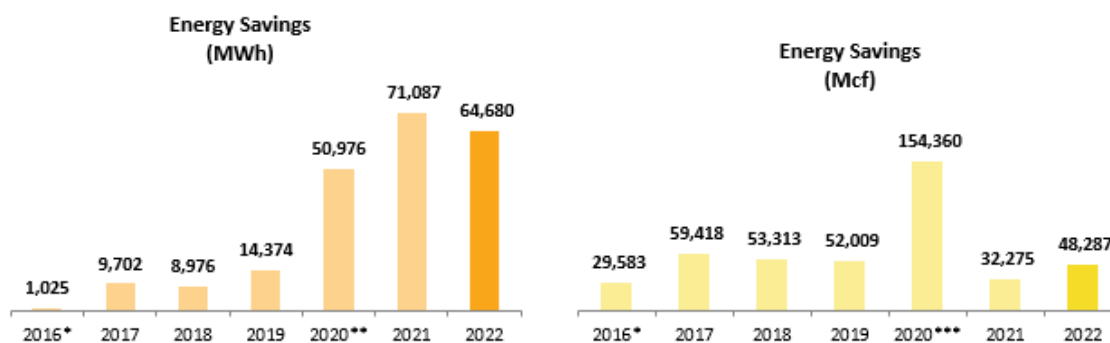
In 2022, the program:

- Received an overall customer satisfaction rating of 8.3 on a 10-point scale.
- Delivered over 12,423 customer interactions.
- Completed 13,874 on-site assessments.
- Installed or delivered 2,059 smart Wi-Fi thermostats.



BUSINESS AGRICULTURE

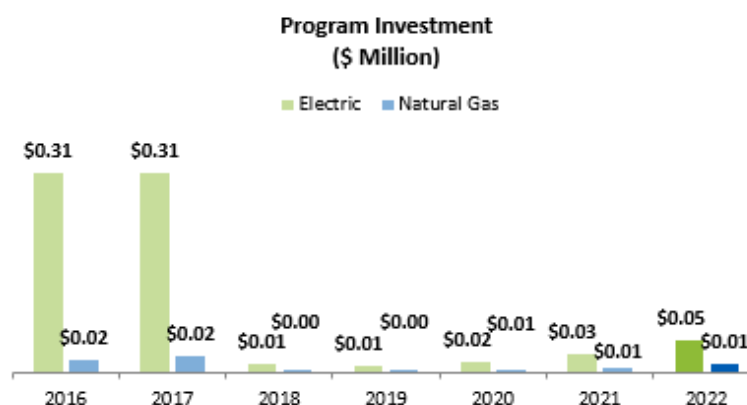
The Business Agriculture program was designed to offer two components to encourage and assist the Agricultural Industry's participation in the program. The first component provides incentives to Tier II United States Department of Agriculture Audits performed by Michigan State University certified agricultural auditors for all residential and commercial agricultural industry customers. The second component provides agricultural customers with either a residential or commercial utility service to access all applicable C&I program process systems and equipment incentives, which include 52 specific agricultural measures—optimizing EWR access for this large diverse Michigan business sector. In 2022, 326 commercial customer applications were processed for a total of \$13,473,390 in project incentives to commercial agriculture customers.



*Includes savings multipliers

**Increase linked to indoor agriculture measures

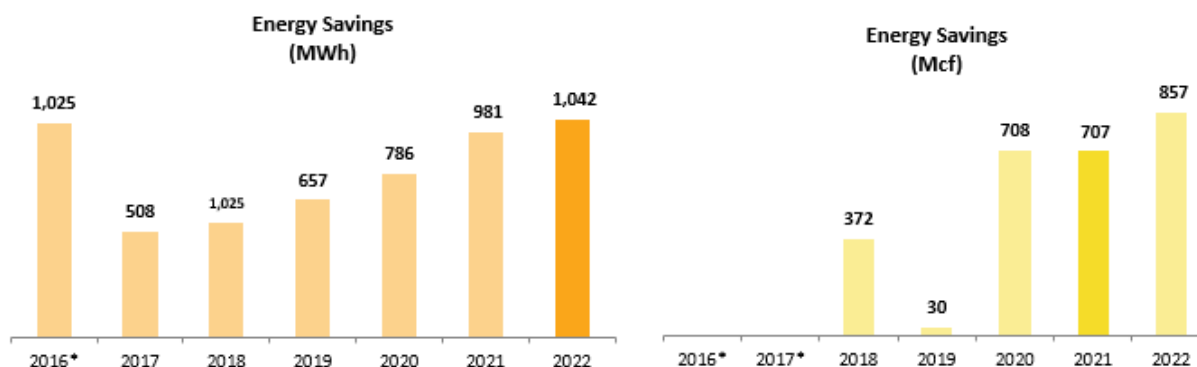
***Approximately 90,000 Mcf was the result of one project in 2020



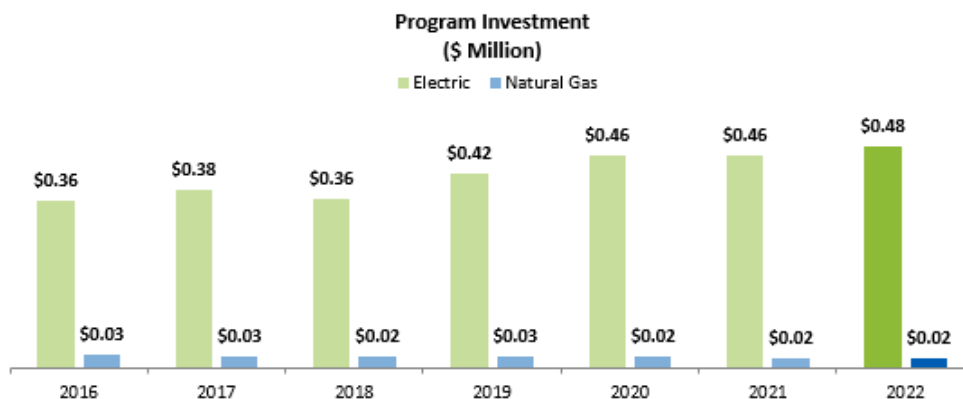
*Business Agriculture energy savings and investments are reported as part of Comprehensive Business Solutions.

RESIDENTIAL AGRICULTURE

The Residential Agriculture program was designed to offer residential agriculture customers incentives for energy saving measures included within the business EWR portfolio. By utilizing the program structure from the business program, the Residential Agriculture program was able to offer commercial incentives to residential farms with industrial-grade equipment and operations. Like the business agriculture component, this residential program collaborated with Michigan State University's Farm Audit program to offer incentives to customers who had an audit completed at their facility. Installed measures for the program included lighting, pre-cooler and agriculture fans, livestock waterers, and refrigeration. In 2022, three farm audits were performed and 63 residential farm applications were processed for a total of \$168,000 in project incentives to residential customers.



*Includes savings multipliers



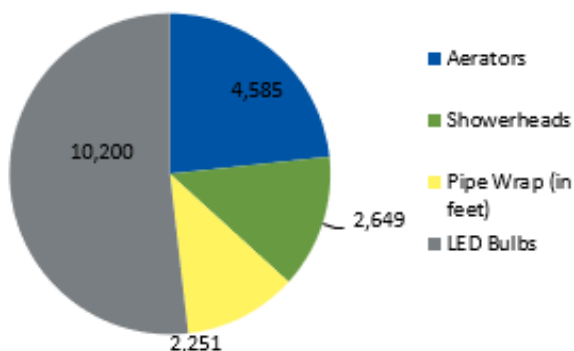
*Measures for natural gas are often designed for commercial agriculture applications and it is not uncommon for there to be zero savings for residential agriculture

MARKET RATE MULTIFAMILY BUSINESS & RESIDENTIAL

This program was designed to offer property owners a free, turnkey service for helping reduce energy use through direct installation of various energy saving- products and access to prescriptive and custom incentives for installation of high efficiency equipment in both common areas and tenant units.

This program assisted customers by coordinating direct installations, identifying energy saving opportunities, providing resources and trade ally assistance, and completing incentive applications on the customer's behalf. Program staff also recruited the participation of trade allies and trained them on the benefits of the program for prescriptive and custom retrofit projects for their customers. Program staff also worked directly with property owners and managers to help them identify energy saving opportunities and direct them to a program-approved trade ally for project implementation.

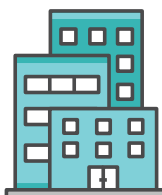
2022 Market Rate Install Totals



288
projects
completed



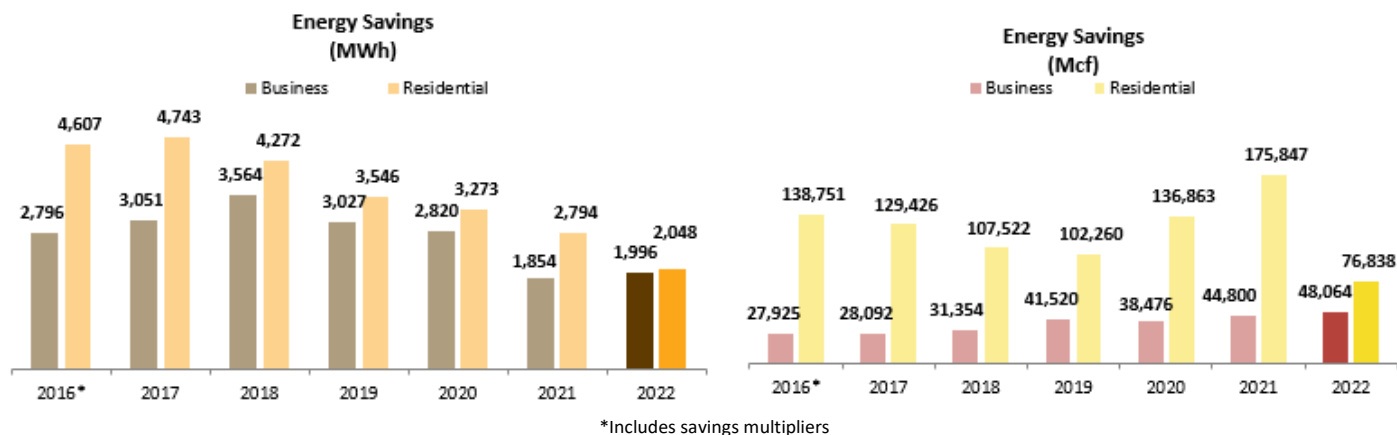
3,081
buildings
served



37,651
units
served



JOINT PROGRAMS

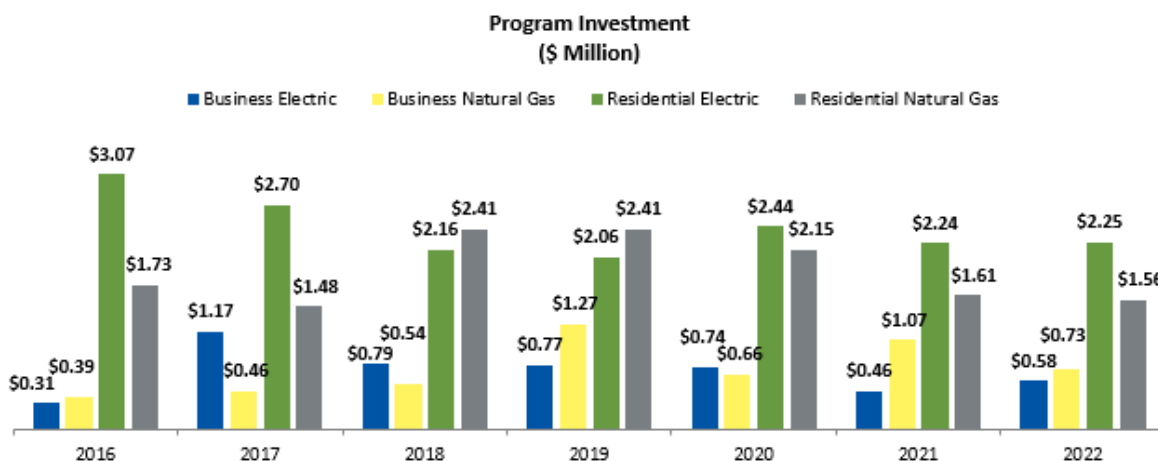


In 2022, the program:

- Provided over \$2.0 million in incentives to market rate customers.
- Achieved natural gas savings equal to carbon sequestered by 11,156 acres of forest* and energy savings equivalent to running a refrigerator for 6,018 years.**
- Replaced over 1,500 furnaces, improving heating ability and energy costs for 1,516 customers (4% of all Market Rate customers served.)

* Source: www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

**Source: <http://www.wrecc.com/what-uses-watts-in-your-home/>



EWR PILOT PROGRAM

The EWR Pilot program pursues new initiatives, customer approaches, and technology that could capture additional energy savings within the residential, small to medium-sized business, and larger business customer segments. The intent of EWR pilots is to research, design, test, and evaluate new program concepts that can provide customer benefit, solve customer challenges, increase program participation, and foster the next generation of clean energy technologies needed to support the Company's energy savings goals. In addition to the residential and business pilot efforts described in this report, the pilot team also explored new EWR measures and industry and technology research to identify, develop, and assess new pilot concepts.

Residential Pilots

Super-Efficient, All-Electric New Homes

Launched in 2020, the Super-Efficient, All-Electric New Homes pilot aims to decarbonize residential buildings and assess the potential of zero energy ready homes in Michigan. This pilot is a collaboration between Consumers Energy and home building partners to foster scalable production of affordable, high-performance single-family homes. Pilot learnings will be used to evaluate energy bill impacts, heat pump performance, customer comfort, builder barriers, and cost-effectiveness. Phase 1 comprised four homes built in Kalamazoo, which were completed and sold. A mix of EWR and decarbonization measures were installed in the homes including rooftop solar photovoltaic (PV) system readiness, cold climate heat pumps with energy recovery ventilator, comprehensive air sealing, premium insulation, ENERGY STAR® triple-pane windows and appliances, and a 240 V outlet for fast level 2 electric vehicle charging.

In 2022:

The Company continued Phase 2 of the pilot that was initiated in 2021, completing 22 residential new construction projects submitted by 11 builders. The minimum eligibility for Phase 2 homes was: all-electric heating equipment, a home energy rating score (HERS) of 40 or less, and the installation of solar photovoltaic infrastructure to meet the Department of Energy's (DOE) Zero Energy Ready Homes requirements. Of the 22 Phase 2 projects, 5 were market rate and 17 were affordable housing for income-challenged customers.

Based on submissions to the pilot, Consumers Energy was able to test the viability of all-electric housing in colder Midwestern climates and gain a better understanding of the barriers that builders face in order to construct the housing stock of the future. While working with builders and HERS raters, the pilot noted a variety of energy efficiency and decarbonization measures installed across qualifying homes' mechanical systems that are not traditionally found in code-built or above-code homes. These include cold climate air source heat pumps, energy recovery ventilators, and heat pump water heaters. Participating projects also included a high-efficiency building envelope with above code insulation installed in the slab, above-grade walls, and attic. As a result of using high-performance building practices, incentivized projects had an average HERS score of 36 before the installation of PV systems. In addition to providing incentives for meeting program requirements, the pilot also provided additional incentives to income-qualified projects that installed solar PV systems.

Looking to the future:

Building off the success of 2022, the pilot is planning to incentivize over 30 additional projects that meet program requirements in 2023.

Income Qualified Health and Safety

The Income Qualified (IQ) Health and Safety pilot began in 2020, and takes a holistic view of homes and multifamily properties through both energy-saving and health benefits perspectives. The pilot assesses what repairs are needed to allow customers to install energy-saving measures and provides assistance on those repairs. The pilot also partners with organizations and contractor networks to leverage other program funds available to participating customers to maximize the assistance they receive.

In 2022:

The Company invested \$2.58 million in this pilot, serving 133 single-family income-qualified customers and 2,004 income-qualified multifamily tenant units. Of those participants, 85 of the single-family and 22 of the multifamily were in utility bill arrears. Additionally, 68 of those single-family participants in arrears reported a household respiratory health issue. The pilot included the following primary components:

- The TrueNorth Health Homes and Habitat for Humanity Holistic Home components leveraged home repair funds to provide home repairs and installation of energy efficiency measures. Repairs at participating residences included roofs, gutters, plumbing, drywall, windows, stairways, railings, indoor air quality, ventilation, carbon monoxide detectors, fire alarms, and appliances. Once completed, a technician assessed the home for energy efficiency opportunities, installing measures such as appliances, insulation, and air sealing.
- The Healthier Homes component partnered with health organizations to provide core energy efficiency measures coupled with expanded remediation actions to customers with asthma, COPD, and other respiratory issues with the aim to improve indoor air quality and reduce environmental triggers in the home. A customer advocate aided each participant with navigating the program. The initiative included an online questionnaire and respiratory ailment screening, a home health and energy assessment to identify and install weatherization measures for customers, and pre- and post-retrofit data collection.
- The Multifamily Health and Safety component engaged trade allies to identify and address energy efficiency deferrals, where present health and safety issues prevent installation of energy efficiency. Services provided ranged from electrical panel upgrades needed for cold climate heat pumps to ceiling structure repairs needed for attic insulation and correcting issues with ventilation and mold remediation for overall tenant health, safety, and comfort. A limited number of energy kits and air purifiers were also provided to tenants.

Looking to the future

In 2023, the Company will increase pilot investment to expand existing efforts while also identifying and engaging new community partners and pilot evaluation. The pilot will also coordinate activities with both the Income Qualified program's Flint Initiative, a new targeted effort to promote coordinated EWR services in Flint zip codes with high energy burden, and anticipated home weatherization expansion efforts driven by federal investment (including IRA and IIJA funding). In 2023, the Healthier Homes component will continue to target customers with respiratory issues to test and evaluate the impact on customers health from energy efficiency coupled with expanded remediation actions. For the Healthier Homes component, the Company will focus on education and outreach to increase referrals of clients with respiratory conditions and identify and secure new healthcare and community agency partners.

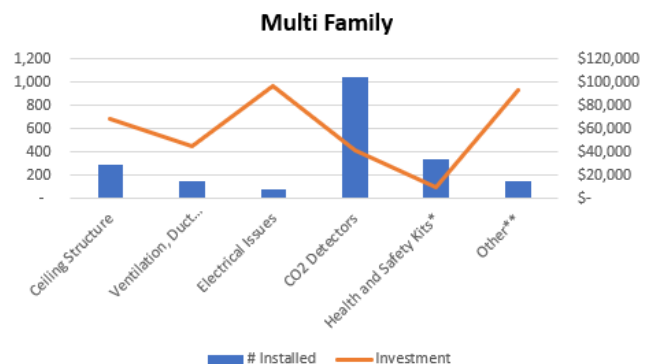
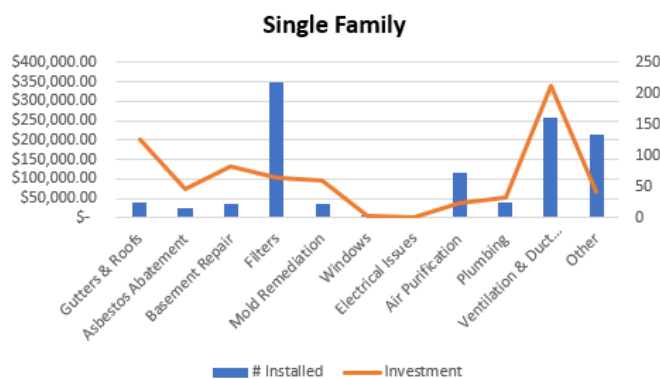
Pursuant to the MPSC Case No. U-20875 (2022 – 2025 EWR Plan) Settlement Agreement the Company is providing the following data for the Health and Safety Pilot.

PILOTS

Income Qualified Health & Safety Pilot		
	Single Family	Multi-Family
Investment	\$2,185,059	\$400,603
Total Energy Savings (MWh)	129	465
Total Energy Savings (MCF)	2,747	4,528
# of Customer Served	133	2,004
# of Deferrals Identified	754	3,097
# of Deferrals Resolved	754	2004*
# of Disconnections	9	8
# of Measures Installed	2,024	2,004
# of Repairs Completed	754	570
Customers in Arrears:		
# of Customers receiving Outreach**	126	954
# of H/S Participants	85	22

*Number of customer units in deferral projects

**All customers in arrears receive communication about EWR Income Qualified programs. In 2022, the energy assistance program sent 70,000 letters or emails referencing EWR low income qualified programs to customers eligible for energy assistance programs or in arrears. The outreach data in this line is the number of pilot participants that were not directly referred by a community partner.



*Health & Safety Kids include: no-touch keychain, instant hand sanitizer, disinfectant wipes, solar bank and 100 Ways to Save Pamphlet

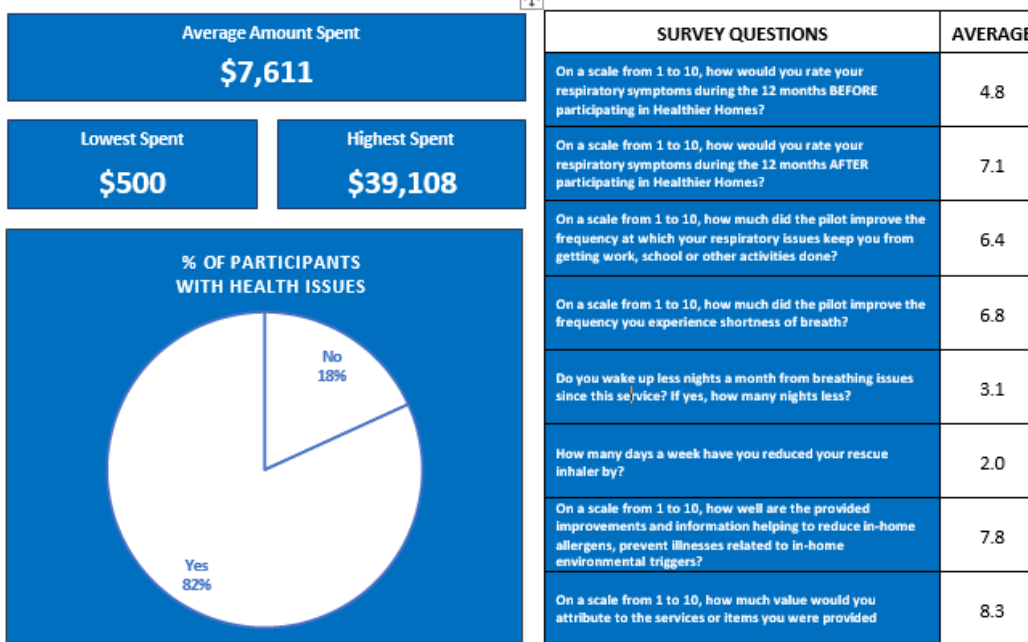
**Other includes: air source heat pumps pipes and pads and air purifiers

Health Impacts

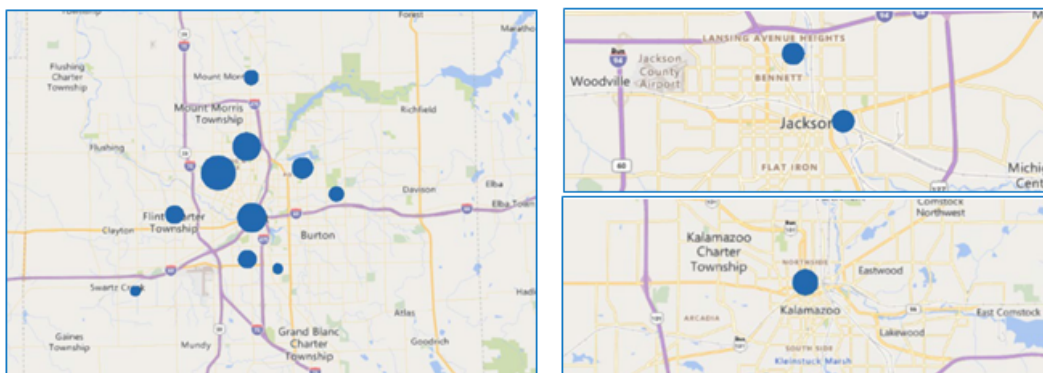
Available single family customer survey data is provided below with additional survey data anticipated in mid-2023. For multifamily, a brief customer survey to assess multifamily participant health impacts is in development with anticipated implementation mid-2023. The Company, working with health entity partners, is in the process of collecting health assessment data. Health outcome data will be included in future annual reports and shared with the EWR Low Income Workgroup per the Case No. U-20875 Settlement Agreement.

2022 Healthier Homes Survey Results

Results from 88 participants



Location based on Zip Code



PILOTS

Customer Testimonials

"Thank you all so much. My daughter's breathing is doing tremendously better. We are sleeping better at night, my house is warmer and my bill is gradually decreasing. Thank you!"

"The pilot was very beneficial to myself and my family being that we suffer from sarcoidosis and chronic asthma. All services were wonderful. I am very appreciative and hope to see more pilots such as this in the future."

"Everything works great. I have no complaints. Everything was installed with instructions. The installers were all nice. My son hasn't had a nose bleed since summer, no hospital trips due to not being able to breathe. No respiratory infection."

"I can't begin to thank the Consumers Energy Healthier Homes program enough. They have been so helpful to me and my patient's in improving air quality in homes of asthmatics. One patient in particular expressed all the extensive investments (new furnace, carpet removed, air purifier, etc.) Consumers Energy has put into her home and how much it has improved her child's asthma. These improvements have significantly reduced their visits to urgent care and the ER department. Making these changes have improved their quality of life now that their symptoms are under control. Thank you so much!"

Predictable Billing

This pilot is testing the use of a predictable bill to prevent increased energy consumption, realize energy savings, and analyze customer behavioral changes to energy use optimization. Customers who have concerns with fluctuating bills receive a flat monthly bill for a 12-month period with no reconciliation during that period. Electricity use is optimized through a smart thermostat to offset any variances in the flat monthly amount. After 12 months, the customer receives a bill credit if their usage was lower than the total paid amount.

In 2022:

2021 pilot learnings indicated that while flat billing combined with energy optimization efforts does reduce energy consumption, the flat bill amount was not an effective predictor of energy consumption. In response, in late 2021, the Company began testing the use of a budget plan that features quarterly adjustments (true ups) to actual usage paired with optimization to assess impact on predicting and managing bill amounts more accurately. In total, 280 customers participated in the predictable billing pilot with 75 new participants added in 2022 with the budget plan. Based on initial customer satisfaction survey results, participants appear to view predictable billing favorably.

Looking to the future:

In 2023, all current participants will be moved to the Consumers Energy budget plan to continue assessing and comparing forecasting accuracy and energy use optimization. Pilot activities will also include continued evaluation work to further determine savings potential and customer satisfaction.

My Energy Analyzer

This pilot brings real-time usage to the fingertips of the user through a mobile App and bridge device that connects to the customer's meter and provides customer consumption data. In this pilot, the Company is testing the technology used to deliver real-time usage, as well as assessing consequent energy savings.

In 2022:

Pilot activity in 2022 focused on building and designing the pilot in partnership with Powerley. Given the complexity, it was determined to start small and enroll approximately 100 employee customers in an initial pilot test group, providing opportunity to evaluate and assess the technology and system integration requirements, and obtain real-time feedback from users. Learnings from this initial cohort will inform the design of a larger scale pilot, currently planned for 2023.

Looking to the future:

The initial employee test group will continue into 2023. The company will also work with Powerley, incorporating learnings from the employee test group to design and implement a larger scale initiative for a broader customer group.

Aerial Thermal Imaging with MyHEAT

The Aerial Thermal Imaging pilot is implemented in partnership with MyHEAT to use aerial thermal imaging to create heat loss maps for individual residential buildings that provide comparative data (a HEAT Rating is assigned to each home with 1 being the most efficient and 10 least efficient) and visual data through an online interactive homeowner profile. The online platform connects homeowners with existing energy efficiency programs to encourage participation in those programs, targeting insulation and other envelope sealing measures.

In 2022:

In the first quarter of 2022, the pilot was launched to customers in Flint and Kalamazoo/Portage, via mailer and email engagements, encouraging customers to visit their online home profile and see personalized images and ratings of their individual home's potential energy loss. Throughout the year, the pilot engaged with customers four times with seasonal and personalized messaging and analyzed key performance indicators such as unique profile visits and click through rates following the engagements to identify future opportunities. MyHEAT and the implementation team also began building an evaluation plan.

Looking ahead:

As part of the evaluation plan, a customer survey was launched in the first quarter to better understand the customer experience. Throughout the first half of 2023, the pilot will have at least two more email engagements with customers. During the second half of the year, the pilot will be evaluated, and the Company will use evaluation results and pilot metrics to determine next steps.

JOINT RESIDENTIAL/BUSINESS PILOTS

Non-Energy Benefits Study

The Non-Energy Benefits study was a review of industry literature surrounding non-energy benefits (NEBs), potential customer impacts from NEBs, and methods for how other utilities have quantified such an impact.

In 2022:

The scope of the study was developed in the fourth quarter of 2022 in collaboration with E Source for the purpose of better understanding NEBs in relation to EWR cost-effectiveness analyses. NEBs include but are not limited to reduced emissions, fuel cost savings, increased economic productivity, improved comfort, and health/safety benefits.

Looking to the future:

The Company will utilize the NEB research study to inform and develop a proof-of-concept pilot focused on quantifying induction cooktop NEBs. Per the NEBs research conducted in 2022, induction cooktops in the current market are not a cost-effective product when examined through the parameters of the Utility Cost Test alone. Given that induction cooktops are of significant interest to consumers and are an award-winning technology (2021-2022 ENERGY STAR Emerging Technology Award) with recognized non-energy benefit, the Company seeks to develop a pilot to review and quantify induction cooktop NEBs for consideration in cost effectiveness analyses.

On-Bill Payments

On-Bill Payments is a proof-of-concept pilot that aims to bring customers one or more financing solutions to remove barriers that would otherwise deter businesses, schools, municipalities, and residential customers from updating equipment with more energy-efficient technology.

In 2022:

Research, industry benchmarking, and business customer interview efforts continued in 2022, while internal billing and payment processes were implemented. High up-front costs, opposition to acquiring debt, bond issuances, and making informed, quality business decisions have been identified as the major deterrents for replacing aging equipment for C&I customers. Early stages of recruitment of K-12 Schools, municipalities, and other C&I and small- and medium-sized business customers in need of alternative financing also kicked-off in 2022.

Looking to the future:

In 2023, the pilot will continue to recruit and enroll business and residential customers to test both the customer need and benefit of providing alternative and on-utility bill financing. The pilot will aim to enroll up to 10 customers between both C&I and residential sectors.

BUSINESS PILOTS

Refrigerant Swap

The Refrigerant Swap technology demonstration pilot was developed to evaluate the potential energy savings from upgrading restaurant and grocery store refrigerants from R404a to R448a. Due to its high global warming potential, R404a has been subject to increased regulation and mandatory bans over the past several years. If proven, this technology presents the ability to reduce the environmental impact in both existing and new refrigeration systems and potentially provide energy efficiency gains between 12 to 18%.

In 2022:

The technology demonstration received high interest from restaurant and grocer customers and ended the year with 74 total customer enrollments. At the end of the year, customer sites began preliminary baseline testing of the existing refrigerant.

Looking to the Future:

In 2023, the pilot will continue six to nine months of baseline testing of the current R404a refrigerant, followed by a refrigerant swap to R448a and additional data collection of the corresponding energy savings. After savings are verified, the data will be collected and submitted for potential inclusion as an MEMD measure in 2024.

Zero Net Energy

The Zero Net Energy (ZNE) pilot was designed to provide a holistic process for building design, construction, measurement, and verification for Consumers Energy business customers and to help participants become “ZNE-ready” by reducing their energy consumption during construction or major renovation projects. Creating a design process to become ZNE-ready and promote awareness throughout the community allows customers to reduce their carbon footprint and become frontrunners in the next generation of building design. The primary objective of the program was to target key regional leaders to educate on the value of ZNE and reduce barriers in design, construction, and operation of new construction and existing buildings.

In 2022:

The four remaining participants in the pilot completed all phases of the ZNE design process, reducing their building energy consumption on average by 35%. However, the current market potential for ZNE-ready commercial buildings is too low to justify a scaled program and therefore the Company ended the pilot in late 2022.

Local Government Benchmarking

Many communities are creating energy and sustainability plans with an increased focus on environmental health, climate, and economic sustainability. The Local Government Benchmarking pilot assists these efforts by partnering with local communities to combine known and documented success of city benchmarking campaigns with programmatic goals and resources of utility-funded energy efficiency programs. In the U.S., these two efforts – while sharing similar goals of energy and cost savings for large commercial buildings—have largely been pursued through separate tracks. This program aims to bring together the efforts of local governments and the utility to leverage relationships and resources to achieve increased participation in energy efficiency programs, increased customer savings, and improved city and customer satisfaction with utility programs and services.

PILOTS

In 2022:

The Kalamazoo Energy Collaborative was the first campaign launched under the Local Government Benchmarking pilot and is a partnership between Consumers Energy, the City of Kalamazoo, and commercial building owners within the city limits. The program successfully enrolled 35 large commercial customers and completed corresponding benchmarking assessments on building performance and potential energy savings recommendations. A website portal was created and used to benchmark participating buildings and recommend energy conservation measures for customers.

Looking to the Future:

In 2023, the pilot will continue its focus in the City of Kalamazoo with services to support the self-service benchmarking tool and implementation of energy efficiency measures, as well as expand to include 10 additional customers within Kalamazoo County. The pilot will conclude in 2023, and the learnings will be evaluated to determine if the program should be scaled within additional communities. The pilot will also explore additional functionality of the benchmarking tool to integrate near real-time data for select customers.

Energy Pay for Performance

The Energy Pay-for-Performance pilot focuses on testing an alternative incentive structure to reward participants based on actual performance savings as opposed to standard prescriptive measures. The performance incentive influences grocery customers to engage in multiple energy efficiency projects over a two-year period and assesses actual energy savings at the end of each calendar year.

In 2022:

In its second year, the pilot enrolled its seventh and final participant. The Company verified actual energy savings of 676,851 kWh for the first 6 participants.

Looking to the future

In 2023, the pilot will assist its final participant with project implementation and review all pilot learnings to determine impact to energy savings potential, customer benefit, and feasibility of scaling a performance incentive structure to all business customers.

Condition Based Maintenance

The Condition Based Maintenance pilot tests a new subscription-based business model to engage underserved small and medium-sized businesses with energy conservation measures specific to roof-top HVAC units ("RTU"). In the pilot, the customer pays a monthly subscription and receives semi-annual tune-ups, service calls, and the installation of an Internet of Things ("IoT") device for predictive analytics and real-time service alerts to dispatch contractors when a malfunction occurs. The key objectives of the pilot are to promote persistent and passive energy savings to business customers, test the effectiveness of an IOT device and its ability to alert and dispatch contractors, understand the customer's willingness to adopt a subscription-based model and at what charge, and enroll 90 roof-top units with a total energy savings of 5,000,000 kWh.

In 2022:

To engage participation, the pilot shifted from a direct-to-customer approach to working through a contractor network to target customers without service agreements. The pilot successfully enrolled 16 customer sites with 89 total roof-top HVAC units.

Looking to the Future:

In 2023, the pilot will complete IoT device installations of all enrolled RTUs, begin performance measurement, and begin testing the service dispatch of contractors to perform maintenance on identified malfunctioning equipment. In parallel, the pilot will perform customer research to gauge the customers' willingness to pay for a subscription-based service, what the amount threshold is for willingness to pay, and cost effectiveness.

Refrigeration Optimization and Peak Shifting

The Refrigeration Optimization and Peak Shifting pilot began in Q2 2022 to address the high energy use of refrigeration loads in grocery stores by providing a software optimization overlay to refrigeration controls. A monthly software subscription fee provides artificial intelligence and machine learning to optimize refrigeration set points and reduce energy usage, as well as providing peak-shifting capabilities to pre-cool refrigeration cases and shift compressor loads to off-peak hours.

The key objectives are to determine if refrigeration optimization results in customer energy reduction, understand the customers' willingness to pay for a subscription-based software service, assess cost effectiveness, prove the reliability of artificial intelligence to optimize refrigeration controls and shift demand to off-peak hours, and to enroll 15 total customer sites with a total energy savings target of 2,500,000 kWh.

In 2022:

The pilot enrolled 13 customer sites, completed software installation and began 9-month baseline data collection.

Looking to the Future:

In 2023, the pilot aims to complete enrollment of 15 customer sites, complete software installation and functionality testing, and perform a 9-month data collection period through the spring and summer months. At the end of the year, the software will be activated to begin energy optimization, continuing in to mid-2024. In the summer of 2023, the pilot will also test the software's ability to pre-cool refrigeration cases and shift compressor loads to off-peak hours.

Refurbished Kitchen Equipment

The Refurbished Kitchen Equipment pilot was developed to target an emerging market opportunity for refurbished kitchen equipment for restaurant customers. Based on market research with distributors, 50% of commercial kitchen equipment sold is used equipment that does not provide energy savings. The pilot aims to fill this need by refurbishing kitchen equipment with energy-efficient components, determine energy savings, and develop a standard certification procedure for distributors to sell refurbished equipment to customers that provides energy savings benefit.

In 2022:

Cost and energy savings analysis were completed on low and medium temperature refrigeration equipment. Multiple sets of equipment were purchased and refurbished, with testing beginning at the end of the year.

Looking to the Future:

In 2023, testing of the refurbished equipment will continue. Once energy savings are verified, a testing procedure and protocol will be developed and submitted to the National Sanitation Foundation (NSF) for certification. After the equipment is NSF certified, the pilot will work with distributors to adopt refurbishment protocols and develop an incentive structure to submit to the Michigan Energy Measures Database.



"The professionalism and expertise of the technician made it very easy to understand what was presented. Made something we don't usually deal with very understandable and approachable."

- Business Energy Analysis Participant*

*Source: 2022 Consumers Energy Participant Satisfaction Survey

APPENDIX

Table 4-1. Statutory Savings Goals and Investment Levels

Electricity	2022
Electric Savings Goal as % of Total Sales	1.00%
Natural Gas	2022
Natural Gas Savings Goal as % of Total Sales	0.75%

Table 4-2. 2022 Electric Results

Savings	Achieved First Year	Target
MWh	651,661	315,780
% of Statutory Target	206%	100%
Investment		
\$ Millions	\$189.0	\$187.0
Benefit-Cost Test Results		
UCT Score	1.89	

Table 4-3. 2022 Natural Gas Results

Savings	Achieved First Year	Target
Mcf	3,174,283	2,159,664
% of Statutory Target	147%	100%
Investment		
\$ Millions	\$84.1	\$84.2
Benefit-Cost Test Results		
UCT Score	1.81	

Table 4-4. 2022 Portfolio Investment

	Utility System Resource Cost Test	Lifetime CCE /kWh*	Lifetime CCE /Mcf*	Electric Investment	Natural Gas Investment	Total Investment
RESIDENTIAL PROGRAMS						
Appliance Recycling	2.00	\$ 0.025	-	\$7,292,958	-	\$7,292,958
Consumers Energy Store	1.45	\$ 0.121	\$0.40	\$1,320,991	\$1,542,989	\$2,863,980
ENERGY STAR® Appliances	1.80	\$ 0.064	\$ 0.57	\$1,235,873	\$869,316	\$2,105,189
ENERGY STAR® Lighting	1.17	\$ 0.048	-	\$4,787,827	-	\$4,787,827
Home Energy Analysis	0.84	\$ 0.133	\$ 0.81	\$4,923,876	\$2,228,945	\$7,152,820
Home Energy Report	0.79	\$ 0.111	\$ 1.99	\$692,709	\$900,557	\$1,593,267
Home Performance with ENERGY STAR®	1.46	\$ 0.384	\$ 0.29	\$431,316	\$1,139,654	\$1,570,970
HVAC and Water Heating	2.47	\$ 0.269	\$ 0.17	\$2,450,574	\$8,808,141	\$11,258,715
Income Qualified Energy Assistance	0.64	\$ 0.115	\$ 1.09	\$11,036,396	\$17,241,339	\$28,277,735
Insulation and Windows Program	2.55	\$ 0.146	\$ 0.17	\$593,052	\$1,710,333	\$2,303,385
Residential Agriculture	1.81	\$ 0.035	\$ 3.23	\$475,660	\$21,318	\$496,978
Residential Multifamily	0.62	\$ 0.200	\$ 1.13	\$2,251,700	\$1,556,578	\$3,808,278
Residential Multifamily Income Qualified	0.39	\$ 0.188	\$ 3.19	\$9,753,133	\$8,063,916	\$17,817,049
New Home Construction	4.60	\$ 0.044	\$ 0.13	\$730,546	\$829,009	\$1,559,555
Think! Energy!®	2.46	\$ 0.044	\$ 0.31	\$1,340,033	\$943,923	\$2,283,956
Residential Pilot Programs	-	-	-	\$5,029,583	\$2,664,067	\$7,693,650
Residential Subtotal	1.41	\$0.089	\$0.50	\$54,346,228	\$48,520,084	\$102,866,311
Comprehensive & Custom Business Solutions**	3.75	\$ 0.018	\$ 0.52	\$71,841,943	\$18,483,905	\$90,325,848
Small Business Direct Install	1.35	\$ 0.059	\$ 1.02	\$16,564,701	\$5,071,957	\$21,636,659
Business Multifamily Direct Install	1.40	\$ 0.069	\$ 0.66	\$580,254	\$729,944	\$1,310,197
Business Pilots	-	-	-	\$7,477,625	\$1,446,609	\$8,924,234
Self-Direct	-	-	-	-	-	-
Business Subtotal	2.30	\$0.030	\$0.84	\$96,464,522	\$25,732,415	\$122,196,938
Utility Oversight	-	-	-	\$21,410,799	\$4,345,226	\$25,756,025
Tracking System	-	-	-	\$2,908,200	\$587,233	\$3,495,433
Education & Awareness	-	-	-	\$6,807,533	\$3,131,912	\$9,939,444
EM&V	-	-	-	\$7,046,622	\$1,809,647	\$8,856,269
Support Services Subtotal	-	-	-	\$38,173,154	\$9,874,018	\$48,047,172
TOTAL	1.86	\$0.04	\$0.73	\$188,983,904	\$84,126,517	\$273,110,421

*Cost of Conserved Energy does not include Pilots or Education and Awareness

**Numbers include Business Agriculture and Specialty Programs

Table 4-5. 2022 Portfolio Savings

	First Year Net MWh Savings	MWh Lifetime Savings	First Year Net MW Savings	First Year Net Mcf Savings	Mcf Lifetime Savings
RESIDENTIAL PROGRAMS					
Appliance Recycling	46,929	289,610	3.07	-	-
Consumers Energy Store	3,078	23,609	0.20	111,954	718,535
ENERGY STAR® Appliances	3,663	33,035	0.87	38,881	368,980
ENERGY STAR® Lighting	23,197	98,965	2.75	-	-
Home Energy Analysis	7,973	53,594	0.62	88,080	881,755
Home Energy Report	16,570	16,570	2.85	92,483	92,483
Home Performance with ENERGY STAR®	256	4,094	0.11	35,479	545,008
HVAC and Water Heating	3,065	41,818	1.06	473,591	6,548,825
Income Qualified Energy Assistance	26,367	246,866	1.31	175,302	2,029,159
Insulation and Windows Program	646	15,812	0.42	56,954	1,365,626
Residential Agriculture	1,042	14,122	0.19	857	17,953
Residential Multifamily	2,048	18,999	0.24	76,838	336,552
Residential Multifamily Income Qualified	8,439	95,001	0.69	78,274	574,706
New Home Construction	1,781	35,627	0.78	62,377	1,247,530
Think! Energy!®	7,365	52,373	0.65	117,389	736,370
Residential Shared Savings**	342	4,706	0.10	45,008	395,943
Residential Pilot Programs	9,166	62,546	-	71,021	779,738
Residential Subtotal	161,926	1,107,347	15.93	1,524,488	16,639,165
BUSINESS PROGRAMS					
Comprehensive & Custom Business Solutions**	374,444	5,241,440	62.84	1,091,676	17,678,934
Small Business Direct Install	63,874	367,516	10.54	275,585	2,131,865
Business Multifamily Direct Install	1,996	18,980	0.20	48,064	199,954
Business Shared Savings**	988	12,098	0.04	73,456	936,603
Business Pilots	26,478	338,434	-	72,746	1,028,534
Self-Direct	4,134	4,134	-	-	-
Business Subtotal	471,913	5,982,601	73.63	1,561,527	21,975,889
SUPPORT SERVICES					
Utility Oversight	-	-	-	-	-
Tracking System	-	-	-	-	-
Education & Awareness	17,822	199,142	-	88,267	1,130,627
EM&V	-	-	-	-	-
Support Services Subtotal	17,822	199,142	-	88,267	1,130,627
TOTAL	651,661	7,289,090	89.55	3,174,283	39,745,682

* Shared savings are defined as unclaimed gas or electric savings from EWR-related work that generates both electric and gas savings at premises where a utility only provides single fuel service

**Numbers include Business Agriculture and Specialty Programs

Table 4-6. Summary of Electric Programs Benefit-Cost Test Results

	Utility Cost Test	Total Resource Cost Test	Participant Measure	Rate Impact Measure
RESIDENTIAL PROGRAMS				
Appliance Recycling	2.00	1.90	24.87	0.21
Consumers Energy Store	0.93	0.96	7.50	0.20
ENERGY STAR® Appliances	1.87	1.41	7.33	0.29
ENERGY STAR® Lighting	1.17	1.26	21.10	0.21
Home Energy Analysis	0.53	0.53	-	0.16
Home Energy Report	1.23	1.23	-	0.23
Home Performance with ENERGY STAR®	0.81	0.60	2.83	0.30
HVAC and Water Heating	1.34	0.63	2.44	0.31
Income Qualified Energy Assistance	0.96	0.96	-	0.18
Insulation and Windows Program	2.46	0.85	2.19	0.46
Residential Agriculture	1.77	1.03	5.95	0.27
Residential Multifamily	0.48	0.56	43.09	0.18
Residential Multifamily Income Qualified	0.50	1.57	13.49	0.17
New Home Construction	3.93	2.43	7.90	0.41
Think! Energy!®	2.05	2.05	-	0.23
Residential Portfolio Average*	1.09	0.96	14.03	0.23
BUSINESS PROGRAMS				
Comprehensive & Custom Business Solutions	3.86	1.74	3.86	0.54
Small Business Direct Install	1.26	1.30	4.89	0.41
Business Multifamily Direct Install	1.85	1.37	4.49	0.46
Business Portfolio Average	2.76	1.61	4.30	0.51
Total Portfolio without Incentive*	2.31	1.48	5.24	0.44
Total Portfolio with Incentive*	1.89	1.30	5.24	0.42

*Does not include Residential or Multifamily Income Qualified programs

Table 4-7. Summary of Natural Gas Programs Benefit-Cost Test Results

	Utility Cost Test	Total Resource Cost Test	Participant Measure	Rate Impact Measure
RESIDENTIAL PROGRAMS				
Appliance Recycling	-	-	-	-
Consumers Energy Store	1.89	3.77	16.55	0.47
ENERGY STAR® Appliances	1.70	1.43	4.58	0.46
ENERGY STAR® Lighting	-	-	-	-
Home Energy Analysis	1.54	1.54	-	0.44
Home Energy Report**	0.41	0.41	-	0.24
Home Performance with ENERGY STAR®	1.71	0.95	2.30	0.46
HVAC and Water Heating	2.78	1.00	2.19	0.51
Income Qualified Energy Assistance	0.43	0.43	-	0.26
Insulation and Windows Program	2.58	0.51	1.04	0.51
Residential Agriculture	2.59	3.53	57.58	0.51
Residential Multifamily	0.83	0.55	2.21	0.35
Residential Multifamily Income Qualified	0.26	1.43	14.47	0.18
New Home Construction	5.19	4.84	12.23	0.56
Think! Energy!®	3.03	3.03	-	0.51
Residential Portfolio Average*	1.90	1.05	2.99	0.47
BUSINESS PROGRAMS				
Comprehensive & Custom Business Solutions	3.31	1.66	2.65	0.74
Small Business Direct Install	1.65	2.45	58.24	0.61
Business Multifamily Direct Install	1.04	0.68	1.71	0.50
Business Portfolio Average	2.74	1.67	3.14	0.71
Total Portfolio without Incentive*	2.32	1.34	3.06	0.59
Total Portfolio with Incentive*	1.81	1.15	3.06	0.55

*Does not include Residential or Multifamily Income Qualified programs

Table 4-8. 2023 Planned Investment

Electric Investment	2023
Planned Investment (\$M)	\$195.0
Natural Gas Investment	2023
Planned Investment (\$M)	\$89.8

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company

Calculation of Annual Energy Savings Targets
Electric Service (Megawatt-hours)

Case No.: U-21312
Exhibit No.: A-2 (LM-2)
Page: 1 of 2
Witness: LMcCollum
Date: May 2023

<u>Line No.</u>	<u>Description</u>	(a)	(b)
		<u>2021</u>	<u>2022</u>
1	WN Retail Electric Sales ^(1)	31,577,968	
2	Prior Year Weather Normal		31,577,968
3	Electric Statutory Savings Percentage		1.0%
4	Electric Statutory Savings Target		315,780

Notes:

(1) Weather normalized calendar sales (excludes Wholesale and ROA).

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company

Calculation of Annual Energy Savings Targets
Natural Gas Service (Thousand Cubic Feet)

Case No.: U-21312
Exhibit No.: A-2 (LM-2)
Page: 2 of 2
Witness: LMcCollum
Date: May 2023

Line No.	Description	(a)	(b)
		<u>2021</u>	<u>2022</u>
1	Gas Sales	302,284,182	
2	Electric Generation Sales (Natural Gas) ¹	14,328,931	
3	Total Adjusted Gas Deliveries	287,955,251	
4	Prior Year Weather Normal		287,955,251
5	Gas Statutory Savings Percentage		0.75%
6	Gas Statutory Savings Target		2,159,664

Notes:

¹ Settlement Agreement, page 2, section 3, Case No. U-20875

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company
2022 Program Savings and Investment Summary
Electric Service

Case No.: U-21312
Exhibit No.: A-3 (LM-3)
Page: 1 of 2
Witness: LMcCollum
Date: May 2023

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
				Actual		Planned		Variance (Actual - Planned)	
			CCE	MWh		MWh		MWh	
Line No.	Description	UCT	(\$ per kWh)	Savings	Investments	Savings	Investments	Savings	Investments
	Residential								
1	Appliance Recycling	2.00	\$ 0.025	46,929	\$ 7,292,958	34,075	\$ 8,059,748	12,854	\$ (766,790)
2	Energy Dashboard	0.00	-	-	-	11,558	558,459	(11,558)	(558,459)
3	Consumers Energy Store (Marketplace)	0.93	0.056	3,078	1,320,991	3,106	1,000,062	(28)	320,929
4	ENERGY STAR Appliances	1.87	0.037	3,663	1,235,873	2,802	844,438	861	391,435
5	ENERGY STAR Lighting	1.17	0.048	23,197	4,787,827	22,653	4,557,328	544	230,499
6	Home Energy Analysis (HEA)	0.53	0.092	7,973	4,923,876	3,775	4,721,709	4,198	202,167
7	Home Energy Report (HER)	1.23	0.052	16,570	692,709	15,255	1,146,839	1,316	(454,130)
8	Home Performance with ENERGY STAR	0.81	0.105	256	431,316	251	469,226	5	(37,910)
9	HVAC & Water Heating	1.34	0.059	3,065	2,450,574	3,167	2,540,836	(102)	(90,262)
10	Income Qualified	0.96	0.045	26,367	11,036,396	21,787	9,600,000	4,580	1,436,396
11	Insulation and Windows Program	2.46	0.038	646	593,052	600	706,955	46	(113,903)
12	Residential Agriculture	1.77	0.034	1,042	475,660	874	766,804	168	(291,143)
13	Residential Multifamily	0.48	0.119	2,048	2,251,700	2,839	2,743,143	(790)	(491,443)
14	Residential Multifamily Income Qualified	0.50	0.103	8,439	9,753,133	10,985	9,400,000	(2,545)	353,133
15	New Home Construction	3.93	0.021	1,781	730,546	1,421	643,822	361	86,724
16	Think! Energy	2.05	0.026	7,365	1,340,033	4,830	1,338,699	2,535	1,334
17	Residential Shared Savings	-	-	342	-	-	-	342	-
18	Residential Pilots	-	-	9,166	5,029,583	9,229	3,685,107	(64)	1,344,476
19	Total Residential	1.09	0.054	161,926	54,346,228	149,205	52,783,176	12,721	1,563,052
	Business								
20	Business Solutions	3.86	0.014	374,444	\$ 71,841,943	383,745	\$ 81,178,149	(9,301)	\$ (9,336,206)
21	Small Business	1.26	0.045	63,874	16,564,701	63,430	18,824,165	444	(2,259,464)
22	Business Multifamily	1.85	0.031	1,996	580,254	2,541	1,175,707	(546)	(595,454)
23	Self-Direct Projects	-	-	4,134	-	-	-	4,134	-
24	Business Shared Savings	-	-	988	-	-	-	988	-
25	Business Pilots	-	-	26,478	7,477,625	29,652	7,518,621	(3,174)	(40,996)
26	Total Business	2.76	0.020	471,913	96,464,522	479,367	108,696,642	(7,454)	(12,232,120)
	Support Services								
27	Utility Oversight			-	\$ 21,410,799	-	\$ 11,175,167	-	\$ 10,235,632
28	Tracking System			-	2,908,200	-	1,294,778	-	1,613,422
29	Education & Awareness			17,822	6,807,533	19,440	5,544,217	(1,619)	1,263,316
30	Evaluation, Measurement, & Verification			-	7,046,622	-	7,498,055	-	(451,433)
31	Total Support Services	-	-	17,822	38,173,154	19,440	25,512,217	(1,619)	12,660,937
32	Total Portfolio	1.89	\$ 0.027	651,661	\$ 188,983,904	648,013	\$ 186,992,035	3,648	\$ 1,991,869

Notes:
UCT - Utility Cost Test
CCE - Cost of Conserved Energy

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company
2022 Program Savings and Investment Summary
Natural Gas Service

Case No.: U-21312
Exhibit No.: A-3 (LM-3)
Page: 2 of 2
Witness: LMcCollum
Date: May 2023

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
				Actual		Planned		Variance (Actual - Planned)	
			CCE	Mcf		Mcf		Mcf	
Line No.	Description	UCT	(\$ per Mcf)	Savings	Investments	Savings	Investments	Savings	Investments
	Residential								
1	Appliance Recycling	-	\$ -	-	\$ -	-	\$ -	-	\$ -
2	Energy Dashboard	-	-	-	-	5,687	325,726	(5,687)	(325,726)
3	Consumers Energy Store (Marketplace)	1.89	0.21	111,954	1,542,989	111,170	1,858,569	785	(315,580)
4	ENERGY STAR Appliances	1.70	0.24	38,881	869,316	34,717	761,749	4,164	107,567
5	ENERGY STAR Lighting	-	-	-	-	-	-	-	-
6	Home Energy Analysis (HEA)	1.54	0.25	88,080	2,228,945	79,575	2,106,755	8,505	122,190
7	Home Energy Report (HER)	0.41	1.06	92,483	900,557	156,845	1,098,205	(64,362)	(197,648)
8	Home Performance with ENERGY STAR	1.71	0.21	35,479	1,139,654	28,871	869,616	6,608	270,038
9	HVAC & Water Heating	2.78	0.13	473,591	8,808,141	541,752	10,555,196	(68,160)	(1,747,055)
10	Income Qualified	0.43	0.86	175,302	17,241,339	164,148	15,750,000	11,154	1,491,339
11	Insulation and Windows Program	2.58	0.13	56,954	1,710,333	56,709	2,145,492	244	(435,159)
12	Residential Agriculture	2.59	0.14	857	21,318	372	31,433	485	(10,115)
13	Residential Multifamily	0.83	0.46	76,838	1,556,578	91,467	1,651,760	(14,629)	(95,182)
14	Residential Multifamily Income Qualified	0.26	1.45	78,274	8,063,916	98,817	7,800,000	(20,543)	263,916
15	New Home Construction	5.19	0.07	62,377	829,009	54,313	1,199,491	8,064	(370,482)
16	Think! Energy	3.03	0.13	117,389	943,923	109,624	1,040,404	7,764	(96,481)
17	Residential Shared Savings	-	-	45,008					
18	Residential Pilots	-	-	71,021	2,664,067	101,147	3,241,545	(30,126)	(577,478)
19	Total Residential	1.90	0.20	1,524,488	48,520,084	1,635,212	50,435,941	(110,723)	(1,915,857)
	Business								
20	Business Solutions	3.31	0.11	1,091,676	\$ 18,483,905	1,205,083	21,553,073	(113,407)	\$ (3,069,168)
21	Small Business	1.65	0.24	275,585	5,071,957	93,710	3,062,632	181,874	2,009,326
22	Business Multifamily	1.04	0.37	48,064	729,944	65,181	850,793	(17,117)	(120,849)
23	Self-Direct Projects	-	-	-	-			-	-
24	Business Shared Savings	-	-	73,456					
25	Business Pilots	-	-	72,746	1,446,609	89,932	1,782,758	(17,186)	(336,149)
26	Total Business	2.74	0.13	1,561,527	25,732,415	1,453,906	27,249,256	107,621	(1,516,840)
	Support Services								
27	Utility Oversight				\$ 4,345,226		\$ 2,256,524	-	\$ 2,088,702
28	Tracking System				587,233		261,446	-	325,787
29	Education & Awareness			88,267	3,131,912	95,540	2,512,151	(7,272)	619,760
30	Evaluation, Measurement, & Verification				1,809,647		1,514,030	-	295,617
31	Total Support Services	-	-	88,267	9,874,018	95,540	6,544,151	(7,272)	3,329,866
32	Total Portfolio	1.81	\$0.20	3,174,283	\$ 84,126,517	3,184,658	\$ 84,229,348	(10,375)	\$ (102,831)

Notes:

UCT - Utility Cost Test
CCE - Cost of Conserved Energy

2022 Electric and Gas EWR Performance Metrics

Line No.	Description	(a)	(b)	(c)	(d)
		Performance Metrics		Financial Incentive Percent	
		Target	Achieved	Metric Weight (6)	Incentive Earned
<u>Electric⁽¹⁾</u>					
1	Lifetime Energy Savings (MWh) (2)	5,939,110	7,289,090	80.00%	\$ 30,237,425
2	Low Income Program investment (3)	\$ 19,000,000	\$ 20,789,529	12.50%	\$ 4,724,598
3	Low Income premium measure installation	4,530	4,433	7.50%	\$ 2,834,759
4	Incentive Total (5)			100.0%	\$ 37,796,781
<u>Gas⁽¹⁾</u>					
1	Lifetime Energy Savings (Mcf) (2)	32,384,708	39,745,682	80.00%	\$ 13,460,243
2	Low Income Program investment (3)	\$ 23,550,000	\$ 25,305,255	10.00%	\$ 1,682,530
3	Low Income premium gas measure installation (4)	7,191	7,646	10.00%	\$ 1,682,530
4	Incentive Total (5)			100.0%	\$ 16,825,303

Notes:

- (1) Eligibility to earn financial incentive is determined first by demonstrating achievement of annual savings thresholds established in Section 75 of Public Act 342 of 2016.
(2) Exhibit A-1 (LM-1), Table 4-5 for achieved lifetime savings.
(3) Electric Exhibit A-3 (LM-3), page 1 line 10(d) + 14(d); gas Exhibit A-3 (LM-3), page 2, line 10(d) + 14(d)
(4) Electric and Gas results certified by Cadmus and included in Residential Certification Report on page 34, Tables 16 & 17.
(5) Exhibit A-5 (LM-5) for calculation of electric and gas incentives.
(6) Additional detail on performance metrics can be found in WP-LM-1

2020 Electric and Gas EWR Financial Incentive

		(a)	(b)	(c)	
Line No.	Description	Electric	Natural Gas	Combined	Source
1	EWR Investments	\$ 188,983,904	\$ 84,126,517	\$ 273,110,421	Exhibit A-3 (LM-3)
2	<u>Financial Incentive</u> % of Net Benefits	\$ 66,062,895	\$ 23,353,070	\$ 89,415,966	L6 page 2
3	% of Investments	\$ 37,796,781	\$ 16,825,303	\$ 54,622,084	L9 page 2
4	Financial Incentive Cap	<u>\$ 37,796,781</u>	<u>\$ 16,825,303</u>	<u>\$ 54,622,084</u>	Min(L2, L3)

2020 Electric and Gas EWR Financial Incentive

		(a)	(b)	
Line No.	Description	Electric	Natural Gas	Source
<u>Financial Incentive based on % of Net Benefits</u>				
1	EWR Investments	\$ 168,194,375	\$ 58,821,261	L1 page 1 - less Low Income
2	Utility Cost Test Score	2.31	2.32	Benefit/cost Test Results (Skinner)
3	NPV of Benefits	\$ 388,404,027	\$ 136,664,829	L1 x L2
4	Net Benefits*	\$ 220,209,651	\$ 77,843,567	L3 - L1
5	Financial Incentive %	30%	30%	
6	Financial Incentive	\$ 66,062,895	\$ 23,353,070	L4 x L5
<u>Financial Incentive based on % of Investments</u>				
7	EWR Investments**	\$ 188,983,904	\$ 84,126,517	L1
8	Financial Incentive %	20%	20%	
9	Financial Incentive	\$ 37,796,781	\$ 16,825,303	L7 x L8

*Net benefits exclude Performance Incentives and Low Income Benefits and Costs

**EWR Investment excludes Performance Incentives but includes Low Income Benefits and Costs

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company

Case No.: U-21312
Exhibit No.: A-6 (LM-6)
Page: 1 of 1
Witness: LMcCollum
Date: May 2023

2022 Electric Energy Waste Reduction (EWR) Credits

		(a)	(b)
<u>Line No.</u>	<u>Description</u>	<u>EWR Credits</u>	<u>Source</u>
1	EWR Credit beginning year balance	-	
2	Credits earned in current year	651,661	(1)
3	Credits used to meet performance incentive	(473,670)	(2)
4	EWR Credit Excess / (Deficiency) relative to standard	177,991	L1 + L2 + L3
5	Credits substituted for Renewable Energy Credits	(177,991)	
6	EWR Credit Ending year balance	-	L4 + L5

Notes:

- (1) Exhibit A-3 (LM-3), Page 1, Line 29, column (c)
(2) U-20875 Settlement Agreement Attachment C page 2 of 4

2022 EWR Program Evaluation Report List

Sector	Name
Business	2022 Business Energy Analysis Experience Survey Presentation
Business	2022 Business Energy Efficiency Program Custom Measure Life Process Memo
Business	2022 Business Energy Efficiency Program Experience Survey Presentation
Business	2022 Business Energy Efficiency Program Industry Standard Practices Manual
Business	2022 Business Energy Efficiency Program Non-Trade Ally Contractor Research Presentation
Business	2022 Business Energy Efficiency Program Trade Ally Kickoff Contractor Interviews Presentation
Business	2022 Business Energy Waste Reduction Certification Report
Business	2022 Business Non-Participant Customer Research Presentation
Business	2022 Small Business Assessment Experience Survey Presentation
Business	2022 Small Business Energy Efficiency Program Experience Survey Presentation
Business	2023 Demand Control Ventilation Pilot Analysis Memo
Business	2023 Demand Control Ventilation Pilot Focus Group & Interviews Memo
Residential	2022 All-Electric New Home Construction Pilot Evaluation Presentation
Residential	2022 Appliance Recycling Program Evaluation Report
Residential	2022 Consumers Energy Store Evaluation Report
Residential	2022 ENERGY STAR Appliances Program Evaluation Report
Residential	2022 ENERGY STAR Lighting Program Evaluation Report
Residential	2022 Home Energy Analysis Electric Program Evaluation Report
Residential	2022 Home Energy Analysis Program Evaluation Report
Residential	2022 Home Energy Reports Evaluation Report
Residential	2022 Home Performance with ENERGY STAR Program Evaluation Report
Residential	2022 HVAC and Water Heating Program Evaluation Report
Residential	2022 Income Qualified Program Evaluation Report
Residential	2022 Income Qualified-Electric Program Evaluation Report
Residential	2022 Insulation and Windows Program Evaluation Report
Residential	2022 Multifamily Program Evaluation Report
Residential	2022 New Home Construction Program Evaluation Report
Residential	2022 Ongoing Customer Satisfaction Survey Annual Report
Residential	2022 Predictable Billing Pilot Evaluation Presentation
Residential	2022 Residential Energy Waste Reduction Certification Report
Residential	2022 Residential Energy Waste Reduction and Demand Response Awareness and Interest Survey Report
Residential	2022 Think! Energy Program Evaluation Report

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

NATHANIEL S. CARVER

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Nathaniel S. Carver, and my business address is 176 Fulton Street W, Grand
3 Rapids, Michigan 49503.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am employed by Consumers Energy Company (“Consumers Energy” or the “Company”)
6 as Demand Side Management Executive Director of Product Management responsible for
7 business Energy Waste Reduction (“EWR”) and Demand Response (“DR”) programs.

8 **Q. Please review your educational background.**

9 A. In 2001, I earned a Bachelor of Science degree with specialization in Business
10 Administration from Hillsdale College.

11 **Q. Please describe your business and professional experience.**

12 A. In 2002, I began my career at Consumers Energy as a Customer Energy Specialist
13 responsible for supporting residential and small business customer energy requests and
14 new service installations. In 2004, I joined Operations Support as an Electric Zonal
15 Planner, working collaboratively with engineering, operational, and scheduling teams to
16 develop monthly and annual workplans for zonal operational headquarters. In 2005, I was
17 promoted to Electric Statewide Planner responsible for coordinating zonal plans across the
18 state with key internal stakeholders, and in 2012 I was promoted to Electric Statewide
19 Planning Lead. In 2016, I accepted the position of Principle Corporate Account
20 Management Lead. In this role I managed the Corporate Account Management team
21 responsible for fostering and managing the Company’s relationship with medium and large
22 energy use business customers, including informing customers of opportunities and issues
23 related to their accounts, communicating engineering and financial energy analyses to

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 customers, and assisting customers with enrollment into programs, primarily EWR and DR
2 offerings. In 2021, I began my current role as Demand Side Management Director of
3 Commercial and Industrial (“C&I”). In this role, I oversee the development,
4 administration, and management of the Company’s C&I EWR and DR demand side
5 products including development of product strategies, optimizing product performance,
6 and solving for gaps in order to achieve C&I demand side management energy and capacity
7 savings targets.

8 **Q. Have you previously filed testimony with the Commission?**

9 A. Yes, I filed testimony on behalf of the Company in the following cases:

10 Case No. U-21233 2021 DR Reconciliation;

11 Case No. U-21205 2021 EWR Reconciliation; and

12 Case No. U-21410 2022 DR Reconciliation.

13 **Q. What is the purpose of your direct testimony in this proceeding?**

14 A. The purpose of my testimony is two-fold:

15 1. To provide an overview of the Company’s 2022 EWR Business Portfolio; and

16 2. To provide the certified energy savings and investments associated with the
17 business programs.

18 **Q. Are you sponsoring any exhibits with your direct testimony?**

19 A. Yes, I am sponsoring one exhibit:

20 Exhibit A-8 (NSC-1) 2022 Self-Direct Annual Report.

21 **Q. Was this exhibit prepared by you or under your direction?**

22 A. Yes.

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 **Q. What EWR programs were available for businesses during 2022?**

2 A. The following EWR programs were available to businesses during 2022:

- 3 1. Comprehensive Business Solutions Program, which includes the following
4 components:
- 5 a. Prescriptive;
- 6 b. Custom;
- 7 c. Smart Buildings (Retro-Commissioning);
- 8 d. Network Lighting Controls for large business;
- 9 e. Agriculture;
- 10 f. Industrial Energy Initiative; and
- 11 g. ENERGY STAR®;
- 12 2. Small Business EWR Program;
- 13 3. Business Multifamily Program; and
- 14 4. Self-Direct/Opt-Out/Opt-In Programs.

15 **Q. Please describe the components of the EWR Comprehensive Business Solutions**
16 **Program.**

17 A. The Comprehensive Business Solutions comprised the following components:

18 **Prescriptive**

19 The Prescriptive component offered cash back incentives to customers when they
20 purchased qualifying equipment or services. The Prescriptive component was designed to
21 offer incentives for high efficiency measures that addressed a variety of market sectors and
22 industries by using targeted, proactive outreach efforts to influence specific market sector
23 actors including:

- 24 • Trade allies (wholesalers, distributors, contractors, and retailers that market
25 qualifying technologies);

NATHANIEL S. CARVER
DIRECT TESTIMONY

- High-impact/high-need customer sectors (such as schools, municipal buildings, and hospitals);
- Industrial business customers; and
- Small and medium business (“SMB”) customers (SMB customers are not limited to participation in the SMB program only).

Overall, the program targeted measures where the unit energy savings can be reliably predicted and, therefore, standard per-measure savings and incentive levels were established, which simplified the application process and reduced administrative costs.

Business customers often decide whether to make an investment based on a first-cost option basis. That is, they focus on project payback related to capital equipment, which often overlooks long-term operating costs. Traditionally, energy efficiency equipment was not directly related to the capital investment strategies of business customers. Therefore, it was essential to educate and provide financial incentives to overcome barriers to implementing energy efficiency improvements. Cash-back mail-in incentives generally equal to 25% to 40% of the incremental cost to purchase energy efficient products were offered, and tiered incentive approaches promoted investment in premium efficiency equipment. The prescriptive program continues to provide an easy avenue for customers to receive a discount at the point of purchase for eligible energy efficient equipment through its Business Instant Discount initiative. The prescriptive component accounted for 48% of the electric savings and 32% of the natural gas savings delivered by the Comprehensive Business program.

Custom

The Custom component assisted larger business customers with the analysis and selection of high-efficiency equipment not covered under the Prescriptive rebates. Large business customers typically had more complex mechanical equipment supporting facility

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 operations and manufacturing processes. As a result, many barriers prevented projects
2 from being implemented. The Custom component was designed to help motivate and assist
3 customers in taking the necessary steps from conceptual project to completed project.

4 The Custom component addressed complex energy savings projects, provided
5 economic analysis, and aided in the completion of the incentive application. Incentives
6 were based on energy savings per kWh and Mcf for installed measures and emphasis was
7 placed on targeting large customers whose operations could most benefit from a custom
8 approach to installing measures not covered by prescriptive incentives. Targeted markets
9 included:

- 10 • Large manufacturing facilities;
- 11 • Hospitals;
- 12 • Education; and
- 13 • Water Treatment Plants.

14 As needed, expanded technical support was offered to help customers evaluate
15 comprehensive energy-efficiency opportunities and increase participation – including
16 walk-through energy assessments to help identify energy saving measures and assistance
17 in specifying projects. The custom component delivered 29% of the electric savings and
18 52% of the gas savings of the Comprehensive Business Program.

19 **Smart Buildings**

20 The Smart Buildings component identified energy saving opportunities for customers
21 through benchmarking, assessment, and analytic strategies, using techniques similar to an
22 initial building commissioning process. Several different program components were
23 offered to customers to focus on retro-commissioning their facility systems, including

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 building benchmarking, controls tune-up, defined actions, and whole building facility IQ.
2 Annual operating expenses are lowered by optimizing building management systems and
3 savings are achieved by implementing energy efficient operational changes and low/no
4 cost measures.

5 **Network Lighting Controls**

6 This component, recognized nationally by the American Council for an Energy Efficient
7 Economy as an Exemplary Program, incentivized large business customers to take a
8 holistic approach to lighting retrofits by transforming the market from a “widget/gadget”
9 approach to a systems approach of lighting improvements that produced deep energy
10 savings. The Network Lighting Controls initiative targeted large installations of these
11 projects in sectors including but not limited to warehouse, cold storage, hospitals, higher
12 education, manufacturing, and big box retail, providing education and incentives to
13 complete projects using the latest technologies, while achieving the most comprehensive
14 savings through integrated fixtures and controls.

15 **Agriculture**

16 The Business Agriculture component was designed to encourage and assist the Agricultural
17 Industry’s participation in EWR through two initiatives. The first initiative incentivizes
18 Tier II United States Department of Agriculture Audits that are performed by Michigan
19 State University certified agricultural auditors for all residential and commercial
20 agricultural industry customers. The second initiative provides agricultural industry
21 customers with commercial utility service access to all of the applicable program
22 incentives, which include 43 specific agricultural measures. Allowing Consumers Energy
23 agriculture/agribusiness customers the ability to utilize other types of C&I process systems

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 and equipment incentives can optimize access for this large, diverse Michigan business
2 sector.

3 **Industrial Energy Initiative**

4 The Industrial Energy Initiative is an industrial energy management (“IEM”) effort
5 designed to make industrial customers aware of the energy savings opportunities and
6 incentives that are available for their energy processes, including but not limited to steam,
7 compressed air, water treatment, wastewater, and energy management. In the larger
8 scheme, it also serves to help industries integrate energy management systems into
9 continuous improvement processes. Not only does this deeper-dive assistance help
10 industrial customers reduce energy use and operational costs while improving process
11 efficiency, but it also leads to repeat participation in the programs. The Company is
12 continuing strategic planning efforts to develop the current IEM work into a formalized
13 Strategic Energy Management (“SEM”) project. Initial work toward this aim includes
14 aligning various existing efforts such as Energy Engineering Services and continuing
15 discussions with external partners and programs to identify opportunities that add benefit
16 to existing efforts. In 2022, the IEM initiative served 42 customers through the American
17 Society of Heating, Refrigerating and Air-Conditioning Engineers (“ASHRAE”) level I
18 audits and 15 customers through ASHRAE level II audits with an investment of
19 \$411,000. These audits identified and delivered projects providing \$3.4 million in
20 incentives, 34,000 MWh, and 13,000 Mcf in 2022 and will continue to produce projects
21 and savings in future years. The IEM segment also completed eight injection molding
22 Barrel insulation audits. The Company remains committed to exploring SEM options and
23 continued work in this area.

NATHANIEL S. CARVER
DIRECT TESTIMONY

Building Performance with ENERGY STAR®

This component assists organizations with identifying energy saving opportunities through benchmarking buildings at single or multiple locations, conducting energy efficiency assessments, generating a report based on the assessment findings, and assisting customers through the ENERGY STAR® Certification process. The assessment report outlines recommended energy efficiency measures intended to achieve energy cost savings across facilities, provides examples of energy and environmental leadership actions, and raises public and corporate awareness of the benefits of energy efficiency.

Q. What results were achieved for the Comprehensive Business Solutions Program in 2022?

A. The Comprehensive Business Solutions Program delivered first-year energy savings of 374,444 MWh and 1,091,676 Mcf. These first-year savings represent lifetime savings of 5,241,440 MWh and 17,678,934 Mcf. Additional program details including investment can be found in Company witness Lynne McCollum's Exhibit A-1 (LM-1).

Q. Please describe the Company's Small Business EWR Program.

A. The Small Business EWR Program was designed to provide hassle-free energy efficiency services to SMB and not-for-profit customers with an average energy use of less than 1,200,000 kWh or 15,000 Mcf (increased from 2021 levels of 750,000 kWh or 100,000 Mcf to better reflect the SMB segment). Market providers of energy efficiency products and services seldom target these smaller SMB customers due to higher costs relative to larger customers. Eligible participants included owner-occupied facilities or tenant facilities with owner permission including but not limited to small retail businesses such as convenience and grocery stores, small offices, service stations, restaurants,

NATHANIEL S. CARVER
DIRECT TESTIMONY

hotels/motels, nonprofit organizations, and small manufacturers. The Small Business EWR Program offered three components in 2022, each targeting SMB customers underserved by other EWR programs often due to SMB customers' more limited technical and financial resources to pursue EWR solutions.

Q. Please describe the Components of the Small Business EWR Program.

A. There were three components of the Small Business Program offered in 2022: (i) Small Business Energy Efficiency, (ii) Small Business Energy Assessment, and (iii) the Small Business Store.

The Small Business Energy Efficiency component aims to reduce the burden of participating in EWR through streamlined processes and higher incentives for SMB customers, with an average return on investment of 1.5 years. Participating customers simply picked a trade ally who then handled all steps of participation including installation of products and submittal of all necessary paperwork. In 2022, the Small Business Energy Efficiency component received 757 applications with an average savings per application of 21 MWh and achieved a high customer satisfaction rating of 8.5 on a 10-point scale. Customer incentives were based on estimated energy savings and paid up to 100% of the cost, with a \$30,000 maximum incentive per premise per year.

The Small Business Energy Assessment component provided a complimentary on-site, personalized assessment of the customer's facility to identify savings opportunities, energy usage information, and EWR recommendations. In addition, the customer could receive installation of products such as smart and programmable thermostats, aerators, pre-rinse sprayers, showerheads, screw-in LEDs, smart strips, and pipe insulation, valued up to \$500. In 2022, the SMB Energy Assessment component

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 completed 13,874 on-site visits, installed 1,464 smart thermostats, delivered 4,146 electric
2 kits and 2,102 power strips, and achieved a customer satisfaction score of 8.1 on a 10-point
3 scale.

4 The Small Business Store component was added to the SMB program in 2020. The
5 Small Business Store offers a hassle-free online experience with deeply discounted energy
6 efficiency products and free shipping. Products available through the Online Store
7 included but were not limited to LEDs, aerators, pre-rinse sprayers, air purifiers, pipe wrap,
8 and other specialty lighting options. In 2022, SMB customers purchased 165 smart
9 thermostats and 5,114 LED bulbs and specialty lighting fixtures through the Small
10 Business Store.

11 **Q. What results were achieved for the Small Business EWR Program in 2022?**

12 A. The Small Business Program delivered first year energy savings of 63,874 MWh and
13 275,585 Mcf. These first-year savings represent lifetime savings of 367,516 MWh and
14 2,131,865 Mcf. Additional program details including investment can be found in Exhibit
15 A-1 (LM-1).

16 **Q. Please describe the Company's Business Multifamily Program.**

17 A. The Business Multifamily Program produced immediate electric energy savings in
18 multi-family buildings through the direct installation of energy-saving measures, both in
19 the common areas of the building and in the individual living units. A crew of installers
20 retrofitted living units in targeted buildings with energy efficient devices. Since this was
21 traditionally a hard-to-reach market, low-cost measures such as LED lighting and low-flow
22 water devices were installed free of charge for the property owner. Program staff also
23 recruited participation of trade allies and trained them on the benefits of the program for

NATHANIEL S. CARVER
DIRECT TESTIMONY

prescriptive and custom retrofit projects. Program staff worked directly with property owners and managers to help them identify energy saving opportunities and assist them in finding a trade ally contractor for project implementation.

Q. What results were achieved for the Business Multifamily EWR Program in 2022?

A. The Business Multifamily Program delivered first-year energy savings of 1,996 MWh and 48,064 Mcf. These first-year savings represent lifetime savings of 18,980 MWh and 199,954 Mcf. Additional program details including investment can be found in Exhibit A-1 (LM-1).

Q. Please describe the Company's Self-Direct, Opt-Out, and Opt-In Program options.

A. The Self-Direct (electric) and Opt-Out (natural gas) Program offerings allowed business customers to complete their own EWR projects in place of participating in Consumers Energy's business EWR programs. Customers who Self-Direct or Opt-Out are still obligated to pay their share of income-qualified program costs but are exempt from receiving any funding associated with the business programs. The Opt-In offering allowed customers who were originally ineligible to participate in the Company's business EWR programs the opportunity to do so by paying the appropriate EWR surcharge.

Q. Did the Company have any customers who participated in and fulfilled the obligations for the Self-Direct Option in 2022?

A. Yes, as shown in my Exhibit A-8 (NSC-1), 3 customers filed plans to self-direct 196 accounts with a total minimum savings of 4,061 MWh and planned savings of 4,134 MWh. The Company received three complete annual reports from customers successfully meeting the obligations of the Self-Direct Option during 2022. These customers generated energy savings totaling 4,135 MWh during 2022.

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 **Q. Did any large gas customers choose to opt out of the Company's EWR programs**
2 **during 2022?**

3 A. No large gas customers chose to opt out of the Company's EWR programs during 2022.

4 **Q. Did any eligible customers choose to opt in to the Company's EWR electric or gas**
5 **programs during 2022?**

6 A. No customers chose to opt in to the Company's EWR programs during 2022.

7 **Q. For each of the business programs, is there additional information available in this**
8 **EWR filing?**

9 A. Yes. Company witness McCollum is sponsoring the Company's 2022 Annual EWR
10 Report, Exhibit A-1 (LM-1), which includes additional information about the business
11 programs addressed in my direct testimony, including program overviews, investments,
12 energy savings, and benefit-cost score results.

13 **Q. How did Consumers Energy implement its Business EWR programs in 2022?**

14 A. Consumers Energy implemented its Business EWR programs utilizing the implementation
15 contractors DNV, SEEL, and Franklin Energy.

16 **Q. What were the actual business MWh, MW, and Mcf savings for 2022?**

17 A. The business portfolio (including self-direct, business pilots as discussed by Company
18 witness McCollum, and business shared savings as discussed by Company witness
19 Jeremiah J. Kraft) delivered first-year electric savings of 471,913 MWh (5,982,601 MWh
20 lifetime), 73.6 MW, and first-year natural gas savings of 1,561,527 Mcf (21,975,889 Mcf
21 lifetime) in 2022. Individual business program energy and demand saving results are
22 shown in Exhibit A-1 (LM-1), Table 4-5.

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 **Q. Has the Company certified the business electric and gas energy savings?**

2 A. Yes. The Company engaged TRC Companies ("TRC") to certify the business EWR
3 program energy and demand savings. TRC's credentials and conclusions regarding 2022
4 business electric and gas savings are presented in the testimony and exhibits of Company
5 witness Kraft.

6 **Q. Did the Company achieve its business electric savings within the investment levels**
7 **approved in Case No. U-20875?**

8 A. Yes. The Company planned its 2022 business electric investment in Case No. U-20875 to
9 be \$108.70. million. The Company actually invested \$96.46 million as shown on Exhibit
10 A-3 (LM-3), page 1, lines 20 - 26, column (d).

11 **Q. Please explain the variance between planned and actual business electric investment.**

12 A. The variance between planned and actual electric business investment is the result of (1) a
13 shift of investment to Income Qualified programs and (2) a change in investment included
14 in utility oversight to align with Company program accounting as explained in the
15 testimony of Company witness McCollum.

16 **Q. Did the Company achieve its business gas savings within the investment levels**
17 **approved in Case No. U-20875?**

18 A. Yes. The Company planned its 2022 business gas investment in Case No. U-20875 to be
19 \$27.25 million (excluding support services). The Company actually invested \$25.73
20 million as shown on Exhibit A-3 (LM-3), page 2, lines 20-26, column (d).

NATHANIEL S. CARVER
DIRECT TESTIMONY

1 **Q. Please describe some of the customer benefits and recognition the Company has**
2 **earned for its business EWR programs in 2022.**

3 A. In 2022, Consumers Energy's Business EWR programs were recognized by multiple
4 organizations and business customers. A few of the Company's EWR business program
5 accomplishments in 2022 are listed below:

- 6 • Business customers who participated in the Company's EWR programs rated it
7 9.2 out of 10 in customer satisfaction.
- 8 • 132 projects utilizing Michigan-made energy efficiency products were
9 delivered through the Buy Michigan incentive bonus initiative.
- 10 • 3,439 business EWR projects were processed, totaling more than \$61.5 million
11 in incentives paid, and generating approximately \$247 million in additional
12 business for Michigan contractors.
- 13 • The Comprehensive Business Solutions Program received national recognition
14 from the Association of Energy Services Professionals as the recipient of its
15 C&I sector groundbreaking program design and implementation award. The
16 program was recognized for its compressed air nozzle initiative that delivered
17 40,000 MWh in savings.
- 18 • The Comprehensive Business Solutions program received the 2022 Utility of
19 the Year award from Michigan Energy Efficiency Contractor Association for
20 program design and implementation. The award recognized that since 2009,
21 the Comprehensive Business Solutions Program has helped Michigan
22 businesses complete 61,870 electric and natural gas energy efficient projects
23 and achieve energy savings of 3.9 million MWh and 14.4 million MCF. These
24 savings are the equivalent of reducing CO2 emission generated by 450,000
25 homes' energy use for one year.

26 **Q. Does that conclude your direct testimony?**

27 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBIT
OF
NATHANIEL S. CARVER
ON BEHALF OF
CONSUMERS ENERGY COMPANY

May 2023

2022 Self-Direct Annual Report

Overview

A total of three large electric customers chose to opt out of participating in Consumers Energy's energy efficiency programs and instead self-direct their own energy efficiency projects. These customers were required to design and submit plans to achieve energy savings equal to or greater than the statutory requirements.

Eligibility Requirements

To be eligible for the self-direct option, a customer was required to have a single account or aggregate accounts with greater than 1 megawatt (MW) of demand.

Customer Enrollment

A one-month open enrollment period was held for plan year 2022 starting June 15, 2021. Eligible customers were notified with an on-bill message and existing self-direct customers with expiring plans were mailed information in May. The plan application form and other useful self-direct program information was posted on the MPSC and Consumers Energy websites.

Energy Savings

Participating customers submitted self-direct plans totaling 4,134 MWh in electric savings for 2022. This total was counted towards Consumers Energy's overall portfolio savings goals.

2022 Self-Direct Program Planned Savings

Projected savings from measures to be implemented under a self-directed plan (cumulative summary of planned savings):

2022 Planned Savings

Number of Customer Plans Participating	Approximate Number of Accounts (sites)	2022 Minimum Savings MWh	2022 Planned Savings MWh	2022 Annual Based Usage MWh
3	196	4,061	4,134	406,064

Full Terminations

Company Number	Number of Sites Terminated	Termination Approval Date	2022 Minimum Savings MWh	2022 Planned Saving MWh
NONE				

Partial Terminations

Company Number	Number of Sites Terminated	Termination Approval Date	2022 Minimum Savings MWh	2022 Planned Saving MWh	2022 Amended Minimum Saving MWh	2022 Amended Plan Saving MWh
NONE						

Amended Planned Savings

Company	Number of Customers Participating	Approximate Number of Accounts (sites)	2022 Minimum Saving MWh	2022 Planned Saving MWh	2022 Annual Based Usage MWh
NONE					

2022 Annual Report Results

Customer-prepared annual progress reports of implemented energy savings covering year 2022 are summarized in the tables below. Three reports were required from customers on March 1, 2023, covering year 2022.

a.) Total Implemented Savings

Plan Year	Number of Annual Reports	Minimum Savings MWh	Planned Savings MWh	Reported Savings MWh
2023	3	4,061	4,134	4,135

b.) 2022 Implemented Savings that are below the minimum standard

Customer Number	Minimum Savings MWh	Reported Savings MWh
NONE		

c.) 2022 Unreported Savings

Customer Number	2022 Minimum Savings MWh	Cause
NONE		

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

AMY C. ELLSWORTH

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Amy C. Ellsworth. My business address is 2490 Junction Place, Suite 400,
3 Boulder, Colorado 80301

4 **Q. Please describe your position and responsibilities.**

5 A. I have been employed by The Cadmus Group, Inc. ("Cadmus") since 2007. My title is
6 Principal in the Energy Division, which provides program and market analysis, statistical
7 and economic analysis, measurement and engineering, and broad utility services across
8 three practice areas: energy program performance, strategic electrification, and distributed
9 energy and renewables. Cadmus's energy program performance work largely focuses on
10 quantifying savings and assessing the performance of energy efficiency programs for
11 utilities across North America. Cadmus currently employs over 120 Demand Side
12 Management ("DSM") professionals in 9 offices in the United States. Our clients include
13 investor-owned and public utilities, public utility commissions, state agencies, and
14 international organizations. Cadmus currently delivers energy efficiency evaluation
15 services in Michigan, Alabama, Arizona, California, Colorado, Georgia, Hawaii, Idaho,
16 Illinois, Iowa, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New
17 York, New Jersey, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island,
18 Texas, Vermont, Virginia, Washington, Wisconsin, Wyoming, and Canada. At Cadmus, I
19 lead a team of 13 analysts, researchers, and program design experts, and serve as the
20 principal in charge for numerous energy efficiency program design and portfolio evaluation
21 projects. This work includes project planning and management, strategic planning, policy
22 analysis and regulatory support, oversight of research and analysis work, and quality
23 control.

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. Please describe your education and professional experience.**

2 A. I hold a bachelor's degree in Anthropology from Michigan State University and a master's
3 degree in Environmental Policy and Management from the University of Denver. Prior to
4 my present position with Cadmus, I led the energy division of a community non-profit
5 organization called the Center for Resource Conservation, which involved energy
6 efficiency and renewable energy program planning, implementation, and evaluation. Early
7 in my career, I worked for consulting firms focused on energy efficiency; renewable
8 energy; climate change technologies, programs, policy, and markets; and energy and
9 sustainability planning, program design, implementation best practices, and evaluation. In
10 my career at Cadmus, I have performed and directed dozens of DSM program evaluations.
11 I have presented and published research for national and international organizations
12 including the Western Interstate Energy Board, the International Energy Agency, the
13 American Wind Energy Association, the International City/County Management
14 Association, the National Wind Coordinating Committee, and the United Nations
15 Framework Convention on Climate Change at the Sixth Conference of the Parties.

16 **Q. Have you previously testified before the Michigan Public Service Commission**
17 **(“MPSC” or the “Commission”)?**

18 A. Yes, I have provided testimony in Consumers Energy Company's ("Consumers Energy"
19 or the "Company") 2016 Energy Optimization Reconciliation, Case No. U-18331; the
20 Company's 2017 Energy Waste Reduction ("EWR") Reconciliation, Case No. U-20028;
21 the Company's 2018 EWR Reconciliation, Case No. U-20365; the Company's 2019 EWR
22 Reconciliation, Case No. U-20702; the Company's 2020 EWR Reconciliation, Case No.
23 U-20865; and the Company's 2021 EWR Reconciliation Case No. U-21205.

AMY C. ELLSWORTH
DIRECT TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to present certified energy savings produced by the Company for its residential programs in the 2022 program year.

Q. Are you sponsoring any exhibits with your direct testimony?

A. Yes, I am sponsoring one exhibit.

- Exhibit A-9 (ACE-1): Consumers Energy 2022 Residential Energy Waste Reduction Certification Report. This is a 145-page report produced by Cadmus, as the Company's independent, third-party evaluator. In this capacity, Cadmus audited and certified the 2022 residential electric and gas energy savings achieved by the Company's residential EWR programs as part of its approved 2022 through 2025 EWR Plan.

Q. Has this exhibit been prepared by you or under your supervision?

A. Yes.

Q. How did Cadmus certify the Company's 2022 residential EWR program energy and demand savings?

A. Cadmus employed a rigorous process to certify energy and demand savings for the Company's residential EWR programs that included:

- Comparing reported savings results to data maintained in Consumers Energy's tracking database and data maintained in program implementation contractor tracking systems to ensure utilization of an accurate process for calculating total savings values by measure, program, and the total portfolio;
- Confirming that the equipment specified on incentive applications and logged in the tracking system met program incentive requirements;
- Reviewing random, statistically significant samples of incentive applications for each program to determine that data were consistently and accurately represented in the tracking systems;
- Verifying that correct factors were used to calculate savings, including: Michigan Energy Measures Database saving values, evaluation derived installation rates, and appropriate net-to-gross factors; and
- Conducting a custom impact analysis for the Home Energy Report Program to determine net energy savings and demand reduction impacts.

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. What are Cadmus's qualifications for certifying the residential energy savings?**

2 A. Over more than two decades of working in the energy industry, Cadmus has conducted
3 more than 1,000 process, impact, and market effects evaluations of energy efficiency
4 programs. Much of this work has involved multi-year, multi-program (portfolio) projects,
5 including many residential programs. Cadmus staff have contributed to some of the most
6 widely used evaluation protocols, including the International Performance Measurement
7 and Verification Protocol, National Action Plan for Energy Efficiency Evaluation
8 Guidelines, United States Department of Energy Uniform Methods Project, Electric Power
9 Research Institute Impact Evaluation Guide, and the California Energy Efficiency
10 Evaluation Protocols.

11 **Q. What were Cadmus's conclusions regarding the amount of electric savings for the**
12 **Company's 2022 residential EWR programs?**

13 A. Table 8 in Cadmus's certification report, Exhibit A-9 (ACE-1), shows that the Company
14 delivered 152,759,982 kWh of net annual residential electric savings in 2022. Table 10
15 shows that 1,044,800,960 kWh of lifetime savings were delivered for the Company's 2022
16 residential EWR programs.

17 **Q. What were Cadmus's conclusions regarding the amount of electric demand savings**
18 **for the Company's 2022 residential EWR programs?**

19 A. Table 12 in Cadmus's certification report, Exhibit A-9 (ACE-1), shows that the Company
20 delivered 15,927 kW of net demand savings.

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. What were Cadmus’s conclusions regarding the amount of gas savings for the**
2 **Company’s 2022 residential EWR programs?**

3 A. Table 15 of Cadmus’s certification report, Exhibit A-9 (ACE-1), shows that the Company
4 delivered 1,453,468 MCF of net annual residential natural gas savings. Table 17 shows
5 that 15,859,426 MCF of lifetime savings were delivered for the Company’s 2022
6 residential EWR programs.

7 **Q. What are “utility shared savings?”**

8 A. Each year, utilities in Michigan perform EWR-related work that generates both electric and
9 gas savings at premises where they only provide single fuel service. Historically, utilities
10 have only claimed savings based on the service they provide, despite quantifiable savings
11 being realized for both fuel types. Utility shared savings are those savings that were created
12 by an “originating” utility but remain unquantified and unclaimed by the utility providing
13 the alternative fuel service (the “receiving” utility). For the purposes of this testimony,
14 utility shared savings represent savings created by Detroit Edison (“DTE”) (originating
15 utility) in areas where Consumers Energy and DTE have overlapping service territory.

16 **Q. Which projects and activities are considered eligible when quantifying utility shared**
17 **savings?**

18 A. Utility shared savings-eligible projects must occur in the originating utility’s single-fuel
19 service territory and generate savings of the secondary fuel type (e.g., the project occurs in
20 the originating utility’s electric-only service territory but saves gas supplied by the
21 receiving utility).

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. What methodology was used to quantify utility shared savings created by DTE and**
2 **claimed by Consumers Energy?**

3 A. Cadmus and TRC Companies (“TRC”) reviewed input data and calculations performed by
4 DTE’s third-party evaluation contractor. To determine verified net utility shared savings,
5 DTE’s evaluator used a four-step approach.

- 6 1. To allocate eligible projects to each utility jurisdiction, DTE’s evaluator
7 conducted a jurisdictional allocation process. The jurisdictional allocation
8 identifies which projects are eligible for shared savings and maps the
9 originating utility’s projects to the receiving utility’s service territory shape file
10 (map). In 2022, to determine project eligibility based on utility jurisdiction,
11 DTE’s evaluator mapped all dual-fuel projects against a map of Consumers
12 Energy’s electric and gas-only service territories. DTE projects that were
13 within Consumers Energy’s service territory *and* created unclaimed saving for
14 the fuel supplied by Consumers Energy were eligible for shared savings. For
15 example, a prescriptive insulation project in DTE’s electric-only territory is
16 eligible for shared savings only if that project was also within Consumers
17 Energy gas-only service territory.
- 18 2. To account for residential customers that use propane as their primary fuel,
19 DTE’s evaluator applied a delivered fuels adjustment factor. This factor is
20 based on estimates from the U.S. Energy Information Administration of the
21 number of Michigan households (approximately 320,000) using propane as
22 their primary heating fuel and represents approximately 8% of the households
23 in the state¹. To account for this, gas utility shared savings values resulting
24 from residential and income-qualified programs were reduced by 8%.
- 25 3. To determine verified gross utility shared savings, DTE’s evaluator applied
26 measure-level in-service rate adjustment factors to measures that were provided
27 to customers for self-installation to account for those assumed to be not installed
28 and operating. The in-service rate adjustment factors were provided by DTE’s
29 evaluator and based on their evaluation of DTE’s EWR programs.
- 30 4. Consistent with Consumers Energy’s commercialized EWR programs, Cadmus
31 and TRC applied the appropriate deemed net-to-gross ratio to determine
32 verified net utility shared savings.

¹ Michigan Public Service Commission: Propane & Petroleum,
<https://www.michigan.gov/mpsc/consumer/petroleum#:~:text=An%20estimated%20320%2C000%20Michigan%20households%20use%20propane%20as%20their%20primary%20heating%20fuel.>

AMY C. ELLSWORTH
DIRECT TESTIMONY

1 **Q. Were all projects and programs reviewed as part of the utility shared savings**
2 **analysis?**

3 A. No. Residential behavior and business custom programs were not included in the 2022
4 utility shared savings analysis.

5 **Q. What are Consumers Energy's verified net utility shared electric energy savings**
6 **associated with the 2022 residential EWR programs?**

7 A. As shown on page 11, Table 2, of Exhibit A-9 (ACE-1), the Cadmus evaluation team
8 determined the verified net annual utility shared electric energy savings for the 2022
9 residential EWR portfolio to be 341,974 kWh (342 MWh) and the net lifetime utility shared
10 electric energy savings to be 4,705,684 kWh (4,705 MWh).

11 **Q. What are Consumers Energy's verified net utility shared electric demand savings**
12 **associated with the 2022 residential EWR programs?**

13 A. As shown on page 11, Table 2, of Exhibit A-9 (ACE-1), the Cadmus evaluation team
14 determined the verified net annual utility shared electric demand savings for the 2022
15 residential EWR portfolio to be 95.17 kW.

16 **Q. What are Consumers Energy's verified net utility shared gas energy savings**
17 **associated with the 2022 residential EWR programs?**

18 A. As shown on page 11, Table 3, of Exhibit A-9 (ACE-1), the Cadmus evaluation team
19 determined the verified net annual utility shared gas energy savings for the 2022 residential
20 EWR portfolio to be 45,009 (MCF) and the net lifetime utility shared gas energy savings
21 to be 395,943 (MCF).

22 **Q. Does that conclude your direct testimony?**

23 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBIT

OF

AMY C. ELLSWORTH


ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023



CADMUS



Residential Energy Waste Reduction Certification Evaluation Report - FINAL

2022 PRODUCT YEAR

May 16, 2023

Presented to:

Joseph Forcillo

Director of Product Research & Evaluation
Consumers Energy
One Energy Plaza
Jackson, MI 49201

Presented by:

Cadmus

2490 Junction Street, Suite 400
Boulder, CO 80301

This report is a deliverable submitted to Consumers Energy as part of a multiyear, independent evaluation contract to conduct impact, process, and market assessment studies of residential energy waste reduction and demand response products administered by Consumers Energy.

The independent evaluation team includes the following firms:

Cadmus, Contract Lead
Illume Advising
Apex Analytics
Walker-Miller Energy Services

Prepared by:

Amy Ellsworth, Principal, Cadmus
Emily Miller, Senior Associate, Cadmus
David Molner, Associate, Cadmus
Noah Lieb, Associate, Apex Analytics
Yu Wu, Associate, Cadmus
Jake Straus, Senior Analyst, Cadmus
Camila Teagle-Alarcon, Analyst, Cadmus
Devin Simmons, Analyst, Cadmus
Cordell Owsley, Research Analyst, Cadmus

Prepared for:

Lynne McCollum, Regulatory Analyst, Consumers Energy
Joseph Forcillo, Director of Product Research & Evaluation, Consumers Energy



Table of Contents

Introduction.....	6
Objective and Scope.....	6
Methodology	8
Task 1: Database Review	9
Task 2a: Measure-Level Savings Analysis	10
Task 2b: Verify Installation and Net Adjustments.....	11
Task 3: Documentation Review	12
Task 4: Calculation of Verified Net Annual and Lifetime Savings	16
Summary of Verified and Certified Savings.....	17
Certified Net Kilowatt-Hour Savings	18
Certified Net Kilowatt Savings	24
Certified Net MCF Savings	27
Certification of Performance Incentive Metrics	34
Certified Water Savings	36
Appendix A: Appliance Recycling	39
Appendix B: ENERGY STAR Appliances Product	41
Appendix C: ENERGY STAR Lighting Product	47
Appendix D: Home Energy Analysis Product	49
Appendix E: Home Energy Analysis-Electric Product.....	54
Appendix F: Home Energy Reports Product	58
Appendix G: Home Performance with ENERGY STAR Product	60
Appendix H: HVAC and Water Heating Product	68
Appendix I: Income Qualified Product	75
Appendix J: Income Qualified-Electric Product	89
Appendix K: Insulation and Windows Product.....	97
Appendix L: Residential Consumers Energy Store Product.....	103
Appendix M: Residential Multifamily Product	107
Appendix N: Multifamily Income Qualified Product	114
Appendix O: New Home Construction Product.....	125
Appendix P: Residential Agriculture Product	129
Appendix Q: Think! Energy Product	133

Tables

Table 1. Consumers Energy Residential Energy Waste Reduction Products and Third-Party Implementers.....	6
Table 2. 2022 Electric (kWh) and Demand (kW) Savings from DTE Natural Gas Customers with Electric Service from Consumers Energy	11
Table 3. 2022 Natural Gas (MCF) Savings from DTE Electric Customers with Natural Gas Service from Consumers Energy.....	11
Table 4. Michigan Public Service Commission Net-to-Gross Orders and Descriptions	12
Table 5. Alternate Application and Installation Documentation	13
Table 6. Selected Sample Sizes and Realization Rate by Product and Fuel Type	15
Table 7. Residential Energy Waste Reduction Products' Verified Net Annual Savings by Fuel Type....	17
Table 8. Summary of Reported Gross and Verified Net Annual kWh Savings by Product.....	19
Table 9. Summary of Reported Net and Verified Net Annual kWh Savings by Product.....	20
Table 10. Summary of Lifetime kWh Savings and Measure Life by Product	20
Table 11. kWh Variances by Product and Measure	22
Table 12. Summary of Reported Gross and Verified Net kW Savings by Product	24
Table 13. Summary of Reported Net and Verified Net kW Savings by Product.....	25
Table 14. kW Variances by Product and Measure	27
Table 15. Summary of Reported Gross and Verified Net Annual MCF Savings by Product.....	28
Table 16. Summary of Reported Net and Verified Net Annual MCF Savings by Product.....	29
Table 17. Summary of Lifetime MCF Savings by Product	30
Table 18. MCF Variances by Product and Measure.....	33
Table 19. Order Agreement U-20875 Financial Incentive Performance Requirements.....	34
Table 20. 2022 Annual Investment Requirement for Low-Income Targeted Products.....	35
Table 21. Targeted Measures Installation Requirement for Low-Income Properties.....	35
Table 22. List of Water Saving Equipment Measures Installed by Product	36
Table 23. Annual and Lifetime Savings by Measure and Product	36
Table 24. Participation and Savings (Appliance Recycling)	39
Table 25. Verified Per-Unit Measure Characteristics (Appliance Recycling)	39
Table 26. Certified Participation and kWh Savings by Measure (Appliance Recycling)	40
Table 27. Certified Participation and kW Savings by Measure (Appliance Recycling)	40
Table 28. Participation and Savings (ENERGY STAR Appliances)	41



Table 29. Verified Per-Unit Measure Characteristics (ENERGY STAR Appliances)	41
Table 30. Certified Participation and kWh Savings by Measure (ENERGY STAR Appliances)	43
Table 31. Certified Participation and kW Savings by Measure (ENERGY STAR Appliances)	45
Table 32. Certified Participation and MCF Savings by Measure (ENERGY STAR Appliances)	46
Table 33. Participation and Savings (ENERGY STAR Lighting)	47
Table 34. Verified Per-Unit Measure Characteristics (ENERGY STAR Lighting).....	47
Table 35. Certified Participation and kWh Savings by Measure (ENERGY STAR Lighting).....	48
Table 36. Certified Participation and kW Savings by Measure (ENERGY STAR Lighting).....	48
Table 37. Participation and Savings (Home Energy Analysis)	49
Table 38. Verified Per-Unit Measure Characteristics (Home Energy Analysis).....	49
Table 39. Certified Participation and kWh Savings by Measure (Home Energy Analysis)	52
Table 40. Certified Participation and kW Savings by Measure (Home Energy Analysis)	52
Table 41. Certified Participation and MCF Savings by Measure (Home Energy Analysis)	53
Table 42. Participation and Savings (Home Energy Analysis-Electric).....	54
Table 43. Verified Per-Unit Measure Characteristics (Home Energy Analysis-Electric)	54
Table 44. Certified Participation and kWh Savings by Measure (Home Energy Analysis-Electric)	56
Table 45. Certified Participation and kW Savings by Measure (Home Energy Analysis-Electric)	57
Table 46. Participation and Savings (Home Energy Reports)	58
Table 47. Verified Per-Unit Measure Characteristics (Home Energy Reports)	58
Table 48. Certified Participation and kWh Savings by Measure (Home Energy Reports)	59
Table 49. Certified Participation and Annual kW Savings by Measure (Home Energy Reports)	59
Table 50. Certified Participation and MCF Savings by Measure (Home Energy Reports)	59
Table 51. Participation and Savings (Home Performance with ENERGY STAR)	60
Table 54 presents verified per-unit savings, measure lifetime, and savings adjustment factors for all measures delivered through the 2022 Home Performance with ENERGY STAR product.	
Table 52. Verified Per-Unit Measure Characteristics (Home Performance with ENERGY STAR)	60
Table 53. Certified and kWh Savings by Measure (Home Performance with ENERGY STAR).....	64
Table 54. Certified Participation and kW Savings by Measure (Home Performance with ENERGY STAR)	65
Table 55. Certified Participation and MCF Savings by Measure (Home Performance with ENERGY STAR)	66
Table 56. Participation and Savings (HVAC and Water Heating)	68
Table 57. Verified Per-Unit Measure Characteristics (HVAC and Water Heating)	68



Table 58. Certified Participation and kWh Savings by Measure (HVAC and Water Heating)	71
Table 59. Certified Participation and kW Savings by Measure (HVAC and Water Heating)	73
Table 60. Certified Participation and MCF Savings by Measure (HVAC and Water Heating)	73
Table 61. Participation and Savings (Income Qualified)	75
Table 62. Verified Per-Unit Measure Characteristics (Income Qualified).....	75
Table 63. Certified Participation and kWh Savings by Measure (Income Qualified).....	82
Table 64. Certified Participation and kW Savings by Measure (Income Qualified).....	85
Table 65. Certified Participation and MCF Savings by Measure (Income Qualified).....	86
Table 66. Participation and Savings (Income Qualified-Electric)	89
Table 67. Verified Per-Unit Measure Characteristics (Income Qualified-Electric)	89
Table 68. Certified Participation and kWh Savings by Measure (Income Qualified-Electric).....	93
Table 69. Certified Participation and kW Savings by Measure (Income Qualified-Electric)	95
Table 70. Participation and Savings (Insulation and Windows)	97
Table 71. Verified Per-Unit Measure Characteristics (Insulation and Windows).....	97
Table 72. Certified Participation and kWh Savings by Measure (Insulation and Windows).....	99
Table 73. Certified Participation and kW Savings by Measure (Insulation and Windows).....	100
Table 74. Certified Participation and MCF Savings by Measure (Insulation and Windows).....	101
Table 75. Participation and Savings (Residential CE Store)	103
Table 76. Verified Per-Unit Measure Characteristics (Residential CE Store)	103
Table 77. Certified Participation and kWh Savings by Measure (Residential CE Store)	105
Table 78. Certified Participation and kW Savings by Measure (Residential CE Store)	105
Table 79. Certified Participation and MCF Savings by Measure (Residential CE Store)	106
Table 80. Participation and Savings (Residential Multifamily).....	107
Table 81. Verified Per-Unit Measure Characteristics (Residential Multifamily)	107
Table 82. Certified Participation and kWh Savings by Measure (Residential Multifamily)	111
Table 83. Certified Participation and kW Savings by Measure (Residential Multifamily)	112
Table 84. Certified Participation and MCF Savings by Measure (Residential Multifamily)	112
Table 85. Participation and Savings (Multifamily Income Qualified)	114
Table 86. Verified Per-Unit Measure Characteristics (Multifamily Income Qualified).....	114
Table 87. Certified Participation and kWh Savings by Measure (Multifamily Income Qualified).....	119
Table 88. Certified Participation and kW Savings by Measure (Multifamily Income Qualified).....	121
Table 89. Certified Participation and MCF Savings by Measure (Multifamily Income Qualified)	123



Table 90. Participation and Savings (New Home Construction)	125
Table 91. Verified Per-Unit Measure Characteristics (New Home Construction)	126
Table 92. Certified Participation and kWh Savings by Measure (New Home Construction)	127
Table 93. Certified Participation and kW Savings by Measure (New Home Construction)	127
Table 94. Certified Participation and MCF Savings by Measure (New Home Construction)	128
Table 95. Participation and Savings (Residential Agriculture)	129
Table 96. Verified Per-Unit Measure Characteristics (Residential Agriculture)	129
Table 97. Certified Participation and kWh Savings by Measure (Residential Agriculture)	131
Table 98. Certified Participation and kW Savings by Measure (Residential Agriculture)	132
Table 99. Certified Participation and MCF Savings by Measure (Residential Agriculture)	132
Table 100. Participation and Savings (Think! Energy)	133
Table 101. Verified Per-Unit Measure Characteristics (Think! Energy)	133
Table 102. Certified Participation and kWh Savings by Measure (Think! Energy)	134
Table 103. Certified Participation and kW Savings by Measure (Think! Energy)	135
Table 104. Certified Participation and MCF Savings by Measure (Think! Energy)	135

Figures

Figure 1. Methodology Overview	9
Figure 2. Share of Verified Net Annual Energy Savings by Product (kWh)	21
Figure 3. Share of Verified Net Lifetime Energy Savings by Product (kWh)	22
Figure 4. Share of Certified Net Energy Savings by Product (kW)	25
Figure 5. Share of Certified Net Annual MCF Savings by Product	30
Figure 6. Share of Certified Net Lifetime MCF Savings by Product	32



Introduction

This report presents certified energy savings from all 2022 residential energy waste reduction (EWR) products administered by Consumers Energy. The Cadmus team reviewed and verified energy savings as part of a comprehensive evaluation of Consumers Energy's residential EWR portfolio.

Objective and Scope

For this certification, the Cadmus team reviewed, reconciled, and verified product-level energy savings tracked by Consumers Energy and third-party implementation firms. The Cadmus team reviewed reported participation and installation data in addition to reported kilowatt-hour (kWh), peak kilowatt (kW), and natural gas (MCF) savings data for each product in the Consumers Energy residential energy waste reduction (EWR) portfolio. Table 1 lists Consumers Energy's residential EWR products and their respective third-party implementers in 2022¹.

**Table 1. Consumers Energy Residential Energy Waste Reduction
Products and Third-Party Implementers**

Product	Third-Party Implementer
Appliance Recycling	CLEAResult
ENERGY STAR® Appliances	ICF
ENERGY STAR® Lighting	ICF
Home Energy Analysis	CLEAResult
Home Energy Analysis – Electric	SEEL
Home Energy Reports	Uplight
Home Performance with ENERGY STAR®	ICF
HVAC and Water Heating	ICF
Income Qualified	CLEAResult
Income Qualified – Electric	SEEL
Insulation and Windows	ICF
Residential Consumers Energy Store	ICF/Uplight
Residential Multifamily	Franklin Energy
Multifamily Income Qualified	Franklin Energy
New Home Construction	ICF
Residential Agriculture	DNV GL
Think! Energy®	National Energy Foundation

¹ The residential portfolio includes pilot products that are not listed in Table 1 because Consumers Energy claims savings for pilots separately.



For this certification, the Cadmus team completed several actions:

- Reviewed and confirmed that participation and installation data in Consumers Energy's and implementers' databases accurately reflect actual product participation and measure installation throughout the 2022 product year.
- Verified that the annual and lifetime kilowatt-hour (kWh) and MCF savings, annual demand reduction (kW), and measure lives attributed to individual product measures accurately reflect:
 - Values maintained in the 2022 *Michigan Energy Measures Database (MEMD)*;
 - Weighted values for weather-sensitive measures, which a third-party contractor independently calculated based on housing vintage, heating/cooling equipment, climate zone, and housing square footage; and
 - Work papers prepared by implementation contractors and approved by the Michigan Public Service Commission (MPSC).
- Conducted a custom regression billing analysis for the Home Energy Reports (HER) product to verify per customer savings for each reporting track; this involves comparing participant energy usage to a matched control population to determine net energy savings and demand reduction impacts for the product. This analysis completes an uplift analysis that compares participation in other EWR programs of customers that receive HERs to that of the control population to ensure energy and demand savings are not double counted.
- Verified the correct application of appropriate installation rates (ISR) as established by evaluation, measurement, and verification (EM&V) research.
- Verified the correct application of net-to-gross (NTG) values as established and approved by the Michigan Public Service Commission (MPSC) to accurately calculate net savings for each measure.
- Reviewed a random sample of customer applications, installation reports, or other project or measure documentation for relevant products to ensure that data were consistently and accurately represented in tracking databases.
- Compared 2022 reported annual and lifetime net savings with certified net savings results for each product and to the entire portfolio of residential EWR products, noting changes, updates, and differences.

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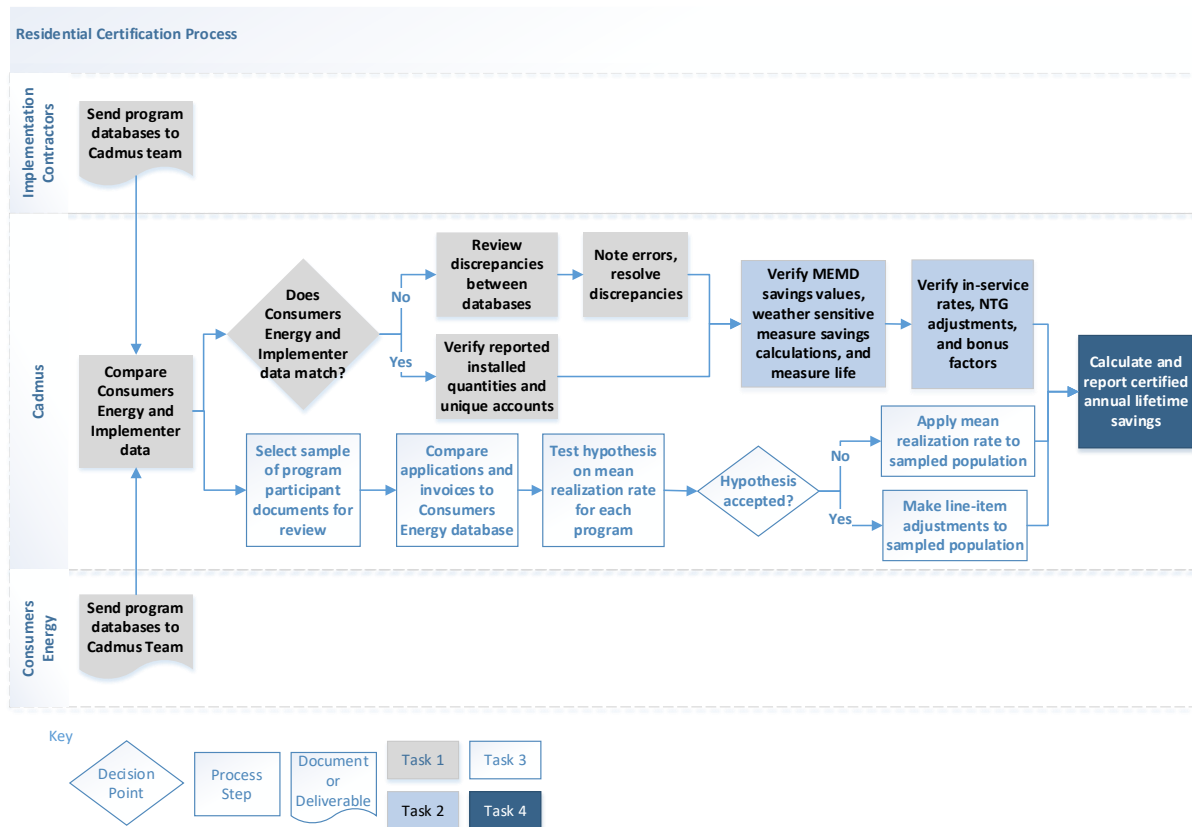
Methodology

The Cadmus team performed four primary tasks to verify energy savings for each residential EWR product. Each product appendix notes discrepancies from the Consumers Energy reported savings:

1. **Task 1: Database Review:** The Cadmus team collected the tracking databases for each product from implementation contractors and Consumers Energy. The team reviewed and compared the Consumers Energy and implementer tracking databases for each product, documenting and reconciling all discrepancies by matching each measure's installation quantities and accounting for each household account number within an individual product.
2. **Task 2a: Measure-Level Savings Analysis:** The Cadmus team reviewed and verified the reported measure-level savings values, measure lives, and incremental costs (as referenced in the 2022 *Michigan Energy Measures Database* (MEMD), third-party calculation workbooks, and work papers).
Task 2b: Verify Installation and Net Adjustments: The Cadmus team verified gross installation rates (ISRs) and net-to-gross (NTG) adjustments for each product measure, derived from impact evaluation, measurement, and verification (EM&V) and respective Michigan Public Service Commission (MPSC) orders.
3. **Task 3: Documentation Review:** For all products with supporting documentation, the Cadmus team reviewed a random and statistically significant sample of product documents (such as incentive applications, product invoices, site reports, and installation tally sheets). Additionally, the Cadmus team reviewed custom project documentation and verified savings calculations.
4. **Task 4: Calculation of Verified Annual and Lifetime Savings:** Using all verified inputs, the Cadmus team calculated annual savings along with lifetime savings.

Figure 1 presents general steps the Cadmus team took to verify energy savings from the 2022 product year.

Figure 1. Methodology Overview



The following sections outline details about each verification task.

Task 1: Database Review

The Cadmus team obtained product tracking databases from each product implementation contractor and from Consumers Energy.² The team reviewed the records for each product in the implementer's and Consumers Energy's databases to verify that:

- The number of participants or households matched;
- Reported quantities of installed measures matched for each measure code;
- Appropriate energy savings were applied for installed measures according to customer type (for example, only MCF savings were reported for a natural gas-only customer); and
- Reported measures were installed during the 2022 product year.

² Consumers Energy's tracking database is managed through eTracker, a web-based tracking system.

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Task 2a: Measure-Level Savings Analysis

The Cadmus team used eTracker, Consumers Energy's tracking database, to retrieve several types of measure-level data for each residential EWR product. Measure descriptions included in the report are taken directly from eTracker.

The Cadmus team mapped each product measure to the appropriate source data. This included mapping non-weather-sensitive measures to the 2022 MEMD and mapping weather-sensitive measures to databases developed independently by Guidehouse and Cadmus. The evaluation teams calculated weighted kWh, kW, and MCF savings for each weather-sensitive measure according to the characteristics of product measure installations (such as geographic distribution, equipment, building size, and vintage). Results from the weighting analysis represented product-specific kWh, kW, and MCF savings for each unique weather-sensitive measure installed during the 2022 product year.

The Cadmus team mapped non-MEMD measures using MPSC-approved white papers and other supporting documentation.

After mapping each measure to an appropriate data source, the Cadmus team verified the kWh, kW, and MCF savings per unit of measure. The team documented and corrected any discrepancies, as necessary, and verified the accuracy of each measure life and incremental cost based on the appropriate source data.

For the Home Energy Report product, Cadmus used a panel regression analysis of monthly customer bills to estimate the product's electricity and natural gas savings per household. Cadmus followed the guidelines in the 2022 Michigan Behavioral Resource Manual (BRM) to estimate product demand savings.³ The Cadmus team tested and compared two general model specifications to check the robustness of savings results: a lagged dependent variable (LDV) model and a linear fixed-effects regression (LFER) model. Cadmus then analyzed product participation and measure savings data to determine and remove savings claimed in other EWR products (i.e., product uplift) from HER product savings.

Uplift savings are the portion of net HER product savings achieved through incremental cross-participation in other Consumers Energy EWR products that are already claimed by those products. While they are "net" to the HER product in the sense that the HER product may have motivated or influenced participation, other energy efficiency products already claim deemed first-year annual and lifetime savings from all these participants. Cadmus then matched this data to HER product participation

Types of measure-level data:

- Descriptions of applicable measures and their corresponding codes
- Units of measure
- Deemed kilowatt-hour (kWh), kilowatt (kW), and MCF savings per unit of measure
- Indicators of whether measure savings were weather sensitive
- Measure lives
- Installation rate (ISR) adjustments
- Net-to-gross (NTG) factors
- Incremental costs
- Size of equipment
- The MEMD reference code or relevant information source for each measure

³ Michigan Energy Waste Reduction Collaborative. *Michigan Behavior Resource Manual*. November 16, 2022. <https://www.michigan.gov/mpsc/regulatory/ewr/michigan-behavior-resource-manual>

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data. The difference in treatment group cross-participation savings and control group cross-participation savings is uplift savings, which is subtracted from the verified gross savings. Cadmus also analyzed pre-treatment period uplift participation to account for any pre-existing participation differences in other EWR products between the treatment and control groups.

Utility Shared Savings (USS) are defined as savings generated from installed measures or projects that produce both gas and electric savings at a premise where Consumers Energy and DTE Energy each provide single fuel service. Shared savings are created when an originating utility installs a qualified dual fuel saving measure in their single fuel territory and the other, receiving utility, which provides the alternative fuel service, then claims the savings for that fuel. For the purposes of the certified savings being claimed by Consumers Energy, utility shared savings represent savings created by DTE Energy (originating utility) in areas where Consumers Energy and DTE have overlapping territory.

Cadmus leveraged an analysis by DTE's evaluation contractor to calculate USS. This analysis relied on a four-step process whereby DTE's evaluator mapped eligible dual fuel projects installed in single-fuel territory to overlapping Consumers Energy territory, then adjusted savings to account for customers using delivered fuels. DTE's evaluator then applied a measure level in-service rate for applicable measures and an appropriate deemed net-to-gross value to estimate the net shared savings estimate. Cadmus provided DTE's evaluator the appropriate net-to-gross values and also reviewed their data inputs and calculation methods to confirm their validity.

Table 2 shows the certified electric (kWh) and demand (kW) savings from DTE shared savings and Table 3 shows certified natural gas (MCF) savings.

Table 2. 2022 Electric (kWh) and Demand (kW) Savings from DTE Natural Gas Customers with Electric Service from Consumers Energy

Product	Verified Net Annual kWh Savings (% of portfolio savings)	Verified Net Lifetime kWh Savings (% of portfolio savings)	Verified Net Annual kW Savings (% of portfolio savings)
Utility Shared Savings	341,974 (0.2%)	4,705,684 (0.5%)	95.17 (0.6%)

Table 3. 2022 Natural Gas (MCF) Savings from DTE Electric Customers with Natural Gas Service from Consumers Energy

Product	Verified Net Annual MCF Savings (% of portfolio savings)	Verified Net Lifetime MCF Savings (% of portfolio savings)
Utility Shared Savings	45,009 (3.1%)	395,943 (2.5%)

Task 2b: Verify Installation and Net Adjustments

After completing the measure-level savings analysis, the Cadmus team confirmed ISRs, based on product evaluations conducted by Cadmus, Guidehouse, and TRC.

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The NTG rates of 0.92 are applied for all residential measures except: 1) upstream lighting, for which the Cadmus team applied an NTG rate of 0.399 for standard LEDs and 0.496 for specialty LEDs; 2) income-qualified measures, for which a NTG rate of 1.0 is applied; and 3) savings realized through the Home Energy Reports product, since Cadmus' custom savings analysis (based on a Randomized Control Trial [RCT] design) results in net savings. MPSC orders regarding NTG rates are shown in Table 4.

Table 4. Michigan Public Service Commission Net-to-Gross Orders and Descriptions

MPSC Order	NTG Order Description
U-17138	Approved an NTG ratio of 1.0 for behavior products.
U-17771	Approved an NTG ratio of 1.0 for income-qualified energy savings.
U-20875	Approved an NTG ratio of 0.92 for Consumers Energy products.
U-20875	Approved an NTG ratio of 0.4 for standard LEDs and 0.5 for specialty LEDs. ⁴

Task 3: Documentation Review

For all products with supporting documentation, the Cadmus team reviewed a random and statistically significant sample of product documents, including customer applications, purchase orders and/or receipts, and installation documents (site reports or measure installation tally sheets). The Cadmus team verified that the data matched between documents and their respective entries in Consumers Energy's product tracking databases.

For some products, customer-level applications and/or installation forms were not applicable because of a product's design or delivery method (for example, the upstream ENERGY STAR Lighting product offers discounts on energy efficient lighting products through a network of retailers and uses point-of-sale (POS) invoicing instead of application forms). Table 5 identifies products for which Task 3 did not apply or was modified and describes alternative documentation reviews the Cadmus team performed.

- Customer type (natural gas, electric, or combination)
- Measure types, efficiency levels, and/or size
- Measure installation quantities

⁴ MPSC settlement language approved NTG values as 0.4 for standard LEDs and 0.5 for specialty LEDs. Cadmus use more precise calculations of 0.399 for standard LEDs and 0.496 for specialty LEDs.



Table 5. Alternate Application and Installation Documentation

Product	Alternate Delivery Approach or Documentation Review
Appliance Recycling	The product generates savings by removing old equipment. Participants apply online, by telephone, or through a participating retailer to schedule appliance removal, then Consumers Energy provides a rebate check by mail. Customers do not complete an application after the appliance removal. Appliance data is documented and tracked by the implementation contractor and verified by the Cadmus team.
ENERGY STAR Lighting	The product is implemented through a network of retail stores that offer discounted lighting products throughout the Consumers Energy service area. The Cadmus team reviewed memorandums of understanding and invoices from manufacturers and retailers and verified total bulb sales under those memorandums of understanding. Sampling for this product was stratified to ensure it included a representative number of participating companies. The Cadmus team conducted three sampling variations for manufacturers and retailers that had submitted between 1 and 499; 500 and 9,999; and over 10,000 product POS invoices.
Home Energy Reports	The product implementer selects customers to receive home energy reports by mail and email and tracks customers who opt out (i.e., request to not receive the reports), move, or otherwise cease participation. The Cadmus team conducted a custom billing and uplift analysis to calculate net savings for total product participants.
New Home Construction	The product uses Ekotrope software to provide Home Energy Rating scores and expected savings for product homes. Applications are submitted with modeled savings verified by HERs raters.
Residential Consumers Energy Store	The product allows Consumers Energy customers to purchase energy-efficient products via a website for delivery to their homes. The rebate is an instant discount that is applied to the customer's purchase during check out. Customers do not complete an application for the product but provide their account number or service address during check out to ensure their account fuel type matches the fuel savings of the energy efficient equipment. The Cadmus team verified customer fuel type matched savings associated with the energy-efficient equipment purchase through the Consumers Energy Store.
Think! Energy	For this product, Consumers Energy provides curriculum materials and energy efficiency kits to teachers at participating schools, who, in turn, distribute the kits to students to install in the home. Kits are also distributed through other community organizations, e.g. senior centers. Individual product participants do not apply for incentives; the product implementer tracks the number of kits provided to each school. The Cadmus team reviewed the database and ensured that appropriate savings were tracked based on the kit measures distributed and the fuel service(s) Consumers Energy provides in the territory where the school is located (natural gas, electric, or combination).

Sampling

The Cadmus team reviewed product documentation for a random, representative sample of each relevant product's participant population. Using a finite population adjustment factor, the Cadmus team chose sample sizes to enable findings with at least 90 percent confidence and ± 10 percent precision at the product level.

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The Cadmus team looked for inconsistencies between the data recorded in product documents and data reported in product tracking databases and determined whether these inconsistencies occurred randomly or presented systematic errors. In general, random errors result from unpredictable mistakes in transcription or data entry, while systematic errors result from inaccuracies persistent across numerous records.

To determine whether a given sample contained random or systematic errors, the Cadmus team tested whether each sample's mean kWh, kW, and MCF realization ratios were statistically equal to 1.0 (or found no systemic errors in the product sample).

- If a sample's mean realization ratio was *statistically equal* to 1.0 at the 90% confidence level, the Cadmus team considered the errors to be random and did not apply the sample mean realization ratio to the relevant participant population. In such cases, the team included individual data discrepancies in the final net savings calculations.
- If a sample's mean realization ratio was *statistically unequal* to 1.0 at the 90% confidence level, the Cadmus team considered the errors systematic and applied the sample's mean realization ratio to the relevant participant population. The Cadmus team found no systematic errors in 2022.

Table 6 summarizes the sampling applied to each residential EWR product and the realization rates by fuel type. All programs except ENERGY STAR Lighting and Income Qualified – Electric achieved a 100% realization rate for their delivered fuel types. During the review for ENERGY STAR Lighting, an additional light bulb was found in the POS invoices. In the Income Qualified – Electric product review, square footage was overstated in one job by 30-square feet.

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Table 6. Selected Sample Sizes and Realization Rate by Product and Fuel Type

Product	Sample Size (n)	Sample kWh Realization Rate	Sample MCF Realization Rate	Apply Sample Realization Rate to Population
Appliance Recycling	N/A	N/A	N/A	N/A
ENERGY STAR Appliances	69	100.00%	100.00%	No
ENERGY STAR Lighting	69	100.01%	N/A	No
Home Energy Analysis	69	100.00%	100.00%	No
Home Energy Analysis – Electric	68	100.00%	N/A	No
Home Energy Report	N/A	N/A	N/A	N/A
Home Performance with ENERGY STAR	64	100.00%	100.00%	No
HVAC and Water Heating	69	100.00%	100.00%	No
Income Qualified	69	100.00%	100.00%	No
Income Qualified – Electric	69	99.99%	N/A	No
Insulation and Windows	69	100.00%	100.00%	No
Residential Consumers Energy Store	N/A	N/A	N/A	N/A
Residential Multifamily	41	100.00%	100.00%	No
Multifamily Income Qualified	48	100.00%	100.00%	No
New Home Construction	N/A	N/A	N/A	N/A
Residential Agriculture	27	100.00%	N/A	No
Think! Energy	N/A	N/A	N/A	N/A

Calculating Realization Rates

First, the Cadmus team calculated kWh, kW, and MCF realization rates for individual records in each product's sample (using identical calculations for kWh, kW, and MCF) by comparing reported and certified savings by fuel type (shown in the equation below). Differences between reported and certified savings occurred due to discrepancies in customer types, measure types, or installed measure quantities.

$$RR_i = \frac{\sum_j \text{Certified Savings}_j}{\sum_j \text{Reported Savings}_j}$$

Where:

- RR = Calculated realization rate
- i = Unique record 'i'
- j = Individual application, invoice, or other documents

The team then calculated mean realization rates for each fuel type at the sample level (these calculations were identical for kW, kWh, and MCF):

$$RR = \frac{\sum_i RR_i}{n}$$

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Where:

n = Number of unique records in the sample

For each fuel type, the Cadmus team conducted a hypothesis test to determine whether the sample's mean realization ratio equaled 1.0 (or 100%). The resulting test statistic (t-statistic, t_{RR}) revealed whether differences discovered during the documentation review were random or systematic (based on whether the realization ratio was significantly different from 1.0). The team only applied the sample realization rate to product savings when the differences were found to be systematic. The Cadmus team calculated t-statistics for each fuel type using the following equations (these calculations were identical for kW, kWh, and MCF):

$$StdDev_{RR} = \sqrt{\frac{\sum_i (RR_i - RR)^2}{n}}$$

$$SE_{RR} = \frac{StdDev_{RR}}{\sqrt{n}}$$

$$t_{RR} = \left| \frac{RR - 100\%}{SE_{RR}} \right|$$

Where:

$StdDev$ = Standard deviation

SE = Standard error

t = t-statistic based on $n - 1$ degrees of freedom

Task 4: Calculation of Verified Net Annual and Lifetime Savings

The Cadmus team calculated net annual savings incorporating verified inputs and certified annual net kWh, kW, and MCF savings using approved ISR and NTG rates. Similarly, the Cadmus team calculated lifetime kWh and MCF savings by applying those same ISR and NTG rates to annual savings.

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Summary of Verified and Certified Savings

This section summarizes annual and lifetime savings calculations for Consumers Energy's residential EWR products and provides a comparison to reported savings. Table 7 presents verified net savings for each residential EWR product by fuel type.

Table 7. Residential Energy Waste Reduction Products' Verified Net Annual Savings by Fuel Type

Product	2022 Verified Net Annual Savings		
	kWh	kW	MCF
Appliance Recycling	46,928,853	3,074.85	N/A
ENERGY STAR Appliances	3,662,852	871.17	38,881
ENERGY STAR Lighting	23,196,677	2,746.78	N/A
Home Energy Analysis	3,589,985	283.04	88,080
Home Energy Analysis – Electric	4,382,523	339.09	N/A
Home Energy Reports	16,570,124	2,851.10	92,483
Home Performance with ENERGY STAR	255,608	112.11	35,479
HVAC and Water Heating	3,064,719	1,063.02	473,591
Income Qualified	16,165,601	697.99	175,302
Income Qualified – Electric	10,201,047	614.38	N/A
Insulation and Windows	645,649	419.93	56,954
Residential Consumers Energy Store	3,078,066	203.94	111,954
Residential Multifamily	2,048,459	238.27	76,838
Multifamily Income Qualified	8,439,257	691.48	78,274
New Home Construction	1,781,362	781.23	62,377
Residential Agriculture	1,041,921	190.42	857
Think! Energy	7,365,308	653.40	117,389
Utility Shared Savings	341,974	95.17	45,009
Total	152,759,982	15,927.36	1,453,468

Note: Totals may not sum due to rounding.

The tables below summarize the following reported and verified net savings values from the 2022 product year, by fuel and savings type (kWh, kW, and MCF):

- **Reported gross and verified net annual savings.** Table 8, Table 12, and Table 15 show reported gross savings (before applying ISR adjustments and NTG factors), verified net savings, and associated product realization rates for kWh, kW, and MCF, respectively. The ISR and NTG adjustments accounted for most of the differences between reported and verified savings. Applying ISRs resulted in adjusted savings claims to account for measure and savings persistence. The Cadmus team reviewed these adjustments through periodic product impact evaluations that captured variations in installation practices, early measure removal, or changes in operating characteristics. The team assigned appropriate NTG factors to account for savings attributed to the product that would have occurred in its absence (known as freeridership) as well as for savings impacts that were influenced by the product but were not captured in the tracked data (known as spillover and market effects). The product realization rates (reported

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gross savings divided by verified net savings) also captured adjustments made throughout the certification process, but these impacts were minor.

- **Reported net and certified net annual savings.** To determine reported net annual savings, the Cadmus team applied measure installation quantities, per-unit savings values, ISR adjustments, and NTGs listed in Consumers Energy's eTracker database. The certified net annual savings in Table 9, Table 13, and Table 16 reflect findings from the Cadmus team's review.
- **Net lifetime savings calculations.** For each product, the Cadmus team calculated net lifetime kWh and MCF savings using weighted average measure lifetimes.
- **Net annual and lifetime savings contributions by product.** For each fuel type, the Cadmus team determined the proportion of net annual and lifetime (kWh and MCF) savings from each product.

Certified Net Kilowatt-Hour Savings

Table 8 summarizes reported gross annual and verified net annual kWh savings for each product and for the portfolio, and Table 9 summarizes reported net annual and verified net annual kWh savings.



**Table 8. Summary of Reported Gross and Verified Net Annual
kWh Savings by Product**

Product	2022 Reported Gross Annual Savings (kWh)	2022 Verified Net Annual Savings (kWh)	Realization Rate
Appliance Recycling	58,213,147	46,928,853	80.62%
ENERGY STAR Appliances	4,017,715	3,662,852	91.17%
ENERGY STAR Lighting	66,813,949	23,196,677	34.72%
Home Energy Analysis	3,936,440	3,589,985	91.20%
Home Energy Analysis – Electric	4,769,020	4,382,523	91.90%
Home Energy Reports	N/A	16,570,124	N/A
Home Performance with ENERGY STAR	277,835	255,608	92.00%
HVAC and Water Heating	3,331,216	3,064,719	92.00%
Income Qualified	17,052,329	16,165,601	94.80%
Income Qualified – Electric	10,473,483	10,201,047	97.40%
Insulation and Windows	701,793	645,649	92.00%
Residential Consumers Energy Store	3,748,837	3,078,066	82.11%
Residential Multifamily	2,279,274	2,048,459	89.87%
Multifamily Income Qualified	8,534,043	8,439,257	98.89%
New Home Construction	1,936,263	1,781,362	92.00%
Residential Agriculture	1,203,483	1,041,921	86.58%
Think! Energy	13,988,805	7,365,308	52.65%
Utility Shared Savings	N/A	341,974	N/A
Total	201,277,630	152,759,982	67.49%*

Note: Totals may not sum due to rounding.

*Total realization rate excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

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Table 9. Summary of Reported Net and Verified Net Annual kWh Savings by Product

Product	2022 Reported Net Annual kWh Savings	2022 Verified Net Annual kWh Savings	Net to Net Ratio
Appliance Recycling	46,928,853	46,928,853	100.00%
ENERGY STAR Appliance	3,662,851	3,662,852	100.00%
ENERGY STAR Lighting	24,714,600	23,196,677	93.86%
Home Energy Analysis	3,589,987	3,589,985	100.00%
Home Energy Analysis – Electric	4,346,744	4,382,523	100.82%
Home Energy Reports	N/A	16,570,124	N/A
Home Performance with ENERGY STAR	255,608	255,608	100.00%
HVAC and Water Heating	3,064,719	3,064,719	100.00%
Income Qualified	16,165,630	16,165,601	100.00%
Income Qualified – Electric	10,274,422	10,201,047	99.29%
Insulation and Windows	645,649	645,649	100.00%
Residential Consumers Energy Store	3,147,126	3,078,066	97.81%
Residential Multifamily	2,076,542	2,048,459	98.65%
Multifamily Income Qualified	8,507,247	8,439,257	99.20%
New Construction	1,781,362	1,781,362	100.00%
Residential Agriculture	1,037,828	1,041,921	100.39%
Think! Energy	7,365,273	7,365,308	100.00%
Utility Shared Savings	N/A	341,974	N/A
Total	137,564,440	152,759,982	98.75%*

Note: Totals may not sum due to rounding.

*Total net to net ratio excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

Table 10 shows lifetime kWh savings and the weighted average measure life for each product. Cadmus calculated the weighted average measure life as the lifetime savings divided by annual savings.

Table 10. Summary of Lifetime kWh Savings and Measure Life by Product

Product	2022 Verified Lifetime Savings (kWh)	Weighted Average Measure Life
Appliance Recycling	289,609,629	6.2
ENERGY STAR Appliances	33,035,274	9.0
ENERGY STAR Lighting	98,964,540	4.3
Home Energy Analysis	26,598,146	7.4
Home Energy Analysis – Electric	26,996,054	6.2
Home Energy Reports	16,570,124	1.0
Home Performance with ENERGY STAR	4,094,392	16.0
HVAC and Water Heating	41,818,034	13.6
Income Qualified	158,453,597	9.8
Income Qualified – Electric	88,412,163	8.7
Insulation and Windows	15,811,886	24.5
Residential Consumers Energy Store	23,609,108	7.7

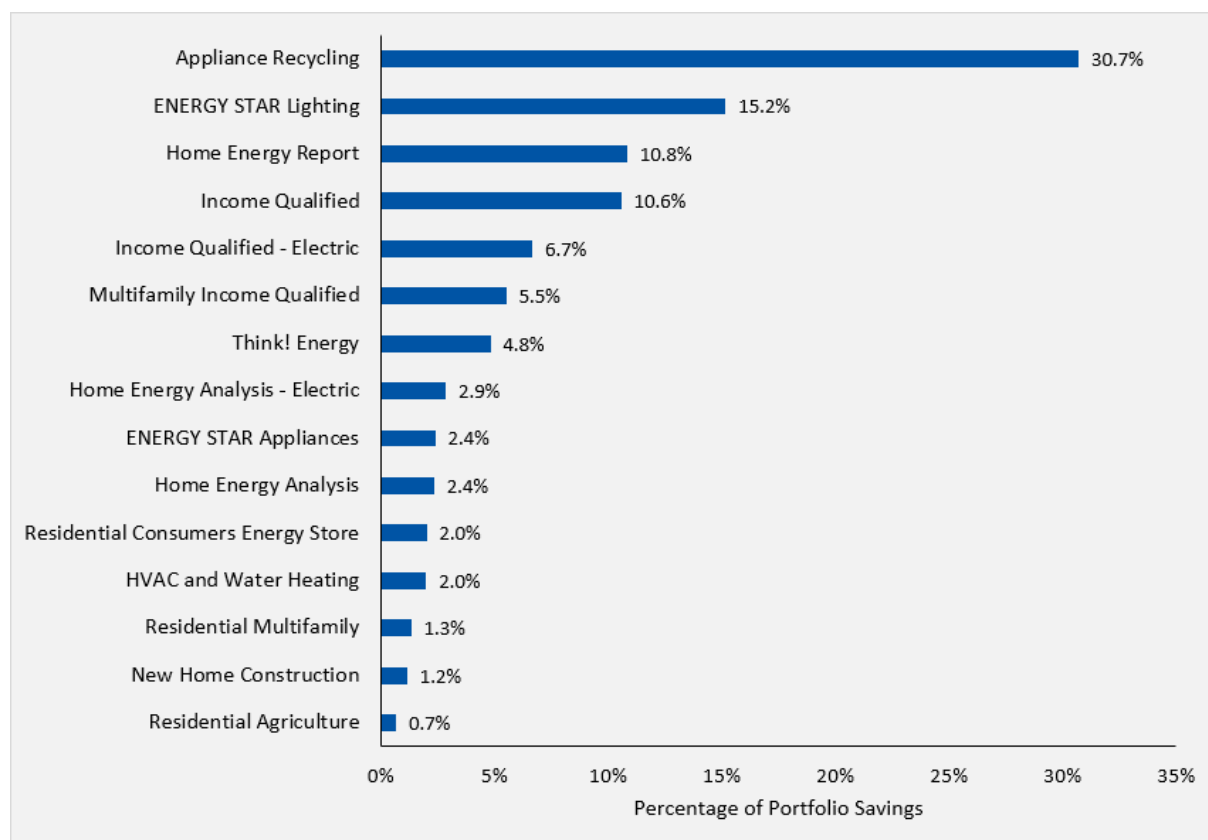
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Product	2022 Verified Lifetime Savings (kWh)	Weighted Average Measure Life
Residential Multifamily	18,999,354	9.3
Multifamily Income Qualified	95,000,792	11.3
New Home Construction	35,627,235	20.0
Residential Agriculture	14,122,261	13.6
Think! Energy	52,372,686	7.1
Utility Shared Savings	4,705,684	13.8
Total	1,044,800,960	6.9

Note: Total may not sum due to rounding.

Figure 2 depicts each residential EWR product's contribution to overall certified annual kWh savings in 2022. Over 30% of the residential portfolio's annual kilowatt-hour savings came from the Appliance Recycling product, while over 15% came from the ENERGY STAR Lighting product. The three Income Qualified products represented about 23% of the kWh savings. The Home Energy Report product contributed almost 11% of the portfolio. The remaining 20% of annual kWh savings came from the other 11 EWR products. The Insulation and Windows product, Home Performance with ENERGY STAR product, and Utility Shared Savings contributed less than one percent of the electric portfolio savings combined.

Figure 2. Share of Verified Net Annual Energy Savings by Product (kWh)



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Figure 3 shows each product's contribution to lifetime kWh savings. The Appliance Recycling product contributed 28% of the residential portfolio's lifetime kWh savings, while the three income-qualified products accounted for nearly 33%. The share of ENERGY STAR Lighting Report product savings decreased from over 27% of annual kWh savings in 2022 to 9.5% of the lifetime kWh savings for the residential portfolio. The Home Performance with ENERGY STAR product and the Utility Shared Savings contributed less than one percent of the share of lifetime portfolio electric savings combined.

Figure 3. Share of Verified Net Lifetime Energy Savings by Product (kWh)

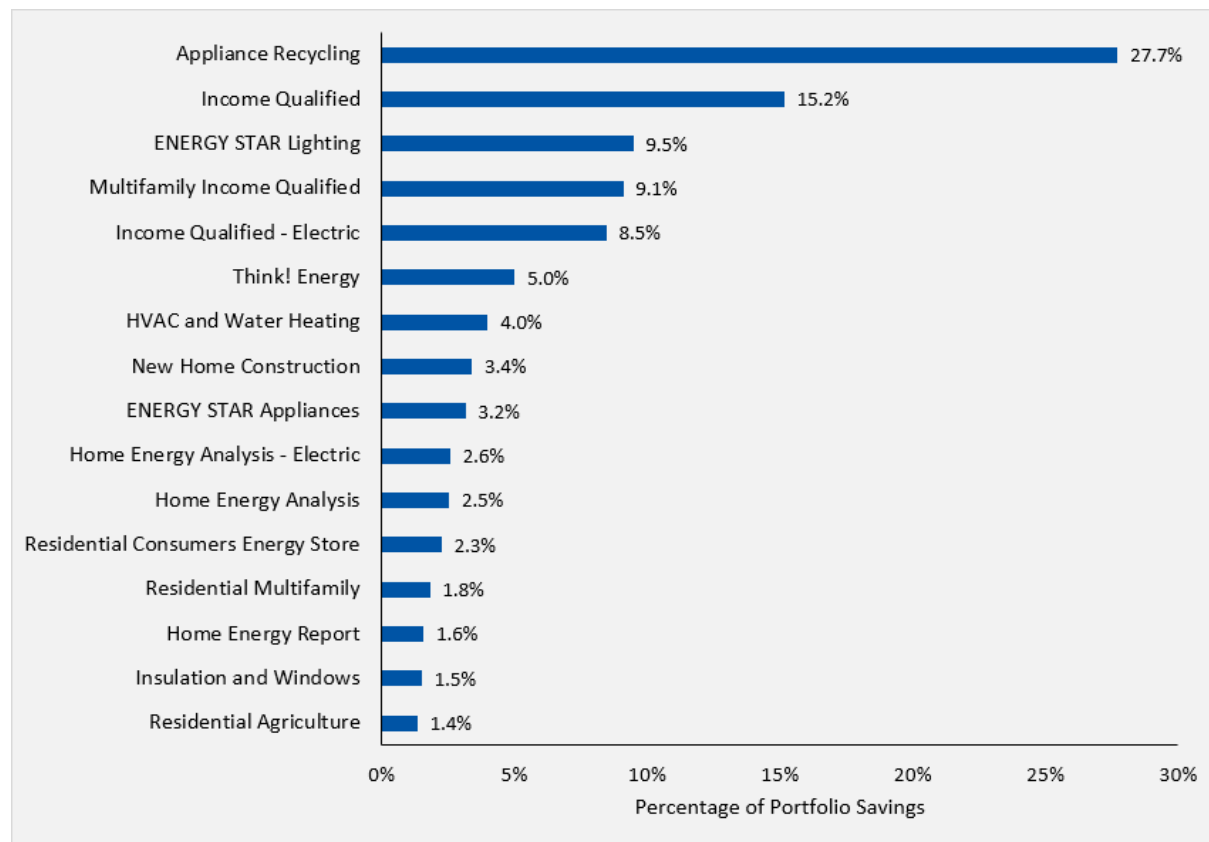


Table 11 shows the kWh savings variances by product and measure for 2022.

Table 11. kWh Variances by Product and Measure

Product	Measure Code	Measure Description	Variance Description	Effect on Reported Annual kWh	Effect on Reported Lifetime kWh
ENERGY STAR Lighting	RBE0316	LED Bulb Replacing A-Line 43W	Electric quantity increased by one bulb based on application review	11	45
ENERGY STAR Lighting	RBE0319	LED A-line (43W Replacement) - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.399	(560,440)	(2,241,759)

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Product	Measure Code	Measure Description	Variance Description	Effect on Reported Annual kWh	Effect on Reported Lifetime kWh
ENERGY STAR Lighting	RBE0320	LED A-line (72W Replacement) - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.399	(464,083)	(1,856,334)
ENERGY STAR Lighting	RBE0323	LED Night Light - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.496	(93,397)	(1,120,759)
ENERGY STAR Lighting	RLE0324	LED Globe - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.496	(213,026)	(1,278,156)
ENERGY STAR Lighting	RLE0325	LED Candelabra - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.496	(186,989)	(1,121,937)
Home Energy Analysis - Electric	RFE0033	Virtual - LED Exterior Fixture Lamp Replacement-2020 & 2021	Per unit savings updated from 0 kWh to 81 kWh; measure life updated from 1 to 12	44,339	532,073
Home Energy Analysis - Electric	RFE0034	Virtual - LED A-Line LT or EQ 6W Replacing 40W Equivalent	Per unit savings updated from 51 kWh to 19.6 kWh	(8,551)	(128,263)
Home Energy Analysis - Electric	RFE0043	Exterior Candelabra	Per unit savings updated from 122.0118 kWh to 122.0000 kWh	(7)	(41)
Income Qualified	RIE0092	Shower Flow Optimizer 1.5gpm - Electric Water Heater (Direct Program)	Per unit savings updated from 334 kWh to 342 kWh	8	85
Income Qualified	RIC0043	Manufactured Belly insulation 100% Coverage Base - (Agency Rebate)	ISR updated from 1.0 to 0.909	(14)	(361)
Income Qualified	RIE0133	Manufactured Belly Insulation 100% Coverage Base - (Agency Rebate)	ISR updated from 1.0 to 0.909	(23)	(571)
Income Qualified - Electric	RFE2072	Cold Climate Heat Pump – Custom	15% adjustment factor applied to all custom jobs ⁵	(73,368)	(1,100,515)
Income Qualified - Electric	RFE2089	Exterior Candelabra	Per unit savings updated from 122.0118 kWh to 122.0000 kWh	(1)	(9)
Income Qualified - Electric	RFE2121	Above Grade Wall Insulation	Electric quantity decreased by 30-sq ft based on application review	(3)	(73)

⁵ Initial temperature binning in custom calculations resulted in higher-than-average heat pump savings when compared to benchmark calculations. A 15% adjustment factor was applied to account for those temperature binning issues.

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Product	Measure Code	Measure Description	Variance Description	Effect on Reported Annual kWh	Effect on Reported Lifetime kWh
Residential Agriculture	RAI0057	Water Pre-Heat Heat Exchanger Electric Water Heater	ISR updated from 0.985 to 0.937, NTG updated from 0.9 to 0.92	(378)	(5,670)
Residential Agriculture	RAI0108	Res Ag - 4-Foot T8 to One (1) 4-Foot LED Tube Light (High Bay >= 15 ft)	Per unit savings updated from 40 kWh to 49.43 kWh	4,471	80,477
Residential Consumers Energy Store	RAE5020	ENERGY STAR Air Purifier CADR 101-150 – GIVEAWAY	Per unit savings updated from 488 kWh to 433 kWh	(69,060)	(621,539)
Multifamily Income Qualified	RQE0470	DI - Window Insulation Kits (Electric)	ISR not applied in standard tracking. Savings updated to reflect 0.64 ISR	(67,990)	(67,990)
Residential Multifamily	RME0432	DI - Window Insulation Kits (Electric)	ISR not applied in standard tracking. Savings updated to reflect 0.64 ISR	(28,083)	(28,083)
Total				(1,839,761)	(9,082,555)

Note: Totals may not sum due to rounding; Measure names are as they appear in eTracker.

Certified Net Kilowatt Savings

Table 12 summarizes reported gross and verified net kW savings for each residential EWR product, and Table 13 summarizes reported net annual and verified net annual kW savings.

Table 12. Summary of Reported Gross and Verified Net kW Savings by Product

Product	2022 Reported Gross Savings (kW)	2022 Verified Net Savings (kW)	Realization Rate
Appliance Recycling	3,849.82	3,074.85	79.87%
ENERGY STAR Appliances	980.63	871.17	88.84%
ENERGY STAR Lighting	7,842.85	2,746.78	35.02%
Home Energy Analysis	308.25	283.04	91.82%
Home Energy Analysis - Electric	388.25	339.09	87.34%
Home Energy Report	N/A	2,851.10	N/A
Home Performance with ENERGY STAR	121.86	112.11	92.00%
HVAC and Water Heating	1,155.46	1,063.02	92.00%
Income Qualified	711.72	697.99	98.07%
Income Qualified – Electric	622.29	614.38	98.73%
Insulation and Windows	456.45	419.93	92.00%
Residential Consumers Energy Store	264.12	203.94	77.21%
Residential Multifamily	261.01	238.27	91.29%
Multifamily Income Qualified	694.46	691.48	99.57%

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Product	2022 Reported Gross Savings (kW)	2022 Verified Net Savings (kW)	Realization Rate
New Home Construction	849.16	781.23	92.00%
Residential Agriculture	3,403.73	190.42	5.59%
Think! Energy	1,138.39	653.40	57.40%
Utility Shared Savings	N/A	95.17	N/A
Total	23,048.46	15,927.36	56.32%*

Note: Totals may not sum due to rounding.

*Total realization rate excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

Table 13. Summary of Reported Net and Verified Net kW Savings by Product

Product	2022 Reported Net kW Savings	2022 Verified Net kW Savings	Net to Net Ratio
Appliance Recycling	3,074.85	3,074.85	100.00%
ENERGY STAR Appliances	871.17	871.17	100.00%
ENERGY STAR Lighting	2,916.04	2,746.78	94.20%
Home Energy Analysis	283.04	283.04	100.00%
Home Energy Analysis – Electric	356.05	339.09	95.24%
Home Energy Report	0.00	2,851.10	N/A
Home Performance with ENERGY STAR	112.11	112.11	100.00%
HVAC and Water Heating	1,063.02	1,063.02	100.00%
Income Qualified	697.99	697.99	100.00%
Income Qualified – Electric	617.85	614.38	99.44%
Insulation and Windows	419.93	419.93	100.00%
Residential Consumers Energy Store	212.10	203.94	96.15%
Residential Multifamily	238.27	238.27	100.00%
Multifamily Income Qualified	691.48	691.48	100.00%
New Home Construction	781.23	781.23	100.00%
Residential Agriculture	2,946.44	190.42	6.46%
Think! Energy	651.21	653.40	100.34%
Utility Shared Savings	N/A	95.17	N/A
Total	15,932.78	15,927.36	81.47%*

Note: Totals may not sum due to rounding.

*Total net-to-net ratio excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

Figure 4 depicts each residential EWR product's contribution to overall certified kW savings in 2022. The Appliance Recycling product contributed the most with over 19% of portfolio kW savings, the Home Energy Report product was the next largest contributor with nearly 18%, and the ENERGY STAR Lighting product was the third largest contributor with over 17% of the portfolio kW savings. These three products contributed to over half (55%) of the residential portfolios share of kW savings.



The HVAC and Water Heating product contributed over 6% and the ENERGY STAR Appliances product contributed over 5% of the certified kW savings. The remaining one-third of kW savings came from the 13 other residential products, including 0.6% from Utility Shared Savings.

Figure 4. Share of Certified Net Energy Savings by Product (kW)

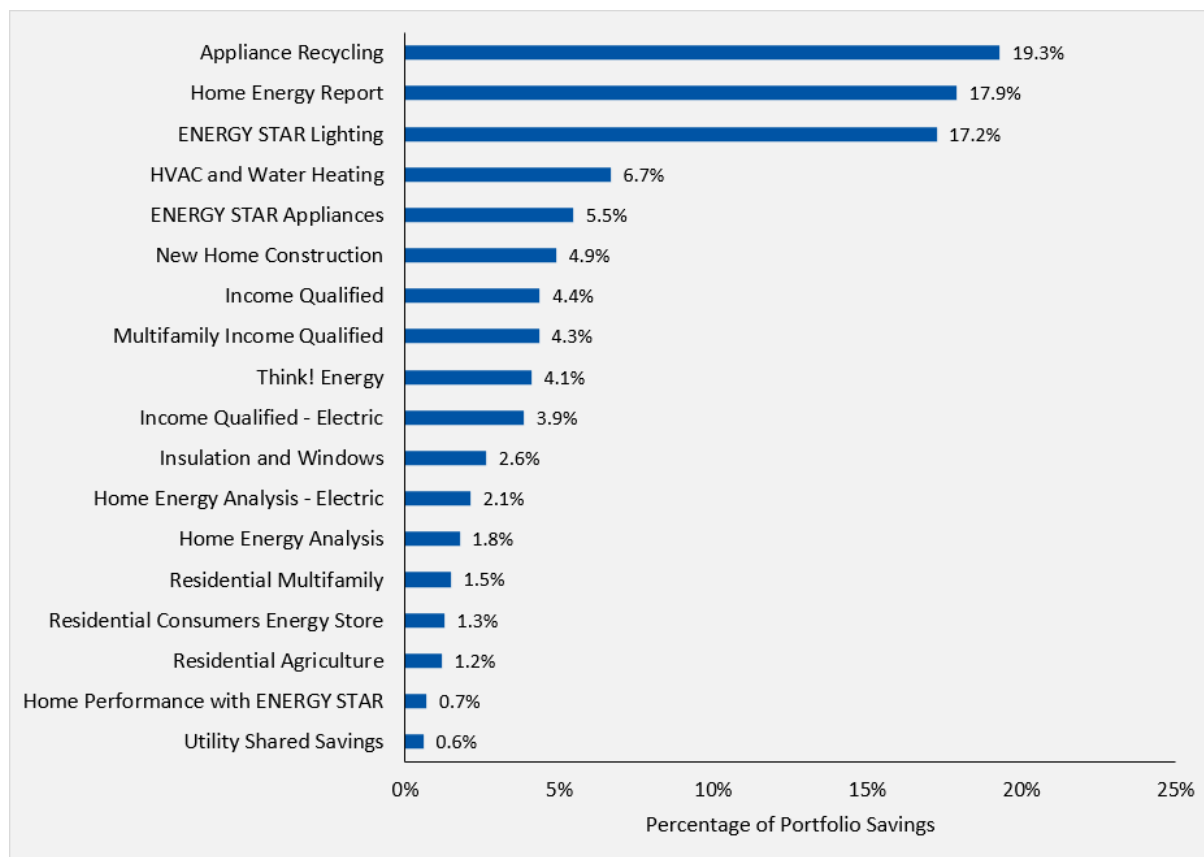


Table 14 shows the kW savings variances by product and measure for 2022.

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Table 14. kW Variances by Product and Measure

Product	Measure Code	Measure Description	Variance Description	Effect on Reported Annual kW
ENERGY STAR Lighting	RBE0316	LED Bulb Replacing A-Line 43W	Electric quantity increased by one bulb based on application review	< 0.01
ENERGY STAR Lighting	RBE0319	LED A-line (43W Replacement) - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.399	(66.86)
ENERGY STAR Lighting	RBE0320	LED A-line (72W Replacement) - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.399	(55.06)
ENERGY STAR Lighting	RLE0324	LED Globe - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.496	(25.25)
ENERGY STAR Lighting	RLE0325	LED Candelabra - Lighting Kit	ISR updated from 0.89 to 0.25, NTG updated from 0.25 to 0.496	(22.09)
Home Energy Analysis - Electric	RFE0034	Virtual - LED A-Line LT or EQ 6W Replacing 40W Equivalent	Per unit savings updated from 0.0058 kW to 0.0023 kW	(0.95)
Home Energy Analysis - Electric	RFE0043	Exterior Candelabra	Per unit savings updated from 0.0283 kW (non-coincident) to 0.0005 kW (coincident)	(16.01)
Income Qualified - Electric	RFE2089	Exterior Candelabra	Per unit savings updated from 0.0283 kW (non-peak) to 0.0005 kW (Peak)	(3.48)
Income Qualified - Electric	RFE2121	Above Grade Wall Insulation	Electric quantity decreased by 30-sq ft based on application review	< (0.01)
Residential Agriculture	RAI0034	Interior LED Lighting (Low Bay LT 18 ft)	Conversion factor error, per unit savings updated from 0.49 kW to 0.00049 kW	(2,756.21)
Residential Agriculture	RAI0057	Water Pre-Heat Heat Exchanger Electric Water Heater	ISR updated from 0.902 to 0.941, NTG updated from 0.9 to 0.92	0.22
Residential Agriculture	RAI0108	Res Ag - 4-Foot T8 to One (1) 4-Foot LED Tube Light (High Bay >= 15 ft)	Per unit savings updated from 0.0090 kW to 0.0091 kW	0.03
Residential Consumers Energy Store	RAE5020	ENERGY STAR Air Purifier CADR 101-150 - GIVEAWAY	Per unit savings updated from 0.056 kW to 0.0495 kW	(8.16)
Total				(102.73)

Note: Totals may not sum due to rounding;

Certified Net MCF Savings

Table 15 summarizes reported gross and verified net annual MCF savings for each product and Table 16 summarizes reported net annual and verified net annual MCF savings.



Table 15. Summary of Reported Gross and Verified Net Annual MCF Savings by Product

Product	2022 Reported Gross Annual Savings (MCF)	2022 Verified Net Annual Savings (MCF)	Realization Rate
Appliance Recycling	N/A	N/A	N/A
ENERGY STAR Appliances	58,511.20	38,881.46	66.45%
ENERGY STAR Lighting	N/A	N/A	N/A
Home Energy Analysis	97,812.42	88,080.08	90.05%
Home Energy Analysis – Electric	N/A	N/A	N/A
Home Energy Report	N/A	92,483.26	N/A
Home Performance with ENERGY STAR	38,564.25	35,479.11	92.00%
HVAC and Water Heating	514,773.23	473,591.37	92.00%
Income Qualified	206,165.23	175,302.11	85.03%
Income Qualified – Electric	N/A	N/A	N/A
Insulation and Windows	61,906.04	56,953.55	92.00%
Residential Consumers Energy Store	124,113.37	111,954.44	90.20%
Residential Multifamily	112,349.45	76,837.84	68.39%
Multifamily Income Qualified	99,451.74	78,273.60	78.71%
New Home Construction	67,800.57	62,376.52	92.00%
Residential Agriculture	944.70	856.96	90.71%
Think! Energy	325,923.75	117,388.87	36.02%
Utility Shared Savings	N/A	45,009	N/A
Total	1,708,315.95	1,453,467.82	77.03%*

Note: Totals may not sum due to rounding.

*Total realization rate excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

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Table 16. Summary of Reported Net and Verified Net Annual MCF Savings by Product

Product	2022 Reported Net Annual MCF Savings	2022 Verified Net Annual MCF Savings	Net to Net Ratio
Appliance Recycling	N/A	N/A	N/A
ENERGY STAR Appliances	38,642.83	38,881.46	100.62%
ENERGY STAR Lighting	N/A	N/A	N/A
Home Energy Analysis	88,080.08	88,080.08	100.00%
Home Energy Analysis – Electric	N/A	N/A	N/A
Home Energy Report	N/A	92,483.26	N/A
Home Performance with ENERGY STAR	35,479.11	35,479.11	100.00%
HVAC and Water Heating	473,591.37	473,591.37	100.00%
Income Qualified	175,308.67	175,302.11	100.00%
Income Qualified – Electric	N/A	N/A	N/A
Insulation and Windows	56,953.55	56,953.55	100.00%
Residential Consumers Energy Store	111,954.44	111,954.44	100.00%
Residential Multifamily	103,240.48	76,837.84	74.43%
Multifamily Income Qualified	99,378.34	78,273.60	78.76%
New Home Construction	62,376.52	62,376.52	100.00%
Residential Agriculture	856.96	856.96	100.00%
Think! Energy	117,388.87	117,388.87	100.00%
Utility Shared Savings	N/A	45,008.64	N/A
Total	1,363,251	1,453,468.82	96.53%*

Note: Totals may not sum due to rounding.

*Total net to net ratio excludes verified net savings for the Home Energy Reports product since the product relies on custom verified savings calculated by independent evaluators. Similarly, Utility Shared Savings are excluded because those savings are determined through analysis conducted by independent evaluators.

For each product, Table 17 shows verified lifetime MCF savings and the weighted average measure life.



Table 17. Summary of Lifetime MCF Savings by Product

Product	2022 Verified Lifetime Savings (MCF)	Weighted Average Measure Life
Appliance Recycling	N/A	N/A
ENERGY STAR Appliances	368,979.64	9.5
ENERGY STAR Lighting	N/A	N/A
Home Energy Analysis	881,755.31	10.0
Home Energy Analysis – Electric	N/A	N/A
Home Energy Report	92,483.26	1.0
Home Performance with ENERGY STAR	545,008.21	15.4
HVAC and Water Heating	6,548,825.04	13.8
Income Qualified	2,029,159.46	11.6
Income Qualified – Electric	N/A	N/A
Insulation and Windows	1,365,625.94	24.0
Residential Consumers Energy Store	718,534.99	6.4
Residential Multifamily	336,552.37	4.4
Multifamily Income Qualified	574,705.83	7.3
New Home Construction	1,247,530.44	20.0
Residential Agriculture	17,953.13	20.9
Think! Energy	736,370.17	6.3
Utility Shared Savings	395,942.51	8.8
Total	15,859,426.30	10.9

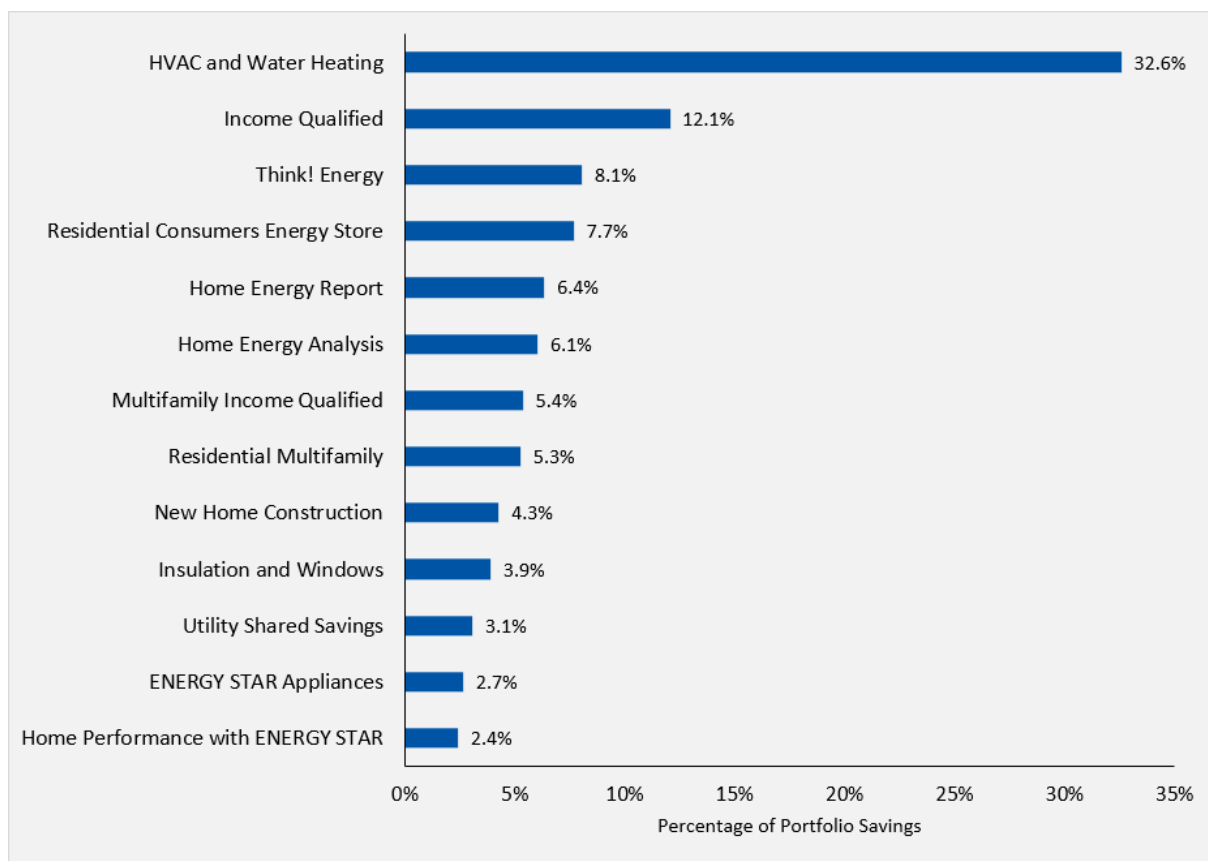
Note: Totals may not sum due to rounding.

Figure 5 depicts how each Consumers Energy residential EWR product contributed to the overall, certified annual MCF savings in 2022. Thirty-three percent of annual MCF savings came from the HVAC and Water Heating product, and over 12% came from the Income Qualified product. Additional products contributing significantly to overall MCF savings included:

- Think! Energy (8.1%)
- Residential Consumers Energy Store (7.7%)
- Home Energy Report (6.4%)
- Home Energy Analysis (6.1%)
- Multifamily Income Qualified (5.4%)
- Residential Multifamily (5.3%)
- New Home Construction (4.3%)
- Insulation and Windows (3.9%)
- Utility Shared Savings (3.1%)
- ENERGY STAR Appliances (2.7%)
- Home Performance with ENERGY STAR (2.4%)

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Figure 5. Share of Certified Net Annual MCF Savings by Product

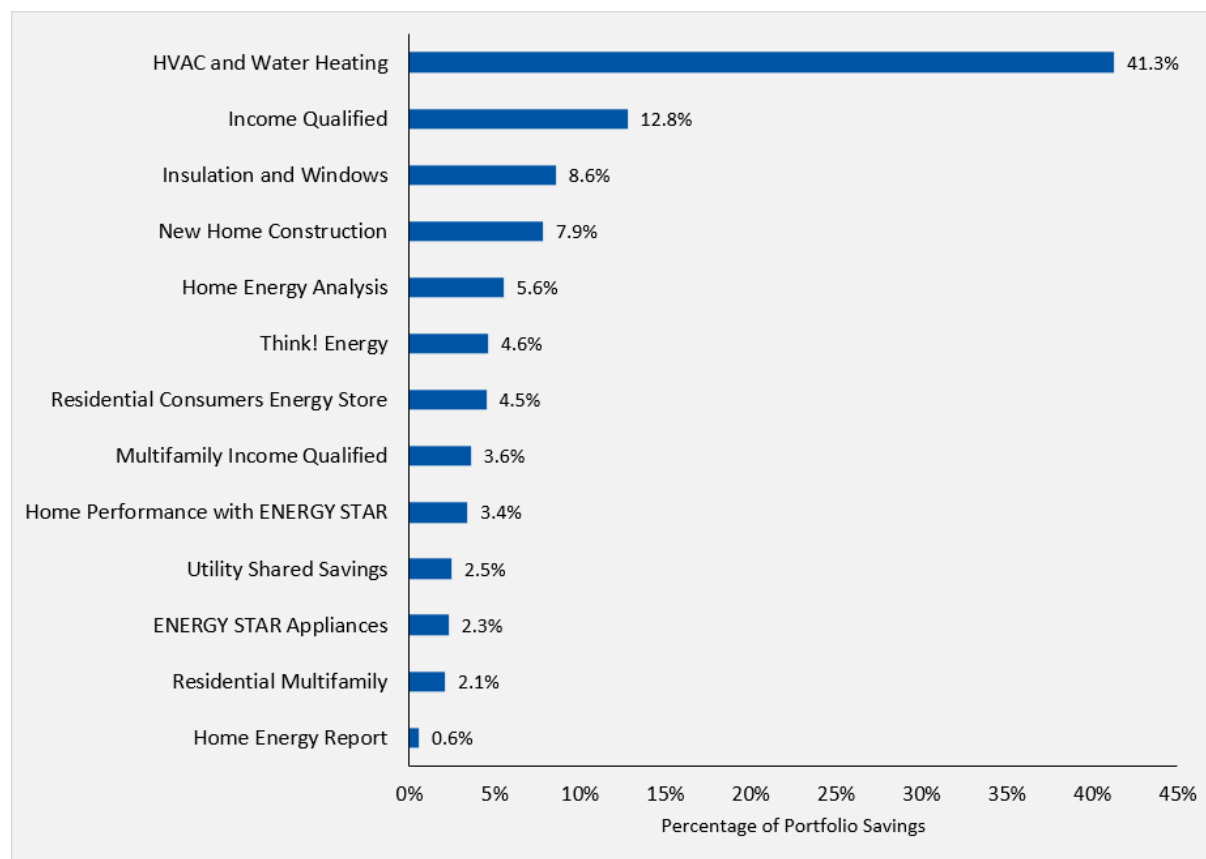


Note: Appliance Recycling, ENERGY STAR Lighting, Home Energy Analysis-Electric, Residential Agriculture and Income Qualified - Electric contributed 0.0% of the annual MCF portfolio share.

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Figure 6 shows each product's contribution to lifetime MCF savings. The HVAC and Water Heating product accounted for over 42% of the lifetime MCF savings, followed by the Income Qualified product with nearly 13% of lifetime savings. The combined income qualified programs contributed about 17% of the lifetime portfolio savings. The Utility Shared Savings contributed 2.5% of lifetime MCF savings to the residential portfolio.

Figure 6. Share of Certified Net Lifetime MCF Savings by Product



Note: The Appliance Recycling, ENERGY STAR Lighting, Home Energy Analysis-Electric, Residential Agriculture, and Income Qualified – Electric products do not contribute natural gas savings and do not contribute to the lifetime MCF portfolio savings.

Table 18 shows the MCF savings variances by product and measure for 2022.

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Table 18. MCF Variances by Product and Measure

<i>Product</i>	<i>Measure Code</i>	<i>Measure Description</i>	<i>Variance Description</i>	Effect on Reported Annual MCF	Effect on Reported Lifetime MCF
ENERGY STAR Appliances	RAG339	Low Flow Showerheads 1.5 gpm - Kit	ISR updated from 0.86 to 0.23, NTG updated from 0.23 to 0.92	238.63	2,386.28
Income Qualified	RIC0043	Manufactured Belly Insulation 100% Coverage Base - (Agency Rebate)	ISR updated from 1.0 to 0.909	(1.15)	(28.68)
Multifamily Income Qualified	RQG0283	DI - Window Insulation Kits (Gas)	ISR not applied in standard tracking. Savings updated to reflect 0.64 ISR	(21,104.74)	(21,104.74)
Residential Multifamily	RMG0265	DI - Window Insulation Kits (Gas)	ISR not applied in standard tracking. Savings updated to reflect 0.64 ISR	(26,402.64)	(26,402.64)
Total				(44,661.63)	(42,541.51)

Note: Totals may not sum due to rounding.

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Certification of Performance Incentive Metrics

The MPSC order agreement U-20875 that approved Consumers Energy EWR plan for 2022-2025 states Consumers Energy must achieve multiple performance incentive metrics for two fuel types (electricity and natural gas) to obtain a financial incentive for its EWR savings. The Cadmus team certified the Consumers Energy 2022 residential portfolio's contribution to applicable performance incentive metrics centered on lifetime low-income savings and the number of multifamily low-income energy assessments provided, as well as total lifetime portfolio savings (to be combined with certified 2022 commercial and industrial lifetime savings) for both natural gas and electricity.

Table 19 shows the performance metrics Consumers Energy must achieve to obtain a financial incentive with the minimum and maximum performance requirements.

Table 19. Order Agreement U-20875 Financial Incentive Performance Requirements

Performance Incentive Metric	Performance Requirement	
	Minimum Incentive	Maximum Incentive
Lifetime MWh savings exceeding 1.0% annual reduction	2,969,555 MWh	5,939,110 MWh
Lifetime MCF savings exceeding 0.75% annual reduction	24,288,537 MCF	32,384,708 MCF
Electric low-income investment in residential single family	\$8,160,000	\$9,600,000
Natural gas low-income investment in residential single family	\$13,387,500	\$15,750,000
Electric low-income investment for residential multifamily	\$7,990,000	\$9,400,000
Natural gas low-income investment in residential multifamily	\$6,630,000	\$7,800,000
Electric Low-income installations of targeted measures ⁶	3,020	4,530
Natural gas Low-income installations of targeted premium measures ⁷	4,794	7,191

The metric associated with lifetime MWh and MCF savings exceeding the required percentage of annual reduction is calculated for both residential and commercial and industrial lifetime portfolio savings. The Cadmus team certified the residential lifetime savings as 1,040,095 MWh and 15,463,484 MCF. The commercial lifetime savings values will need to be added with the residential lifetime savings values to determine if the total lifetime portfolio savings achieves the performance requirement for this metric.

⁶ Per the MPSC, "Targeted measures are defined as cold climate heat pumps, heat pump hot water heater, air sealing (20%, 30%, 40%, 50%), above grade wall insulation, attic insulation, basement wall insulation, crawlspace insulation, floor insulation, kneewall insulation or rim joist insulation. Electrically heated single family or multifamily buildings with air-conditioning or non-Consumers fossil fuel heat (gas or propane) and air-conditioning." [STATEOFMICHIGAN\(force.com\)](https://www.force.com/STATEOFMICHIGAN)

⁷ Per the MPSC, targeted measures include "Air sealing 20%, air sealing 30%, air sealing 40%, air sealing 50%, above grade wall insulation, attic insulation, basement wall insulation, crawlspace insulation, floor insulation, kneewall insulation or rim joist insulation with all measures counted separately. Maximum of one air sealing measure per housing unit can be counted." [STATEOFMICHIGAN\(force.com\)](https://www.force.com/STATEOFMICHIGAN)

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Consumers Energy achieved the maximum targets for electric and natural gas investment in multifamily low-income and for the natural gas investment for single family low income. The minimum target was achieved for the electric investment for single family low income. Table 20 shows low-income investment by fuel and dwelling type.

Table 20. 2022 Annual Investment Requirement for Low-Income Targeted Products

Dwelling and Fuel Type	Actual Investment	Performance Requirement		Actual Spending as a percentage or performance requirement	
		Minimum	Maximum	Minimum	Maximum
Single Family Electric	\$11,036,396	\$8,160,000	\$9,600,000	135%	115%
Single Family Natural Gas	\$17,241,339	\$13,387,500	\$15,750,000	129%	109%
Multifamily Electric	\$9,753,133	\$7,990,000	\$9,400,000	122%	104%
Multifamily Natural Gas	\$8,063,916	\$6,630,000	\$7,800,000	122%	103%

Table 21 shows the installation of targeted measures installed in low-income dwellings. Targeted measures include weatherization measures such as insulation and air sealing for electric and natural gas fuel as well as cold climate heat pumps and heat pump water heaters for electric fuel.

The Cadmus team certified that Consumers Energy achieved the minimum target for the installation of targeted measures and achieved 98% of the electric maximum target and 106% of the natural gas maximum target.

Table 21. Targeted Measures Installation Requirement for Low-Income Properties

Dwelling Type	Targeted Measures installed	Performance Requirement		Percentage of Target Achieved	
		Minimum	Maximum	Minimum	Maximum
Single Family Dwelling Electric	889.30	3,020	4,530	147%	98%
Multifamily Dwelling Electric	3,544.04				
Electric Subtotal	4,433.34				
Single Family Dwelling Natural Gas	3,395.00	4,794	7,191	159%	106%
Multifamily Dwelling Natural Gas	4,251.02				
Natural Gas Subtotal	7,646.02				

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Certified Water Savings

The Cadmus team identified water savings measures that were offered through eight of Consumers Energy's residential products in 2022 to calculate the gallons of water saved. Table 22 lists energy efficiency measures that produce water savings and the products that offer each measure.

Table 22. List of Water Saving Equipment Measures Installed by Product

Product	Clothes Washer	Kitchen Aerator	Bath Aerator	Showerhead	Showerstart
ENERGY STAR Appliances	✓			✓	
Home Energy Analysis		✓	✓	✓	✓
HEA – Electric		✓	✓	✓	✓
Income Qualified		✓	✓	✓	✓
Income Qualified - Electric		✓	✓	✓	✓
Residential Multifamily		✓	✓	✓	
Multifamily Income Qualified		✓	✓	✓	
Think! Energy		✓	✓	✓	

The Cadmus team found that households saved 223,706,264 net gallons through the installation of water-saving direct install measures and clothes washers in 2022. These measures will save 2,241,458,600 gallons of water over 11 years based on the average life of water saving measures.

The Cadmus team calculated net water savings by verifying the gross MEMD gallons per minute (GPM) based on duration of usage (minutes/person), average household size, average number of measures per household, and baseline and efficiency flow rate (GPM). The team applied ISR and NTG values to calculate net savings in gallons of water.

Table 23. Annual and Lifetime Savings by Measure and Product

Product	Equipment Type	Installation Quantity	Annual Gallons Saved Per Unit	Annual Gallons Saved Total	Lifetime Gallons of Water Total
ENERGY STAR Appliances	Clothes Washer (4.0 GPM)	3,213	1,396.19	4,485,965	49,345,614
ENERGY STAR Appliances	Showerheads (1.75 GPM)	14,927	1,671.15	24,945,195	249,451,950
ENERGY STAR Appliances	Showerheads (1.5 GPM)	12,077	609.65	7,362,795	73,627,950
Home Energy Analysis	Handheld showerheads (1.5 GPM)	5,513	2,650.67	14,613,149	146,131,486
Home Energy Analysis	Showerheads (1.5 GPM)	2,777	2,532.72	6,727,967	67,279,673
Home Energy Analysis	Showerstart Only (1.5 GPM)	46	440.83	20,278	202,780
Home Energy Analysis	Showerstart and Showerhead (1.5 GPM)	6	3,091.50	18,549	185,490
Home Energy Analysis	Bath Aerators (1.0 GPM)	9,577	745.23	7,137,032	71,370,325
Home Energy Analysis	Kitchen Aerators (1.5 GPM)	3,280	2,496.86	8,189,686	81,896,861
Home Energy Analysis – Electric	Showerheads (1.5 GPM)	211	2,414.76	509,515	5,095,146

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Product	Equipment Type	Installation Quantity	Annual Gallons Saved Per Unit	Annual Gallons Saved Total	Lifetime Gallons of Water Total
Home Energy Analysis – Electric	Handheld showerheads (1.5 GPM)	295	2,650.67	781,948	7,819,479
Home Energy Analysis – Electric	Showerstart and Showerhead (1.5 GPM)	8	3,091.50	24,732	247,320
Home Energy Analysis – Electric	Bath Aerators (1.0 GPM)	486	745.23	362,180	3,621,800
Home Energy Analysis – Electric	Kitchen Aerators (1.5 GPM)	217	2,496.86	541,818	5,418,176
Income Qualified	Showerheads (1.5 GPM)	992	2,895.57	2,886,091	28,860,908
Income Qualified	Handheld showerheads (1.5 GPM)	2,135	2,881.16	6,151,285	61,512,851
Income Qualified	Showerstart Only (1.5 GPM)	11	479.16	5,271	52,708
Income Qualified	Showerstart and Showerhead (1.5 GPM)	1	3,393.93	3,394	33,939
Income Qualified	Bath Aerators (1.0 GPM)	3,371	648.95	2,635,652	26,356,523
Income Qualified	Kitchen Aerators (1.5 GPM)	1,918	2,123.47	5,018,320	50,183,200
Income Qualified – Electric	Showerheads (1.5 GPM)	149	2,895.57	431,109	4,311,086
Income Qualified – Electric	Handheld showerheads (1.5 GPM)	324	2,881.16	933,497	9,334,971
Income Qualified – Electric	Showerstart and Showerhead (1.5 GPM)	3	3,360.32	10,081	100,810
Income Qualified – Electric	Bath Aerators (1.0 GPM)	435	825.67	365,469	3,654,689
Income Qualified – Electric	Kitchen Aerators (1.5 GPM)	266	2,763.42	749,615	7,496,152
Multifamily Income Qualified	Showerheads (1.5 GPM)	786	2,678.79	2,106,210	21,062,099
Multifamily Income Qualified	Showerheads (1.75 GPM)	151	2,028.74	310,039	3,100,385
Multifamily Income Qualified	Handheld showerheads (1.5 GPM)	391	2,816.22	1,101,143	11,011,427
Multifamily Income Qualified	Bath Aerators (1.5 GPM)	646	510.59	329,844	3,298,438
Multifamily Income Qualified	Bath Aerators (1.0 GPM)	775	875.30	678,361	6,783,607
Multifamily Income Qualified	Kitchen Aerators (1.5 GPM)	892	2,053.55	1,831,763	18,317,626
Residential Consumers Energy Store	Showerheads (1.5 GPM)	694	2,650.67	1,839,566	18,395,656
Residential Consumers Energy Store	Bath Aerators (1.5 GPM)	175	481.30	84,227	842,271
Residential Consumers Energy Store	Kitchen Aerators (1.5 GPM)	287	2,676.16	768,057	7,680,574
Residential Multifamily	Showerheads (1.5 GPM)	2,275	2,464.49	5,616,265	56,162,654

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Product	Equipment Type	Installation Quantity	Annual Gallons Saved Per Unit	Annual Gallons Saved Total	Lifetime Gallons of Water Total
Residential Multifamily	Handheld showerheads (1.5 GPM)	220	2,267.06	512,355	5,123,552
Residential Multifamily	Showerheads (1.75 GPM)	154	1,836.32	282,793	2,827,929
Residential Multifamily	Bath Aerators (1.5 GPM)	1,202	469.75	564,635	5,646,353
Residential Multifamily	Bath Aerators (1.0 GPM)	2,115	805.28	1,703,167	17,031,667
Residential Multifamily	Kitchen Aerators (1.5 GPM)	1,268	1,889.26	2,395,584	23,955,840
Think! Energy	Showerheads (1.5 GPM)	31,283	1,636.92	51,207,776	512,077,756
Think! Energy	Bath Aerators (1.0 GPM)	64,069	498.87	29,249,903	292,499,025
Think! Energy	Kitchen Aerators (1.5 GPM)	27,744	1,016.94	28,213,986	282,139,855
Total		197,365		223,706,264	2,241,548,600

Note: Totals may not sum due to rounding.

Appendix A: Appliance Recycling

Table 24 presents the reported gross and verified net energy savings and demand reduction for the Appliance Recycling product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 24. Participation and Savings (Appliance Recycling)

	Participation Total	Total kWh Savings	Total kW Savings
Reported Gross Participation and Savings	325,815	58,213,147	3,849.82
Verified Annual Net Participation and Savings	325,815	46,928,853	3,074.85
Verified Lifetime Net Savings	N/A	289,609,629	N/A
Product Realization Rate	100.00%	80.62%	79.87%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A

Table 25 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Appliance Recycling product.

Table 25. Verified Per-Unit Measure Characteristics (Appliance Recycling)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RTE0020	Refrigerator Recycling	1,135.0000	0.1310	0.0000	8.00	0.870	0.920
RTE0021	Freezer Recycling	944.0000	0.1160	0.0000	8.00	0.750	0.920
RTE0022	Dehumidifier Recycling	139.0000	0.0350	0.0000	8.00	1.000	0.920
RTE0023	Room Unit Air Conditioner Recycling	113.0000	0.1070	0.0000	8.00	1.000	0.920
RTE0032	LED Bulb Replacing A- Line 60W – With Savings (Kit)	28.5000	0.0034	0.0000	4.00	0.900	0.920
RTE0033	LED Night Light – With Savings (Kit)	22.0000	0.0000	0.0000	12.00	0.930	0.920
RTE0035	Outdoor LED PAR Flood	276.4000	0.0000	0.0000	4.00	0.890	0.920
RTE0036	Small Refrigerator Recycling	289.6500	0.0331	0.0000	5.62	0.870	0.920
RTE0037	Small Freezer Recycling	252.7000	0.0288	0.0000	5.62	0.750	0.920
RTE0038	Advanced Power Strip Tier 1 AV Systems	77.0000	0.0093	0.0000	5.00	1.000	0.920

Note: Measure names are as they appear in eTracker.

Table 26 documents first year and lifetime kWh savings, and Table 27 documents kW savings. The Appliance Recycling product did not result in MCF savings.

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Table 26. Certified Participation and kWh Savings by Measure (Appliance Recycling)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RTE0020	20,376	23,126,760	23,126,760	18,510,659	148,085,270	80.04%
RTE0021	4,391	4,145,104	4,145,104	2,860,122	22,880,974	69.00%
RTE0022	1,792	249,088	249,088	229,161	1,833,288	92.00%
RTE0023	1,691	191,083	191,083	175,796	1,406,371	92.00%
RTE0032	88,626	2,525,841	2,525,841	2,091,396	8,365,585	82.80%
RTE0033	91,400	2,010,800	2,010,800	1,720,440	20,645,286	85.56%
RTE0035	90,123	24,909,997	24,909,997	20,396,306	81,585,223	81.88%
RTE0036	454	131,501	131,501	105,253	591,525	80.04%
RTE0037	162	40,937	40,937	28,247	158,747	69.00%
RTE0038	11,455	882,035	882,035	811,472	4,057,361	92.00%
Total	310,470	58,213,147	58,213,147	46,928,853	289,609,629	81.80%

Table 27. Certified Participation and kW Savings by Measure (Appliance Recycling)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RTE0020	20,376	2,669.26	2,669.26	2,136.47	80.04%
RTE0021	4,391	509.36	509.36	351.46	69.00%
RTE0022	1,792	62.72	62.72	57.70	92.00%
RTE0023	1,691	180.94	180.94	166.46	92.00%
RTE0032	88,626	301.33	301.33	249.50	82.80%
RTE0033	91,400	0.00	0.00	0.00	N/A
RTE0035	90,123	0.00	0.00	0.00	N/A
RTE0036	454	15.03	15.03	12.03	80.04%
RTE0037	162	4.67	4.67	3.22	69.00%
RTE0038	11,455	106.53	106.53	98.01	92.00%
Total	310,470	3,849.82	3,849.82	3,074.85	80.24%

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Appendix B: ENERGY STAR Appliances Product

Table 28 presents reported gross and verified net energy savings by fuel type and demand reduction for the ENERGY STAR Appliances product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 28. Participation and Savings (ENERGY STAR Appliances)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	62,527	4,017,715	980.63	58,511.20
Verified Annual Net Participation and Savings	62,527	3,662,852	871.17	38,881.46
Verified Lifetime Net Savings	N/A	33,035,274	N/A	368,979.64
Product Realization Rate	100.00%	91.17%	88.84%	66.45%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.62%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.65%

Table 29 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 ENERGY STAR Appliances product.

Table 29. Verified Per-Unit Measure Characteristics (ENERGY STAR Appliances)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RAC0309	Wi-Fi Enabled Thermostat - Combination Customers	124.4533	0.0000	6.7298	9.00	0.971	0.920
RAC0328	Wi-Fi Enabled Thermostat - Tier 3 - Combination Customers	130.4723	0.0000	7.0580	9.00	0.971	0.920
RAE0303	Energy Star Dehumidifier	236.8000	0.1450	0.0000	12.00	0.972	0.920
RAE0304	Energy Star Room A C	62.7500	0.0950	0.0000	9.00	0.914	0.920
RAE0310	Wi-Fi Enabled Thermostat - Electric Customers	133.5011	0.0000	0.0000	9.00	0.971	0.920
RAE0315	Clothes Washer ENERGY STAR, Gas Water Heater, Gas Dryer - Electric Customers	20.3600	0.0021	0.0000	11.00	1.000	0.920
RAE0318	Clothes Washer ENERGY STAR, Gas water heater, Electric dryer - Electric Customers	103.6600	0.0138	0.0000	11.00	1.000	0.920
RAE0321	Clothes Washer ENERGY STAR, Electric Water Heater, Gas Dryer - Electric Customers	81.4600	0.0107	0.0000	11.00	1.000	0.920
RAE0322	Clothes Washer ENERGY STAR, Electric Water Heater, Gas Dryer - Combination Customer	81.4600	0.0107	0.3273	11.00	1.000	0.920
RAE0324	Clothes Washer ENERGY STAR, Electric Water Heater, Electric Dryer - Electric Customer	164.6600	0.0224	0.0000	11.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RAE0325	Clothes Washer ENERGY STAR, Electric Water heater, Electric Dryer - Combination	164.6600	0.0224	0.0000	11.00	1.000	0.920
RAE0327	Variable Speed Pool Pump	1,081.0000	0.7960	0.0000	10.00	1.000	0.920
RAE0329	Wi-Fi Enabled Thermostat - Tier 3 - Electric Customers	137.1792	0.0000	0.0000	9.00	0.971	0.920
RAE0336	ENERGY STAR Air Purifier CADR 51-100	298.5000	0.0341	0.0000	9.00	1.000	0.920
RAE0337	ENERGY STAR Air Purifier CADR 101-150	433.0000	0.0495	0.0000	9.00	1.000	0.920
RAE0338	ENERGY STAR Air Purifier CADR 151-200	517.5000	0.0591	0.0000	9.00	1.000	0.920
RAE0339	ENERGY STAR Air Purifier CADR 201-250	664.5000	0.0759	0.0000	9.00	1.000	0.920
RAE0340	ENERGY STAR Air Purifier CADR Over 250	885.0000	0.1011	0.0000	9.00	1.000	0.920
RAE0341	ENERGY STAR 8.0 TV (31-40")	96.7000	0.0880	0.0000	6.00	1.000	0.920
RAE0342	ENERGY STAR 8.0 TV (41-50")	149.9000	0.1293	0.0000	6.00	1.000	0.920
RAE0343	ENERGY STAR 8.0 TV (51-60")	216.2000	0.1779	0.0000	6.00	1.000	0.920
RAE0344	ENERGY STAR 8.0 TV (>60")	311.1000	0.2425	0.0000	6.00	1.000	0.920
RAE0345	ENERGY STAR Continuous Bathroom Exhaust Fan	54.2700	0.0062	0.0000	15.00	1.000	0.920
RAE0346	ENERGY STAR Electric Clothes Dryer	143.2000	0.0511	0.0000	12.00	1.000	0.920
RAE0347	ENERGY STAR Heat Pump Clothes Dryer	378.4000	0.1351	0.0000	12.00	1.000	0.920
RAE0348	Refrigerators Freezers ENERGY STAR - Side by Side	56.4000	0.0096	0.0000	16.00	1.000	0.920
RAE0349	Refrigerators Freezers ENERGY STAR - Top Freezer	40.8000	0.0069	0.0000	16.00	1.000	0.920
RAE0350	Refrigerators Freezers ENERGY STAR - Bottom Freezer	59.9000	0.0102	0.0000	16.00	1.000	0.920
RAE0351	Freezers ENERGY STAR - Chest Freezer	30.2000	0.0051	0.0000	21.00	1.000	0.920
RAE0352	Tier 1 Advanced Power Strips	64.2000	0.0077	0.0000	5.00	1.000	0.920
RAG0311	Wi-Fi Enabled Thermostat - Gas Customers	0.0000	0.0000	6.7013	9.00	0.971	0.920
RAG0314	Clothes Washer ENERGY STAR, Gas Water Heater, Gas Dryer - Gas Customers	0.0000	0.0000	0.5299	11.00	1.000	0.920
RAG0316	Clothes Washer ENERGY STAR, Gas Water Heater, Gas Dryer - Combination Customers	20.3600	0.0021	0.5299	11.00	1.000	0.920
RAG0317	Clothes Washer ENERGY STAR, Gas Water Heater, Electric Dryer - Gas Customers	0.0000	0.0000	0.2532	11.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RAG0319	Clothes Washer ENERGY STAR, Gas Water Heater, Electric Dryer - Combination Customers	103.6600	0.0138	0.2532	11.00	1.000	0.920
RAG0320	Clothes Washer ENERGY STAR, Electric Water Heater, Gas Dryer - Gas Customers	0.0000	0.0000	0.3273	11.00	1.000	0.920
RAG0330	Wi-Fi Enabled Thermostat - Tier 3 - Gas Customers	0.0000	0.0000	7.0341	9.00	0.971	0.920
RAG0335	Low Flow Showerheads 1.75 gpm Gas Water Heater Instant Markdown	0.0000	0.0000	1.0714	10.00	0.860	0.920
RAG0337	ENERGY STAR Gas Clothes Dryer	0.0000	0.0000	0.4832	12.00	1.000	0.920
RAG339	Low Flow Showerheads 1.5 gpm - Kit	0.0000	0.0000	1.4318	10.00	0.230	0.920
RAG0335	Low Flow Showerheads 1.75 gpm Gas Water Heater Instant Markdown	0.0000	0.0000	1.0714	10.00	0.860	0.920
RAC0309	Wi-Fi Enabled Thermostat - Combination Customers	124.4533	0.0000	6.7298	9.00	0.971	0.920
RAC0328	Wi-Fi Enabled Thermostat - Tier 3 - Combination Customers	130.4723	0.0000	7.0580	9.00	0.971	0.920

Note: Measure names are as they appear in eTracker.

Table 30 documents first year and lifetime kWh savings, Table 31 documents kW first year savings, and Table 32 documents MCF first year and lifetime savings.

Table 30. Certified Participation and kWh Savings by Measure (ENERGY STAR Appliances)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RAC0309	520	64,716	64,716	57,812	520,307	89.33%
RAC0328	489	63,801	63,801	56,995	512,952	89.33%
RAE0303	1,280	303,104	303,104	271,048	3,252,573	89.42%
RAE0304	3,489	218,935	218,935	184,098	1,656,881	84.09%
RAE0310	732	97,723	97,723	87,298	785,680	89.33%
RAE0315	401	8,164	8,164	7,511	82,623	92.00%
RAE0318	311	32,238	32,238	29,659	326,251	92.00%
RAE0321	93	7,576	7,576	6,970	76,667	92.00%
RAE0322	55	4,480	4,480	4,122	45,341	92.00%
RAE0324	282	46,434	46,434	42,719	469,913	92.00%
RAE0325	134	22,064	22,064	20,299	223,292	92.00%
RAE0327	91	98,371	98,371	90,501	905,013	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RAE0329	623	85,463	85,463	76,345	687,109	89.33%
RAE0336	310	92,535	92,535	85,132	766,190	92.00%
RAE0337	1,254	542,982	542,982	499,543	4,495,891	92.00%
RAE0338	52	26,910	26,910	24,757	222,815	92.00%
RAE0339	623	413,984	413,984	380,865	3,427,783	92.00%
RAE0340	716	633,660	633,660	582,967	5,246,705	92.00%
RAE0341	1	97	97	89	534	92.00%
RAE0342	1	150	150	138	827	92.00%
RAE0343	1	216	216	199	1,193	92.00%
RAE0344	1	311	311	286	1,717	92.00%
RAE0345	3,141	170,462	170,462	156,825	2,352,377	92.00%
RAE0346	689	98,665	98,665	90,772	1,089,259	92.00%
RAE0347	7	2,649	2,649	2,437	29,243	92.00%
RAE0348	202	11,393	11,393	10,481	167,702	92.00%
RAE0349	269	10,975	10,975	10,097	161,555	92.00%
RAE0350	1,313	78,649	78,649	72,357	1,157,709	92.00%
RAE0351	119	3,594	3,594	3,306	69,432	92.00%
RAE0352	12,923	829,657	829,657	763,284	3,816,420	92.00%
RAG0316	355	7,228	7,228	6,650	73,145	92.00%
RAG0319	391	40,531	40,531	37,289	410,174	92.00%
Total	30,868	4,017,715	4,017,715	3,662,852	33,035,274	91.17%



Table 31. Certified Participation and kW Savings by Measure (ENERGY STAR Appliances)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RAE0303	1,280	185.60	185.60	165.97	89.42%
RAE0304	3,489	331.46	331.46	278.71	84.09%
RAE0315	401	0.84	0.84	0.77	92.00%
RAE0318	311	4.29	4.29	3.95	92.00%
RAE0321	93	1.00	1.00	0.92	92.00%
RAE0322	55	0.59	0.59	0.54	92.00%
RAE0324	282	6.32	6.32	5.81	92.00%
RAE0325	134	3.00	3.00	2.76	92.00%
RAE0327	91	72.44	72.44	66.64	92.00%
RAE0336	310	10.57	10.57	9.73	92.00%
RAE0337	1,254	62.07	62.07	57.11	92.00%
RAE0338	52	3.07	3.07	2.83	92.00%
RAE0339	623	47.29	47.29	43.50	92.00%
RAE0340	716	72.39	72.39	66.60	92.00%
RAE0341	1	0.09	0.09	0.08	92.00%
RAE0342	1	0.13	0.13	0.12	92.00%
RAE0343	1	0.18	0.18	0.16	92.00%
RAE0344	1	0.24	0.24	0.22	92.00%
RAE0345	3,141	19.47	19.47	17.92	92.00%
RAE0346	689	35.21	35.21	32.39	92.00%
RAE0347	7	0.95	0.95	0.87	92.00%
RAE0348	202	1.94	1.94	1.78	92.00%
RAE0349	269	1.86	1.86	1.71	92.00%
RAE0350	1,313	13.39	13.39	12.32	92.00%
RAE0351	119	0.61	0.61	0.56	92.00%
RAE0352	12,923	99.51	99.51	91.55	92.00%
RAG0316	355	0.75	0.75	0.69	92.00%
RAG0319	391	5.40	5.40	4.96	92.00%
Total	28,504	980.63	980.63	871.17	88.84%

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Table 32. Certified Participation and MCF Savings by Measure (ENERGY STAR Appliances)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RAC0309	520	3,499.50	3,499.50	3,126.17	28,135.53	89.33%
RAC0328	489	3,451.36	3,451.36	3,083.17	27,748.54	89.33%
RAE0322	55	18.00	18.00	16.56	182.18	92.00%
RAG0311	1,078	7,224.00	7,224.00	6,453.34	58,080.10	89.33%
RAG0314	785	415.97	415.97	382.69	4,209.63	92.00%
RAG0316	355	188.11	188.11	173.07	1,903.72	92.00%
RAG0317	259	65.58	65.58	60.33	663.66	92.00%
RAG0319	391	99.00	99.00	91.08	1,001.89	92.00%
RAG0320	68	22.26	22.26	20.48	225.23	92.00%
RAG0330	1,392	9,791.47	9,791.47	8,746.91	78,722.22	89.33%
RAG0335	14,927	15,992.79	15,992.79	12,653.49	126,534.94	79.12%
RAG0337	934	451.31	451.31	415.20	4,982.45	92.00%
RAG339	12,077	17,291.85	17,291.85	3,658.96	36,589.55	21.16%
Total	33,330	58,511.20	58,511.20	38,881.46	368,979.64	66.45%

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Appendix C: ENERGY STAR Lighting Product

Table 33 presents the reported gross and verified net energy savings and demand reduction for the ENERGY STAR Lighting product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 33. Participation and Savings (ENERGY STAR Lighting)

	Participation Total	Total kWh Savings	Total kW Savings
Reported Gross Participation and Savings	2,212,586	66,813,949	7,842.85
Verified Annual Net Participation and Savings	2,212,587	23,196,677	2,746.78
Verified Lifetime Net Savings	N/A	98,964,540	N/A
Product Realization Rate	100.00%	34.72%	35.02%
Annual Net Verified v. Net Reported Savings	N/A	93.86%	94.20%
Lifetime Net Verified v. Net Reported Savings	N/A	92.85%	N/A

Table 34 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 ENERGY STAR Lighting product.

Table 34. Verified Per-Unit Measure Characteristics (ENERGY STAR Lighting)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net ⁸
RBE0310	LED Globe	27.0000	0.0032	0.0000	6.00	1.0000	0.4960
RBE0311	Outdoor LED PAR Flood	276.4000	0.0000	0.0000	4.00	1.0000	0.0000
RBE0312	LED Downlight	44.0000	0.0053	0.0000	15.00	1.0000	0.4960
RBE0314	LED Candelabra	23.7000	0.0028	0.0000	6.00	1.0000	0.4960
RBE0316	LED Bulb Replacing A-Line 43W	28.5000	0.0034	0.0000	4.00	1.0000	0.3990
RBE0317	LED Bulb Replacing A-Line 53W	34.6000	0.0041	0.0000	4.00	1.0000	0.3990
RBE0318	LED Bulb Replacing A-Line 100W (72W Halogen)	47.2000	0.0056	0.0000	4.00	1.0000	0.3990
RBE0319	LED A-line (43W Replacement) - Lighting Kit	28.5000	0.0034	0.0000	4.00	0.2500	0.3990
RBE0320	LED A-line (72W Replacement) - Lighting Kit	47.2000	0.0056	0.0000	4.00	0.2500	0.3990
RBE0323	LED Night Light - Lighting Kit	22.0000	0.0000	0.0000	12.00	0.2500	0.4960
RBE0324	LED Nightlight (non-kit)	22.0000	0.0000	0.0000	12.00	1.0000	0.4960
RLE0319	LED Flood PAR	54.0000	0.0064	0.0000	4.00	1.0000	0.0000
RLE0324	LED Globe - Lighting Kit	27.0000	0.0032	0.0000	6.00	0.2500	0.4960
RLE0325	LED Candelabra - Lighting Kit	23.7000	0.0028	0.0000	6.00	0.2500	0.4960

Note: Measure names are as they appear in eTracker.

⁸ Cadmus used NTG factors to the third digit of 0.399 for standard LEDs and 0.496 for specialty LEDs for precision.



Table 35 documents first year and lifetime kWh savings and Table 36 documents kW savings. The Energy Star Lighting product did not result in MCF savings.

Table 35. Certified Participation and kWh Savings by Measure (ENERGY STAR Lighting)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RBE0310	50,856	1,373,112	1,373,112	681,064	4,086,381	49.60%
RBE0311	37	10,227	10,227	0	0	0.00%
RBE0312	136	5,984	5,984	2,968	44,521	49.60%
RBE0314	119,285	2,827,055	2,827,055	1,402,219	8,413,314	49.60%
RBE0316	1,330,771	37,926,945	37,926,974	15,132,862	60,531,450	39.90%
RBE0317	109,718	3,796,243	3,796,243	1,514,701	6,058,804	39.90%
RBE0318	159,578	7,532,082	7,532,082	3,005,301	12,021,202	39.90%
RBE0319	160,200	4,565,700	4,565,700	455,429	1,821,714	9.98%
RBE0320	80,100	3,780,720	3,780,720	377,127	1,508,507	9.98%
RBE0323	40,050	881,100	881,100	109,256	1,311,077	12.40%
RBE0324	1,116	24,552	24,552	12,178	146,134	49.60%
RLE0319	540	29,160	29,160	0	0	0.00%
RLE0324	80,100	2,162,700	2,162,700	268,175	1,609,049	12.40%
RLE0325	80,100	1,898,370	1,898,370	235,398	1,412,387	12.40%
Total	2,212,587	66,813,949	66,813,977	23,196,677	98,964,540	34.72%

Table 36. Certified Participation and kW Savings by Measure (ENERGY STAR Lighting)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RBE0310	50,856	162.74	162.74	80.72	49.60%
RBE0312	136	0.72	0.72	0.36	49.60%
RBE0314	119,285	334.00	334.00	165.66	49.60%
RBE0316	1,330,771	4,524.62	4,524.62	1,805.32	39.90%
RBE0317	109,718	449.84	449.84	179.49	39.90%
RBE0318	159,578	893.64	893.64	356.56	39.90%
RBE0319	160,200	544.68	544.68	54.33	9.98%
RBE0320	80,100	448.56	448.56	44.74	9.98%
RLE0319	540	3.46	3.46	0.00	0.00%
RLE0324	80,100	256.32	256.32	31.78	12.40%
RLE0325	80,100	224.28	224.28	27.81	12.40%
Total	2,171,384	7,842.85	7,842.86	2,746.78	35.02%

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Appendix D: Home Energy Analysis Product

Table 37 presents reported gross and verified net energy savings by fuel type and demand reduction for the Home Energy Analysis product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 37. Participation and Savings (Home Energy Analysis)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	226,530	3,936,440	308.25	97,812.42
Verified Annual Net Participation and Savings	226,530	3,589,985	283.04	88,080.08
Verified Lifetime Net Savings	N/A	26,598,146	N/A	881,755.31
Product Realization Rate	100.00%	91.20%	91.82%	90.05%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 38 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Home Energy Analysis product.

Table 38. Verified Per-Unit Measure Characteristics (Home Energy Analysis)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RXC0329	Setback thermostat - full setback - Combination Customers	254.9277	0.0000	16.7494	9.00	1.0000	0.9200
RXC0343	Wifi Thermostat - Full Setback - Combination Customer	289.2976	0.0000	19.9103	9.00	1.0000	0.9200
RXC0345	Setback Thermostat - Moderate Setback	155.3179	0.0000	8.3357	9.00	1.0000	0.9200
RXC0346	Wi-Fi Thermostat - Moderate Setback	175.3095	0.0000	9.5286	9.00	1.0000	0.9200
RXC0360	Programming Existing Thermostat - Full – Combination Customers	456.3398	0.0000	32.0025	3.00	1.0000	0.9200
RXC0361	Programming Existing Thermostat - Moderate – Combination Customers	174.4801	0.0000	9.3627	3.00	1.0000	0.9200
RXE0312	Dual Spray Kitchen Low Flow Aerator (1.5gpm) - Electric Water Heater	287.5500	0.0320	0.0000	10.00	0.9330	0.9200
RXE0314	Handheld Showerheads (1.5 gpm) - Electric Water Heater	342.4700	0.0270	0.0000	10.00	1.0000	0.9200
RXE0317	LED Bulb Replacing A-Line 60W	28.5000	0.0034	0.0000	4.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RXE0318	LED Night Light	22.0000	0.0000	0.0000	12.00	0.9260	0.9200
RXE0319	Low Flow Showerheads (1.5 gpm) - Electric water heater	342.4700	0.0270	0.0000	10.00	0.9110	0.9200
RXE0325	Pipe Wrap 3 4 inch - electric water heater	51.0000	0.0058	0.0000	15.00	1.0000	0.9200
RXE0327	Std Low Flow Bath Aerator (1.0 gpm) - Electric Water Heater	70.5500	0.0080	0.0000	10.00	0.9320	0.9200
RXE0338	Setback Thermostat - Moderate Setback - Electric	184.5815	0.0000	0.0000	9.00	1.0000	0.9200
RXE0339	Wi-Fi Thermostat - Moderate Setback - Electric	202.3855	0.0000	0.0000	9.00	1.0000	0.9200
RXE0342	Shower Flow Optimizer (1.5gpm) - Electric Water Heater	342.4700	0.0270	0.0000	10.00	1.0000	0.9200
RXE0343	Outdoor LED PAR Flood	276.4000	0.0000	0.0000	4.00	1.0000	0.9200
RXE0344	LED Exterior Fixture Lamp Replacement	81.0000	0.0000	0.0000	12.00	1.0000	0.9200
RXE0345	LED A-line LT or EQ 6W Replacing 40W Equivalent	19.6000	0.0023	0.0000	4.00	1.0000	0.9200
RXE0346	LED Globe LT or EQ 8W	27.0000	0.0032	0.0000	6.00	1.0000	0.9200
RXE0347	LED Candelabra Small Base LT or EQ 5W	23.7000	0.0028	0.0000	6.00	1.0000	0.9200
RXE0348	LED Candelabra Medium Base LT or EQ 5W	23.7000	0.0028	0.0000	6.00	1.0000	0.9200
RXE0349	LED PAR/R/BR <=15.5 Watt	54.0000	0.0064	0.0000	4.00	1.0000	0.9200
RXE0350	USB LED Night Light	22.0000	0.0000	0.0000	12.00	0.9260	0.9200
RXE0351	Advanced Power Strip Tier 1 Workstations	25.8000	0.0028	0.0000	5.00	1.0000	0.9200
RXE0352	Advanced Power Strip Tier 1 AV Stations	77.0000	0.0093	0.0000	5.00	1.0000	0.9200
RXE0353	Holiday Lights	10.6000	0.0000	0.0000	10.00	1.0000	0.9200
RXE0361	Programming Existing Thermostat - Moderate – Electric Customers	200.2224	0.0000	0.0000	3.00	1.0000	0.9200
RXE0362	ENERGY STAR Air Purifier CADR 201-250	664.5000	0.0759	0.0000	9.00	1.0000	0.9200
RXG0311	Dual Spray Kitchen Low Flow Aerator (1.5 gpm) - Gas Water Heater	0.0000	0.0000	1.1980	10.00	0.9330	0.9200
RXG0313	Handheld Showerheads (1.5 gpm) - Gas Water Heater	0.0000	0.0000	1.4318	10.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RXG0316	Shower Start (1.5 gpm) - Gas Water Heater	0.0000	0.0000	1.3344	10.00	1.0000	0.9200
RXG0320	Low Flow Showerheads (1.5 gpm) - Gas Water Heater	0.0000	0.0000	1.4318	10.00	0.9110	0.9200
RXG0321	Low Flow Showerheads (1.5 gpm) + Shower Start - Gas Water Heater	0.0000	0.0000	1.4318	10.00	1.0000	0.9200
RXG0326	Pipe Wrap 3 4 inch - Gas Water Heater	0.0000	0.0000	0.2532	15.00	1.0000	0.9200
RXG0328	Std Low Flow Bath Aerator (1.0 gpm) - Gas Water Heater	0.0000	0.0000	0.2922	10.00	0.9320	0.9200
RXG0331	Setback Thermostat - Full Setback - Gas Customer Only	0.0000	0.0000	11.0739	9.00	1.0000	0.9200
RXG0341	Shower Flow Optimizer (1.5gpm) - Gas Water Heater	0.0000	0.0000	1.4318	10.00	1.0000	0.9200
RXG0344	Wifi Thermostat - Full Setback - Gas Customer Only	0.0000	0.0000	18.1060	9.00	1.0000	0.9200
RXG0346	Setback Thermostat - Moderate Setback	0.0000	0.0000	7.6362	9.00	1.0000	0.9200
RXG0347	Wi-Fi Thermostat - Moderate Setback	0.0000	0.0000	8.9816	9.00	1.0000	0.9200
RXG0360	Programming Existing Thermostat - Full - Gas	0.0000	0.0000	13.5606	3.00	1.0000	0.9200
RXG0361	Programming Existing Thermostat - Moderate - Gas	0.0000	0.0000	9.2771	3.00	1.0000	0.9200
RXG0362	Window Film Insulation Kit (Coverage = 15 SQ FT Glazing)	0.0000	0.0000	1.5758	1.00	0.8700	0.9200

Note: Measure names are as they appear in eTracker.

Table 39 documents first year and lifetime kWh savings, Table 40 documents kW first year savings, and Table 41 documents MCF savings.

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Table 39. Certified Participation and kWh Savings by Measure (Home Energy Analysis)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RXC0329	1	255	255	235	2,111	92.00%
RXC0343	7	2,025	2,025	1,863	16,768	92.00%
RXC0345	294	45,663	45,663	42,010	378,093	92.00%
RXC0346	798	139,897	139,897	128,705	1,158,347	92.00%
RXC0360	1	456	456	420	1,259	92.00%
RXC0361	16	2,792	2,792	2,568	7,705	92.00%
RXE0312	94	27,030	27,030	23,201	232,012	85.84%
RXE0314	161	55,138	55,138	50,727	507,267	92.00%
RXE0317	30,848	879,168	879,168	808,835	3,235,338	92.00%
RXE0318	16,522	363,484	363,484	309,659	3,715,911	85.19%
RXE0319	114	39,042	39,042	32,722	327,215	83.81%
RXE0325	2,388	121,788	121,788	112,045	1,680,674	92.00%
RXE0327	226	15,945	15,944	13,671	136,713	85.74%
RXE0338	3	554	554	509	4,585	92.00%
RXE0339	9	1,821	1,821	1,676	15,082	92.00%
RXE0342	5	1,712	1,712	1,575	15,754	92.00%
RXE0343	1,548	427,867	427,867	393,638	1,574,551	92.00%
RXE0344	3,172	256,932	256,932	236,377	2,836,529	92.00%
RXE0345	172	3,371	3,371	3,102	12,406	92.00%
RXE0346	4,740	127,980	127,980	117,742	706,450	92.00%
RXE0347	5,004	118,595	118,595	109,107	654,643	92.00%
RXE0348	1,248	29,578	29,578	27,211	163,268	92.00%
RXE0349	5,228	282,312	282,312	259,727	1,038,908	92.00%
RXE0350	622	13,684	13,684	11,658	139,892	85.19%
RXE0351	198	5,108	5,108	4,700	23,499	92.00%
RXE0352	213	16,401	16,401	15,089	75,445	92.00%
RXE0353	1,037	10,992	10,992	10,113	101,128	92.00%
RXE0361	3	601	601	553	1,658	92.00%
RXE0362	1,424	946,248	946,248	870,548	7,834,933	92.00%
Total	76,096	3,936,440	3,936,438	3,589,985	26,598,146	91.20%

Table 40. Certified Participation and kW Savings by Measure (Home Energy Analysis)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RXE0312	94	3.01	3.01	2.58	85.84%
RXE0314	161	4.35	4.35	4.00	92.00%
RXE0317	30,848	104.88	104.88	96.49	92.00%
RXE0319	114	3.08	3.08	2.58	83.81%
RXE0325	2,388	13.85	13.85	12.74	92.00%
RXE0327	226	1.81	1.81	1.55	85.74%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RXE0342	5	0.14	0.14	0.12	92.00%
RXE0345	172	0.40	0.40	0.36	92.00%
RXE0346	4,740	15.17	15.17	13.95	92.00%
RXE0347	5,004	14.01	14.01	12.89	92.00%
RXE0348	1,248	3.49	3.49	3.21	92.00%
RXE0349	5,228	33.46	33.46	30.78	92.00%
RXE0351	198	0.55	0.55	0.51	92.00%
RXE0352	213	1.98	1.98	1.82	92.00%
RXE0362	1,424	108.08	108.08	99.44	92.00%
Total	52,063	308.25	308.25	283.04	91.82%

Table 41. Certified Participation and MCF Savings by Measure (Home Energy Analysis)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RXC0329	1	16.75	16.75	15.41	139	92.00%
RXC0343	7	139.37	139.37	128.22	1,154	92.00%
RXC0345	294	2,450.70	2,450.70	2,254.64	20,292	92.00%
RXC0346	798	7,603.82	7,603.82	6,995.52	62,960	92.00%
RXC0360	1	32.00	32.00	29.44	88	92.00%
RXC0361	16	149.80	149.80	137.82	413	92.00%
RXG0311	3,186	3,816.83	3,816.83	3,276.21	32,762	85.84%
RXG0313	5,352	7,662.99	7,662.99	7,049.95	70,500	92.00%
RXG0316	46	61.38	61.38	56.47	565	92.00%
RXG0320	2,569	3,678.29	3,678.29	3,082.85	30,829	83.81%
RXG0321	6	8.59	8.59	7.90	79	92.00%
RXG0326	109,225	27,655.77	27,655.77	25,443.31	381,650	92.00%
RXG0328	9,351	2,732.36	2,732.36	2,342.84	23,428	85.74%
RXG0331	12	132.89	132.89	122.26	1,100	92.00%
RXG0341	89	127.43	127.43	117.24	1,172	92.00%
RXG0344	12	217.27	217.27	199.89	1,799	92.00%
RXG0346	1,085	8,285.28	8,285.28	7,622.45	68,602	92.00%
RXG0347	2,273	20,415.18	20,415.18	18,781.96	169,038	92.00%
RXG0360	1	13.56	13.56	12.48	37	92.00%
RXG0361	278	2,579.03	2,579.03	2,372.71	7,118	92.00%
RXG0362	6,367	10,033.12	10,033.12	8,030.51	8,031	80.04%
Total	140,969	97,812.42	97,812.42	88,080.08	881,755.31	90.05%

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Appendix E: Home Energy Analysis-Electric Product

Table 42 presents reported gross and verified net energy savings by fuel type and demand reduction for the Home Energy Analysis-Electric product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 42. Participation and Savings (Home Energy Analysis-Electric)

	Participation Total	Total kWh Savings	Total kW Savings
Reported Gross Participation and Savings	123,343	4,769,020	388.25
Verified Annual Net Participation and Savings	123,343	4,382,523	339.09
Verified Lifetime Net Savings	N/A	26,996,054	N/A
Product Realization Rate	100.00%	91.90%	87.34%
Annual Net Verified v. Net Reported Savings	N/A	100.82%	95.24%
Lifetime Net Verified v. Net Reported Savings	N/A	101.52%	N/A

Table 43 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Home Energy Analysis-Electric product.

Table 43. Verified Per-Unit Measure Characteristics (Home Energy Analysis-Electric)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE0001	Dual Spray Kitchen Low Flow Aerator (1.5 gpm)	287.5500	0.0320	0.0000	10.00	0.933	0.920
RFE0003	LED Bulb Replacing A-Line 60W	28.5000	0.0034	0.0000	4.00	1.000	0.920
RFE0004	LED Night Light	22.0000	0.0000	0.0000	12.00	0.926	0.920
RFE0005	Low Flow Showerheads (1.5 gpm)	342.4700	0.0270	0.0000	10.00	0.911	0.920
RFE0006	Low Flow Showerheads (1.5 gpm) - Handheld	342.4700	0.0270	0.0000	10.00	1.000	0.920
RFE0008	Pipe wrap 3/4" - Electric water heater (R3)	51.0000	0.0058	0.0000	15.00	1.000	0.920
RFE0011	Std Low Flow Bath Aerator (1.0 gpm)	70.5500	0.0080	0.0000	10.00	0.932	0.920
RFE0012	LED Candelabra <= 5W	23.7000	0.0028	0.0000	6.00	1.000	0.920
RFE0013	LED Globe <= 8W	27.0000	0.0032	0.0000	6.00	1.000	0.920
RFE0014	LED PAR/R/BR <= 15.5W	54.0000	0.0064	0.0000	4.00	1.000	0.920
RFE0016	Outdoor LED PAR/Flood	276.4000	0.0000	0.0000	4.00	1.000	0.920
RFE0018	LED Exterior Fixture Lamp Replacement-2020 & 2021	81.0000	0.0000	0.0000	12.00	1.000	0.920
RFE0021	Wi-Fi Programmable Thermostat - Full setback (Tier 2)	184.3244	0.0000	0.0000	9.00	1.000	0.920
RFE0022	Virtual - Dual Spray Kitchen Low Flow Aerator (1.5 gpm)	287.5500	0.0320	0.0000	10.00	0.933	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE0023	Virtual - Shower Start/Thermostatic Shower Head (1.5 gpm)	403.8800	0.0238	0.0000	10.00	1.000	0.920
RFE0024	Virtual - LED Bulb Replacing A- Line 60W	28.5000	0.0034	0.0000	4.00	1.000	0.920
RFE0025	Virtual - LED Night Light	22.0000	0.0000	0.0000	12.00	0.926	0.920
RFE0026	Virtual - Low Flow Showerheads (1.5 gpm)	342.4700	0.0270	0.0000	10.00	0.911	0.920
RFE0027	Virtual - Low Flow Showerheads (1.5 gpm) - Handheld	342.4700	0.0270	0.0000	10.00	1.000	0.920
RFE0028	Virtual - Std Low Flow Bath Aerator (1.0 gpm)	70.5500	0.0080	0.0000	10.00	0.932	0.920
RFE0029	Virtual - LED Candelabra <= 5W	23.7000	0.0028	0.0000	6.00	1.000	0.920
RFE0030	Virtual - LED Globe <= 8W	27.0000	0.0032	0.0000	6.00	1.000	0.920
RFE0031	Virtual - LED BR30	54.0000	0.0064	0.0000	4.00	1.000	0.920
RFE0032	Virtual - Outdoor LED/PAR Flood	276.4000	0.0000	0.0000	4.00	1.000	0.920
RFE0033	Virtual - LED Exterior Fixture Lamp Replacement-2020 & 2021	81.0000	0.0000	0.0000	12.00	1.000	0.920
RFE0034	Virtual - LED A-Line LT or EQ 6W Replacing 40W Equivalent	19.6000	0.0023	0.0000	15.00	1.000	0.920
RFE0035	Virtual - LED PAR/R/BR <= 15.5W	54.0000	0.0064	0.0000	4.00	1.000	0.920
RFE0037	Virtual HEA - Pipe Wrap R3 - Electric Water Heater	51.0000	0.0058	0.0000	15.00	1.000	0.920
RFE0041	DI HEA - Advanced Power Strips Tier 1	64.2000	0.0077	0.0000	5.00	1.000	0.920
RFE0043	Exterior Candelabra	122.0000	0.0005	0.0000	6.00	1.000	0.920
RFE0044	LED Holiday Lights	10.6000	0.0000	0.0000	10.00	1.000	0.920
RFE0045	CFL baseline - LED A-line LT or EQ 13W Replacing A-line Equivalent	3.3580	0.0004	0.0000	4.00	1.000	0.920
RFE0047	Virtual - CFL baseline - LED A- line LT or EQ 13W Replacing A- line Equivalent	3.3580	0.0004	0.0000	4.00	1.000	0.920
RFE0048	LED PAR/R/BR 14W replacing CFL	6.7160	0.0008	0.0000	4.00	1.000	0.920
RFE0049	Outdoor LED PAR/Flood = 14W replacing CFL	34.5520	0.0000	0.0000	4.00	1.000	0.920
RFE0050	Virtual - Outdoor LED PAR/Flood = 14W replacing CFL	34.5520	0.0000	0.0000	4.00	1.000	0.920
RFE0051	Holiday Lights	10.6000	0.0000	0.0000	10.00	1.000	0.920
RFE0052	ENERGY STAR Air Purifier CADR 201-250	664.5000	0.0759	0.0000	9.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net

Note: Measure names are as they appear in eTracker.

Table 44 documents first year and lifetime kWh savings. Table 45 documents first year kW first year savings.

Table 44. Certified Participation and kWh Savings by Measure (Home Energy Analysis-Electric)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RFE0001	72	20,704	20,704	17,771	177,711	85.84%
RFE0003	34,917	995,135	995,135	915,524	3,662,095	92.00%
RFE0004	16,200	356,400	356,400	303,624	3,643,491	85.19%
RFE0005	104	35,617	35,617	29,851	298,512	83.81%
RFE0006	113	38,699	38,699	35,603	356,032	92.00%
RFE0008	1,181	60,231	60,231	55,413	831,188	92.00%
RFE0011	145	10,230	10,230	8,771	87,714	85.74%
RFE0012	10,199	241,716	241,716	222,379	1,334,274	92.00%
RFE0013	6,901	186,327	186,327	171,421	1,028,525	92.00%
RFE0014	10,733	579,582	579,582	533,215	2,132,862	92.00%
RFE0016	2,090	577,676	577,676	531,462	2,125,848	92.00%
RFE0018	2,697	218,457	218,457	200,980	2,411,765	92.00%
RFE0021	6	1,106	1,106	1,017	9,157	92.00%
RFE0022	145	41,695	41,695	35,789	357,891	85.84%
RFE0023	8	3,231	3,231	2,973	29,726	92.00%
RFE0024	11,159	318,032	318,032	292,589	1,170,356	92.00%
RFE0025	3,060	67,320	67,320	57,351	688,215	85.19%
RFE0026	107	36,644	36,644	30,712	307,123	83.81%
RFE0027	182	62,330	62,330	57,343	573,432	92.00%
RFE0028	341	24,059	24,058	20,628	206,279	85.74%
RFE0029	2,142	50,765	50,765	46,704	280,225	92.00%
RFE0030	1,980	53,460	53,460	49,183	295,099	92.00%
RFE0031	1,581	85,374	85,374	78,544	314,176	92.00%
RFE0032	983	271,701	271,701	249,965	999,860	92.00%
RFE0033	595	0	48,195	44,339	532,073	0.00%
RFE0034	296	15,096	5,802	5,337	80,062	35.36%
RFE0035	1,045	56,430	56,430	51,916	207,662	92.00%
RFE0037	1,024	52,224	52,224	48,046	720,691	92.00%
RFE0041	356	22,855	22,855	21,027	105,134	92.00%
RFE0043	626	76,379	76,372	70,262	421,573	91.99%
RFE0044	80	848	848	780	7,802	92.00%
RFE0045	5,633	18,916	18,916	17,402	69,609	92.00%
RFE0047	250	840	840	772	3,089	92.00%
RFE0048	877	5,890	5,890	5,419	21,675	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RFE0049	20	691	691	636	2,543	92.00%
RFE0050	56	1,935	1,935	1,780	7,120	92.00%
RFE0051	158	1,675	1,675	1,541	15,408	92.00%
RFE0052	269	178,751	178,751	164,450	1,480,054	92.00%
Total	118,331	4,769,020	4,807,910	4,382,523	26,996,054	91.90%

Table 45. Certified Participation and kW Savings by Measure (Home Energy Analysis-Electric)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RFE0001	72	2.30	2.30	1.98	85.84%
RFE0003	34,917	118.72	118.72	109.22	92.00%
RFE0005	104	2.81	2.81	2.35	83.81%
RFE0006	113	3.05	3.05	2.81	92.00%
RFE0008	1,181	6.85	6.85	6.30	92.00%
RFE0011	145	1.16	1.16	0.99	85.74%
RFE0012	10,199	28.56	28.56	26.27	92.00%
RFE0013	6,901	22.08	22.08	20.32	92.00%
RFE0014	10,733	68.69	68.69	63.20	92.00%
RFE0022	145	4.64	4.64	3.98	85.84%
RFE0023	8	0.19	0.19	0.18	92.00%
RFE0024	11,159	37.94	37.94	34.91	92.00%
RFE0026	107	2.89	2.89	2.42	83.81%
RFE0027	182	4.91	4.91	4.52	92.00%
RFE0028	341	2.73	2.73	2.34	85.74%
RFE0029	2,142	6.00	6.00	5.52	92.00%
RFE0030	1,980	6.34	6.34	5.83	92.00%
RFE0031	1,581	10.12	10.12	9.31	92.00%
RFE0034	296	1.72	0.68	0.63	36.48%
RFE0035	1,045	6.69	6.69	6.15	92.00%
RFE0037	1,024	5.94	5.94	5.46	92.00%
RFE0041	356	2.74	2.74	2.52	92.00%
RFE0043	626	17.72	0.31	0.29	1.63%
RFE0045	5,633	2.25	2.25	2.07	92.00%
RFE0047	250	0.10	0.10	0.09	92.00%
RFE0048	877	0.70	0.70	0.65	92.00%
RFE0052	269	20.42	20.42	18.78	92.00%
Total	92,386	388.25	369.81	339.09	87.34%

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Appendix F: Home Energy Reports Product

Table 46 presents verified net energy savings by fuel type and demand reduction for the Home Energy Reports product. The verified net savings are based on findings from the custom HER savings analysis. Because Consumers Energy uses custom saving calculations that rely on a treatment and control billing analysis, as well as an uplift EWR product participation analysis after the program year has ended to determine the evaluated savings, reported savings are not reported for the Home Energy Report product.

Table 46. Participation and Savings (Home Energy Reports)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	673,010	N/A	N/A	N/A
Verified Annual Net Participation and Savings	673,010	16,570,124	2,851.10	92,483.26
Verified Lifetime Net Savings	N/A	16,570,124	N/A	92,483.26
Product Realization Rate	100.00%	N/A	N/A	N/A
Annual Net Verified v. Net Reported Savings	N/A	N/A	N/A	N/A
Lifetime Net Verified v. Net Reported Savings	N/A	N/A	N/A	N/A

Table 47 presents verified per-unit savings, measure lifetime, and savings adjustment factors for all measures (product tracks) delivered through the 2022 Home Energy Reports product.

Table 47. Verified Per-Unit Measure Characteristics (Home Energy Reports)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
ROC0035	Track 17: Combination_2020 Start	58.8228	0.0103	0.2182	1.00	1.0000	1.0000
ROE0013	Track 11a: Electric Test_Print_2017 Start	107.3471	0.0186	0.0000	1.00	1.0000	1.0000
ROE0014	Track 14: Electric_2019 Start	144.0608	0.0244	0.0000	1.00	1.0000	1.0000
ROE0015	Track 15: Electric_2020 Start	96.4180	0.0166	0.0000	1.00	1.0000	1.0000
ROE0016	Track 19: Electric_2022 Start	33.7075	0.0057	0.0000	1.00	1.0000	1.0000
ROG0018	Track 13: Gas_2018 Start	0.0000	0.0000	0.8445	1.00	1.0000	1.0000
ROG0019	Track 16: Gas_2020 Start	0.0000	0.0000	0.3309	1.00	1.0000	1.0000
ROG0020	Track 18: Gas_2021 Start	0.0000	0.0000	0.4736	1.00	1.0000	1.0000
ROG0021	Track 20: Gas_eHER only_2022 Start	0.0000	0.0000	0.0118	1.00	1.0000	1.0000

Note: Measure names are as they appear in eTracker.

Table 48 documents first year and lifetime kWh savings, Table 49 documents first year kW savings, and Table 50 documents first year and lifetime MCF savings.

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Table 48. Certified Participation and kWh Savings by Measure (Home Energy Reports)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
ROC0035	61,776	N/A	3,633,838	3,633,838	3,633,838	N/A
ROE0013	35,697	N/A	3,831,970	3,831,970	3,831,970	N/A
ROE0014	24,273	N/A	3,496,788	3,496,788	3,496,788	N/A
ROE0015	47,321	N/A	4,562,595	4,562,595	4,562,595	N/A
ROE0016	31,000	N/A	1,044,933	1,044,933	1,044,933	N/A
Total	200,067	N/A	16,570,124	16,570,124	16,570,124	N/A

Table 49. Certified Participation and Annual kW Savings by Measure (Home Energy Reports)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
ROC0035	61,776	N/A	636.32	636.32	N/A
ROE0013	35,697	N/A	662.76	662.76	N/A
ROE0014	24,273	N/A	592.70	592.70	N/A
ROE0015	47,321	N/A	783.82	783.82	N/A
ROE0016	31,000	N/A	175.51	175.51	N/A
Total	200,067	N/A	2,851.10	2,851.10	N/A

Table 50. Certified Participation and MCF Savings by Measure (Home Energy Reports)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
ROC0035	61,776	N/A	13,482.05	13,482.05	13,482.05	N/A
ROG0018	20,289	N/A	17,134.08	17,134.08	17,134.08	N/A
ROG0019	127,342	N/A	42,141.84	42,141.84	42,141.84	N/A
ROG0020	39,149	N/A	18,541.76	18,541.76	18,541.76	N/A
ROG0021	100,000	N/A	1,183.54	1,183.54	1,183.54	N/A
Total	348,556	N/A	92,483.26	92,483.26	92,483.26	N/A

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Appendix G: Home Performance with ENERGY STAR Product

Table 51 presents the reported gross and verified net energy savings by fuel type and demand reduction for the Home Performance with ENERGY STAR product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 51. Participation and Savings (Home Performance with ENERGY STAR)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	10,366	277,835	121.86	38,564.25
Verified Net Participation and Savings	10,366	255,608	112.11	35,479.11
Verified Actual Lifetime Savings	N/A	4,094,392	N/A	545,008.21
Product Realization Rate	100.00%	92.00%	92.00%	92.00%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 52 presents verified per-unit savings, measure lifetime, and savings adjustment factors for all measures delivered through the 2022 Home Performance with ENERGY STAR product.

Table 52. Verified Per-Unit Measure Characteristics (Home Performance with ENERGY STAR)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RZC0007	Basement Wall Insulation - Combination Customer	20.4205	-0.0253	4.8102	25.00	1.0000	0.9200
RZC0008	Crawlspace Insulation - Combination Customer	-1.0434	-0.0148	1.8935	25.00	1.0000	0.9200
RZC0009	Duct Insulation and or Replacement - Combination Customer	14.2285	0.0193	3.0911	20.00	1.0000	0.9200
RZC0010	Duct Sealing 15% Reduction - Combination Customer	29.4709	0.0181	1.2847	18.00	1.0000	0.9200
RZC0011	Duct Sealing 30% Reduction - Combination Customer	69.0536	0.0524	2.8520	18.00	1.0000	0.9200
RZC0018	Infiltration Reduction of 20% - Combination Customer	122.0027	0.0501	8.7764	13.00	1.0000	0.9200
RZC0019	Infiltration Reduction of 30% - Combination Customer	167.0127	0.0745	12.3406	13.00	1.0000	0.9200
RZC0020	Infiltration Reduction of 50% - Combination Customer	222.1291	0.1134	16.4664	13.00	1.0000	0.9200
RZC0022	Roof (Attic) Insulation - Combination Customer	80.5789	0.0341	5.5527	20.00	1.0000	0.9200
RZC0023	Wall Insulation - Combination Customer	91.6213	0.0289	6.2606	25.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RZC0024	Floor Insulation- Combination Customer	0.0772	-0.0415	5.0001	25.00	1.0000	0.9200
RZC0055	Rim Joist Insulation - Combination Customers	67.6751	0.0202	4.8886	25.00	1.0000	0.9200
RZC0060	Window Replacement - Combination Customers	1.4709	0.0012	0.0526	25.00	1.0000	0.9200
RZC0063	Natural Gas Boiler 95% - Combination Customer	-569.7227	0.0000	57.0414	15.00	1.0000	0.9200
RZC0078	Wi-Fi Enabled Thermostat - Combination	173.0493	0.0000	9.4041	9.00	1.0000	0.9200
RZC0081	MIM - Roof (Attic) Insulation - Combination Customer	77.4375	0.0431	5.2565	20.00	1.0000	0.9200
RZC0082	MIM - Wall Insulation - Combination Customer	88.1880	0.0261	5.7510	25.00	1.0000	0.9200
RZC0086	Knee Wall Insulation - Combination Customers	89.2143	0.0468	5.6180	20.00	1.0000	0.9200
RZC0087	MIM - Knee Wall Insulation - Combination Customers	154.6657	0.0846	9.5530	20.00	1.0000	0.9200
RZC0088	Wi-Fi Enabled Thermostat (Full Setback) – Combination Customers	187.7643	0.0000	13.1677	9.00	1.0000	0.9200
RZC0089	Tier 3 Thermostat – Combination	117.4106	0.0000	6.5783	9.00	1.0000	0.9200
RZC0090	R-30 Roof (Attic) Insulation – Combination Customers	38.5920	0.0170	2.7387	20.00	1.0000	0.9200
RZE0007	Basement Wall Insulation - Electric Customers	46.7344	-0.0253	0.0000	25.00	1.0000	0.9200
RZE0008	Crawlspace Insulation - Electric Customers	5.7185	-0.0165	0.0000	25.00	1.0000	0.9200
RZE0009	Duct Insulation and or Replacement - Electric Customers	83.3717	0.0511	0.0000	20.00	1.0000	0.9200
RZE0010	Duct Sealing 15% Reduction - Electric Customers	63.3699	0.0284	0.0000	18.00	1.0000	0.9200
RZE0011	Duct Sealing 30% Reduction - Electric Customers	56.1567	0.0311	0.0000	18.00	1.0000	0.9200
RZE0018	Infiltration Reduction of 20% - Electric Customers	155.8249	0.0466	0.0000	13.00	1.0000	0.9200
RZE0019	Infiltration Reduction of 30% - Electric Customers	156.6750	0.0532	0.0000	13.00	1.0000	0.9200
RZE0020	Infiltration Reduction of 50% - Electric Customers	259.5813	0.0836	0.0000	13.00	1.0000	0.9200
RZE0021	Operations and Maintenance HVAC Tune Up - Electric Customers	119.2280	0.1743	0.0000	5.00	1.0000	0.9200
RZE0022	Roof (Attic) Insulation - Electric Customers	94.0903	0.0398	0.0000	20.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RZE0023	Wall Insulation - Electric Customers	115.3491	0.0275	0.0000	25.00	1.0000	0.9200
RZE0055	Rim Joist Insulation - Electric Customers	70.0118	0.0177	0.0000	25.00	1.0000	0.9200
RZE0058	Split System Central AC GT SEER 15	234.7025	0.0816	0.0000	15.00	1.0000	0.9200
RZE0063	Window Replacement - Electric Customers	1.4413	0.0009	0.0000	25.00	1.0000	0.9200
RZE0082	MIM - Roof (attic) Insulation - Electric Customers	112.5956	0.0469	0.0000	20.00	1.0000	0.9200
RZE0083	MIM - Wall Insulation - Electric Customers	74.0671	0.0216	0.0000	25.00	1.0000	0.9200
RZE0086	Split System Central AC GT SEER 16	336.3391	0.1996	0.0000	15.00	1.0000	0.9200
RZE0087	Split System Central AC GT SEER 17	471.3041	0.4149	0.0000	15.00	1.0000	0.9200
RZE0088	Split System Central AC GT SEER 18	474.8481	0.4646	0.0000	15.00	1.0000	0.9200
RZE0089	Split System Central AC GT SEER 19	733.6584	0.5554	0.0000	15.00	1.0000	0.9200
RZE0090	Split System Central AC GT SEER 20	512.6440	0.4073	0.0000	15.00	1.0000	0.9200
RZE0093	Knee Wall Insulation - Electric Customers	156.3674	0.0662	0.0000	20.00	1.0000	0.9200
RZE0094	MIM - Knee Wall Insulation - Electric Customers	40.3009	0.0171	0.0000	20.00	1.0000	0.9200
RZE0096	Tier 3 Thermostat - Electric Customers	193.2627	0.0000	0.0000	9.00	1.0000	0.9200
RZE0097	R-30 Roof (attic) Insulation – Electric Customers	54.9263	0.0192	0.0000	20.00	1.0000	0.9200
RZG0007	Basement Wall Insulation - Gas Customers	0.0000	0.0000	5.0376	25.00	1.0000	0.9200
RZG0008	Crawlspace Insulation - Gas Customers	0.0000	0.0000	1.9757	25.00	1.0000	0.9200
RZG0009	Duct Insulation and or Replacement - Gas Customers	0.0000	0.0000	4.3844	20.00	1.0000	0.9200
RZG0010	Duct Sealing 15% Reduction - Gas Customers	0.0000	0.0000	1.9812	18.00	1.0000	0.9200
RZG0011	Duct Sealing 30% Reduction - Gas Customers	0.0000	0.0000	2.9321	18.00	1.0000	0.9200
RZG0012	Floor Insulation - Gas Customers	0.0000	0.0000	3.7120	25.00	1.0000	0.9200
RZG0014	Gas Furnace 95% AFUE	0.0000	0.0000	15.5751	15.00	1.0000	0.9200
RZG0015	Gas Furnace 96% AFUE	0.0000	0.0000	19.1535	15.00	1.0000	0.9200
RZG0016	Gas Furnace 97% AFUE	0.0000	0.0000	21.4667	15.00	1.0000	0.9200
RZG0017	Gas Furnace 98% AFUE	0.0000	0.0000	24.0504	15.00	1.0000	0.9200

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RZG0018	Infiltration Reduction of 20% - Gas Customers	0.0000	0.0000	7.7048	13.00	1.0000	0.9200
RZG0019	Infiltration Reduction of 30% - Gas Customers	0.0000	0.0000	11.4158	13.00	1.0000	0.9200
RZG0020	Infiltration Reduction of 50% - Gas Customers	0.0000	0.0000	17.9094	13.00	1.0000	0.9200
RZG0021	Operations and Maintenance HVAC Tune Up - Gas Customers	0.0000	0.0000	180.8767	5.00	1.0000	0.9200
RZG0022	Roof (attic) Insulation - Gas Customers	0.0000	0.0000	4.8540	20.00	1.0000	0.9200
RZG0023	Wall Insulation - Gas Customers	0.0000	0.0000	5.5732	25.00	1.0000	0.9200
RZG0054	Natural Gas Boiler 95% AFUE - Gas Customers	0.0000	0.0000	78.4273	15.00	1.0000	0.9200
RZG0055	Rim Joist Insulation - Gas Customers	0.0000	0.0000	5.1745	25.00	1.0000	0.9200
RZG0056	Super High Efficiency Gas Water Heater - Gas or Combination Customers	0.0000	0.0000	1.7922	13.00	1.0000	0.9200
RZG0057	Tankless Water Heater - Gas or Combination Customers	0.0000	0.0000	5.0745	20.00	1.0000	0.9200
RZG0060	Window Replacement - Gas Customers	0.0000	0.0000	0.0494	25.00	1.0000	0.9200
RZG0078	Wi-Fi Enabled Thermostat – Gas Customers	0.0000	0.0000	10.7014	9.00	1.0000	0.9200
RZG0082	MIM - Roof (attic) Insulation - Gas Customers	0.0000	0.0000	4.8361	20.00	1.0000	0.9200
RZG0083	MIM - Wall Insulation - Gas Customers	0.0000	0.0000	3.2851	25.00	1.0000	0.9200
RZG0087	Knee Wall Insulation - Gas Customers	0.0000	0.0000	6.4928	20.00	1.0000	0.9200
RZG0090	Tier 3 Thermostat – Gas Customers	0.0000	0.0000	7.8207	9.00	1.0000	0.9200
RZG0091	R-30 Roof (attic) Insulation – Gas Customers	0.0000	0.0000	2.5503	20.00	1.0000	0.9200

Note: Measure names are as they appear in eTracker.

Table 53 documents first year and lifetime kWh savings, Table 54 documents first year kW savings, and Table 55 documents first year and lifetime MCF savings.

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Table 53. Certified and kWh Savings by Measure (Home Performance with ENERGY STAR)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RZC0007	7	143	143	132	3,288	92.00%
RZC0008	81	-85	-85	-78	-1,944	92.00%
RZC0009	3	43	43	39	785	92.00%
RZC0010	167	4,922	4,922	4,528	81,502	92.00%
RZC0011	236	16,297	16,297	14,993	269,873	92.00%
RZC0018	134	16,348	16,348	15,040	195,526	92.00%
RZC0019	118	19,707	19,707	18,131	235,702	92.00%
RZC0020	51	11,329	11,329	10,422	135,490	92.00%
RZC0022	165	13,296	13,296	12,232	244,638	92.00%
RZC0023	267	24,463	24,463	22,506	562,646	92.00%
RZC0024	1	0	0	0	2	92.00%
RZC0055	253	17,122	17,122	15,752	393,801	92.00%
RZC0060	1,123	1,652	1,652	1,520	37,992	92.00%
RZC0063	5	-2,849	-2,849	-2,621	-39,311	92.00%
RZC0078	2	346	346	318	2,866	92.00%
RZC0081	53	4,104	4,104	3,776	75,517	92.00%
RZC0082	6	529	529	487	12,170	92.00%
RZC0086	40	3,569	3,569	3,283	65,662	92.00%
RZC0087	1	155	155	142	2,846	92.00%
RZC0088	2	376	376	345	3,109	92.00%
RZC0089	416	48,843	48,843	44,935	404,418	92.00%
RZC0090	59	2,277	2,277	2,095	41,895	92.00%
RZE0007	1	47	47	43	1,075	92.00%
RZE0008	11	63	63	58	1,447	92.00%
RZE0009	1	83	83	77	1,534	92.00%
RZE0010	3	190	190	175	3,148	92.00%
RZE0011	1	56	56	52	930	92.00%
RZE0018	10	1,558	1,558	1,434	18,637	92.00%
RZE0019	11	1,723	1,723	1,586	20,612	92.00%
RZE0020	7	1,817	1,817	1,672	21,732	92.00%
RZE0021	6	715	715	658	3,291	92.00%
RZE0022	5	470	470	433	8,656	92.00%
RZE0023	16	1,846	1,846	1,698	42,448	92.00%
RZE0055	26	1,820	1,820	1,675	41,867	92.00%
RZE0058	38	8,919	8,919	8,205	123,078	92.00%
RZE0063	1,766	2,545	2,545	2,342	58,543	92.00%
RZE0082	6	676	676	622	12,431	92.00%
RZE0083	1	74	74	68	1,704	92.00%
RZE0086	65	21,862	21,862	20,113	301,696	92.00%
RZE0087	2	943	943	867	13,008	92.00%
RZE0088	4	1,899	1,899	1,747	26,212	92.00%
RZE0089	16	11,739	11,739	10,799	161,992	92.00%
RZE0090	68	34,860	34,860	32,071	481,065	92.00%
RZE0093	2	313	313	288	5,754	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RZE0094	1	40	40	37	742	92.00%
RZE0096	2	387	387	356	3,200	92.00%
RZE0097	11	604	604	556	11,117	92.00%
Total	5,270	277,835	277,835	255,608	4,094,392	92.00%

Table 54. Certified Participation and kW Savings by Measure (Home Performance with ENERGY STAR)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RZC0007	7	-0.18	-0.18	-0.16	92.00%
RZC0008	81	-1.20	-1.20	-1.10	92.00%
RZC0009	3	0.06	0.06	0.05	92.00%
RZC0010	167	3.02	3.02	2.78	92.00%
RZC0011	236	12.37	12.37	11.38	92.00%
RZC0018	134	6.71	6.71	6.18	92.00%
RZC0019	118	8.79	8.79	8.09	92.00%
RZC0020	51	5.78	5.78	5.32	92.00%
RZC0022	165	5.63	5.63	5.18	92.00%
RZC0023	267	7.72	7.72	7.10	92.00%
RZC0024	1	-0.04	-0.04	-0.04	92.00%
RZC0055	253	5.11	5.11	4.70	92.00%
RZC0060	1,123	1.35	1.35	1.24	92.00%
RZC0081	53	2.28	2.28	2.10	92.00%
RZC0082	6	0.16	0.16	0.14	92.00%
RZC0086	40	1.87	1.87	1.72	92.00%
RZC0087	1	0.08	0.08	0.08	92.00%
RZC0090	59	1.00	1.00	0.92	92.00%
RZE0007	1	-0.03	-0.03	-0.02	92.00%
RZE0008	11	-0.18	-0.18	-0.17	92.00%
RZE0009	1	0.05	0.05	0.05	92.00%
RZE0010	3	0.09	0.09	0.08	92.00%
RZE0011	1	0.03	0.03	0.03	92.00%
RZE0018	10	0.47	0.47	0.43	92.00%
RZE0019	11	0.59	0.59	0.54	92.00%
RZE0020	7	0.59	0.59	0.54	92.00%
RZE0021	6	1.05	1.05	0.96	92.00%
RZE0022	5	0.20	0.20	0.18	92.00%
RZE0023	16	0.44	0.44	0.40	92.00%
RZE0055	26	0.46	0.46	0.42	92.00%
RZE0058	38	3.10	3.10	2.85	92.00%
RZE0063	1,766	1.59	1.59	1.46	92.00%
RZE0082	6	0.28	0.28	0.26	92.00%
RZE0083	1	0.02	0.02	0.02	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RZE0086	65	12.97	12.97	11.94	92.00%
RZE0087	2	0.83	0.83	0.76	92.00%
RZE0088	4	1.86	1.86	1.71	92.00%
RZE0089	16	8.89	8.89	8.18	92.00%
RZE0090	68	27.70	27.70	25.48	92.00%
RZE0093	2	0.13	0.13	0.12	92.00%
RZE0094	1	0.02	0.02	0.02	92.00%
RZE0097	11	0.21	0.21	0.19	92.00%
Total	4,843	121.86	121.86	112.11	92.00%

Table 55. Certified Participation and MCF Savings by Measure (Home Performance with ENERGY STAR)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RZC0007	7	33.67	33.67	30.98	774.44	92.00%
RZC0008	81	153.37	153.37	141.10	3,527.59	92.00%
RZC0009	3	9.27	9.27	8.53	170.63	92.00%
RZC0010	167	214.54	214.54	197.38	3,552.86	92.00%
RZC0011	236	673.07	673.07	619.23	11,146.07	92.00%
RZC0018	134	1,176.04	1,176.04	1,081.95	14,065.41	92.00%
RZC0019	118	1,456.19	1,456.19	1,339.70	17,416.04	92.00%
RZC0020	51	839.79	839.79	772.60	10,043.85	92.00%
RZC0022	165	916.20	916.20	842.90	16,858.00	92.00%
RZC0023	267	1,671.58	1,671.58	1,537.85	38,446.34	92.00%
RZC0024	1	5.00	5.00	4.60	115.00	92.00%
RZC0055	253	1,236.82	1,236.82	1,137.87	28,446.76	92.00%
RZC0060	1,123	59.07	59.07	54.34	1,358.61	92.00%
RZC0063	5	285.21	285.21	262.39	3,935.86	92.00%
RZC0078	2	18.81	18.81	17.30	155.73	92.00%
RZC0081	53	278.59	278.59	256.31	5,126.14	92.00%
RZC0082	6	34.51	34.51	31.75	793.64	92.00%
RZC0086	40	224.72	224.72	206.74	4,134.85	92.00%
RZC0087	1	9.55	9.55	8.79	175.78	92.00%
RZC0088	2	26.34	26.34	24.23	218.06	92.00%
RZC0089	416	2,736.57	2,736.57	2,517.65	22,658.82	92.00%
RZC0090	59	161.58	161.58	148.66	2,973.13	92.00%
RZG0007	7	35.26	35.26	32.44	811.05	92.00%
RZG0008	56	110.64	110.64	101.79	2,544.70	92.00%
RZG0009	21	92.07	92.07	84.71	1,694.13	92.00%
RZG0010	31	61.42	61.42	56.50	1,017.07	92.00%
RZG0011	63	184.72	184.72	169.94	3,059.00	92.00%
RZG0012	4	14.85	14.85	13.66	341.50	92.00%
RZG0014	75	1,168.13	1,168.13	1,074.68	16,120.23	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RZG0015	291	5,573.67	5,573.67	5,127.78	76,916.63	92.00%
RZG0016	7	150.27	150.27	138.25	2,073.68	92.00%
RZG0017	138	3,318.96	3,318.96	3,053.44	45,801.58	92.00%
RZG0018	178	1,371.45	1,371.45	1,261.74	16,402.59	92.00%
RZG0019	188	2,146.17	2,146.17	1,974.48	25,668.20	92.00%
RZG0020	43	770.10	770.10	708.50	9,210.45	92.00%
RZG0021	24	4,341.04	4,341.04	3,993.76	19,968.79	92.00%
RZG0022	291	1,412.51	1,412.51	1,299.51	25,990.26	92.00%
RZG0023	315	1,755.56	1,755.56	1,615.11	40,377.83	92.00%
RZG0054	1	78.43	78.43	72.15	1,082.30	92.00%
RZG0055	322	1,666.19	1,666.19	1,532.89	38,322.35	92.00%
RZG0056	1	1.79	1.79	1.65	21.43	92.00%
RZG0057	2	10.15	10.15	9.34	186.74	92.00%
RZG0060	1,383	68.32	68.32	62.85	1,571.36	92.00%
RZG0078	11	117.72	117.72	108.30	974.68	92.00%
RZG0082	91	440.09	440.09	404.88	8,097.57	92.00%
RZG0083	5	16.43	16.43	15.11	377.79	92.00%
RZG0087	111	720.70	720.70	663.04	13,260.89	92.00%
RZG0090	78	610.01	610.01	561.21	5,050.92	92.00%
RZG0091	42	107.11	107.11	98.54	1,970.87	92.00%
Total	6,969	38,564.25	38,564.25	35,479.11	545,008.21	92.00%

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Appendix H: HVAC and Water Heating Product

Table 56 presents reported gross and verified net energy savings by fuel type and demand reduction for the HVAC and Water Heating product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 56. Participation and Savings (HVAC and Water Heating)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	44,980	3,331,216	1,155.46	514,773.23
Verified Net Participation and Savings	44,980	3,064,719	1,063.02	473,591.37
Verified Actual Lifetime Savings	N/A	41,818,034	N/A	6,548,825.04
Product Realization Rate	100.00%	92.00%	92.00%	92.00%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 57 presents verified per-unit savings, measure lifetime, and savings adjustment factors for all measures delivered through the 2022 HVAC and Water Heating product.

Table 57. Verified Per-Unit Measure Characteristics (HVAC and Water Heating)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RHC0100	Setback Thermostat - Moderate Setback (Combo)	110.6114	0.0000	5.9495	9.00	1.0000	0.9200
RHC0101	Wi-Fi Enabled Thermostat – Combination Customers	134.3470	0.0000	7.2563	9.00	1.0000	0.9200
RHC0105	Wi-Fi Enabled Thermostat Tier 3 – Combination Customers	125.6517	0.0000	6.7062	9.00	1.0000	0.9200
RHC0107	MIDSTREAM Wi-Fi Enabled Thermostat - Combination	138.0986	0.0000	7.1357	9.00	1.0000	0.9200
RHC0108	MIDSTREAM Wi-Fi Enabled Thermostat Tier 3 – Combination Customers	126.8547	0.0000	6.6591	9.00	1.0000	0.9200
RHE0004	Setback thermostat - moderate setback -- Electric Customers Only	124.3521	0.0000	0.0000	9.00	1.0000	0.9200
RHE0005	Split System Central AC GT SEER 14.5	161.3352	0.1326	0.0000	15.00	1.0000	0.9200
RHE0006	Split System Central AC GT SEER 15	264.5082	0.0840	0.0000	15.00	1.0000	0.9200
RHE0007	Split System Central AC GT SEER 16	365.5738	0.2293	0.0000	15.00	1.0000	0.9200
RHE0008	Tier 1 Ground Source Heat Pump GT 17 EER	1,516.4946	0.3067	0.0000	15.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RHE0009	Tier 2 Ground Source Heat Pump GT 19 EER	2,639.6248	0.5800	0.0000	15.00	1.0000	0.9200
RHE0011	Tier 2 Air Source Heat Pump GT 15 SEER	764.8399	0.2833	0.0000	15.00	1.0000	0.9200
RHE0012	Tier 3 Air Source Heat Pump GT 16 SEER	919.6020	0.4302	0.0000	15.00	1.0000	0.9200
RHE0016	Operations and Maintenance HVAC Tune Up – Electric Customers	87.9613	0.1252	0.0000	5.00	1.0000	0.9200
RHE0017	Split System Central AC GT SEER 17	443.0378	0.3387	0.0000	15.00	1.0000	0.9200
RHE0018	Split System Central AC GT SEER 18	465.6247	0.4042	0.0000	15.00	1.0000	0.9200
RHE0019	Split System Central AC GT SEER 19	774.7886	0.6929	0.0000	15.00	1.0000	0.9200
RHE0020	Split System Central AC GT SEER 20	584.7820	0.5601	0.0000	15.00	1.0000	0.9200
RHE0021	Split System Central AC GT SEER 21	609.0949	0.5890	0.0000	15.00	1.0000	0.9200
RHE0022	Wi-Fi Enabled Thermostat – Electric Customers	143.1396	0.0000	0.0000	9.00	1.0000	0.9200
RHE0023	SEER21 Minisplit Heat pump - Electric Only	7,831.3243	-0.4251	0.0000	15.00	1.0000	0.9200
RHE0026	Wi-Fi Enabled Thermostat Tier 3 – Electric Customers	144.5553	0.0000	0.0000	9.00	1.0000	0.9200
RHE0027	SEER 18 HSPF 9 Minisplit Heat Pump – Electric Customers	3,613.4019	0.2042	0.0000	15.00	1.0000	0.9200
RHE0028	SEER 19 HSPF 9 Minisplit Heat Pump - Electric	3,900.0317	0.2592	0.0000	15.00	1.0000	0.9200
RHE0029	SEER 20 HSPF 10 Minisplit Heat Pump – Electric Customers	4,143.3993	0.3011	0.0000	15.00	1.0000	0.9200
RHE0030	Midstream ECM Boiler Circulator Pump, LT 100W	456.0000	0.0000	0.0000	15.00	1.0000	0.9200
RHE0031	Midstream ECM Boiler Circulator Pump, 100-500W	2,282.0000	0.0000	0.0000	15.00	1.0000	0.9200
RHE0034	Midstream ENERGY STAR Heat Pump Water Heaters LT or EQ 55 gal - UEF GT or EQ 3.0	2,072.0000	0.1660	0.0000	10.00	1.0000	0.9200
RHE0036	Self-Submit Heat Pump Water Heater	1,539.0000	0.1230	0.0000	10.00	1.0000	0.9200
RHE0037	MIDSTREAM Split System Central AC GT SEER 15	392.3453	0.1313	0.0000	15.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RHE0038	MIDSTREAM Split System Central AC GT SEER 16	288.2116	0.1890	0.0000	15.00	1.0000	0.9200
RHE0043	MIDSTREAM Split System Central AC GT SEER 17	499.1558	0.4059	0.0000	15.00	1.0000	0.9200
RHE0044	MIDSTREAM Split System Central AC GT SEER 18	477.8598	0.4211	0.0000	15.00	1.0000	0.9200
RHE0045	MIDSTREAM Split System Central AC GT SEER 19	773.0932	0.7274	0.0000	15.00	1.0000	0.9200
RHE0046	MIDSTREAM Split System Central AC GT SEER 20	609.5617	0.6112	0.0000	15.00	1.0000	0.9200
RHE0047	MIDSTREAM Split System Central AC GT SEER 21	222.8143	0.2242	0.0000	15.00	1.0000	0.9200
RHE0048	MIDSTREAM Wi-Fi Enabled Thermostat - Electric	145.0218	0.0000	0.0000	9.00	1.0000	0.9200
RHE0050	MIDSTREAM Wi-Fi Enabled Thermostat Tier 3 - Electric	145.1341	0.0000	0.0000	9.00	1.0000	0.9200
RHG0002	Tankless Gas Water htr. EF GT 0.82	0.0000	0.0000	5.0745	20.00	1.0000	0.9200
RHG0004	Setback thermostat - moderate setback -- Gas Customer	0.0000	0.0000	6.2291	9.00	1.0000	0.9200
RHG0008	Super High Efficiency Gas Water Heater EF GT or EQ 0.67	0.0000	0.0000	1.7922	13.00	1.0000	0.9200
RHG0010	Natural Gas Furnace 95% AFUE	0.0000	0.0000	14.5392	15.00	1.0000	0.9200
RHG0011	Natural Gas Furnace 96% AFUE	0.0000	0.0000	19.7214	15.00	1.0000	0.9200
RHG0012	Natural Gas Furnace 97% AFUE	0.0000	0.0000	23.4640	15.00	1.0000	0.9200
RHG0013	Natural Gas Furnace 98% OR GT AFUE	0.0000	0.0000	23.0955	15.00	1.0000	0.9200
RHG0016	Natural gas boiler GT 95% AFUE	0.0000	0.0000	44.3056	15.00	1.0000	0.9200
RHG0022	Wi-Fi Enabled Thermostat - Gas	0.0000	0.0000	7.3479	9.00	1.0000	0.9200
RHG0023	Operations and Maintenance HVAC Furnace Tune Up - Gas	0.0000	0.0000	5.2271	2.00	1.0000	0.9200
RHG0024	Operations and Maintenance HVAC Boiler Tune Up - Gas	0.0000	0.0000	7.7503	2.00	1.0000	0.9200
RHG0028	Wi-Fi Enabled Thermostat Tier 3 - Gas	0.0000	0.0000	6.7017	9.00	1.0000	0.9200
RHG0029	Midstream ENERGY STAR Certified UEF rated Tankless gas water htr	0.0000	0.0000	5.0745	20.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RHG0031	Midstream Natural gas boiler GT 95% AFUE	0.0000	0.0000	49.5182	15.00	1.0000	0.9200
RHG0032	Midstream ENERGY STAR Certified UEF rated Gas Tank Water Heater	0.0000	0.0000	1.7922	13.00	1.0000	0.9200
RHG0036	MIDSTREAM Natural Gas Furnace 96% AFUE	0.0000	0.0000	18.4006	15.00	1.0000	0.9200
RHG0037	MIDSTREAM Natural Gas Furnace 97% AFUE	0.0000	0.0000	22.3250	15.00	1.0000	0.9200
RHG0038	MIDSTREAM Natural Gas Furnace 98% OR GT AFUE	0.0000	0.0000	24.6172	15.00	1.0000	0.9200
RHG0040	MIDSTREAM Wi-Fi Enabled Thermostat Tier 3 - Gas	0.0000	0.0000	6.7831	9.00	1.0000	0.9200

Note: Measure names are as they appear in eTracker.

Table 58 documents first year and lifetime kWh savings, Table 59 documents first year kW savings, and Table 60 documents first year and lifetime MCF savings.

Table 58. Certified Participation and kWh Savings by Measure (HVAC and Water Heating)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RHC0100	977	108,067	108,067	99,422	894,798	92.00%
RHC0101	814	109,358	109,358	100,610	905,488	92.00%
RHC0105	1,242	156,059	156,059	143,575	1,292,172	92.00%
RHC0107	5	690	690	635	5,717	92.00%
RHC0108	116	14,715	14,715	13,538	121,841	92.00%
RHE0004	490	60,933	60,933	56,058	504,521	92.00%
RHE0005	24	3,872	3,872	3,562	53,434	92.00%
RHE0006	1,545	408,665	408,665	375,972	5,639,579	92.00%
RHE0007	2,070	756,738	756,738	696,199	10,442,981	92.00%
RHE0008	3	4,549	4,549	4,186	62,783	92.00%
RHE0009	34	89,747	89,747	82,567	1,238,512	92.00%
RHE0011	12	9,178	9,178	8,444	126,657	92.00%
RHE0012	43	39,543	39,543	36,379	545,692	92.00%
RHE0016	760	66,851	66,851	61,503	307,513	92.00%
RHE0017	369	163,481	163,481	150,402	2,256,037	92.00%
RHE0018	310	144,344	144,344	132,796	1,991,942	92.00%
RHE0019	63	48,812	48,812	44,907	673,601	92.00%
RHE0020	93	54,385	54,385	50,034	750,509	92.00%
RHE0021	28	17,055	17,055	15,690	235,354	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RHE0022	297	42,512	42,512	39,111	352,003	92.00%
RHE0023	66	516,867	516,867	475,518	7,132,770	92.00%
RHE0026	892	128,943	128,943	118,628	1,067,651	92.00%
RHE0027	22	79,495	79,495	73,135	1,097,029	92.00%
RHE0028	14	54,600	54,600	50,232	753,486	92.00%
RHE0029	32	132,589	132,589	121,982	1,829,725	92.00%
RHE0030	22	10,032	10,032	9,229	138,442	92.00%
RHE0031	5	11,410	11,410	10,497	157,458	92.00%
RHE0034	2	4,144	4,144	3,812	38,125	92.00%
RHE0036	4	6,156	6,156	5,664	56,635	92.00%
RHE0037	41	16,086	16,086	14,799	221,989	92.00%
RHE0038	61	17,581	17,581	16,174	242,617	92.00%
RHE0043	6	2,995	2,995	2,755	41,330	92.00%
RHE0044	25	11,946	11,946	10,991	164,862	92.00%
RHE0045	13	10,050	10,050	9,246	138,693	92.00%
RHE0046	28	17,068	17,068	15,702	235,535	92.00%
RHE0047	3	668	668	615	9,225	92.00%
RHE0048	3	435	435	400	3,602	92.00%
RHE0050	73	10,595	10,595	9,747	87,725	92.00%
Total	10,607	3,331,216	3,331,216	3,064,719	41,818,034	92.00%

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Table 59. Certified Participation and kW Savings by Measure (HVAC and Water Heating)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RHE0005	24	3.18	3.18	2.93	92.00%
RHE0006	1,545	129.78	129.78	119.40	92.00%
RHE0007	2,070	474.65	474.65	436.68	92.00%
RHE0008	3	0.92	0.92	0.85	92.00%
RHE0009	34	19.72	19.72	18.14	92.00%
RHE0011	12	3.40	3.40	3.13	92.00%
RHE0012	43	18.50	18.50	17.02	92.00%
RHE0016	760	95.15	95.15	87.54	92.00%
RHE0017	369	124.98	124.98	114.98	92.00%
RHE0018	310	125.30	125.30	115.28	92.00%
RHE0019	63	43.65	43.65	40.16	92.00%
RHE0020	93	52.09	52.09	47.92	92.00%
RHE0021	28	16.49	16.49	15.17	92.00%
RHE0023	66	-28.06	-28.06	-25.81	92.00%
RHE0027	22	4.49	4.49	4.13	92.00%
RHE0028	14	3.63	3.63	3.34	92.00%
RHE0029	32	9.64	9.64	8.86	92.00%
RHE0034	2	0.33	0.33	0.31	92.00%
RHE0036	4	0.49	0.49	0.45	92.00%
RHE0037	41	5.38	5.38	4.95	92.00%
RHE0038	61	11.53	11.53	10.61	92.00%
RHE0043	6	2.44	2.44	2.24	92.00%
RHE0044	25	10.53	10.53	9.69	92.00%
RHE0045	13	9.46	9.46	8.70	92.00%
RHE0046	28	17.11	17.11	15.74	92.00%
RHE0047	3	0.67	0.67	0.62	92.00%
Total	5,671	1,155.46	1,155.46	1,063.02	92.00%

Table 60. Certified Participation and MCF Savings by Measure (HVAC and Water Heating)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RHC0100	977	5,812.66	5,812.66	5,348	48,129	92.00%
RHC0101	814	5,906.63	5,906.63	5,434	48,907	92.00%
RHC0105	1,242	8,329.10	8,329.10	7,663	68,965	92.00%
RHC0107	5	35.68	35.68	33	295	92.00%
RHC0108	116	772.46	772.46	711	6,396	92.00%
RHG0002	11	55.82	55.82	51	1,027	92.00%
RHG0004	811	5,051.80	5,051.80	4,648	41,829	92.00%
RHG0008	14	25.09	25.09	23	300	92.00%
RHG0010	1,085	15,775.03	15,775.03	14,513	217,695	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RHG0011	16,741	330,155.96	330,155.96	303,743	4,556,152	92.00%
RHG0012	1,094	25,669.62	25,669.62	23,616	354,241	92.00%
RHG0013	1,487	34,343.01	34,343.01	31,596	473,934	92.00%
RHG0016	12	531.67	531.67	489	7,337	92.00%
RHG0022	1,691	12,425.30	12,425.30	11,431	102,881	92.00%
RHG0023	2,556	13,360.47	13,360.47	12,292	24,583	92.00%
RHG0024	64	496.02	496.02	456	913	92.00%
RHG0028	4,873	32,657.38	32,657.38	30,045	270,403	92.00%
RHG0029	388	1,968.91	1,968.91	1,811	36,228	92.00%
RHG0031	241	11,933.89	11,933.89	10,979	164,688	92.00%
RHG0032	289	517.95	517.95	477	6,195	92.00%
RHG0036	288	5,299.37	5,299.37	4,875	73,131	92.00%
RHG0037	2	44.65	44.65	41	616	92.00%
RHG0038	104	2,560.19	2,560.19	2,355	35,331	92.00%
RHG0040	154	1,044.60	1,044.60	961	8,649	92.00%
Total	35,059	514,773.23	514,773.23	473,591.37	6,548,825.04	92.00%

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Appendix I: Income Qualified Product

Table 61 presents the reported gross and verified net energy savings by fuel type and demand reductions for the Income Qualified product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 61. Participation and Savings (Income Qualified)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	4,478,766	17,052,329	711.72	206,165.23
Verified Annual Net Participation and Savings	4,478,766	16,165,601	697.99	175,302.11
Verified Lifetime Net Savings	N/A	158,453,597	N/A	2,029,159.46
Product Realization Rate	100.00%	94.80%	98.07%	85.03%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	99.99%

Table 62 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Income Qualified product.

Table 62. Verified Per-Unit Measure Characteristics (Income Qualified)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RCE0002	Residential Income Qualified Custom – Electric Customers	245.8336	0.0235	0.0000	11.06	1.000	1.000
RCG0002	Residential Income Qualified Custom – Gas Customers	0.0000	0.0000	85.1851	15.56	1.000	1.000
RIC0003	Setback thermostat - Full Setback - Combination (Direct Program)	143.4786	0.0000	8.0690	9.00	1.000	1.000
RIC0014	Duct sealing GT or EQ 25% and LT 30% leakage base (Direct Program)	0.2151	0.0001	0.0086	18.00	1.000	1.000
RIC0015	Duct sealing GT or EQ 30% and LT 35% leakage base (Direct Program)	0.3078	0.0002	0.0121	18.00	1.000	1.000
RIC0016	Duct sealing GT or EQ 35% and LT 40% leakage base (Direct Program)	0.4115	0.0003	0.0164	18.00	1.000	1.000
RIC0017	Duct sealing GT or EQ 40% and LT 45% leakage base (Direct Program)	0.5380	0.0004	0.0236	18.00	1.000	1.000
RIC0018	Duct sealing GT or EQ 45% and LT 50% Leakage Base (Direct Program)	0.6551	0.0004	0.0279	18.00	1.000	1.000
RIC0019	Duct sealing GT or EQ 50% Leakage Base (Direct Program)	0.7996	0.0005	0.0346	18.00	1.000	1.000
RIC0022	NEST E Thermostats Moderate Setback - Combination Service (Direct Program)	161.7876	0.0000	7.8600	9.00	1.000	1.000
RIC0025	Air Sealing - 20% Reduction - (Agency Rebate)	0.0670	0.0000	0.0039	13.00	1.000	1.000

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIC0026	Air Sealing - 30% Reduction - (Agency Rebate)	0.0999	0.0000	0.0059	13.00	1.000	1.000
RIC0027	Air Sealing - 40% Reduction - (Agency Rebate)	0.1322	0.0000	0.0078	13.00	1.000	1.000
RIC0028	Air Sealing - 50% Reduction - (Agency Rebate)	0.1724	0.0001	0.0101	13.00	1.000	1.000
RIC0032	Attic Insulation to R30 - (Agency Rebate)	0.0434	0.0000	0.0026	20.00	1.000	1.000
RIC0033	Attic Insulation to R49 - (Agency Rebate)	0.0437	0.0000	0.0026	20.00	1.000	1.000
RIC0034	Wall Insulation - (Agency Rebate)	0.0949	0.0000	0.0054	25.00	1.000	1.000
RIC0036	Basement Wall Insulation - (Agency Rebate)	0.0735	0.0000	0.0069	25.00	1.000	1.000
RIC0039	Band Joist Insulation - (Agency Rebate)	78.0964	0.0153	5.1434	25.00	1.000	1.000
RIC0042	Wi-Fi Enabled Thermostat Moderate Setback - (Agency Rebate)	156.2781	0.0000	7.5268	9.00	1.000	1.000
RIC0043	Manufactured Belly insulation 100% coverage base - (Agency Rebate)	0.0880	0.0000	0.0070	25.00	0.909	1.000
RIC0044	Programmable Thermostat Moderate Setback - (Agency Rebate)	109.4235	0.0000	5.3082	9.00	1.000	1.000
RIC0045	Programmable Thermostat Moderate Setback - (Direct Program)	152.9283	0.0000	7.4247	9.00	1.000	1.000
RIC0047	Energy Star Window Replacement (Per Square Footage) - (Agency Rebate)	1.4422	0.0008	0.0562	25.00	1.000	1.000
RIC0048	Trade Ally Programmable Thermostat Moderate Setback - (Direct Program)	146.0005	0.0000	7.1401	9.00	1.000	1.000
RIC0054	Wi-Fi Thermostat - Moderate Setback - (Direct Program)	161.2650	0.0000	7.9319	9.00	1.000	1.000
RIC0055	Attic Insulation Installed _ R-38 Final Effective value - (Direct Program)	0.0611	0.0000	0.0036	20.00	1.000	1.000
RIC0056	Attic Insulation Installed _ R-49 Final Effective value - (Direct Program)	0.0754	0.0000	0.0045	20.00	1.000	1.000
RIC0057	Single Family Air Sealing - 20% Reduction - (Direct Program)	0.0637	0.0000	0.0039	13.00	1.000	1.000
RIC0058	Single Family Air Sealing - 30% Reduction - (Direct Program)	0.0943	0.0000	0.0058	13.00	1.000	1.000
RIC0059	Single Family Air Sealing - 40% Reduction - (Direct Program)	0.1271	0.0000	0.0078	13.00	1.000	1.000
RIC0060	Single Family Air Sealing - 50% Reduction - (Direct Program)	0.1544	0.0000	0.0096	13.00	1.000	1.000
RIC0061	Programming Existing Thermostat - Moderate - Combination - (Direct Program)	161.5699	0.0000	8.0028	3.00	1.000	1.000

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIC0064	Window Film Insulation Kit (Coverage = 15 SQ FT Glazing) - (Direct Program)	25.8320	0.0000	1.6438	1.00	0.870	1.000
RIE0025	LED Night Light (Direct Program)	22.0000	0.0000	0.0000	12.00	1.000	1.000
RIE0035	Low Flow Showerhead - 1.5 gpm (Direct Program)	342.4700	0.0270	0.0000	10.00	1.010	1.000
RIE0036	Low Flow Showerhead - 1.5 gpm Handheld (Direct Program)	342.4700	0.0270	0.0000	10.00	1.000	1.000
RIE0039	Low Flow Kitchen Faucet Aerator - Electric 1.5gpm (Direct Program)	287.5500	0.0320	0.0000	10.00	0.900	1.000
RIE0048	Low Flow Bath Faucet Aerators - Electric 1.0gpm (Direct Program)	70.5500	0.0080	0.0000	10.00	0.900	1.000
RIE0050	Pipe Wrap - Electric (Direct Program)	51.0000	0.0058	0.0000	15.00	0.940	1.000
RIE0054	LED Bulb Replacing A-Line 60W (Direct Program)	28.5000	0.0034	0.0000	4.00	1.000	1.000
RIE0083	Outdoor LED PAR Flood (Direct Program)	276.4000	0.0000	0.0000	4.00	1.000	1.000
RIE0086	LED Exterior Fixture Lamp Replacement (Direct Program)	81.0000	0.0000	0.0000	12.00	1.000	1.000
RIE0087	LED Night Light (Lighting Kit _ NON- CAA)	22.0000	0.0000	0.0000	12.00	1.000	1.000
RIE0088	LED Interior Fixture Lamp Replacement (Lighting Kit _ NON- CAA)	28.5000	0.0034	0.0000	3.00	1.000	1.000
RIE0092	Shower Flow Optimizer 1.5gpm - Electric Water Heater (Direct Program)	342.4700	0.0270	0.0000	10.00	1.000	1.000
RIE0094	LED A-line LT or EQ 6W Replacing 40W Equivalent (Direct Program)	19.6000	0.0023	0.0000	4.00	1.000	1.000
RIE0095	LED Globe LT or EQ 8W (Direct Program)	27.0000	0.0032	0.0000	6.00	1.000	1.000
RIE0096	LED Candelabra Small Base LT or EQ 5W (Direct Program)	23.7000	0.0028	0.0000	6.00	1.000	1.000
RIE0097	ENERGY STAR Dehumidifier (Direct Program)	236.8000	0.1450	0.0000	12.00	1.000	1.000
RIE0098	LED Candelabra Medium Base LT or EQ 5W (Direct Program)	23.7000	0.0028	0.0000	6.00	1.000	1.000
RIE0104	LED A-line 9W<13W replacing Incandescent/Halogen Food Bank Bulb Distribution (Di	28.5000	0.0034	0.0000	4.00	1.000	1.000
RIE0105	LED PAR/R/BR <=15.5 Watt (Direct Program)	54.0000	0.0064	0.0000	4.00	1.000	1.000
RIE0106	Advanced Power Strip Tier 1 Workstations (Direct Program)	25.8000	0.0028	0.0000	5.00	1.000	1.000
RIE0107	Advanced Power Strip Tier 1 AV Systems (Direct Program)	77.0000	0.0093	0.0000	5.00	1.000	1.000

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIE0108	Single Family Air Sealing - 20% Reduction - (Agency Rebate)	0.0669	0.0000	0.0000	13.00	1.000	1.000
RIE0109	Single Family Air Sealing - 30% Reduction - (Agency Rebate)	0.0974	0.0000	0.0000	13.00	1.000	1.000
RIE0110	Single Family Air Sealing - 40% Reduction - (Agency Rebate)	0.1235	0.0000	0.0000	13.00	1.000	1.000
RIE0111	Single Family Air Sealing - 50% Reduction - (Agency Rebate)	0.1592	0.0000	0.0000	13.00	1.000	1.000
RIE0115	Attic Insulation to R-30 - (Agency Rebate)	0.0417	0.0000	0.0000	20.00	1.000	1.000
RIE0116	Attic Insulation to R-49 - (Agency Rebate)	0.0776	0.0000	0.0000	20.00	1.000	1.000
RIE0117	Wall Insulation - (Agency Rebate)	0.1037	0.0000	0.0000	25.00	1.000	1.000
RIE0119	Basement Wall Insulation - (Agency Rebate)	0.0675	0.0000	0.0000	25.00	1.000	1.000
RIE0120	Floor Insulation - (Agency Rebate)	0.0646	0.0000	0.0000	25.00	1.000	1.000
RIE0121	Crawlspace Wall Insulation - (Agency Rebate)	0.0400	0.0000	0.0000	25.00	1.000	1.000
RIE0122	Rim (Band) Joist Insulation - (Agency Rebate)	58.8672	0.0113	0.0000	25.00	1.000	1.000
RIE0124	Refrigerator Recycling & Replacement - (Agency Rebate)	1,175.8000	0.1379	0.0000	8.30	1.000	1.000
RIE0125	ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space, <= 55 gallons	1,539.0000	0.1230	0.0000	10.00	1.000	1.000
RIE0126	Central AC - 16 SEER or Higher - (Agency Rebate)	237.7138	0.1450	0.0000	15.00	1.000	1.000
RIE0130	Wi-Fi Enabled Thermostat Moderate Setback - (Agency Rebate)	128.5706	0.0000	0.0000	9.00	1.000	1.000
RIE0132	ENERGY STAR Dehumidifier - (Agency Rebate)	236.8000	0.1450	0.0000	12.00	1.000	1.000
RIE0133	Manufactured Belly Insulation 100% Coverage Base - (Agency Rebate)	0.0965	0.0000	0.0000	25.00	0.909	1.000
RIE0135	LED Holiday Lights (Direct Program)	10.6000	0.0000	0.0000	10.00	1.000	1.000
RIE0136	Programmable Thermostat Moderate Setback - (Agency Rebate)	110.8082	0.0000	0.0000	9.00	1.000	1.000
RIE0137	Programmable Thermostat Moderate Setback - (Direct Program)	130.1409	0.0000	0.0000	9.00	1.000	1.000
RIE0138	ENERGY STAR Continuous Bathroom Exhaust Fan - (Agency Rebate)	54.2700	0.0062	0.0000	15.00	1.000	1.000
RIE0144	LED Night Light Food Bank Bulb Distribution	22.0000	0.0000	0.0000	12.00	0.928	1.000
RIE0145	16 SEER or Higher AHRI certified AC up to 2.5 tons - (Direct Program)	279.2841	0.1667	0.0000	15.00	1.000	1.000
RIE0146	16 SEER or Higher AHRI certified AC Greater Than 3 Tons - (Direct Program)	401.8836	0.2309	0.0000	15.00	1.000	1.000

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIE0148	ENERGY STAR Heat Pump Water Heaters in Semi-Conditioned Space e 2.5 UEF - (Direct Program)	1,858.0000	0.1480	0.0000	10.00	1.000	1.000
RIE0170	Wi-Fi Thermostat - Moderate Setback - (Direct Program)	76.6326	0.0000	0.0000	9.00	1.000	1.000
RIE0171	Air Purifier CADR 201-250 ES FoodBank (Direct Program)	664.5000	0.0759	0.0000	9.00	0.928	1.000
RIG0011	Setback thermostat - full setback - Gas or Combination (Direct Program)	0.0000	0.0000	9.4510	9.00	1.000	1.000
RIG0049	Low Flow Showerhead - 1.5 gpm (Direct Program)	0.0000	0.0000	1.4318	10.00	1.010	1.000
RIG0050	Low Flow Showerhead - 1.5 gpm Handheld (Direct Program)	0.0000	0.0000	1.4318	10.00	1.000	1.000
RIG0052	O and M Tuneup Furnace Only - Direct Install (Direct Program)	0.0000	0.0000	4.8661	2.00	1.000	1.000
RIG0053	Low Flow Kitchen Faucet Aerator - Gas 1.5gpm (Direct Program)	0.0000	0.0000	1.1980	10.00	0.900	1.000
RIG0093	Low Flow Bath Faucet Aerators - Gas 1.0 gpm (Direct Program)	0.0000	0.0000	0.2922	10.00	0.900	1.000
RIG0095	Door weatherstripping (Direct Program)	0.0000	0.0000	0.2265	5.00	1.000	1.000
RIG0097	Pipe Wrap - Gas (Direct Program)	0.0000	0.0000	0.2386	15.00	0.940	1.000
RIG0100	O and M Tuneup Boiler Only - (Direct Program)	0.0000	0.0000	7.2669	2.00	1.000	1.000
RIG0135	Duct Sealing GT Or EQ 15% And LT 20% Leakage Base (Direct Program)	0.0000	0.0000	0.0030	18.00	1.000	1.000
RIG0136	Duct Sealing GT Or EQ 20% And LT 25%Leakage Base (Direct Program)	0.0000	0.0000	0.0061	18.00	1.000	1.000
RIG0137	Duct Sealing GT Or EQ 25% And LT 30% Leakage Base (Direct Program)	0.0000	0.0000	0.0097	18.00	1.000	1.000
RIG0145	Duct Sealing GT Or EQ 30% And LT 35% Leakage Base (Direct Program)	0.0000	0.0000	0.0123	18.00	1.000	1.000
RIG0146	Duct Sealing GT Or EQ 35% And LT 40% Leakage Base (Direct Program)	0.0000	0.0000	0.0162	18.00	1.000	1.000
RIG0147	Duct Sealing GT Or EQ 40% And LT 45% Leakage Base (Direct Program)	0.0000	0.0000	0.0235	18.00	1.000	1.000
RIG0148	Duct Sealing GT Or EQ 45% And LT 50% Leakage Base (Direct Program)	0.0000	0.0000	0.0271	18.00	1.000	1.000
RIG0149	Duct sealing GT or EQ 50% leakage base (Direct Program)	0.0000	0.0000	0.0328	18.00	1.000	1.000
RIG0159	Shower Start Added to Existing Low Flow Showerhead 1.5 gpm - Gas Water Heater (D	0.0000	0.0000	0.2630	10.00	1.000	1.000
RIG0160	Low Flow Showerheads (1.5 gpm) + Shower Start - Gas Water Heater (NON-CAA)	0.0000	0.0000	1.6850	10.00	1.010	1.000

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIG0161	Shower Flow Optimizer 1.5gpm - Gas Water Heater (Direct Program)	0.0000	0.0000	1.4318	10.00	1.000	1.000
RIG0166	NEST E Thermostats Moderate Setback - Gas Only Service (Direct Program)	0.0000	0.0000	5.1906	9.00	1.000	1.000
RIG0171	Air Sealing - 40% Reduction - (Agency Rebate)	0.0000	0.0000	0.0077	13.00	1.000	1.000
RIG0172	Air Sealing - 50% Reduction - (Agency Rebate)	0.0000	0.0000	0.0099	13.00	1.000	1.000
RIG0176	Attic Insulation to R30 - (Agency Rebate)	0.0000	0.0000	0.0026	20.00	1.000	1.000
RIG0177	Attic Insulation to R49 - (Agency Rebate)	0.0000	0.0000	0.0044	20.00	1.000	1.000
RIG0178	Wall Insulation - (Agency Rebate)	0.0000	0.0000	0.0054	25.00	1.000	1.000
RIG0179	Kneewall Insulation - (Agency Rebate)	0.0000	0.0000	0.0286	20.00	1.000	1.000
RIG0180	Basement Wall Insulation - (Agency Rebate)	0.0000	0.0000	0.0069	25.00	1.000	1.000
RIG0182	Crawlspace Insulation - (Agency Rebate)	0.0000	0.0000	0.0072	25.00	1.000	1.000
RIG0183	Band Joist Insulation - (Agency Rebate)	0.0000	0.0000	6.0234	25.00	1.000	1.000
RIG0187	Natural Gas Furnace Tune-Up - (Agency Rebate)	0.0000	0.0000	4.4149	2.00	1.000	1.000
RIG0191	Natural Gas Boiler AFUE > = 95% - (Agency Rebate)	0.0000	0.0000	20.8663	15.00	1.000	1.000
RIG0198	Air Sealing - 20% Reduction - (Agency Rebate)	0.0000	0.0000	0.0039	13.00	1.000	1.000
RIG0199	Air Sealing - 30% Reduction - (Agency Rebate)	0.0000	0.0000	0.0058	13.00	1.000	1.000
RIG0200	Programmable Thermostat Moderate Setback - (Agency Rebate)	0.0000	0.0000	5.7017	9.00	1.000	1.000
RIG0201	Programmable Thermostat Moderate Setback - (Direct Program)	0.0000	0.0000	5.7477	9.00	1.000	1.000
RIG0205	ENERGY STAR Window Replacement (Per Square Footage) - (Agency Rebate)	0.0000	0.0000	0.0571	25.00	1.000	1.000
RIG0208	Emergency Natural Gas Furnace AFUE > = 96 - (Agency Rebate)	0.0000	0.0000	14.7294	15.00	1.000	1.000
RIG0209	Emergency Manufactured Home Natural Gas Furnace AFUE > = 95 - (Agency Rebate)	0.0000	0.0000	12.0391	15.00	1.000	1.000
RIG0210	Emergency ENERGY STAR Tankless Water Heater Replacement UEF>= 0.81 - (Agency Reb	0.0000	0.0000	5.0745	20.00	1.000	1.000

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIG0211	Emergency Power Vented Water Heater ENERGY STAR UEF > = 0.64 - (Agency Rebate)	0.0000	0.0000	1.7922	13.00	1.000	1.000
RIG0215	Natural Gas Boiler AFUE > = 95 - (Direct Program)	0.0000	0.0000	35.4980	15.00	1.000	1.000
RIG0216	Natural Gas Furnace AFUE > = 96 - (Direct Program)	0.0000	0.0000	16.8128	15.00	1.000	1.000
RIG0217	Natural Gas Furnace AFUE > = 96 (100 KBTUH) - (Direct Program)	0.0000	0.0000	25.3779	15.00	1.000	1.000
RIG0224	High-Capacity Natural Gas Storage Power Vented Water Heater ENERGY STAR UEF	0.0000	0.0000	1.7922	13.00	1.000	1.000
RIG0226	High-Capacity Natural Gas On-demand Water Heater e 0.81 UEF - (Direct Program)	0.0000	0.0000	5.0745	20.00	1.000	1.000
RIG0228	Trade Ally Programmable Thermostat Moderate Setback - (Direct Program)	0.0000	0.0000	5.6564	9.00	1.000	1.000
RIG0235	Low Flow Bath Faucet Aerators - Gas 1.0gpm - Gas Kit (Direct Program)	0.0000	0.0000	0.2922	10.00	0.440	1.000
RIG0236	Low Flow Kitchen Faucet Aerator - Gas 1.5gpm - Gas Kit (Direct Program)	0.0000	0.0000	1.1980	10.00	0.390	1.000
RIG0240	Emergency Tanked Water Heater ENERGY STAR UEF > = 0.64 - (Agency Rebate)	0.0000	0.0000	1.7922	13.00	1.000	1.000
RIG0248	Manufactured Home O and M Tuneup Furnace Only - Direct Install (Direct Program)	0.0000	0.0000	4.7052	2.00	1.000	1.000
RIG0249	Window Film Insulation Kit (Coverage = 15 SQ FT Glazing) Food Bank Bulb Distribution	0.0000	0.0000	1.6051	1.00	0.870	1.000
RIG0250	Wi-Fi Thermostat - Moderate Setback - (Direct Program)	0.0000	0.0000	7.3331	9.00	1.000	1.000
RIG0252	Attic Insulation Installed _ R-38 Final Effective value - (Direct Program)	0.0000	0.0000	0.0034	20.00	1.000	1.000
RIG0253	Attic Insulation Installed _ R-49 Final Effective value - (Direct Program)	0.0000	0.0000	0.0043	20.00	1.000	1.000
RIG0254	Manufactured Home Natural Gas Furnace AFUE > = 95% - (Direct Program)	0.0000	0.0000	16.8839	15.00	1.000	1.000
RIG0255	Single Family Air Sealing - 20% Reduction - (Direct Program)	0.0000	0.0000	0.0031	13.00	1.000	1.000
RIG0256	Single Family Air Sealing - 30% Reduction - (Direct Program)	0.0000	0.0000	0.0046	13.00	1.000	1.000
RIG0257	Single Family Air Sealing - 40% Reduction - (Direct Program)	0.0000	0.0000	0.0062	13.00	1.000	1.000

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RIG0258	Single Family Air Sealing - 50% Reduction - (Direct Program)	0.0000	0.0000	0.0077	13.00	1.000	1.000
RIG0259	Trade Ally Band Joist R-20 or higher - (Direct Program)	0.0000	0.0000	4.1839	25.00	1.000	1.000
RIG0260	Programming Existing Thermostat - Moderate - Gas - (Direct Program)	0.0000	0.0000	7.4394	3.00	1.000	1.000
RIG0261	Pipe Wrap R3 Insulation Kit (Coverage = 6 Linier FT) Food Bank Bulb Distribution	0.0000	0.0000	1.5189	15.00	0.530	1.000

Note: Measure names are as they appear in eTracker.

Table 63 documents first year and lifetime kWh savings, Table 64 documents first year kW savings, and Table 65 documents first year and lifetime MCF savings.

Table 63. Certified Participation and kWh Savings by Measure (Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RCE0002	83	20,404	20,404	20,404	225,638	100.00%
RIC0003	1	143	143	143	1,291	100.00%
RIC0014	1,497	322	322	322	5,796	100.00%
RIC0015	13,519	4,161	4,161	4,161	74,901	100.00%
RIC0016	6,310	2,597	2,597	2,597	46,738	100.00%
RIC0017	4,258	2,291	2,291	2,291	41,234	100.00%
RIC0018	10,089	6,609	6,609	6,609	118,967	100.00%
RIC0019	12,282	9,821	9,821	9,821	176,772	100.00%
RIC0022	8	1,294	1,294	1,294	11,649	100.00%
RIC0025	29,909	2,004	2,004	2,004	26,051	100.00%
RIC0026	21,919	2,190	2,190	2,190	28,466	100.00%
RIC0027	16,744	2,214	2,214	2,214	28,776	100.00%
RIC0028	13,068	2,253	2,253	2,253	29,288	100.00%
RIC0032	41,781	1,813	1,813	1,813	36,266	100.00%
RIC0033	17,060	746	746	746	14,910	100.00%
RIC0034	24,043	2,282	2,282	2,282	57,042	100.00%
RIC0036	388	29	29	29	713	100.00%
RIC0039	2	156	156	156	3,905	100.00%
RIC0042	3	469	469	469	4,220	100.00%
RIC0043	1,801	158	158	144	3,602	90.90%
RIC0044	25	2,736	2,736	2,736	24,620	100.00%

CADMUS

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RIC0045	196	29,974	29,974	29,974	269,766	100.00%
RIC0047	230	332	332	332	8,293	100.00%
RIC0048	97	14,162	14,162	14,162	127,458	100.00%
RIC0054	230	37,091	37,091	37,091	333,819	100.00%
RIC0055	37,965	2,320	2,320	2,320	46,393	100.00%
RIC0056	464,636	35,034	35,034	35,034	700,671	100.00%
RIC0057	142,960	9,107	9,107	9,107	118,385	100.00%
RIC0058	44,341	4,181	4,181	4,181	54,358	100.00%
RIC0059	19,622	2,494	2,494	2,494	32,421	100.00%
RIC0060	6,558	1,013	1,013	1,013	13,163	100.00%
RIC0061	4	646	646	646	1,939	100.00%
RIC0064	15	387	387	337	337	87.00%
RIE0025	9,913	218,086	218,086	218,086	2,617,032	100.00%
RIE0035	83	28,425	28,425	28,709	287,093	101.00%
RIE0036	143	48,973	48,973	48,973	489,732	100.00%
RIE0039	131	37,669	37,669	33,902	339,021	90.00%
RIE0048	193	13,617	13,616	12,255	122,545	89.99%
RIE0050	1,259	64,209	64,209	60,356	905,347	94.00%
RIE0054	18,559	528,932	528,932	528,932	2,115,726	100.00%
RIE0083	618	170,815	170,815	170,815	683,261	100.00%
RIE0086	1,272	103,032	103,032	103,032	1,236,384	100.00%
RIE0087	15	330	330	330	3,960	100.00%
RIE0088	5	143	143	143	428	100.00%
RIE0092	1	334	342	342	3,425	102.54%
RIE0094	62	1,215	1,215	1,215	4,861	100.00%
RIE0095	2,077	56,079	56,079	56,079	336,474	100.00%
RIE0096	2,803	66,431	66,431	66,431	398,587	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RIE0097	97	22,970	22,970	22,970	275,635	100.00%
RIE0098	554	13,130	13,130	13,130	78,779	100.00%
RIE0104	107,681	3,068,909	3,068,909	3,068,909	12,275,634	100.00%
RIE0105	847	45,738	45,738	45,738	182,952	100.00%
RIE0106	83	2,141	2,141	2,141	10,707	100.00%
RIE0107	128	9,856	9,856	9,856	49,280	100.00%
RIE0108	45,178	3,022	3,022	3,022	39,291	100.00%
RIE0109	28,899	2,815	2,815	2,815	36,592	100.00%
RIE0110	10,497	1,296	1,296	1,296	16,853	100.00%
RIE0111	3,155	502	502	502	6,530	100.00%
RIE0115	304,549	12,700	12,700	12,700	253,994	100.00%
RIE0116	28,921	2,244	2,244	2,244	44,885	100.00%
RIE0117	9,750	1,011	1,011	1,011	25,277	100.00%
RIE0119	347	23	23	23	586	100.00%
RIE0120	1,072	69	69	69	1,731	100.00%
RIE0121	300	12	12	12	300	100.00%
RIE0122	17	1,001	1,001	1,001	25,019	100.00%
RIE0124	21	24,692	24,692	24,692	204,942	100.00%
RIE0125	3	4,617	4,617	4,617	46,170	100.00%
RIE0126	3	713	713	713	10,697	100.00%
RIE0130	4	514	514	514	4,629	100.00%
RIE0132	10	2,368	2,368	2,368	28,416	100.00%
RIE0133	2,600	251	251	228	5,702	90.90%
RIE0135	917	9,720	9,720	9,720	97,202	100.00%
RIE0136	336	37,232	37,232	37,232	335,084	100.00%
RIE0137	5	651	651	651	5,856	100.00%
RIE0138	20	1,085	1,085	1,085	16,281	100.00%
RIE0144	483,825	10,644,150	10,644,150	9,877,771	118,533,254	92.80%
RIE0145	120	33,514	33,514	33,514	502,711	100.00%
RIE0146	12	4,823	4,823	4,823	72,339	100.00%
RIE0148	6	11,148	11,148	11,148	111,480	100.00%
RIE0170	1	77	77	77	690	100.00%
RIE0171	2,332	1,549,614	1,549,614	1,438,042	12,942,376	92.80%
Total	2,001,068	17,052,329	17,052,336	16,165,601	158,453,597	94.80%

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Table 64. Certified Participation and kW Savings by Measure (Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RCE0002	83	1.95	1.95	1.95	100.00%
RIC0014	1,497	0.15	0.15	0.15	100.00%
RIC0015	13,519	2.70	2.70	2.70	100.00%
RIC0016	6,310	1.89	1.89	1.89	100.00%
RIC0017	4,258	1.70	1.70	1.70	100.00%
RIC0018	10,089	4.04	4.04	4.04	100.00%
RIC0019	12,282	6.14	6.14	6.14	100.00%
RIC0028	13,068	1.31	1.31	1.31	100.00%
RIC0039	2	0.03	0.03	0.03	100.00%
RIC0047	230	0.18	0.18	0.18	100.00%
RIE0035	83	2.24	2.24	2.26	101.00%
RIE0036	143	3.86	3.86	3.86	100.00%
RIE0039	131	4.19	4.19	3.77	90.00%
RIE0048	193	1.54	1.54	1.39	90.00%
RIE0050	1,259	7.30	7.30	6.86	94.00%
RIE0054	18,559	63.10	63.10	63.10	100.00%
RIE0088	5	0.02	0.02	0.02	100.00%
RIE0092	1	0.03	0.03	0.03	100.00%
RIE0094	62	0.14	0.14	0.14	100.00%
RIE0095	2,077	6.65	6.65	6.65	100.00%
RIE0096	2,803	7.85	7.85	7.85	100.00%
RIE0097	97	14.07	14.07	14.07	100.00%
RIE0098	554	1.55	1.55	1.55	100.00%
RIE0104	107,681	366.12	366.12	366.12	100.00%
RIE0105	847	5.42	5.42	5.42	100.00%
RIE0106	83	0.23	0.23	0.23	100.00%
RIE0107	128	1.19	1.19	1.19	100.00%
RIE0122	17	0.19	0.19	0.19	100.00%
RIE0124	21	2.90	2.90	2.90	100.00%
RIE0125	3	0.37	0.37	0.37	100.00%
RIE0126	3	0.44	0.44	0.44	100.00%
RIE0132	10	1.45	1.45	1.45	100.00%
RIE0138	20	0.12	0.12	0.12	100.00%
RIE0145	120	20.00	20.00	20.00	100.00%
RIE0146	12	2.77	2.77	2.77	100.00%
RIE0148	6	0.89	0.89	0.89	100.00%
RIE0171	2,332	177.00	177.00	164.25	92.80%
Total	198,588	711.72	711.72	697.99	98.07%

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Table 65. Certified Participation and MCF Savings by Measure (Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RCG0002	389	33,137.00	33,137.00	33,137.00	515,671.43	100.00%
RIC0003	1	8.07	8.07	8.07	72.62	100.00%
RIC0014	1,497	12.87	12.87	12.87	231.74	100.00%
RIC0015	13,519	163.58	163.58	163.58	2,944.44	100.00%
RIC0016	6,310	103.48	103.48	103.48	1,862.71	100.00%
RIC0017	4,258	100.49	100.49	100.49	1,808.80	100.00%
RIC0018	10,089	281.48	281.48	281.48	5,066.70	100.00%
RIC0019	12,282	424.96	424.96	424.96	7,649.23	100.00%
RIC0022	8	62.88	62.88	62.88	565.92	100.00%
RIC0025	29,909	116.65	116.65	116.65	1,516.39	100.00%
RIC0026	21,919	129.32	129.32	129.32	1,681.19	100.00%
RIC0027	16,744	130.60	130.60	130.60	1,697.84	100.00%
RIC0028	13,068	131.99	131.99	131.99	1,715.83	100.00%
RIC0032	41,781	108.63	108.63	108.63	2,172.61	100.00%
RIC0033	17,060	44.36	44.36	44.36	887.12	100.00%
RIC0034	24,043	129.83	129.83	129.83	3,245.81	100.00%
RIC0036	388	2.68	2.68	2.68	66.93	100.00%
RIC0039	2	10.29	10.29	10.29	257.17	100.00%
RIC0042	3	22.58	22.58	22.58	203.22	100.00%
RIC0043	1,801	12.61	12.61	11.46	286.49	100.00%
RIC0044	25	132.71	132.71	132.71	1,194.35	100.00%
RIC0045	196	1,455.24	1,455.24	1,455.24	13,097.17	100.00%
RIC0047	230	12.93	12.93	12.93	323.15	100.00%
RIC0048	97	692.59	692.59	692.59	6,233.31	100.00%
RIC0054	230	1,824.34	1,824.34	1,824.34	16,419.03	100.00%
RIC0055	37,965	136.67	136.67	136.67	2,733.48	100.00%
RIC0056	464,636	2,090.86	2,090.86	2,090.86	41,817.24	100.00%
RIC0057	142,960	557.54	557.54	557.54	7,248.07	100.00%
RIC0058	44,341	257.18	257.18	257.18	3,343.31	100.00%
RIC0059	19,622	153.05	153.05	153.05	1,989.67	100.00%
RIC0060	6,558	62.96	62.96	62.96	818.44	100.00%
RIC0061	4	32.01	32.01	32.01	96.03	100.00%
RIC0064	15	24.66	24.66	21.45	21.45	87.00%
RIG0011	32	302.43	302.43	302.43	2,721.89	100.00%
RIG0049	888	1,271.44	1,271.44	1,284.15	12,841.53	101.00%
RIG0050	1,992	2,852.15	2,852.15	2,852.15	28,521.46	100.00%
RIG0052	665	3,235.96	3,235.96	3,235.96	6,471.91	100.00%
RIG0053	1,785	2,138.43	2,138.43	1,924.59	19,245.87	90.00%
RIG0093	3,175	927.74	927.74	834.96	8,349.62	90.00%
RIG0095	38	8.61	8.61	8.61	43.04	100.00%
RIG0097	24,467	5,837.83	5,837.83	5,487.56	82,313.35	94.00%
RIG0100	10	72.67	72.67	72.67	145.34	100.00%
RIG0135	6,378	19.13	19.13	19.13	344.41	100.00%
RIG0136	15,979	97.47	97.47	97.47	1,754.49	100.00%
RIG0137	33,206	322.10	322.10	322.10	5,797.77	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RIG0145	99,661	1,225.83	1,225.83	1,225.83	22,064.95	100.00%
RIG0146	115,579	1,872.38	1,872.38	1,872.38	33,702.84	100.00%
RIG0147	109,100	2,563.85	2,563.85	2,563.85	46,149.30	100.00%
RIG0148	137,435	3,724.49	3,724.49	3,724.49	67,040.79	100.00%
RIG0149	295,341	9,687.18	9,687.18	9,687.18	174,369.33	100.00%
RIG0159	11	2.89	2.89	2.89	28.93	100.00%
RIG0160	1	1.69	1.69	1.70	17.02	101.00%
RIG0161	20	28.64	28.64	28.64	286.36	100.00%
RIG0166	22	114.19	114.19	114.19	1,027.74	100.00%
RIG0171	12,123	93.35	93.35	93.35	1,213.51	100.00%
RIG0172	5,293	52.40	52.40	52.40	681.21	100.00%
RIG0176	19,003	49.41	49.41	49.41	988.16	100.00%
RIG0177	24,890	109.52	109.52	109.52	2,190.32	100.00%
RIG0178	10,093	54.50	54.50	54.50	1,362.56	100.00%
RIG0179	306	8.75	8.75	8.75	175.03	100.00%
RIG0180	1,147	7.91	7.91	7.91	197.86	100.00%
RIG0182	2,259	16.26	16.26	16.26	406.62	100.00%
RIG0183	2	12.05	12.05	12.05	301.17	100.00%
RIG0187	9	39.73	39.73	39.73	79.47	100.00%
RIG0191	3	62.60	62.60	62.60	938.98	100.00%
RIG0198	41,919	163.48	163.48	163.48	2,125.29	100.00%
RIG0199	14,547	84.37	84.37	84.37	1,096.84	100.00%
RIG0200	13	74.12	74.12	74.12	667.10	100.00%
RIG0201	1,280	7,357.06	7,357.06	7,357.06	66,213.50	100.00%
RIG0205	329	18.79	18.79	18.79	469.65	100.00%
RIG0208	231	3,402.49	3,402.49	3,402.49	51,037.37	100.00%
RIG0209	26	313.02	313.02	313.02	4,695.25	100.00%
RIG0210	13	65.97	65.97	65.97	1,319.37	100.00%
RIG0211	140	250.91	250.91	250.91	3,261.80	100.00%
RIG0215	22	780.96	780.96	780.96	11,714.34	100.00%
RIG0216	386	6,489.74	6,489.74	6,489.74	97,346.11	100.00%
RIG0217	10	253.78	253.78	253.78	3,806.69	100.00%
RIG0224	330	591.43	591.43	591.43	7,688.54	100.00%
RIG0226	23	116.71	116.71	116.71	2,334.27	100.00%
RIG0228	61	345.04	345.04	345.04	3,105.36	100.00%
RIG0235	3	0.88	0.88	0.39	3.86	44.00%
RIG0236	2	2.40	2.40	0.93	9.34	39.00%
RIG0240	7	12.55	12.55	12.55	163.09	100.00%
RIG0248	39	183.50	183.50	183.50	367.01	100.00%
RIG0249	28,250	45,344.08	45,344.08	39,449.35	39,449.35	87.00%
RIG0250	253	1,855.27	1,855.27	1,855.27	16,697.47	100.00%
RIG0252	12,177	41.40	41.40	41.40	828.04	100.00%
RIG0253	1,318,102	5,667.84	5,667.84	5,667.84	113,356.77	100.00%
RIG0254	55	928.61	928.61	928.61	13,929.22	100.00%
RIG0255	51,618	160.02	160.02	160.02	2,080.21	100.00%
RIG0256	18,550	85.33	85.33	85.33	1,109.29	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RIG0257	7,979	49.47	49.47	49.47	643.11	100.00%
RIG0258	2,482	19.11	19.11	19.11	248.45	100.00%
RIG0259	47	196.64	196.64	196.64	4,916.08	100.00%
RIG0260	27	200.86	200.86	200.86	602.59	100.00%
RIG0261	34,050	51,728.76	51,718.55	27,410.83	411,162.43	52.99%
Total	3,385,834	206,165.23	206,155.01	175,302.11	2,029,159.46	85.03%

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Appendix J: Income Qualified-Electric Product

Table 66 presents the reported gross and verified net energy savings by fuel type and demand reductions for the Income Qualified-Electric product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 66. Participation and Savings (Income Qualified-Electric)

	Participation Total	Total kWh Savings	Total kW Savings
Reported Gross Participation and Savings	113,404	10,473,483	622.29
Verified Annual Net Participation and Savings	113,403	10,201,047	614.38
Verified Lifetime Net Savings	N/A	88,412,163	N/A
Product Realization Rate	100.00%	97.40%	98.73%
Annual Net Verified v. Net Reported Savings	N/A	99.29%	99.44%
Lifetime Net Verified v. Net Reported Savings	N/A	98.77%	N/A

Table 67 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Income Qualified-Electric product.

Table 67. Verified Per-Unit Measure Characteristics (Income Qualified-Electric)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE2004	LED Night Light (NON-CAA)	22.0000	0.0000	0.0000	12.00	1.000	1.000
RFE2005	Low Flow Showerhead - 1.5 gpm (NON-CAA)	342.4700	0.0270	0.0000	10.00	1.010	1.000
RFE2006	Low Flow Showerhead - 1.5 gpm Handheld (NON-CAA)	342.4700	0.0270	0.0000	10.00	1.000	1.000
RFE2007	Low Flow Kitchen Faucet Aerator - Electric 1.5gpm (NON-CAA)	287.5500	0.0320	0.0000	10.00	0.900	1.000
RFE2008	Low Flow Bath Faucet Aerators - Electric 1.0gpm (NON-CAA)	70.5500	0.0080	0.0000	10.00	0.900	1.000
RFE2009	Pipe Wrap - Electric (NON-CAA)	51.0000	0.0058	0.0000	15.00	1.000	1.000
RFE2010	LED Bulb Replacing A-Line 60W (Base Incandescent)-2021	28.5000	0.0034	0.0000	4.00	1.000	1.000
RFE2011	LED PAR/R/BR <= 15.5W	54.0000	0.0064	0.0000	4.00	1.000	1.000
RFE2012	Outdoor LED PAR Flood-2020 & 2021	276.4000	0.0000	0.0000	4.00	1.000	1.000
RFE2013	LED Exterior Fixture Lamp Replacement-2020 & 2021	81.0000	0.0000	0.0000	12.00	1.000	1.000
RFE2015	Low Flow Showerheads + Shower Start - Electric Water Heater (NON-CAA)	403.8800	0.0238	0.0000	10.00	1.000	1.000
RFE2017	LED Globe LT or EQ 8W-2020 & 2021	27.0000	0.0032	0.0000	6.00	1.000	1.000
RFE2018	LED Candelabra Small Base LT or EQ 5W-2020 & 2021	23.7000	0.0028	0.0000	6.00	1.000	1.000

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE2019	LED Candelabra Medium Base LT or EQ 5W-2020 & 2021	23.7000	0.0028	0.0000	6.00	1.000	1.000
RFE2021	Tier 1 Advanced Power Strips (NON-CAA)	77.0000	0.0093	0.0000	5.00	1.000	1.000
RFE2022	ENERGY STAR Dehumidifier (NON-CAA)	236.8000	0.1450	0.0000	12.00	1.000	1.000
RFE2026	Refrigerator - 15 cf -- Income Qualified Direct Install - ENERGY STAR	1,175.8000	0.1379	0.0000	8.30	1.000	1.000
RFE2027	Refrigerator - 18 cf -- Income Qualified Direct Install - ENERGY STAR	1,175.8000	0.1379	0.0000	8.30	1.000	1.000
RFE2028	Refrigerator - 21 cf -- Income Qualified Direct Install - ENERGY STAR	1,175.8000	0.1379	0.0000	8.30	1.000	1.000
RFE2029	9W LED Kit for Food Banks	28.5000	0.0034	0.0000	4.00	0.928	1.000
RFE2030	Nightlight Kit for Food Banks	22.0000	0.0000	0.0000	12.00	0.928	1.000
RFE2033	Wi-Fi Programmable Thermostat - Full setback (Tier 2)	227.0603	0.0000	0.0000	9.00	1.000	1.000
RFE2034	Outdoor LED PAR Distribution for Food Banks	276.4000	0.0000	0.0000	4.00	0.928	1.000
RFE2035	9W LED Distribution for Food Banks	28.5000	0.0034	0.0000	4.00	0.928	1.000
RFE2036	Virtual - Dual Spray Kitchen Low Flow Aerator (1.5 gpm)	287.5500	0.0320	0.0000	10.00	1.000	1.000
RFE2037	Virtual - Shower Start/Thermostatic Shower Head (1.5 gpm)	403.8800	0.0238	0.0000	10.00	1.000	1.000
RFE2038	Virtual - LED Bulb Replacing A-Line 60W	28.5000	0.0034	0.0000	4.00	1.000	1.000
RFE2039	Virtual - LED Night Light	22.0000	0.0000	0.0000	12.00	1.000	1.000
RFE2040	Virtual - Low Flow Showerheads (1.5 gpm)	342.4700	0.0270	0.0000	10.00	1.000	1.000
RFE2041	Virtual - Low Flow Showerheads (1.5 gpm) - Handheld	342.4700	0.0270	0.0000	10.00	1.000	1.000
RFE2042	Virtual - Std Low Flow Bath Aerator (1.0 gpm)	70.5500	0.0080	0.0000	10.00	1.000	1.000
RFE2043	Virtual - LED Candelabra <= 5W	23.7000	0.0028	0.0000	6.00	1.000	1.000
RFE2044	Virtual - LED Globe <= 8W	27.0000	0.0032	0.0000	6.00	1.000	1.000
RFE2045	Virtual - LED BR30	54.0000	0.0064	0.0000	4.00	1.000	1.000
RFE2046	Virtual - Outdoor LED/PAR Flood	276.4000	0.0000	0.0000	4.00	1.000	1.000
RFE2047	Virtual - LED Exterior Fixture Lamp Replacement-2020 & 2021	81.0000	0.0000	0.0000	12.00	1.000	1.000
RFE2048	Virtual - LED A-Line LT or EQ 6W Replacing 40W Equivalent	19.6000	0.0023	0.0000	4.00	1.000	1.000
RFE2049	Virtual - LED PAR/R/BR <= 15.5W	54.0000	0.0064	0.0000	4.00	1.000	1.000

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE2055	Minisplit Cold Climate Heat pump SEER 18 HSPF 11 Elec Resistance base	13,403.3233	-0.5171	0.0000	15.00	1.000	1.000
RFE2056	Minisplit Cold Climate Heat pump SEER 19 HSPF 11 Elec Resistance base	10,907.8309	-0.5153	0.0000	15.00	1.000	1.000
RFE2057	Minisplit Cold Climate Heat pump SEER 20 HSPF 11 Elec Resistance base	14,377.6828	-0.5419	0.0000	15.00	1.000	1.000
RFE2058	Minisplit Cold Climate Heat pump SEER 21 HSPF 11 Elec Resistance base	13,424.1976	-0.2548	0.0000	15.00	1.000	1.000
RFE2072	Cold-Climate Heat Pump - Custom	32,019.2702	0.0000	0.0000	15.00	1.000	1.000
RFE2074	Virtual IQ - Pipe Wrap R3 - Electric Water Heater	51.0000	0.0058	0.0000	15.00	1.000	1.000
RFE2083	Partner Refrigerator Rebate	1,175.8000	0.1379	0.0000	8.30	1.000	1.000
RFE2086	ENERGY STAR Heat Pump Water Heaters in Conditioned Space, <= 55 gallons UEF >= 3	2,473.0000	0.1980	0.0000	10.00	1.000	1.000
RFE2087	ENERGY STAR Heat Pump Water Heaters in Conditioned Space, <= 55 gallons UEF >= 3	2,612.0000	0.2090	0.0000	10.00	1.000	1.000
RFE2088	O&M Tune-up	84.2503	0.1304	0.0000	5.00	1.000	1.000
RFE2089	Exterior Candelabra	122.0000	0.0005	0.0000	6.00	1.000	1.000
RFE2090	AC replacement SEER 13 to SEER 16	318.1768	0.1797	0.0000	15.00	1.000	1.000
RFE2091	AC replacement SEER 13 to SEER 17	435.8346	0.3184	0.0000	15.00	1.000	1.000
RFE2096	LED Holiday Lights	10.6000	0.0000	0.0000	10.00	1.000	1.000
RFE2097	Virtual - LED Candelabra <= 5W small base	23.7000	0.0028	0.0000	6.00	1.000	1.000
RFE2098	virtual - LED candelabra <= 5W medium base	23.7000	0.0028	0.0000	6.00	1.000	1.000
RFE2099	CFL baseline - LED A-line LT or EQ 13W Replacing A-line Equivalent	3.3580	0.0004	0.0000	4.00	1.000	1.000
RFE2100	CFL baseline - LED Bulb Replacing 9W CFL with A-Line	2.7704	0.0003	0.0000	4.00	1.000	1.000
RFE2101	LED PAR/R/BR 14W replacing CFL	6.7160	0.0008	0.0000	4.00	1.000	1.000
RFE2102	Outdoor LED PAR/Flood = 14W replacing CFL	34.5520	0.0000	0.0000	4.00	1.000	1.000
RFE2103	CFL baseline - LED Bulb Replacing 9W CFL with A-Line	3.3580	0.0004	0.0000	4.00	1.000	1.000
RFE2106	ENERGY STAR Room AC less Than 8,000 Btu hr	31.5000	0.0480	0.0000	9.00	1.000	1.000
RFE2107	ENERGY STAR Room AC greater than or equal 8,000 Btu hr	94.0000	0.1420	0.0000	9.00	1.000	1.000

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RFE2108	Food Bank Night Lights	22.0000	0.0000	0.0000	12.00	0.928	1.000
RFE2109	Infiltration reduction - 20%	64.1092	0.0173	0.0000	13.00	1.000	1.000
RFE2110	Infiltration reduction - 30%	97.0655	0.0256	0.0000	13.00	1.000	1.000
RFE2111	Infiltration reduction - 40%	129.2643	0.0357	0.0000	13.00	1.000	1.000
RFE2112	Infiltration reduction - 50%	156.7363	0.0609	0.0000	13.00	1.000	1.000
RFE2113	R-30 Roof Insulation	43.0686	0.0149	0.0000	20.00	1.000	1.000
RFE2114	R-49 Roof Insulation	75.0967	0.0250	0.0000	20.00	1.000	1.000
RFE2115	Rim Joist Insulation	33.7638	0.0092	0.0000	25.00	1.000	1.000
RFE2116	Basement Wall Insulation	67.5313	-0.0297	0.0000	25.00	1.000	1.000
RFE2117	Crawlspace Wall Insulation	40.0454	-0.0346	0.0000	25.00	1.000	1.000
RFE2118	Single Family Home Floor Insulation R-19 or higher	36.2433	-0.0212	0.0000	25.00	1.000	1.000
RFE2119	Manufactured Home Floor Insulation R-19 or higher	124.1088	0.0544	0.0000	25.00	1.000	1.000
RFE2120	Kneewall Insulation R-19 or higher	505.4992	0.1836	0.0000	20.00	1.000	1.000
RFE2121	Above Grade Wall Insulation	97.6723	0.0242	0.0000	25.00	1.000	1.000
RFE2123	Manufactured Home Duct Sealing 40%	495.4588	0.3107	0.0000	18.00	1.000	1.000
RFE2124	Manufactured Home Duct Sealing 50%	815.2355	0.6347	0.0000	18.00	1.000	1.000
RFE2125	Setback thermostat - moderate setback	123.5437	0.0000	0.0000	9.00	1.000	1.000
RFE2127	ENERGY STAR Air Purifier CADR 201-250	664.5000	0.0759	0.0000	9.00	1.000	1.000
RFE2131	Furnace/AC - SEER 15	219.9779	0.0544	0.0000	15.00	1.000	1.000
RFE2132	Room AC less than 8,000 Btu hr- CUSTOM SAVINGS	16.0000	0.0280	0.0000	9.00	1.000	1.000
RFE2133	ENERGY STAR Bathroom Exhaust Fan	54.2700	0.0062	0.0000	15.00	1.000	1.000

Note: Measure names are as they appear in eTracker.

Table 68 documents first year and lifetime kWh savings, and

Table 69 documents kW savings.



Table 68. Certified Participation and kWh Savings by Measure (Income Qualified-Electric)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RFE2004	12,418	273,196	273,196	273,196	3,278,352	100.00%
RFE2005	63	21,576	21,576	21,791	217,914	101.00%
RFE2006	117	40,069	40,069	40,069	400,690	100.00%
RFE2007	83	23,867	23,867	21,480	214,800	90.00%
RFE2008	145	10,230	10,230	9,207	92,068	89.99%
RFE2009	856	43,656	43,656	43,656	654,840	100.00%
RFE2010	16,411	467,714	467,714	467,714	1,870,854	100.00%
RFE2011	2,207	119,178	119,178	119,178	476,712	100.00%
RFE2012	618	170,815	170,815	170,815	683,261	100.00%
RFE2013	1,063	86,103	86,103	86,103	1,033,236	100.00%
RFE2015	1	404	404	404	4,039	100.00%
RFE2017	3,147	84,969	84,969	84,969	509,814	100.00%
RFE2018	3,429	81,267	81,267	81,267	487,604	100.00%
RFE2019	898	21,283	21,283	21,283	127,696	100.00%
RFE2021	171	13,167	13,167	13,167	65,835	100.00%
RFE2022	48	11,366	11,366	11,366	136,397	100.00%
RFE2026	6	7,055	7,055	7,055	58,555	100.00%
RFE2027	197	231,633	231,633	231,633	1,922,551	100.00%
RFE2028	146	171,667	171,667	171,667	1,424,834	100.00%
RFE2029	3,200	91,200	91,200	84,634	338,534	92.80%
RFE2030	3,200	70,400	70,400	65,331	783,974	92.80%
RFE2033	2	454	454	454	4,087	100.00%
RFE2034	7,000	1,934,800	1,934,800	1,795,494	7,181,978	92.80%
RFE2035	13,456	383,496	383,496	355,884	1,423,537	92.80%
RFE2036	183	52,622	52,622	52,622	526,217	100.00%
RFE2037	2	808	808	808	8,078	100.00%
RFE2038	10,447	297,740	297,740	297,740	1,190,958	100.00%
RFE2039	2,536	55,792	55,792	55,792	669,504	100.00%
RFE2040	86	29,452	29,452	29,452	294,524	100.00%
RFE2041	207	70,891	70,891	70,891	708,913	100.00%
RFE2042	290	20,461	20,460	20,460	204,595	99.99%
RFE2043	364	8,627	8,627	8,627	51,761	100.00%
RFE2044	1,721	46,467	46,467	46,467	278,802	100.00%
RFE2045	871	47,034	47,034	47,034	188,136	100.00%
RFE2046	1,102	304,593	304,593	304,593	1,218,371	100.00%
RFE2047	574	46,494	46,494	46,494	557,928	100.00%
RFE2048	43	843	843	843	3,371	100.00%
RFE2049	683	36,882	36,882	36,882	147,528	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RFE2055	15	201,050	201,050	201,050	3,015,748	100.00%
RFE2056	2	21,816	21,816	21,816	327,235	100.00%
RFE2057	8	115,021	115,021	115,021	1,725,322	100.00%
RFE2058	8	107,394	107,394	107,394	1,610,904	100.00%
RFE2072	51	1,706,350	1,632,983	1,632,983	24,494,742	95.70%
RFE2074	1,045	53,295	53,295	53,295	799,425	100.00%
RFE2083	47	55,263	55,263	55,263	458,680	100.00%
RFE2086	35	86,555	86,555	86,555	865,550	100.00%
RFE2087	33	86,196	86,196	86,196	861,960	100.00%
RFE2088	1	84	84	84	421	100.00%
RFE2089	125	15,251	15,250	15,250	91,500	99.99%
RFE2090	177	56,317	56,317	56,317	844,759	100.00%
RFE2091	3	1,308	1,308	1,308	19,613	100.00%
RFE2096	527	5,586	5,586	5,586	55,862	100.00%
RFE2097	836	19,813	19,813	19,813	118,879	100.00%
RFE2098	526	12,466	12,466	12,466	74,797	100.00%
RFE2099	2,259	7,586	7,586	7,586	30,343	100.00%
RFE2100	408	1,130	1,130	1,130	4,521	100.00%
RFE2101	165	1,108	1,108	1,108	4,433	100.00%
RFE2102	62	2,142	2,142	2,142	8,569	100.00%
RFE2103	381	1,279	1,279	1,279	5,118	100.00%
RFE2106	14	441	441	441	3,969	100.00%
RFE2107	113	10,622	10,622	10,622	95,598	100.00%
RFE2108	10,931	240,482	240,482	223,167	2,678,008	92.80%
RFE2109	44	2,834	2,834	2,834	36,837	100.00%
RFE2110	35	3,443	3,443	3,443	44,758	100.00%
RFE2111	19	2,496	2,496	2,496	32,449	100.00%
RFE2112	19	2,972	2,972	2,972	38,632	100.00%
RFE2113	32	1,357	1,357	1,357	27,142	100.00%
RFE2114	37	2,781	2,781	2,781	55,617	100.00%
RFE2115	35	1,181	1,181	1,181	29,526	100.00%
RFE2116	0	29	29	29	726	100.00%
RFE2117	1	36	36	36	911	100.00%
RFE2118	5	191	191	191	4,766	100.00%
RFE2119	4	534	534	534	13,342	100.00%
RFE2120	1	344	344	344	6,875	100.00%
RFE2121	32	3,123	3,120	3,120	77,991	99.91%
RFE2123	2	793	793	793	14,269	100.00%
RFE2124	1	742	742	742	13,354	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RFE2125	31	3,830	3,830	3,830	34,469	100.00%
RFE2127	3,400	2,259,300	2,259,300	2,259,300	20,333,700	100.00%
RFE2131	2	440	440	440	6,599	100.00%
RFE2132	1	16	16	16	144	100.00%
RFE2133	4	217	217	217	3,256	100.00%
Total	109,468	10,473,483	10,400,108	10,201,047	88,412,163	97.40%

Table 69. Certified Participation and kW Savings by Measure (Income Qualified-Electric)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RFE2005	63	1.70	1.70	1.72	101.00%
RFE2006	117	3.16	3.16	3.16	100.00%
RFE2007	83	2.66	2.66	2.39	90.00%
RFE2008	145	1.16	1.16	1.04	90.00%
RFE2009	856	4.96	4.96	4.96	100.00%
RFE2010	16,411	55.80	55.80	55.80	100.00%
RFE2011	2,207	14.12	14.12	14.12	100.00%
RFE2015	1	0.02	0.02	0.02	100.00%
RFE2017	3,147	10.07	10.07	10.07	100.00%
RFE2018	3,429	9.60	9.60	9.60	100.00%
RFE2019	898	2.51	2.51	2.51	100.00%
RFE2021	171	1.59	1.59	1.59	100.00%
RFE2022	48	6.96	6.96	6.96	100.00%
RFE2026	6	0.83	0.83	0.83	100.00%
RFE2027	197	27.17	27.17	27.17	100.00%
RFE2028	146	20.13	20.13	20.13	100.00%
RFE2029	3,200	10.88	10.88	10.10	92.80%
RFE2035	13,456	45.75	45.75	42.46	92.80%
RFE2036	183	5.86	5.86	5.86	100.00%
RFE2037	2	0.05	0.05	0.05	100.00%
RFE2038	10,447	35.52	35.52	35.52	100.00%
RFE2040	86	2.32	2.32	2.32	100.00%
RFE2041	207	5.59	5.59	5.59	100.00%
RFE2042	290	2.32	2.32	2.32	100.00%
RFE2043	364	1.02	1.02	1.02	100.00%
RFE2044	1,721	5.51	5.51	5.51	100.00%
RFE2045	871	5.57	5.57	5.57	100.00%
RFE2048	43	0.10	0.10	0.10	100.00%
RFE2049	683	4.37	4.37	4.37	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RFE2055	15	-7.76	-7.76	-7.76	100.00%
RFE2056	2	-1.03	-1.03	-1.03	100.00%
RFE2057	8	-4.34	-4.34	-4.34	100.00%
RFE2058	8	-2.04	-2.04	-2.04	100.00%
RFE2074	1,045	6.06	6.06	6.06	100.00%
RFE2083	47	6.48	6.48	6.48	100.00%
RFE2086	35	6.93	6.93	6.93	100.00%
RFE2087	33	6.90	6.90	6.90	100.00%
RFE2088	1	0.13	0.13	0.13	100.00%
RFE2089	125	3.54	0.06	0.06	1.77%
RFE2090	177	31.81	31.81	31.81	100.00%
RFE2091	3	0.96	0.96	0.96	100.00%
RFE2097	836	2.34	2.34	2.34	100.00%
RFE2098	526	1.47	1.47	1.47	100.00%
RFE2099	2,259	0.90	0.90	0.90	100.00%
RFE2100	408	0.12	0.12	0.12	100.00%
RFE2101	165	0.13	0.13	0.13	100.00%
RFE2103	381	0.15	0.15	0.15	100.00%
RFE2106	14	0.67	0.67	0.67	100.00%
RFE2107	113	16.05	16.05	16.05	100.00%
RFE2109	44	0.76	0.76	0.76	100.00%
RFE2110	35	0.91	0.91	0.91	100.00%
RFE2111	19	0.69	0.69	0.69	100.00%
RFE2112	19	1.15	1.15	1.15	100.00%
RFE2113	32	0.47	0.47	0.47	100.00%
RFE2114	37	0.93	0.93	0.93	100.00%
RFE2115	35	0.32	0.32	0.32	100.00%
RFE2116	0	-0.01	-0.01	-0.01	100.00%
RFE2117	1	-0.03	-0.03	-0.03	100.00%
RFE2118	5	-0.11	-0.11	-0.11	100.00%
RFE2119	4	0.23	0.23	0.23	100.00%
RFE2120	1	0.12	0.12	0.12	100.00%
RFE2121	32	0.77	0.77	0.77	99.91%
RFE2123	2	0.50	0.50	0.50	100.00%
RFE2124	1	0.58	0.58	0.58	100.00%
RFE2127	3,400	258.06	258.06	258.06	100.00%
RFE2131	2	0.11	0.11	0.11	100.00%
RFE2132	1	0.03	0.03	0.03	100.00%
RFE2133	4	0.02	0.02	0.02	100.00%
Total	69,353	622.29	618.82	614.38	98.73%

Appendix K: Insulation and Windows Product

Table 70 presents reported gross and verified net energy savings by fuel type and demand reductions for the Insulation and Windows product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 70. Participation and Savings (Insulation and Windows)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	55,657	701,793	456.45	61,906.04
Verified Annual Net Participation and Savings	55,657	645,649	419.93	56,953.55
Verified Lifetime Net Savings	N/A	15,811,886	N/A	1,365,625.94
Product Realization Rate	100.00%	92.00%	92.00%	92.00%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 71 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Insulation and Windows product.

Table 71. Verified Per-Unit Measure Characteristics (Insulation and Windows)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RWC0001	Roof (attic) Insulation R-38- Combination Customers	61.5520	0.0270	4.1993	20.00	1.0000	0.9200
RWC0002	Wall Insulation – Combination Customers	79.4384	0.0249	5.4025	25.00	1.0000	0.9200
RWC0003	Basement Wall Insulation - Combination Customers	28.4838	-0.0294	6.0799	25.00	1.0000	0.9200
RWC0004	Crawlspace Insulation- Combination Customers	-2.4584	-0.0193	2.5280	25.00	1.0000	0.9200
RWC0006	Rim Joist Insulation – Combination Customers	65.4667	0.0192	4.6793	25.00	1.0000	0.9200
RWC0008	Window Replacement (Per Unit) - Combination Customers	27.8139	0.0219	1.0491	25.00	1.0000	0.9200
RWC0009	Door Replacement (Per Unit) – Combination Customers	37.4833	0.0293	1.4071	25.00	1.0000	0.9200
RWC0011	MIM - Wall Insulation – Combination Customers	91.9061	0.0278	6.0064	25.00	1.0000	0.9200
RWC0017	Roof (Attic) Insulation R-49 - Combination Customers	81.1156	0.0359	5.5590	20.00	1.0000	0.9200
RWC0018	MIM - Roof (Attic) Insulation R- 38 - Combination Customers	70.7145	0.0327	4.8113	20.00	1.0000	0.9200
RWC0019	MIM - Roof (Attic) Insulation R- 49 - Combination Customers	84.7418	0.0458	5.7697	20.00	1.0000	0.9200
RWC0020	Roof (Attic) Insulation R-30 - Combination Customers	35.3847	0.0163	2.4798	20.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RWC0021	Roof (Attic) Insulation R-60 - Combination Customers	85.2340	0.0396	5.8966	20.00	1.0000	0.9200
RWC0022	MIM - Roof (Attic) Insulation R-30 - Combination Customers	81.4050	0.0485	4.7187	20.00	1.0000	0.9200
RWC0023	MIM - Roof (Attic) Insulation R-60 - Combination Customers	87.8698	0.0490	5.9167	20.00	1.0000	0.9200
RWC0024	Triple Pane Window - Combination Customers	35.9292	0.0350	0.8891	25.00	1.0000	0.9200
RWE0001	Roof (Attic) Insulation R-38 - Electric Customers	59.2520	0.0239	0.0000	20.00	1.0000	0.9200
RWE0002	Wall Insulation - Electric Customers	106.1897	0.0287	0.0000	25.00	1.0000	0.9200
RWE0003	Basement Wall Insulation - Electric Customers	46.0907	-0.0252	0.0000	25.00	1.0000	0.9200
RWE0004	Crawlspace Insulation - Electric Customers	4.9996	-0.0139	0.0000	25.00	1.0000	0.9200
RWE0006	Rim Joist Insulation – Electric Customers	72.3832	0.0206	0.0000	25.00	1.0000	0.9200
RWE0008	Window Replacement (Per Unit) – Electric Customers	28.3059	0.0168	0.0000	25.00	1.0000	0.9200
RWE0009	Door Replacement (Per Unit) – Electric Customers	53.9937	0.0324	0.0000	25.00	1.0000	0.9200
RWE0011	MIM - Wall Insulation – Electric Customers	96.9533	0.0260	0.0000	25.00	1.0000	0.9200
RWE0017	Roof (Attic) Insulation R-49 - Electric Customers	87.5148	0.0338	0.0000	20.00	1.0000	0.9200
RWE0018	MIM - Roof (Attic) Insulation R-38 - Electric Customers	64.9169	0.0254	0.0000	20.00	1.0000	0.9200
RWE0019	MIM - Roof (Attic) Insulation R-49 - Electric Customers	91.7853	0.0354	0.0000	20.00	1.0000	0.9200
RWE0020	Roof (Attic) Insulation R-30 - Electric Customers	39.7482	0.0156	0.0000	20.00	1.0000	0.9200
RWE0021	Roof (Attic) Insulation R-60 - Electric Customers	106.2440	0.0420	0.0000	20.00	1.0000	0.9200
RWE0022	MIM - Roof (Attic) Insulation R-30 - Electric Customers	21.4822	0.0085	0.0000	20.00	1.0000	0.9200
RWE0023	MIM - Roof (Attic) Insulation R-60 - Electric Customers	98.3781	0.0395	0.0000	20.00	1.0000	0.9200
RWE0024	Triple Pane Window – Electric Customers	41.6817	0.0324	0.0000	25.00	1.0000	0.9200
RWG0001	Roof (Attic) Insulation R-38 Gas Customers	0.0000	0.0000	3.5142	20.00	1.0000	0.9200
RWG0002	Wall Insulation – Gas Customers	0.0000	0.0000	5.2621	25.00	1.0000	0.9200
RWG0003	Basement Wall Insulation-Gas Customers	0.0000	0.0000	4.8328	25.00	1.0000	0.9200
RWG0004	Crawlspace Insulation-Gas	0.0000	0.0000	2.0600	25.00	1.0000	0.9200

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RWG0006	Rim Joist Insulation – Gas Customers	0.0000	0.0000	3.8817	25.00	1.0000	0.9200
RWG0008	Window Replacement (Per Unit) – Gas Customers	0.0000	0.0000	0.8850	25.00	1.0000	0.9200
RWG0009	Door Replacement (Per Unit) – Gas Customers	0.0000	0.0000	1.7599	25.00	1.0000	0.9200
RWG0011	MIM - Wall Insulation – Gas Customers	0.0000	0.0000	4.6727	25.00	1.0000	0.9200
RWG0017	Roof (Attic) Insulation R-49 -Gas Customers	0.0000	0.0000	5.1012	20.00	1.0000	0.9200
RWG0018	MIM - Roof (Attic) Insulation R-38 - Gas Customers	0.0000	0.0000	4.1561	20.00	1.0000	0.9200
RWG0019	MIM - Roof (Attic) Insulation R-49 – Gas Customers	0.0000	0.0000	5.1484	20.00	1.0000	0.9200
RWG0020	Roof (Attic) Insulation R-30 - Gas Customers	0.0000	0.0000	2.4457	20.00	1.0000	0.9200
RWG0021	Roof (Attic) Insulation R-60 – Gas Customers	0.0000	0.0000	6.3426	20.00	1.0000	0.9200
RWG0022	MIM - Roof (Attic) Insulation R-30 – Gas Customers	0.0000	0.0000	1.7501	20.00	1.0000	0.9200
RWG0023	MIM - Roof (Attic) Insulation R-60 - Gas Customers	0.0000	0.0000	6.0678	20.00	1.0000	0.9200
RWG0024	Triple Pane Window – Gas Customers	0.0000	0.0000	1.0796	25.00	1.0000	0.9200

Note: Measure names are as they appear in eTracker.

Table 72 documents first year and lifetime kWh savings, Table 73 documents first year kW savings, and Table 74 documents first year and lifetime MCF savings.

Table 72. Certified Participation and kWh Savings by Measure (Insulation and Windows)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RWC0001	71	4,370	4,370	4,021	80,412	92.00%
RWC0002	301	23,911	23,911	21,998	549,952	92.00%
RWC0003	27	769	769	708	17,688	92.00%
RWC0004	57	-140	-140	-129	-3,223	92.00%
RWC0006	151	9,885	9,885	9,095	227,366	92.00%
RWC0008	10,559	293,687	293,687	270,192	6,754,800	92.00%
RWC0009	497	18,629	18,629	17,139	428,472	92.00%
RWC0011	13	1,195	1,195	1,099	27,480	92.00%
RWC0017	213	17,278	17,278	15,895	317,908	92.00%
RWC0018	2	141	141	130	2,602	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RWC0019	49	4,152	4,152	3,820	76,403	92.00%
RWC0020	65	2,300	2,300	2,116	42,320	92.00%
RWC0021	166	14,149	14,149	13,017	260,339	92.00%
RWC0022	1	81	81	75	1,498	92.00%
RWC0023	58	5,096	5,096	4,689	93,775	92.00%
RWC0024	531	19,078	19,078	17,552	438,803	92.00%
RWE0001	21	1,244	1,244	1,145	22,895	92.00%
RWE0002	131	13,911	13,911	12,798	319,950	92.00%
RWE0003	19	876	876	806	20,142	92.00%
RWE0004	24	120	120	110	2,760	92.00%
RWE0006	87	6,297	6,297	5,794	144,839	92.00%
RWE0008	7,255	205,359	205,359	188,931	4,723,264	92.00%
RWE0009	354	19,114	19,114	17,585	439,617	92.00%
RWE0011	6	582	582	535	13,380	92.00%
RWE0017	124	10,852	10,852	9,984	199,674	92.00%
RWE0018	9	584	584	538	10,750	92.00%
RWE0019	24	2,203	2,203	2,027	40,532	92.00%
RWE0020	25	994	994	914	18,284	92.00%
RWE0021	58	6,162	6,162	5,669	113,384	92.00%
RWE0022	1	21	21	20	395	92.00%
RWE0023	20	1,968	1,968	1,810	36,203	92.00%
RWE0024	406	16,923	16,923	15,569	389,224	92.00%
Total	21,325	701,793	701,793	645,649	15,811,886	92.00%

Table 73. Certified Participation and kW Savings by Measure (Insulation and Windows)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RWC0001	71	1.92	1.92	1.76	92.00%
RWC0002	301	7.49	7.49	6.90	92.00%
RWC0003	27	-0.79	-0.79	-0.73	92.00%
RWC0004	57	-1.10	-1.10	-1.01	92.00%
RWC0006	151	2.90	2.90	2.67	92.00%
RWC0008	10,559	231.24	231.24	212.74	92.00%
RWC0009	497	14.56	14.56	13.40	92.00%
RWC0011	13	0.36	0.36	0.33	92.00%
RWC0017	213	7.65	7.65	7.03	92.00%
RWC0018	2	0.07	0.07	0.06	92.00%
RWC0019	49	2.24	2.24	2.06	92.00%
RWC0020	65	1.06	1.06	0.97	92.00%
RWC0021	166	6.57	6.57	6.05	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RWC0022	1	0.05	0.05	0.04	92.00%
RWC0023	58	2.84	2.84	2.61	92.00%
RWC0024	531	18.59	18.59	17.10	92.00%
RWE0001	21	0.50	0.50	0.46	92.00%
RWE0002	131	3.76	3.76	3.46	92.00%
RWE0003	19	-0.48	-0.48	-0.44	92.00%
RWE0004	24	-0.33	-0.33	-0.31	92.00%
RWE0006	87	1.79	1.79	1.65	92.00%
RWE0008	7,255	121.88	121.88	112.13	92.00%
RWE0009	354	11.47	11.47	10.55	92.00%
RWE0011	6	0.16	0.16	0.14	92.00%
RWE0017	124	4.19	4.19	3.86	92.00%
RWE0018	9	0.23	0.23	0.21	92.00%
RWE0019	24	0.85	0.85	0.78	92.00%
RWE0020	25	0.39	0.39	0.36	92.00%
RWE0021	58	2.44	2.44	2.24	92.00%
RWE0022	1	0.01	0.01	0.01	92.00%
RWE0023	20	0.79	0.79	0.73	92.00%
RWE0024	406	13.15	13.15	12.10	92.00%
Total	21,325	456.45	456.45	419.93	92.00%

Table 74. Certified Participation and MCF Savings by Measure (Insulation and Windows)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RWC0001	71	298.15	298.15	274.30	5,485.97	92.00%
RWC0002	301	1,626.15	1,626.15	1,496.06	37,401.51	92.00%
RWC0003	27	164.16	164.16	151.02	3,775.62	92.00%
RWC0004	57	144.10	144.10	132.57	3,314.21	92.00%
RWC0006	151	706.57	706.57	650.05	16,251.21	92.00%
RWC0008	10,559	11,077.45	11,077.45	10,191.25	254,781.28	92.00%
RWC0009	497	699.33	699.33	643.38	16,084.56	92.00%
RWC0011	13	78.08	78.08	71.84	1,795.91	92.00%
RWC0017	213	1,184.07	1,184.07	1,089.34	21,786.83	92.00%
RWC0018	2	9.62	9.62	8.85	177.06	92.00%
RWC0019	49	282.72	282.72	260.10	5,201.96	92.00%
RWC0020	65	161.19	161.19	148.29	2,965.84	92.00%
RWC0021	166	978.84	978.84	900.53	18,010.58	92.00%
RWC0022	1	4.72	4.72	4.34	86.82	92.00%
RWC0023	58	343.17	343.17	315.72	6,314.30	92.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RWC0024	531	472.11	472.11	434.34	10,858.58	92.00%
RWG0001	102	358.45	358.45	329.77	6,595.45	92.00%
RWG0002	419	2,204.82	2,204.82	2,028.43	50,710.86	92.00%
RWG0003	34	164.32	164.32	151.17	3,779.25	92.00%
RWG0004	70	144.20	144.20	132.66	3,316.60	92.00%
RWG0006	239	927.73	927.73	853.51	21,337.70	92.00%
RWG0008	25,048	22,167.48	22,167.48	20,394.08	509,852.04	92.00%
RWG0009	1,735	3,053.43	3,053.43	2,809.15	70,228.81	92.00%
RWG0011	60	280.36	280.36	257.93	6,448.33	92.00%
RWG0017	697	3,555.54	3,555.54	3,271.09	65,421.87	92.00%
RWG0018	3	12.47	12.47	11.47	229.42	92.00%
RWG0019	261	1,343.73	1,343.73	1,236.23	24,724.68	92.00%
RWG0020	82	200.55	200.55	184.50	3,690.07	92.00%
RWG0021	521	3,304.49	3,304.49	3,040.14	60,802.70	92.00%
RWG0022	6	10.50	10.50	9.66	193.21	92.00%
RWG0023	100	606.78	606.78	558.24	11,164.75	92.00%
RWG0024	4,947	5,340.78	5,340.78	4,913.52	122,837.97	92.00%
Total	47,085	61,906.04	61,906.04	56,953.55	1,365,625.94	92.00%

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Appendix L: Residential Consumers Energy Store Product

Table 75 presents reported gross and verified net energy savings by fuel type and demand reduction for the Residential Consumers Energy Store product. The product allows customers to purchase energy-efficiency products on Consumers Energy's website. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 75. Participation and Savings (Residential CE Store)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	46,724	3,748,837	264.12	124,113.37
Verified Annual Net Participation and Savings	46,724	3,078,066	203.94	111,954.44
Verified Lifetime Net Savings	N/A	23,609,108	N/A	718,534.99
Product Realization Rate	100.00%	82.11%	77.21%	90.20%
Annual Net Verified v. Net Reported Savings	N/A	97.81%	96.15%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	97.43%	N/A	100.00%

Table 76 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Residential Consumers Energy Store product.

Table 76. Verified Per-Unit Measure Characteristics (Residential CE Store)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RAC5002	Wi-Fi Enabled Thermostat - Combination Customers	119.2921	0.0000	6.4724	9.00	0.971	0.920
RAC5003	Wi-Fi Enabled Thermostat - Tier 3 - Combination Customers	117.5023	0.0000	6.3590	9.00	0.971	0.920
RAE5002	ENERGY STAR Air Purifier CADR 101-150	433.0000	0.0495	0.0000	9.00	1.000	0.920
RAE5007	ENERGY STAR Dehumidifier	236.8000	0.1450	0.0000	12.00	0.972	0.920
RAE5008	Wi-Fi Enabled Thermostat - Electric Customers	125.3493	0.0000	0.0000	9.00	0.971	0.920
RAE5009	Wi-Fi Enabled Thermostat - Tier 3 - Electric Customers	124.1577	0.0000	0.0000	9.00	0.971	0.920
RAE5015	Tier 1 Advanced Power Strips	64.2000	0.0077	0.0000	5.00	1.000	0.920
RAE5017	Low Flow Bathroom Faucet Aerators - 1.5 gpm Electric Water Heater	40.0000	0.0050	0.0000	10.00	1.000	0.920
RAE5018	Low Flow Kitchen Faucet Aerators - 1.5 gpm Electric Water Heater	279.0000	0.0320	0.0000	10.00	1.000	0.920
RAE5019	Low Flow Showerheads 1.5 gpm Electric Water Heater	334.0000	0.0270	0.0000	10.00	1.000	0.920
RAE5020	ENERGY STAR Air Purifier CADR 101-150 - GIVEAWAY	433.0000	0.0495	0.0000	9.00	0.860	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RAE5021	Tier 1 Advanced Power Strips - GIVEAWAY	64.2000	0.0077	0.0000	5.00	0.860	0.920
RAG5002	Wi-Fi Enabled Thermostat - Gas Customers	0.0000	0.0000	6.5417	9.00	0.971	0.920
RAG5003	Wi-Fi Enabled Thermostat - Tier 3 - Gas Customers	0.0000	0.0000	6.1965	9.00	0.971	0.920
RAG5004	Low Flow Bathroom Faucet Aerators - 1.5 gpm Gas Water Heater	0.0000	0.0000	0.1753	10.00	1.000	0.920
RAG5005	Low Flow Kitchen Faucet Aerators - 1.5 gpm Gas Water Heater	0.0000	0.0000	1.1980	10.00	1.000	0.920
RAG5006	Low Flow Showerheads 1.5 gpm Gas Water Heater	0.0000	0.0000	1.4318	10.00	1.000	0.920
RAG5007	Window Insulation Film (5 Window Kit)	0.0000	0.0000	10.3097	1.00	1.000	0.920

Note: Measure names are as they appear in eTracker.

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Table 77 documents first year and lifetime kWh savings, Table 78 documents first year kW savings, and Table 79 documents first year and lifetime MCF savings.

Table 77. Certified Participation and kWh Savings by Measure (Residential CE Store)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RAC5002	1,175	140,168	140,168	125,215	1,126,936	89.33%
RAC5003	5,196	610,542	610,542	545,409	4,908,684	89.33%
RAE5002	206	89,198	89,198	82,062	738,559	92.00%
RAE5007	22	5,210	5,210	4,659	55,904	89.42%
RAE5008	1,029	128,984	128,984	115,224	1,037,019	89.33%
RAE5009	5,129	636,805	636,805	568,871	5,119,835	89.33%
RAE5015	817	52,451	52,451	48,255	241,276	92.00%
RAE5017	34	1,360	1,360	1,251	12,512	92.00%
RAE5018	55	15,345	15,345	14,117	141,174	92.00%
RAE5019	122	40,748	40,748	37,488	374,882	92.00%
RAE5020	1,587	774,456	687,171	543,690	4,893,207	70.20%
RAE5021	19,526	1,253,569	1,253,569	991,824	4,959,120	79.12%
Total	34,898	3,748,837	3,661,552	3,078,066	23,609,108	82.11%

Table 78. Certified Participation and kW Savings by Measure (Residential CE Store)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RAE5002	206	10.20	10.20	9.38	92.00%
RAE5007	22	3.19	3.19	2.85	89.42%
RAE5015	817	6.29	6.29	5.79	92.00%
RAE5017	34	0.17	0.17	0.16	92.00%
RAE5018	55	1.76	1.76	1.62	92.00%
RAE5019	122	3.29	3.29	3.03	92.00%
RAE5020	1,587	88.87	78.56	62.15	69.94%
RAE5021	19,526	150.35	150.35	118.96	79.12%
Total	22,369	264.12	253.81	203.94	77.21%

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Table 79. Certified Participation and MCF Savings by Measure (Residential CE Store)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RAC5002	1,175	7,605.07	7,605.07	6,793.76	61,143.85	89.33%
RAC5003	5,196	33,041.36	33,041.36	29,516.51	265,648.60	89.33%
RAG5002	1,334	8,726.63	8,726.63	7,795.67	70,161.04	89.33%
RAG5003	5,520	34,204.68	34,204.68	30,555.72	275,001.52	89.33%
RAG5004	141	24.72	24.72	22.74	227.40	92.00%
RAG5005	232	277.94	277.94	255.70	2,557.01	92.00%
RAG5006	572	818.99	818.99	753.47	7,534.70	92.00%
RAG5007	3,823	39,413.98	39,413.98	36,260.86	36,260.86	92.00%
Total	17,993	124,113.37	124,113.37	111,954.44	718,534.99	90.20%

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Appendix M: Residential Multifamily Product

Table 80 presents reported gross and verified net energy savings by fuel type and demand reductions for the Residential Multifamily product. The implementation of the Residential Multifamily product is identical to the commercial and industrial (C&I) Multifamily product. The Residential Multifamily product captures energy savings from energy-efficient equipment installed in Multifamily complexes on residential rate accounts as opposed to C&I rate accounts. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 80. Participation and Savings (Residential Multifamily)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	21,808,281	2,279,274	261.01	112,349.45
Verified Annual Net Participation and Savings	22,295,735	2,048,459	238.27	76,837.84
Verified Lifetime Net Savings	N/A	18,999,354	N/A	336,552.37
Product Realization Rate	102.24%	89.87%	91.29%	68.39%
Annual Net Verified v. Net Reported Savings	N/A	98.65%	100.00%	74.43%
Lifetime Net Verified v. Net Reported Savings	N/A	99.85%	N/A	92.73%

Table 81 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Residential Multifamily product.

Table 81. Verified Per-Unit Measure Characteristics (Residential Multifamily)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RME0164	LED Fixture-Interior	44.0000	0.0053	0.0000	15.00	1.000	0.920
RME0167	LED A-Series Lamp-50-79W Replacement	100.4000	0.0184	0.0000	2.00	0.943	0.920
RME0168	LED A-Series Lamp-60W Replacement	28.5000	0.0034	0.0000	4.00	0.943	0.920
RME0173	LED Lamp-Flood/PAR	54.0000	0.0064	0.0000	4.00	1.000	0.920
RME0182	LED Candelabra	23.7000	0.0028	0.0000	6.00	1.000	0.920
RME0197	LED (Night Only) Replacing HID Fixture	4.3190	0.0000	0.0000	16.00	1.000	0.920
RME0229	NC-Low-Flow Bath Aerator-1.5gpm-Electric DHW	42.5400	0.0050	0.0000	10.00	0.976	0.920
RME0230	NC-Low-Flow Kitchen Aerator-1.5gpm-Electric DHW	208.1900	0.0230	0.0000	10.00	0.976	0.920
RME0231	NC-Low-Flow Showerhead-1.5gpm- Electric DHW	334.2800	0.0260	0.0000	10.00	0.945	0.920
RME0277	DI-Pipe Wrap-DHW- Common Area (Electric)	44.7350	0.0051	0.0000	20.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RME0285	DI-LED Candelabra	23.7000	0.0028	0.0000	6.00	1.000	0.920
RME0286	DI-LED A-Series Lamp- 60W Replacement	28.5000	0.0034	0.0000	4.00	0.943	0.920
RME0288	DI-LED Lamp-Globe	27.0000	0.0032	0.0000	6.00	1.000	0.920
RME0291	DI-LED A-Series Lamp-50- 79W Replacement	100.4000	0.0184	0.0000	2.00	0.943	0.920
RME0297	LED Fixture replacing Fluorescent Tube Fixture	2.6690	0.0005	0.0000	18.00	1.000	0.920
RME0309	DI-Low-Flow Bath Aerator-Electric DHW	72.6400	0.0080	0.0000	10.00	0.976	0.920
RME0310	DI-Low-Flow Kitchen Aerator-1.5gpm-Electric DHW	208.1900	0.0230	0.0000	10.00	0.976	0.920
RME0311	DI-Low-Flow Showerhead-1.5gpm- Electric DHW	334.2800	0.0260	0.0000	10.00	0.945	0.920
RME0312	DI-Low-Flow Handheld Showerhead-1.5gpm- Electric DHW	334.2800	0.0260	0.0000	10.00	1.000	0.920
RME0380	NC-LED Fixture-Interior	11.0000	0.0013	0.0000	15.00	1.000	0.920
RME0381	NC-LED Fixture-Exterior	20.2500	0.0000	0.0000	12.00	1.000	0.920
RME0390	NC-LED Fixture-Exterior (RES Code)	41.3250	0.0000	0.0000	2.00	1.000	0.920
RME0425	NC - LED Fixture - Interior (RES Code)	141.5000	0.0260	0.0000	3.00	1.000	0.920
RME0432	DI - Window Insulation Kits (Electric)	143.7145	0.0000	0.0000	1.00	0.640	0.920
RME0435	DI-Door weatherstripping-Sweep Only (Electric)	11.0647	0.0000	0.0000	5.00	1.000	0.920
RME0438	DI-Pipe Wrap R3-DHW-In- Unit (Electric)	51.0000	0.0058	0.0000	15.00	1.000	0.920
RME0448	NC-Split System Air Conditioner-SEER 14-In- Unit	41.8362	0.0520	0.0000	15.00	1.000	0.920
RME0449	NC-Split System Air Conditioner-SEER 14.5-In- Unit	60.5905	0.0753	0.0000	15.00	1.000	0.920
RME0451	NC-Split System Air Conditioner-SEER 16-In- Unit	92.6031	0.0838	0.0000	15.00	1.000	0.920
RME0469	NC-Split System Air Conditioner-SEER 16- Common Area	92.6031	0.0838	0.0000	15.00	1.000	0.920
RME0565	DI-Duct Sealing (Electric)	0.0888	0.0000	0.0000	18.00	1.000	0.920
RME0566	DI-Advanced Power Strips Tier 1	64.2000	0.0077	0.0000	5.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RME0567	DI - ENERGY STAR Air Purifier CADR Over 250	885.0000	0.1011	0.0000	9.00	1.000	0.920
RMG0011	Space Heating Boiler Tune-Up	0.0000	0.0000	0.0603	2.00	1.000	0.920
RMG0019	Instant Hot Water Heater-Common Area	0.0000	0.0000	12.2724	20.00	1.000	0.920
RMG0020	Furnace Tune-Up (40-80 MBH)	0.0000	0.0000	2.2079	2.00	1.000	0.920
RMG0021	Furnace Tune-Up (> 80 MBH)	0.0000	0.0000	3.7566	2.00	1.000	0.920
RMG0137	Furnace Replacement >= 95 AFUE	0.0000	0.0000	10.5201	15.00	1.000	0.920
RMG0141	Furnace Tune-Up (40-80 MBH)	0.0000	0.0000	2.4428	2.00	1.000	0.920
RMG0142	Furnace Tune-Up (> 80 MBH)	0.0000	0.0000	4.1322	2.00	1.000	0.920
RMG0149	Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.945	0.920
RMG0155	Low-Flow Bath Aerator-1.0gpm-Natural Gas DHW	0.0000	0.0000	0.3019	10.00	0.976	0.920
RMG0172	NC-Low-Flow Bath Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.1753	10.00	0.976	0.920
RMG0173	NC-Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.8669	10.00	0.976	0.920
RMG0174	NC-Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.945	0.920
RMG0175	NC-Low-Flow Showerhead-1.75gpm-Natural Gas DHW	0.0000	0.0000	1.0519	10.00	0.945	0.920
RMG0178	NC-Furnace Replacement >= 95 AFUE	0.0000	0.0000	9.0612	15.00	1.000	0.920
RMG0180	NC-Furnace Replacement e 92 AFUE	0.0000	0.0000	7.0076	15.00	1.000	0.920
RMG0184	NC-ENERGY STAR Door (Gas)	0.0000	0.0000	1.5501	20.00	1.000	0.920
RMG0185	NC-Instant Hot Water Heater-Common Area	0.0000	0.0000	12.2724	20.00	1.000	0.920
RMG0188	NC-Indirect Water Heater (High Efficiency, 90 percent TE)	0.0000	0.0000	0.2417	15.00	1.000	0.920
RMG0195	DI-Pipe Wrap-Space Heat-Common Area	0.0000	0.0000	0.3896	20.00	1.000	0.920
RMG0196	DI-Pipe Wrap-DHW-Common Area (Gas)	0.0000	0.0000	0.2079	20.00	1.000	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RMG0202	Wi-Fi Programmable T-stat-In-Unit (Gas)	0.0000	0.0000	1.7149	9.00	1.000	0.920
RMG0204	NC-Low-Flow Bath Aerator-1.0gpm-Natural Gas DHW	0.0000	0.0000	0.3019	10.00	0.976	0.920
RMG0205	DI-Low-Flow Bath Aerator-Natural Gas DHW	0.0000	0.0000	0.3019	10.00	0.976	0.920
RMG0206	DI-Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.8669	10.00	0.976	0.920
RMG0207	DI-Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.976	0.920
RMG0208	DI-Low-Flow Handheld Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	1.000	0.920
RMG0209	NC-Large High Efficiency Tank-Style DHW Unit (94 percent TE)	0.0000	0.0000	30.0282	13.00	1.000	0.920
RMG0220	NC-Airtight Can Light (Gas)	0.0000	0.0000	0.2642	15.00	1.000	0.920
RMG0247	Boiler 95% Plus AFUE 82 AFUE BASE	0.0000	0.0000	0.3142	15.00	1.000	0.920
RMG0251	Boiler 300 - 2500 kBtuh 90 Et	0.0000	0.0000	0.1188	20.00	1.000	0.920
RMG0260	NC - ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF,	0.0000	0.0000	1.7922	13.00	1.000	0.920
RMG0262	NC - ENERGY STAR High Efficiency High Draw Gas Storage Water Heater 0.68 UEF, <=	0.0000	0.0000	1.8409	13.00	1.000	0.920
RMG0265	Di - Window Insulation Kits (Gas)	0.0000	0.0000	10.2098	1.00	0.640	0.920
RMG0268	DI-Door Weatherstripping-Sweep Only (Gas)	0.0000	0.0000	0.2436	5.00	1.000	0.920
RMG0269	DI-Door Weatherstripping-Strip Only (Gas)	0.0000	0.0000	0.2436	5.00	1.000	0.920
RMG0276	Di-Duct Sealing (Gas)	0.0000	0.0000	0.0020	18.00	1.000	0.920

Note: Measure names are as they appear in eTracker.

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Table 82 documents first year and lifetime kWh savings, Table 83 documents first year kW savings, and Table 84 documents first year and lifetime MCF savings.

Table 82. Certified Participation and kWh Savings by Measure (Residential Multifamily)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RME0164	132.00	5,808	5,808	5,343	80,150	92.00%
RME0167	22.00	2,209	2,209	1,916	3,833	86.76%
RME0168	1,780.00	50,730	50,730	44,011	176,045	86.76%
RME0173	46.00	2,484	2,484	2,285	9,141	92.00%
RME0182	26.00	616	616	567	3,401	92.00%
RME0197	4,535.00	19,587	19,587	18,020	288,316	92.00%
RME0229	540.00	22,972	22,972	20,627	206,267	89.79%
RME0230	206.00	42,887	42,887	38,509	385,092	89.79%
RME0231	412.00	137,723	137,723	119,737	1,197,367	86.94%
RME0277	183.00	8,187	8,187	7,532	150,632	92.00%
RME0285	40.00	948	948	872	5,233	92.00%
RME0286	766.00	21,831	21,831	18,940	75,759	86.76%
RME0288	2,866.00	77,382	77,382	71,191	427,149	92.00%
RME0291	13.00	1,305	1,305	1,132	2,265	86.76%
RME0297	2,160.00	5,765	5,765	5,304	95,469	92.00%
RME0309	496.00	36,029	36,029	32,352	323,516	89.79%
RME0310	109.00	22,693	22,693	20,376	203,762	89.79%
RME0311	395.00	132,041	132,041	114,796	1,147,961	86.94%
RME0312	131.00	43,791	43,791	40,287	402,874	92.00%
RME0380	3,857.00	42,427	42,427	39,033	585,493	92.00%
RME0381	623.00	12,616	12,616	11,606	139,278	92.00%
RME0390	9.00	372	372	342	684	92.00%
RME0425	20.00	2,830	2,830	2,604	7,811	92.00%
RME0432	590.00	84,792	84,792	49,925	49,925	58.88%
RME0435	2.00	22	22	20	102	92.00%
RME0438	1,274.00	64,974	64,974	59,776	896,641	92.00%
RME0448	51.03	2,135	2,135	1,964	29,462	92.00%
RME0449	81.58	4,943	4,943	4,548	68,213	92.00%
RME0451	241.60	22,373	22,373	20,583	308,746	92.00%
RME0469	1.60	148	148	136	2,045	92.00%
RME0565	180,580.00	16,036	16,036	14,753	265,548	92.00%
RME0566	225.00	14,445	14,445	13,289	66,447	92.00%
RME0567	1,555.00	1,376,175	1,376,175	1,266,081	11,394,729	92.00%
Total	203,969	2,279,274	2,279,274	2,048,459	18,999,354	89.87%

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Table 83. Certified Participation and kW Savings by Measure (Residential Multifamily)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RME0164	132	0.70	0.70	0.64	92.00%
RME0167	22	0.40	0.40	0.35	86.76%
RME0168	1,780	6.05	6.05	5.25	86.76%
RME0173	46	0.29	0.29	0.27	92.00%
RME0182	26	0.07	0.07	0.07	92.00%
RME0229	540	2.70	2.70	2.42	89.79%
RME0230	206	4.74	4.74	4.25	89.79%
RME0231	412	10.71	10.71	9.31	86.94%
RME0277	183	0.93	0.93	0.86	92.00%
RME0285	40	0.11	0.11	0.10	92.00%
RME0286	766	2.60	2.60	2.26	86.76%
RME0288	2,866	9.17	9.17	8.44	92.00%
RME0291	13	0.24	0.24	0.21	86.76%
RME0297	2,160	1.08	1.08	0.99	92.00%
RME0309	496	3.97	3.97	3.56	89.79%
RME0310	109	2.51	2.51	2.25	89.79%
RME0311	395	10.27	10.27	8.93	86.94%
RME0312	131	3.41	3.41	3.13	92.00%
RME0380	3,857	5.01	5.01	4.61	92.00%
RME0425	20	0.52	0.52	0.48	92.00%
RME0438	1,274	7.39	7.39	6.80	92.00%
RME0448	51	2.65	2.65	2.44	92.00%
RME0449	82	6.14	6.14	5.65	92.00%
RME0451	242	20.25	20.25	18.63	92.00%
RME0469	2	0.13	0.13	0.12	92.00%
RME0566	225	1.73	1.73	1.59	92.00%
RME0567	1,555	157.21	157.21	144.63	92.00%
Total	17,630	261.01	261.01	238.27	91.29%

Table 84. Certified Participation and MCF Savings by Measure (Residential Multifamily)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RMG0011	4,471.00	269.60	269.60	248.03	496.07	92.00%
RMG0019	8.00	98.18	98.18	90.32	1,806.50	92.00%
RMG0020	5,090.00	11,238.21	11,238.21	10,339.15	20,678.31	92.00%
RMG0021	23.00	86.40	86.40	79.49	158.98	92.00%
RMG0137	1.00	10.52	10.52	9.68	145.18	92.00%
RMG0141	527.00	1,287.36	1,287.36	1,184.37	2,368.73	92.00%
RMG0142	2.00	8.26	8.26	7.60	15.21	92.00%
RMG0149	480.00	673.25	673.25	585.32	5,853.22	86.94%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RMG0155	600.00	181.14	181.14	162.65	1,626.49	89.79%
RMG0172	662.00	116.05	116.05	104.20	1,042.02	89.79%
RMG0173	148.00	128.30	128.30	115.20	1,152.04	89.79%
RMG0174	414.00	580.68	580.68	504.84	5,048.40	86.94%
RMG0175	154.00	161.99	161.99	140.84	1,408.36	86.94%
RMG0178	977.00	8,852.79	8,852.79	8,144.57	122,168.54	92.00%
RMG0180	25.00	175.19	175.19	161.17	2,417.62	92.00%
RMG0184	387.00	599.89	599.89	551.90	11,037.95	92.00%
RMG0185	6.00	73.63	73.63	67.74	1,354.87	92.00%
RMG0188	5.40	1.31	1.31	1.20	18.01	92.00%
RMG0195	437.00	170.26	170.26	156.63	3,132.70	92.00%
RMG0196	357.00	74.22	74.22	68.28	1,365.65	92.00%
RMG0202	448.00	768.28	768.28	706.81	6,361.32	92.00%
RMG0204	84.00	25.36	25.36	22.77	227.71	89.79%
RMG0205	935.00	282.28	282.28	253.46	2,534.62	89.79%
RMG0206	805.00	697.85	697.85	626.62	6,266.18	89.79%
RMG0207	574.00	805.09	805.09	722.91	7,229.09	89.79%
RMG0208	89.00	124.83	124.83	114.84	1,148.45	92.00%
RMG0209	4.00	120.11	120.11	110.50	1,436.55	92.00%
RMG0220	128.00	33.82	33.82	31.11	466.68	92.00%
RMG0247	970.00	304.77	304.77	280.39	4,205.88	92.00%
RMG0251	1,450.00	172.26	172.26	158.48	3,169.58	92.00%
RMG0260	20.00	35.84	35.84	32.98	428.69	92.00%
RMG0262	139.00	255.89	255.89	235.41	3,060.39	92.00%
RMG0265	7,808.00	79,718.12	79,718.12	46,938.03	46,938.03	58.88%
RMG0268	17.00	4.14	4.14	3.81	19.05	92.00%
RMG0269	4.00	0.97	0.97	0.90	4.48	92.00%
RMG0276	2,106,305.00	4,212.61	4,212.61	3,875.60	69,760.82	92.00%
Total	2,134,554.40	112,349.45	112,349.45	76,837.84	336,552.37	68.39%

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Appendix N: Multifamily Income Qualified Product

Table 85 presents reported gross and verified net energy savings by fuel type and demand reduction for the Multifamily Income Qualified product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 85. Participation and Savings (Multifamily Income Qualified)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	1,205,689,016	8,534,043	694.46	99,451.74
Verified Annual Net Participation and Savings	1,207,547,885	8,439,257	691.48	78,273.60
Verified Lifetime Net Savings	N/A	95,000,792	N/A	574,705.83
Product Realization Rate	100.15%	98.89%	99.57%	78.71%
Annual Net Verified v. Net Reported Savings	N/A	99.20%	100.00%	78.76%
Lifetime Net Verified v. Net Reported Savings	N/A	99.93%	N/A	96.46%

Table 86 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Multifamily Income Qualified product.

Table 86. Verified Per-Unit Measure Characteristics (Multifamily Income Qualified)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQE0001	Bonus-Multifamily Custom-Electric	57,771.6728	0.7741	0.0000	16.04	1.00	1.00
RQE0003	LED Exit Sign	201.0000	0.0230	0.0000	15.00	1.00	1.00
RQE0166	LED A-Series Lamp-40W Replacement	19.6000	0.0023	0.0000	4.00	0.94	1.00
RQE0167	LED A-Series Lamp-50-79W Replacement	100.4000	0.0184	0.0000	2.00	0.94	1.00
RQE0168	LED A-Series Lamp-60W Replacement	28.5000	0.0034	0.0000	4.00	0.94	1.00
RQE0171	LED Lamp-Flood/PAR	149.9000	0.0275	0.0000	3.00	1.00	1.00
RQE0182	LED Candelabra	23.7000	0.0028	0.0000	6.00	1.00	1.00
RQE0224	LED Lamp-Globe	27.0000	0.0032	0.0000	6.00	1.00	1.00
RQE0228	DI-ENERGY STAR Refrigerator & Recycle-15cf	1,175.8000	0.1379	0.0000	8.30	1.00	1.00
RQE0232	NC-Low-Flow Bath Aerator-1.5gpm-Electric DHW	42.5400	0.0050	0.0000	10.00	0.98	1.00
RQE0234	NC-Low-Flow Showerhead-1.5gpm-Electric DHW	334.2800	0.0260	0.0000	10.00	0.95	1.00
RQE0235	NC-Low-Flow Showerhead-1.75gpm-Electric DHW	251.2100	0.0200	0.0000	10.00	0.95	1.00
RQE0246	NC-LED A-Series Lamp-60W Replacement	7.1250	0.0009	0.0000	4.00	0.94	1.00

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQE0284	NC-ENERGY STAR Door (Electric)	77.6522	0.0100	0.0000	20.00	1.00	1.00
RQE0287	DI-Pipe Wrap-DHW-Common Area (Electric)	44.7350	0.0051	0.0000	20.00	1.00	1.00
RQE0296	DI-LED Candelabra	23.7000	0.0028	0.0000	6.00	1.00	1.00
RQE0297	DI-LED A-Series Lamp-60W Replacement	28.5000	0.0034	0.0000	4.00	0.94	1.00
RQE0298	DI-LED Lamp-Flood/PAR	54.0000	0.0064	0.0000	4.00	1.00	1.00
RQE0299	DI-LED Lamp-Globe	27.0000	0.0032	0.0000	6.00	1.00	1.00
RQE0300	DI-LED Candelabra	124.0000	0.0000	0.0000	3.00	1.00	1.00
RQE0302	DI-LED A-Series Lamp-50-79W Replacement	100.4000	0.0184	0.0000	2.00	0.94	1.00
RQE0308	LED Fixture replacing Fluorescent Tube Fixture	2.6690	0.0005	0.0000	18.00	1.00	1.00
RQE0309	LED Fixture (24/7) replacing Fluorescent Tube Fixture	8.7600	0.0005	0.0000	6.00	1.00	1.00
RQE0311	NC-ECM on Domestic Hot Water Recirculation 100-500W	5,008.0000	1.1390	0.0000	15.00	1.00	1.00
RQE0312	NC-ECM on Domestic Hot Water Recirculation >500W	20,032.0000	4.5560	0.0000	15.00	1.00	1.00
RQE0319	NC-Low-Flow Bath Aerator-1.0gpm-Electric DHW	72.6400	0.0080	0.0000	10.00	0.98	1.00
RQE0320	DI-Low-Flow Bath Aerator-Electric DHW	72.6400	0.0080	0.0000	10.00	0.98	1.00
RQE0321	DI-Low-Flow Kitchen Aerator-1.5gpm-Electric DHW	208.1900	0.0230	0.0000	10.00	0.98	1.00
RQE0322	DI-Low-Flow Showerhead-1.5gpm-Electric DHW	334.2800	0.0260	0.0000	10.00	0.95	1.00
RQE0323	DI-Low-Flow Handheld Showerhead-1.5gpm-Electric DHW	334.2800	0.0260	0.0000	10.00	1.00	1.00
RQE0324	DI-Low-Flow Bath Aerator-Electric DHW	169.6600	0.0189	0.0000	10.00	0.98	1.00
RQE0325	DI-Low-Flow Kitchen Aerator-Electric DHW	208.1900	0.0230	0.0000	10.00	0.98	1.00
RQE0336	LED Fixture-Interior	44.0000	0.0053	0.0000	15.00	1.00	1.00
RQE0337	LED Fixture-Exterior	81.0000	0.0000	0.0000	12.00	1.00	1.00
RQE0338	LED Fixture-Interior	141.5000	0.0260	0.0000	3.00	1.00	1.00
RQE0339	LED Fixture-Exterior	165.3000	0.0000	0.0000	2.00	1.00	1.00
RQE0353	LED (Night Only) Replacing HID Fixture	4.3190	0.0000	0.0000	16.00	1.00	1.00
RQE0354	LED (24/7) Replacing HID Fixture	8.7600	0.0010	0.0000	16.00	1.00	1.00
RQE0369	NC-Air Source Heat Pump-14.5 SEER-8.7 HSPF	79.5731	0.0364	0.0000	15.00	1.00	1.00

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQE0371	NC-Air Source Heat Pump-15 SEER-8.7 HSPF	152.8053	0.0316	0.0000	15.00	1.00	1.00
RQE0373	NC-Air Source Heat Pump-16 SEER-9.0 HSPF	256.9085	0.0912	0.0000	15.00	1.00	1.00
RQE0375	NC-Air Source Heat Pump-17 SEER-9.4 HSPF	294.9817	0.1410	0.0000	15.00	1.00	1.00
RQE0379	NC-Air Source Heat Pump-19 SEER-9.7 HSPF	510.6587	0.1650	0.0000	15.00	1.00	1.00
RQE0380	Air Source Heat Pump-20 SEER-9.7 HSPF	607.6698	0.2569	0.0000	15.00	1.00	1.00
RQE0381	NC-Air Source Heat Pump-20 SEER-9.7 HSPF	582.1512	0.1881	0.0000	15.00	1.00	1.00
RQE0382	Air Source Heat Pump-21 SEER-9.7 HSPF	675.5144	0.2318	0.0000	15.00	1.00	1.00
RQE0402	NC-Air Source Heat Pump-16 SEER-9.0 HSPF	256.9085	0.0912	0.0000	15.00	1.00	1.00
RQE0404	NC-Air Source Heat Pump-17 SEER-9.4 HSPF	302.4693	0.1214	0.0000	15.00	1.00	1.00
RQE0414	NC-LED Fixture-Interior	11.0000	0.0013	0.0000	15.00	1.00	1.00
RQE0415	NC-LED Fixture-Exterior	20.2500	0.0000	0.0000	12.00	1.00	1.00
RQE0424	NC-LED Fixture-Exterior (RES Code)	41.3250	0.0000	0.0000	2.00	1.00	1.00
RQE0427	Occupancy Sensor (<180W)	96.0800	0.0026	0.0000	10.00	1.00	1.00
RQE0454	NC-LPD Interior (Com Code)	2.6690	0.0005	0.0000	15.00	1.00	1.00
RQE0455	NC-LPD Exterior (Com Code)	4.3190	0.0000	0.0000	12.00	1.00	1.00
RQE0463	NC - LED Fixture - Interior (RES Code)	141.5000	0.0260	0.0000	3.00	1.00	1.00
RQE0464	Exterior Occupancy Sensor (Per Watt Controlled)	3.4600	0.0000	0.0000	10.00	1.00	1.00
RQE0470	DI - Window Insulation Kits (Electric)	142.7526	0.0000	0.0000	1.00	0.64	1.00
RQE0475	DI-Pipe Wrap R3-DHW-In-Unit (Electric)	51.0000	0.0058	0.0000	15.00	1.00	1.00
RQE0478	Split System Air Conditioner- SEER 15-In-Unit	45.5184	-0.0122	0.0000	15.00	1.00	1.00
RQE0487	NC-Split System Air Conditioner-SEER 15-In-Unit	52.6165	-0.0037	0.0000	15.00	1.00	1.00
RQE0496	Split System Air Conditioner- SEER 15-Common Area	45.5184	-0.0122	0.0000	15.00	1.00	1.00
RQE0503	NC-Split System Air Conditioner-SEER 14- Common Area	39.5630	0.0330	0.0000	15.00	1.00	1.00
RQE0505	NC-Split System Air Conditioner-SEER 15- Common Area	52.6165	-0.0037	0.0000	15.00	1.00	1.00
RQE0513	LED A-Line 450-799 Lumen Output-Replacing CFL-In-Unit	2.8000	0.0003	0.0000	2.00	0.94	1.00

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQE0525	LED A-Line 800-1099 Lumen Output-Replacing CFL-24/7 Common Area	35.0000	0.0004	0.0000	2.00	0.94	1.00
RQE0530	LED PAR/R/BR-Replacing CFL-12/7 Common Area	35.0000	0.0008	0.0000	3.00	1.00	1.00
RQE0534	LED Fixture-Replacing CFL-12/7 Common Area	48.2000	0.0011	0.0000	3.00	1.00	1.00
RQE0535	LED Fixture-Replacing CFL-24/7 Common Area	96.4000	0.0011	0.0000	3.00	1.00	1.00
RQE0558	NC-LED Fixture-Replacing CFL-12/7 Common Area	48.2000	0.0011	0.0000	3.00	1.00	1.00
RQE0559	NC-LED Fixture-Replacing CFL-24/7 Common Area	96.4000	0.0011	0.0000	3.00	1.00	1.00
RQE0560	1 Lamp 2 Foot T8 LED Lamp replacing 1 Lamp 2 Foot T12-In-Unit	12.7680	0.0012	0.0000	18.00	1.00	1.00
RQE0561	1 Lamp 2 Foot T8 LED Lamp replacing 1 Lamp 2 Foot T8-In-Unit	6.8880	0.0007	0.0000	18.00	1.00	1.00
RQE0563	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T12-In-Unit	18.0600	0.0017	0.0000	18.00	1.00	1.00
RQE0564	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T8-In-Unit	12.6000	0.0012	0.0000	18.00	1.00	1.00
RQE0570	1 Lamp 2 Foot T8 LED Lamp replacing 1 Lamp 2 Foot T12-12/7 Common Area	66.5760	0.0000	0.0000	18.00	1.00	1.00
RQE0572	1 Lamp 2 Foot T8 LED Lamp replacing 1 Lamp 2 Foot T8-12/7 Common Area	35.9160	0.0000	0.0000	18.00	1.00	1.00
RQE0576	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T12-12/7 Common Area	94.1700	0.0000	0.0000	18.00	1.00	1.00
RQE0577	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T12-24/7 Common Area	188.3400	0.0194	0.0000	18.00	1.00	1.00
RQE0578	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T8-12/7 Common Area	65.7000	0.0000	0.0000	18.00	1.00	1.00
RQE0579	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T8-24/7 Common Area	131.4000	0.0135	0.0000	18.00	1.00	1.00
RQE0603	DI-Advanced Power Strips Tier 1	64.2000	0.0077	0.0000	5.00	1.00	1.00
RQE0604	DI - ENERGY STAR Air Purifier CADR Over 250	885.0000	0.1011	0.0000	9.00	1.00	1.00

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQG0001	Bonus-Multifamily Custom-Natural Gas	0.0000	0.0000	505.1883	15.91	1.00	1.00
RQG0011	Space Heating Boiler Tune-Up	0.0000	0.0000	0.0596	2.00	1.00	1.00
RQG0020	Furnace Tune-Up (40-80 MBH)	0.0000	0.0000	2.2581	2.00	1.00	1.00
RQG0021	Furnace Tune-Up (> 80 MBH)	0.0000	0.0000	3.3058	2.00	1.00	1.00
RQG0034	Airtight Can Light (Gas)	0.0000	0.0000	0.3455	15.00	1.00	1.00
RQG0035	ENERGY STAR Window (Gas)	0.0000	0.0000	0.0435	25.00	1.00	1.00
RQG0119	Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.8669	10.00	0.98	1.00
RQG0120	Low-Flow Bath Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.1753	10.00	0.98	1.00
RQG0131	DHW Boiler Tune-Up	0.0000	0.0000	0.0558	2.00	1.00	1.00
RQG0137	Furnace Replacement >= 95 AFUE	0.0000	0.0000	10.4612	15.00	1.00	1.00
RQG0141	Furnace Tune-Up (40-80 MBH)	0.0000	0.0000	2.6349	2.00	1.00	1.00
RQG0142	Furnace Tune-Up (> 80 MBH)	0.0000	0.0000	4.7415	2.00	1.00	1.00
RQG0145	Indirect Water Heater (High Efficiency, 90 percent TE)	0.0000	0.0000	0.2417	15.00	1.00	1.00
RQG0149	Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.95	1.00
RQG0176	NC-Low-Flow Bath Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.1753	10.00	0.98	1.00
RQG0177	NC-Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.8669	10.00	0.98	1.00
RQG0178	NC-Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.95	1.00
RQG0179	NC-Low-Flow Showerhead-1.75gpm-Natural Gas DHW	0.0000	0.0000	1.0519	10.00	0.95	1.00
RQG0182	NC-Furnace Replacement >= 95 AFUE	0.0000	0.0000	6.3507	15.00	1.00	1.00
RQG0185	NC-Furnace Replacement e 95 AFUE	0.0000	0.0000	10.3890	15.00	1.00	1.00
RQG0193	NC-Indirect Water Heater (High Efficiency, 90 percent TE)	0.0000	0.0000	0.2417	15.00	1.00	1.00
RQG0210	Wall Insulation (Gas)	0.0000	0.0000	4.3457	25.00	1.00	1.00
RQG0212	DI-Pipe Wrap-Space Heat-Common Area	0.0000	0.0000	0.3896	20.00	1.00	1.00
RQG0213	DI-Pipe Wrap-DHW-Common Area (Gas)	0.0000	0.0000	0.2079	20.00	1.00	1.00
RQG0221	Setback thermostat - moderate setback	0.0000	0.0000	1.5808	9.00	1.00	1.00

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RQG0222	DI-Programmable T-stat-Common Area (Gas)	0.0000	0.0000	1.9622	9.00	1.00	1.00
RQG0223	Wi-Fi Programmable T-stat-Common Area (Gas)	0.0000	0.0000	1.2744	9.00	1.00	1.00
RQG0225	NC-Low-Flow Bath Aerator-1.0gpm-Natural Gas DHW	0.0000	0.0000	0.3019	10.00	0.98	1.00
RQG0226	DI-Low-Flow Bath Aerator-Natural Gas DHW	0.0000	0.0000	0.3019	10.00	0.98	1.00
RQG0227	DI-Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	0.0000	0.0000	0.8669	10.00	0.98	1.00
RQG0228	DI-Low-Flow Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	0.95	1.00
RQG0229	DI-Low-Flow Handheld Showerhead-1.5gpm-Natural Gas DHW	0.0000	0.0000	1.4026	10.00	1.00	1.00
RQG0230	NC-Large High Efficiency Tank-Style DHW Unit (94 percent TE)	0.0000	0.0000	30.0282	13.00	1.00	1.00
RQG0263	Boiler 92% plus AFUE 82 AFUE BASE	0.0000	0.0000	0.2512	15.00	1.00	1.00
RQG0265	Boiler 95% plus AFUE 82 AFUE BASE	0.0000	0.0000	0.3302	15.00	1.00	1.00
RQG0269	Boiler 300 - 2500 kBtuh 90 Et	0.0000	0.0000	0.1017	20.00	1.00	1.00
RQG0275	Boiler Combination for Space and Water Heating 95% AFUE	0.0000	0.0000	0.2987	20.00	1.00	1.00
RQG0277	ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater 0.64 UEF, <= 55	0.0000	0.0000	1.7922	13.00	1.00	1.00
RQG0283	DI - Window Insulation Kits (Gas)	0.0000	0.0000	10.7135	1.00	0.64	1.00
RQG0288	DI-Pipe Wrap R3-DHW-In-Unit (Gas)	0.0000	0.0000	0.2532	15.00	1.00	1.00
RQG0293	DI-Duct Sealing (Gas)	0.0000	0.0000	0.0022	18.00	1.00	1.00

Note: Measure names are as they appear in eTracker.

Table 87 documents first year and lifetime kWh savings, Table 88 documents first year kW savings, and Table 89 documents first year and lifetime MCF savings.

Table 87. Certified Participation and kWh Savings by Measure (Multifamily Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RQE0001	31.00	1,790,922	1,790,922	1,790,922	28,721,551	100.00%
RQE0003	161.00	32,361	32,361	32,361	485,415	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RQE0166	144.00	2,822	2,822	2,662	10,646	94.30%
RQE0167	90.00	9,036	9,036	8,521	17,042	94.30%
RQE0168	11,228.00	319,998	319,998	301,758	1,207,032	94.30%
RQE0171	4.00	600	600	600	1,799	100.00%
RQE0182	47.00	1,114	1,114	1,114	6,683	100.00%
RQE0224	601.00	16,227	16,227	16,227	97,362	100.00%
RQE0228	75.00	88,185	88,185	88,185	731,936	100.00%
RQE0232	203.00	8,636	8,636	8,428	84,284	97.60%
RQE0234	230.00	76,884	76,884	72,656	726,558	94.50%
RQE0235	19.00	4,773	4,773	4,510	45,105	94.50%
RQE0246	321.00	2,287	2,287	2,157	8,627	94.30%
RQE0284	60.00	4,659	4,659	4,659	93,183	100.00%
RQE0287	180.00	8,052	8,052	8,052	161,046	100.00%
RQE0296	546.00	12,940	12,940	12,940	77,641	100.00%
RQE0297	1,016.00	28,956	28,956	27,306	109,222	94.30%
RQE0298	12.00	648	648	648	2,592	100.00%
RQE0299	153.00	4,131	4,131	4,131	24,786	100.00%
RQE0300	19.00	2,356	2,356	2,356	7,068	100.00%
RQE0302	23.00	2,309	2,309	2,178	4,355	94.30%
RQE0308	44,706.60	119,322	119,322	119,322	2,147,794	100.00%
RQE0309	52,745.20	462,048	462,048	462,048	2,772,288	100.00%
RQE0311	3.00	15,024	15,024	15,024	225,360	100.00%
RQE0312	2.00	40,064	40,064	40,064	600,960	100.00%
RQE0319	62.00	4,504	4,504	4,396	43,956	97.60%
RQE0320	44.00	3,196	3,196	3,119	31,195	97.60%
RQE0321	79.00	16,447	16,447	16,052	160,523	97.60%
RQE0322	9.00	3,009	3,009	2,843	28,431	94.50%
RQE0323	31.00	10,363	10,363	10,363	103,627	100.00%
RQE0324	2.00	339	339	331	3,312	97.60%
RQE0325	2.00	416	416	406	4,064	97.60%
RQE0336	1,601.00	70,444	70,444	70,444	1,056,660	100.00%
RQE0337	193.00	15,633	15,633	15,633	187,596	100.00%
RQE0338	228.00	32,262	32,262	32,262	96,786	100.00%
RQE0339	6.00	992	992	992	1,984	100.00%
RQE0353	56,566.00	244,309	244,309	244,309	3,908,937	100.00%
RQE0354	197.00	1,726	1,726	1,726	27,612	100.00%
RQE0369	34.50	2,745	2,745	2,745	41,179	100.00%
RQE0371	94.00	14,364	14,364	14,364	215,455	100.00%
RQE0373	60.75	15,607	15,607	15,607	234,108	100.00%
RQE0375	180.08	53,120	53,120	53,120	796,805	100.00%
RQE0379	28.50	14,554	14,554	14,554	218,307	100.00%
RQE0380	15.00	9,115	9,115	9,115	136,726	100.00%
RQE0381	30.00	17,465	17,465	17,465	261,968	100.00%
RQE0382	175.25	118,384	118,384	118,384	1,775,758	100.00%
RQE0402	8.70	2,235	2,235	2,235	33,527	100.00%
RQE0404	2.00	605	605	605	9,074	100.00%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RQE0414	6,907.00	75,977	75,977	75,977	1,139,655	100.00%
RQE0415	66.00	1,337	1,337	1,337	16,038	100.00%
RQE0424	25.00	1,033	1,033	1,033	2,066	100.00%
RQE0427	3,298.00	316,872	316,872	316,872	3,168,718	100.00%
RQE0454	1,092.00	2,915	2,915	2,915	43,718	100.00%
RQE0455	9,354.00	40,400	40,400	40,400	484,799	100.00%
RQE0463	40.00	5,660	5,660	5,660	16,980	100.00%
RQE0464	6,400.00	22,144	22,144	22,144	221,440	100.00%
RQE0470	1,323.00	188,862	188,862	120,871	120,871	64.00%
RQE0475	171.00	8,721	8,721	8,721	130,815	100.00%
RQE0478	291.72	13,279	13,279	13,279	199,179	100.00%
RQE0487	364.80	19,194	19,194	19,194	287,917	100.00%
RQE0496	3.62	165	165	165	2,472	100.00%
RQE0503	2.28	90	90	90	1,353	100.00%
RQE0505	9.88	520	520	520	7,798	100.00%
RQE0513	48.00	134	134	127	253	94.30%
RQE0525	250.00	8,750	8,750	8,251	16,503	94.30%
RQE0530	4.00	140	140	140	420	100.00%
RQE0534	215.00	10,363	10,363	10,363	31,089	100.00%
RQE0535	1,027.00	99,003	99,003	99,003	297,008	100.00%
RQE0558	18.00	868	868	868	2,603	100.00%
RQE0559	83.00	8,001	8,001	8,001	24,004	100.00%
RQE0560	750.00	9,576	9,576	9,576	172,368	100.00%
RQE0561	60.00	413	413	413	7,439	100.00%
RQE0563	2,847.00	51,417	51,417	51,417	925,503	100.00%
RQE0564	4,983.00	62,786	62,786	62,786	1,130,144	100.00%
RQE0570	3.00	200	200	200	3,595	100.00%
RQE0572	85.00	3,053	3,053	3,053	54,951	100.00%
RQE0576	1,660.00	156,322	156,322	156,322	2,813,800	100.00%
RQE0577	30.00	5,650	5,650	5,650	101,704	100.00%
RQE0578	3,288.00	216,022	216,022	216,022	3,888,389	100.00%
RQE0579	932.00	122,465	122,465	122,465	2,204,366	100.00%
RQE0603	2,511.00	161,206	161,206	161,206	806,031	100.00%
RQE0604	3,632.00	3,214,320	3,214,320	3,214,320	28,928,880	100.00%
Total	224,042.88	8,534,043	8,534,043	8,439,257	95,000,792	98.89%

Table 88. Certified Participation and kW Savings by Measure (Multifamily Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RQE0001	31	24.00	24.00	24.00	100.00%
RQE0003	161	3.70	3.70	3.70	100.00%
RQE0166	144	0.33	0.33	0.31	94.30%
RQE0167	90	1.66	1.66	1.56	94.30%

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Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RQE0168	11,228	38.18	38.18	36.00	94.30%
RQE0171	4	0.11	0.11	0.11	100.00%
RQE0182	47	0.13	0.13	0.13	100.00%
RQE0224	601	1.92	1.92	1.92	100.00%
RQE0228	75	10.34	10.34	10.34	100.00%
RQE0232	203	1.02	1.02	0.99	97.60%
RQE0234	230	5.98	5.98	5.65	94.50%
RQE0235	19	0.38	0.38	0.36	94.50%
RQE0246	321	0.29	0.29	0.27	94.30%
RQE0284	60	0.60	0.60	0.60	100.00%
RQE0287	180	0.92	0.92	0.92	100.00%
RQE0296	546	1.53	1.53	1.53	100.00%
RQE0297	1,016	3.45	3.45	3.26	94.30%
RQE0298	12	0.08	0.08	0.08	100.00%
RQE0299	153	0.49	0.49	0.49	100.00%
RQE0302	23	0.42	0.42	0.40	94.30%
RQE0308	44,707	22.35	22.35	22.35	100.00%
RQE0309	52,745	26.37	26.37	26.37	100.00%
RQE0311	3	3.42	3.42	3.42	100.00%
RQE0312	2	9.11	9.11	9.11	100.00%
RQE0319	62	0.50	0.50	0.48	97.60%
RQE0320	44	0.35	0.35	0.34	97.60%
RQE0321	79	1.82	1.82	1.77	97.60%
RQE0322	9	0.23	0.23	0.22	94.50%
RQE0323	31	0.81	0.81	0.81	100.00%
RQE0324	2	0.04	0.04	0.04	97.60%
RQE0325	2	0.05	0.05	0.04	97.60%
RQE0336	1,601	8.49	8.49	8.49	100.00%
RQE0338	228	5.93	5.93	5.93	100.00%
RQE0354	197	0.20	0.20	0.20	100.00%
RQE0369	35	1.26	1.26	1.26	100.00%
RQE0371	94	2.97	2.97	2.97	100.00%
RQE0373	61	5.54	5.54	5.54	100.00%
RQE0375	180	25.39	25.39	25.39	100.00%
RQE0379	29	4.70	4.70	4.70	100.00%
RQE0380	15	3.85	3.85	3.85	100.00%
RQE0381	30	5.64	5.64	5.64	100.00%
RQE0382	175	40.62	40.62	40.62	100.00%
RQE0402	9	0.79	0.79	0.79	100.00%
RQE0404	2	0.24	0.24	0.24	100.00%
RQE0414	6,907	8.98	8.98	8.98	100.00%
RQE0427	3,298	8.57	8.57	8.57	100.00%
RQE0454	1,092	0.55	0.55	0.55	100.00%
RQE0463	40	1.04	1.04	1.04	100.00%
RQE0475	171	0.99	0.99	0.99	100.00%
RQE0478	292	-3.56	-3.56	-3.56	100.00%

CADMUS

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RQE0487	365	-1.35	-1.35	-1.35	100.00%
RQE0496	4	-0.04	-0.04	-0.04	100.00%
RQE0503	2	0.08	0.08	0.08	100.00%
RQE0505	10	-0.04	-0.04	-0.04	100.00%
RQE0513	48	0.01	0.01	0.01	94.30%
RQE0525	250	0.10	0.10	0.09	94.30%
RQE0530	4	0.00	0.00	0.00	100.00%
RQE0534	215	0.24	0.24	0.24	100.00%
RQE0535	1,027	1.13	1.13	1.13	100.00%
RQE0558	18	0.02	0.02	0.02	100.00%
RQE0559	83	0.09	0.09	0.09	100.00%
RQE0560	750	0.90	0.90	0.90	100.00%
RQE0561	60	0.04	0.04	0.04	100.00%
RQE0563	2,847	4.84	4.84	4.84	100.00%
RQE0564	4,983	5.98	5.98	5.98	100.00%
RQE0577	30	0.58	0.58	0.58	100.00%
RQE0579	932	12.58	12.58	12.58	100.00%
RQE0603	2,511	19.33	19.33	19.33	100.00%
RQE0604	3,632	367.20	367.20	367.20	100.00%
Total	145,055	694.46	694.46	691.48	99.57%

Table 89. Certified Participation and MCF Savings by Measure (Multifamily Income Qualified)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RQG0001	37.00	18,691.97	18,691.97	18,691.97	297,355.55	100.00%
RQG0011	30,750.00	1,832.70	1,832.70	1,832.70	3,665.40	100.00%
RQG0020	2,805.00	6,333.97	6,333.97	6,333.97	12,667.94	100.00%
RQG0021	27.00	89.26	89.26	89.26	178.51	100.00%
RQG0034	507.00	175.17	175.17	175.17	2,627.53	100.00%
RQG0035	13,787.96	599.78	599.78	599.78	14,994.41	100.00%
RQG0119	100.00	86.69	86.69	84.61	846.09	97.60%
RQG0120	311.00	54.52	54.52	53.21	532.10	97.60%
RQG0131	2,610.00	145.64	145.64	145.64	291.28	100.00%
RQG0137	171.00	1,788.87	1,788.87	1,788.87	26,832.98	100.00%
RQG0141	11.00	28.98	28.98	28.98	57.97	100.00%
RQG0142	10.00	47.42	47.42	47.42	94.83	100.00%
RQG0145	1,200.00	290.04	290.04	290.04	4,350.60	100.00%
RQG0149	252.00	353.46	353.46	334.02	3,340.15	94.50%
RQG0176	132.00	23.14	23.14	22.58	225.84	97.60%
RQG0177	101.00	87.56	87.56	85.46	854.56	97.60%
RQG0178	130.00	182.34	182.34	172.31	1,723.09	94.50%
RQG0179	132.00	138.85	138.85	131.21	1,312.14	94.50%

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Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RQG0182	72.00	457.25	457.25	457.25	6,858.76	100.00%
RQG0185	3.00	31.17	31.17	31.17	467.51	100.00%
RQG0193	1,700.00	410.89	410.89	410.89	6,163.35	100.00%
RQG0210	1.80	7.82	7.82	7.82	195.56	100.00%
RQG0212	6,521.00	2,540.58	2,540.58	2,540.58	50,811.63	100.00%
RQG0213	300.00	62.37	62.37	62.37	1,247.40	100.00%
RQG0221	209.00	330.39	330.39	330.39	2,973.48	100.00%
RQG0222	1.00	1.96	1.96	1.96	17.66	100.00%
RQG0223	8.00	10.20	10.20	10.20	91.76	100.00%
RQG0225	190.00	57.36	57.36	55.98	559.84	97.60%
RQG0226	477.00	144.01	144.01	140.55	1,405.50	97.60%
RQG0227	610.00	528.81	528.81	516.12	5,161.18	97.60%
RQG0228	165.00	231.43	231.43	218.70	2,187.00	94.50%
RQG0229	360.00	504.94	504.94	504.94	5,049.36	100.00%
RQG0230	9.00	270.25	270.25	270.25	3,513.30	100.00%
RQG0263	570.00	143.18	143.18	143.18	2,147.76	100.00%
RQG0265	1,737.00	573.56	573.56	573.56	8,603.36	100.00%
RQG0269	1,700.00	172.89	172.89	172.89	3,457.80	100.00%
RQG0275	7,140.00	2,132.72	2,132.72	2,132.72	42,654.36	100.00%
RQG0277	42.00	75.27	75.27	75.27	978.54	100.00%
RQG0283	5,472.00	58,624.27	58,624.27	37,519.53	37,519.53	64.00%
RQG0288	963.00	243.83	243.83	243.83	3,657.47	100.00%
RQG0293	430,120.00	946.26	946.26	946.26	17,032.75	100.00%
Total	511,444.76	99,451.74	99,451.74	78,273.60	574,705.83	78.71%

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Appendix O: New Home Construction Product

Table 90 presents reported gross and verified net energy savings by fuel type and demand reductions for the New Home Construction product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 90. Participation and Savings (New Home Construction)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	1,791	1,936,263	849.16	67,800.57
Verified Annual Net Participation and Savings	1,791	1,781,362	781.23	62,376.52
Verified Lifetime Net Savings	N/A	35,627,235	N/A	1,247,530.44
Product Realization Rate	100.00%	92.00%	92.00%	92.00%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.00%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 91 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 New Home Construction product.

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Table 91. Verified Per-Unit Measure Characteristics (New Home Construction)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
RNC0007	ENERGY STAR - Single Family – Combination Customers	1,853.6717	0.9842	86.0865	20.00	1.000	0.920
RNC0008	ENERGY STAR - Townhouse – Combination Customers	870.4916	0.4353	17.3403	20.00	1.000	0.920
RNC0009	Home Energy Rating - HERs Rebate – Combination	1,591.3169	0.5169	61.2659	20.00	1.000	0.920
RNC0010	ENERGY STAR - Single Family – Combination Customers	2,014.4834	1.3910	80.2951	20.00	1.000	0.920
RNC0014	Home Energy Rating - HERs Rebate – Combination Customers	904.7246	0.0119	19.0675	20.00	1.000	0.920
RNC0015	Connected Housing ENERGY STAR OR HERS 56 or Less - No BONUS	781.4971	0.3158	11.1629	20.00	1.000	0.920
RNC0019	Connected Housing ENERGY STAR OR HERS 56 or Less - Combo BONUS	1,942.5001	0.7580	73.5443	20.00	1.000	0.920
RNE0017	ENERGY STAR - Single Family – Electric Customers	1,803.4185	0.9012	0.0000	20.00	1.000	0.920
RNE0019	Home Energy Rating - HERs Rebate – Electric Customers	1,433.3464	0.8441	0.0000	20.00	1.000	0.920
RNE0022	ENERGY STAR - Single Family – Electric Customers	4,922.3071	0.4165	0.0000	20.00	1.000	0.920
RNE0023	ENERGY STAR - Single Family – Electric Customers	7,245.2482	0.9470	0.0000	20.00	1.000	0.920
RNE0024	Home Energy Rating - HERs Rebate – Electric Customers	18,560.0633	1.6885	0.0000	20.00	1.000	0.920
RNE0025	Connected Housing ENERGY STAR OR HERS 56 or Less - NO BONUS	741.6211	0.2477	0.0000	20.00	1.000	0.920
RNE0028	Connected Housing ENERGY STAR OR HERS 56 or Less - Geothermal ASHP - Electric BONUS	4,744.4178	0.3342	0.0000	20.00	1.000	0.920
RNG0016	ENERGY STAR - Single Family – Gas Customers	0.0000	0.0000	75.3473	20.00	1.000	0.920
RNG0018	Home Energy Rating - HERs Rebate - Gas	0.0000	0.0000	56.7328	20.00	1.000	0.920
RNG0019	ENERGY STAR - Single Family – Gas Customers	0.0000	0.0000	53.3819	20.00	1.000	0.920
RNG0020	Connected Housing ENERGY STAR OR HERS 56 or Less - NO BONUS	0.0000	0.0000	9.0901	20.00	1.000	0.920

Note: Measure names are as they appear in eTracker.

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Table 92 documents first year and lifetime kWh savings, Table 136 documents first year kW savings, and Table 94 documents first year and lifetime MCF savings.

Table 92. Certified Participation and kWh Savings by Measure (New Home Construction)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RNC0007	117	216,880	216,880	199,529	3,990,584	92.00%
RNC0008	1	870	870	801	16,017	92.00%
RNC0009	392	623,796	623,796	573,893	11,477,851	92.00%
RNC0010	6	12,087	12,087	11,120	222,399	92.00%
RNC0014	3	2,714	2,714	2,497	49,941	92.00%
RNC0015	154	120,351	120,351	110,723	221,4450	92.00%
RNC0019	1	1,943	1,943	1,787	35,742	92.00%
RNE0017	7	12,624	12,624	11,614	232,280	92.00%
RNE0019	524	751,074	751,074	690,988	13,819,753	92.00%
RNE0022	1	4,922	4,922	4,529	90,570	92.00%
RNE0023	3	21,736	21,736	19,997	399,938	92.00%
RNE0024	6	111,360	111,360	102,452	2,049,031	92.00%
RNE0025	37	27,440	27,440	25,245	504,896	92.00%
RNE0028	6	28,467	28,467	26,189	523,784	92.00%
Total	1,258	1,936,263	1,936,263	1,781,362	35,627,235	92.00%

Table 93. Certified Participation and kW Savings by Measure (New Home Construction)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RNC0007	117	115.15	115.15	105.94	92.00%
RNC0008	1	0.44	0.44	0.40	92.00%
RNC0009	392	202.62	202.62	186.41	92.00%
RNC0010	6	8.35	8.35	7.68	92.00%
RNC0014	3	0.04	0.04	0.03	92.00%
RNC0015	154	48.63	48.63	44.74	92.00%
RNC0019	1	0.76	0.76	0.70	92.00%
RNE0017	7	6.31	6.31	5.80	92.00%
RNE0019	524	442.31	442.31	406.92	92.00%
RNE0022	1	0.42	0.42	0.38	92.00%
RNE0023	3	2.84	2.84	2.61	92.00%
RNE0024	6	10.13	10.13	9.32	92.00%
RNE0025	37	9.16	9.16	8.43	92.00%
RNE0028	6	2.01	2.01	1.84	92.00%
Total	1,258	849.16	849.16	781.23	92.00%

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Table 94. Certified Participation and MCF Savings by Measure (New Home Construction)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RNC0007	117	10,072.12	10,072.12	9,266.35	185,327.02	92.00%
RNC0008	1	17.34	17.34	15.95	319.06	92.00%
RNC0009	392	24,016.23	24,016.23	22,094.93	441,898.68	92.00%
RNC0010	6	481.77	481.77	443.23	8,864.58	92.00%
RNC0014	3	57.20	57.20	52.63	1,052.53	92.00%
RNC0015	154	1,719.09	1,719.09	1,581.56	31,631.19	92.00%
RNC0019	1	73.54	73.54	67.66	1,353.22	92.00%
RNG0016	70	5,274.31	5,274.31	4,852.37	97,047.32	92.00%
RNG0018	423	23,997.97	23,997.97	22,078.14	441,562.73	92.00%
RNG0019	39	2,081.89	2,081.89	1,915.34	38,306.85	92.00%
RNG0020	1	9.09	9.09	8.36	167.26	92.00%
Total	1,207	67,800.57	67,800.57	62,376.52	1,247,530.44	92.00%

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Appendix P: Residential Agriculture Product

Table 95 presents reported gross and verified net energy savings by fuel type and demand reduction for the Residential Agriculture product⁹. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 95. Participation and Savings (Residential Agriculture)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	450,497	1,203,483	3,403.73	944.70
Verified Annual Net Participation and Savings	451,264	1,041,921	190.42	856.96
Verified Lifetime Net Savings	N/A	14,122,261	N/A	17,953.13
Product Realization Rate	100.17%	86.58%	5.59%	90.71%
Annual Net Verified v. Net Reported Savings	N/A	100.39%	6.46%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.53%	N/A	100.00%

Table 96 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Residential Agriculture product.

Table 96. Verified Per-Unit Measure Characteristics (Residential Agriculture)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors			
		kWh	kW	MCF		Gross kWh	Gross kW	Gross MCF	Net
RAI0001	Variable Speed Controller for Vacuum Pump	597.8000	0.1946	0.0000	10.00	0.937	0.941	0.986	0.920
RAI0002	Variable Speed Controller on Milk Pump with Existing Milk Pre-Cooler	0.5840	0.0002	0.0000	15.00	0.937	0.941	0.986	0.920
RAI0011	Lighting Power Density	2.6690	0.0005	0.0000	15.00	0.937	0.941	0.986	0.920
RAI0013	Dairy Refrigeration Tune-up	0.0973	0.0000	0.0000	5.00	0.937	0.941	0.986	0.920
RAI0021	Ag Circulation, Exhaust, or Vent Fans (36 inch to 47 inch Fan blade diam)	625.2300	0.1980	0.0000	7.00	0.937	0.941	0.986	0.920
RAI0022	Ag Circulation, Exhaust, or Vent Fans (48 inch to 71 inch Fan blade diam)	1,122.3600	0.3560	0.0000	7.00	0.937	0.941	0.986	0.920
RAI0026	Interior LED Lighting (High Bay GT OR EQ 18 ft)	4.1600	0.0010	0.0000	16.00	0.937	0.941	0.986	0.920
RAI0027	Exterior LED Lighting Retrofit	4.3190	0.0000	0.0000	16.00	0.937	0.941	0.986	0.920

⁹ The Residential Agriculture product captures energy savings from energy efficient equipment installed in the C&I Business Solutions Product for agricultural customers who use a residential rate. The energy savings from energy efficient equipment installed in the C&I Business Solutions Product for agricultural customers who use a C&I rate are included in the C&I Certification Report compiled by TRC.

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors			
		kWh	kW	MCF		Gross kWh	Gross kW	Gross MCF	Net
RAI0031	Lighting Power Density (Exterior)	4.3190	0.0000	0.0000	12.00	0.937	0.941	0.986	0.920
RAI0032	8-Foot T12 to One 8-Foot LED Tube Light	125.1500	0.0230	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0034	Interior LED Lighting (Low Bay LT 18 ft)	2.6690	0.0005	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0035	Greenhouse Infrared Film Replacing Double Layer With Double Layer	0.0000	0.0000	0.0132	5.00	0.937	0.941	0.986	0.920
RAI0036	Low-Energy Livestock Waterer	1,596.0000	0.0000	0.0000	10.00	0.937	0.941	0.986	0.920
RAI0039	Fan Thermostat Controller	1,586.0000	0.0000	0.0000	15.00	0.937	0.941	0.986	0.920
RAI0050	4-Foot T12 to 4-Foot LED Tube Lights	66.7800	0.0123	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0051	8-Foot T12 to Two 4-Foot LED Tube Lights	125.1500	0.0230	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0057	Water Pre-Heat Heat Exchanger Electric Water Heater	1.7600	0.0005	0.0000	15.00	0.937	0.941	0.986	0.920
RAI0059	4-Foot T8 to 4-Foot LED Tube Lights	49.4300	0.0091	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0069	Greenhouse Infrared Film Replacing Single Layer with Double Layer	0.0000	0.0000	0.0424	4.00	0.937	0.941	0.986	0.920
RAI0072	Lamp Removal - Remove 4-foot T12 Fluorescent Lamp (with T8 Ballast Retrofit)	70.8000	0.0132	0.0000	15.00	0.937	0.941	0.986	0.920
RAI0089	4-Foot T5 to One (1) 4-Foot LED Tube Light (High Bay GT or EQ 15 ft)	137.6544	0.0314	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0100	Indoor Agriculture Dehumidification Units (> 155 Pints/Day Capacity)	22.2660	0.0029	0.0000	10.00	0.937	0.941	0.986	0.920
RAI0101	HVAC Reduction in Indoor Agriculture Grow Rooms	1.0950	0.0002	0.0000	11.00	0.937	0.941	0.986	0.920
RAI0102	Wall Insulation (GO)	0.0000	0.0000	0.1036	30.00	0.937	0.941	0.986	0.920
RAI0105	Infrared Heaters (EG)	26.2762	0.0060	0.3981	15.00	0.937	0.941	0.986	0.920
RAI0108	Res Ag - 4-Foot T8 to One (1) 4-Foot LED Tube Light (High Bay >= 15 ft)	49.4300	0.0091	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0112	Res Ag - New Linear LED Tube Fixture (Low Bay < 15 ft)	2.6690	0.0005	0.0000	18.00	0.937	0.941	0.986	0.920
RAI0113	Res Ag - LED Screw-in Replacing HID	4.1600	0.0010	0.0000	16.00	0.937	0.941	0.986	0.920
RAI0114	Res Ag - Trim Kits	85.6500	0.0157	0.0000	3.00	0.937	0.941	0.986	0.920

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Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors			
		kWh	kW	MCF		Gross kWh	Gross kW	Gross MCF	Net
RAI0116	LED Grow Lights < 6,570 Annual Hours	4.3800	0.0010	0.0000	11.00	0.937	0.941	0.986	0.920
RAI0117	LED Grow Lights e 6,570 Annual Hours	6.5700	0.0010	0.0000	7.60	0.937	0.941	0.986	0.920

Note: Measure names are as they appear in eTracker.

Table 97 documents first year and lifetime kWh savings, Table 98 documents first year kW savings, and Table 99 documents first year and lifetime MCF savings.

Table 97. Certified Participation and kWh Savings by Measure (Residential Agriculture)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
RAI0001	20	11,956	11,956	10,307	103,066	86.20%
RAI0002	45,970	26,846	26,846	23,143	347,141	86.20%
RAI0011	14,524	38,765	38,765	33,417	501,249	86.20%
RAI0013	114,019	11,094	11,094	9,564	47,818	86.20%
RAI0021	3	1,876	1,876	1,617	11,318	86.20%
RAI0022	24	26,937	26,937	23,220	162,543	86.20%
RAI0026	77,559	322,645	322,645	278,133	4,450,132	86.20%
RAI0027	30,407	131,328	131,328	113,210	1,811,358	86.20%
RAI0031	2,937	12,685	12,685	10,935	131,219	86.20%
RAI0032	80	10,012	10,012	8,631	155,353	86.20%
RAI0034	6,504	17,359	17,359	14,964	269,357	86.20%
RAI0036	3	4,788	4,788	4,127	41,274	86.20%
RAI0039	46	72,956	72,956	62,891	943,365	86.20%
RAI0050	62	4,140	4,140	3,569	64,245	86.20%
RAI0051	12	1,502	1,502	1,295	23,303	86.20%
RAI0057	8,780	15,453	15,453	13,321	199,814	86.20%
RAI0059	24	1,186	1,186	1,023	18,408	86.20%
RAI0072	4	283	283	244	3,662	86.20%
RAI0089	90	12,389	12,389	10,680	192,235	86.20%
RAI0100	1,600	35,626	35,626	30,711	307,107	86.20%
RAI0101	56,520	61,889	61,889	53,351	586,863	86.20%
RAI0105	300	7,883	7,883	6,795	101,930	86.20%
RAI0108	550	22,000	27,187	23,436	421,845	106.53%
RAI0112	1,104	2,947	2,947	2,540	45,721	86.20%
RAI0113	1,169	4,863	4,863	4,192	67,074	86.20%
RAI0114	9	771	771	665	1,994	86.20%
RAI0116	67,280	294,686	294,686	254,031	2,794,346	86.20%
RAI0117	7,400	48,618	48,618	41,911	318,521	86.20%
Total	437,000	1,203,483	1,208,669	1,041,921	14,122,261	86.58%

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Table 98. Certified Participation and kW Savings by Measure (Residential Agriculture)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
RAI0001	20	3.89	3.89	3.37	86.57%
RAI0002	45,970	9.19	9.19	7.96	86.57%
RAI0011	14,524	7.26	7.26	6.29	86.57%
RAI0021	3	0.59	0.59	0.51	86.57%
RAI0022	24	8.54	8.54	7.40	86.57%
RAI0026	77,559	77.56	77.56	67.14	86.57%
RAI0032	80	1.84	1.84	1.59	86.57%
RAI0034	6,504	3,186.96	3.25	2.82	0.09%
RAI0050	62	0.76	0.76	0.66	86.57%
RAI0051	12	0.28	0.28	0.24	86.57%
RAI0057	8,780	4.39	4.39	3.80	86.57%
RAI0059	24	0.22	0.22	0.19	86.57%
RAI0072	4	0.06	0.05	0.05	70.98%
RAI0089	90	2.83	2.83	2.45	86.57%
RAI0100	1,600	4.64	4.64	4.02	86.57%
RAI0101	56,520	11.30	11.30	9.79	86.57%
RAI0105	300	1.80	1.80	1.56	86.57%
RAI0108	550	4.95	5.01	4.33	87.53%
RAI0112	1,104	0.66	0.55	0.48	72.14%
RAI0113	1,169	1.17	1.17	1.01	86.57%
RAI0114	9	0.14	0.14	0.12	86.57%
RAI0116	67,280	67.28	67.28	58.25	86.57%
RAI0117	7,400	7.40	7.40	6.41	86.57%
Total	289,588	3,403.73	219.95	190.42	5.59%

Table 99. Certified Participation and MCF Savings by Measure (Residential Agriculture)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
RAI0035	3,456	45.62	45.62	41.38	206.91	90.71%
RAI0069	5,096	216.07	216.07	196.00	784.01	90.71%
RAI0102	5,440	563.58	563.58	511.24	15,337.15	90.71%
RAI0105	300	119.43	119.43	108.34	1,625.06	90.71%
Total	14,292	944.70	944.70	856.96	17,953.13	90.71%

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Appendix Q: Think! Energy Product

Table 100 presents reported gross and verified net energy savings by fuel type and demand reductions for the Think! Energy product. The realization rates reflect adjustments the Cadmus team made based on the certification tasks and applied ISRs and NTG.

Table 100. Participation and Savings (Think! Energy)

	Participation Total	Total kWh Savings	Total kW Savings	Total MCF Savings
Reported Gross Participation and Savings	522,978	13,988,805	1,138.39	325,923.75
Verified Annual Net Participation and Savings	522,978	7,365,308	653.40	117,388.87
Verified Lifetime Net Savings	N/A	52,372,686	N/A	736,370.17
Product Realization Rate	100.00%	52.65%	57.40%	36.02%
Annual Net Verified v. Net Reported Savings	N/A	100.00%	100.34%	100.00%
Lifetime Net Verified v. Net Reported Savings	N/A	100.00%	N/A	100.00%

Table 101 presents verified per-unit savings, measure lifetimes, and savings adjustment factors for all measures delivered through the 2022 Think! Energy product.

Table 101. Verified Per-Unit Measure Characteristics (Think! Energy)

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
REE0005	LED Night Light	22.0000	0.0000	0.0000	12.00	0.9200	0.9200
REE0006	LED A-Line 800-1099 Lumen output replacing Incandescent/Halogen	28.5000	0.0034	0.0000	4.00	0.8900	0.9200
REE0007	Advanced Power Strip Tier 1 AV Systems	77.0000	0.0093	0.0000	5.00	0.6800	0.9200
REE0010	Window Insulation Kit (90.42 sq ft) - Electric	138.7817	0.0000	0.0000	1.00	0.3600	0.9200
REE0011	Door weatherstripping – Electric	3.9983	0.0000	0.0000	5.00	0.5600	0.9200
REE0012	Low Flow Bath Faucet Aerators - Education (1.0 GPM) - Electric	109.1079	0.0125	0.0000	10.00	0.4400	0.9200
REE0013	Low Flow Kitchen Faucet Aerators (1.5 GPM) - Electric	279.0000	0.0320	0.0000	10.00	0.3800	0.9200
REE0014	Low Flow Showerheads - Education (1.5 GPM) - Electric	491.0000	0.0390	0.0000	10.00	0.4200	0.9200
REE0015	R3 Pipe Wrap - Electric Water Heater	51.0000	0.0058	0.0000	15.00	0.5300	0.9200
REE0016	LED Task Light	39.0000	0.0046	0.0000	12.00	0.8900	0.9200
REG0002	R3 Pipe Wrap - Gas Water Heater	0.0000	0.0000	0.2532	15.00	0.5300	0.9200

CADMUS

Consumers Energy Measure ID	Measure Name	Verified Per-Unit Savings			Verified Measure Life (years)	Verified Adjustment Factors	
		kWh	kW	MCF		Gross	Net
REG0005	Low Flow Kitchen Faucet Aerators (1.5 GPM) - Gas	0.0000	0.0000	1.1980	10.00	0.3800	0.9200
REG0008	Low Flow Showerheads - Education (1.5 GPM) - Gas	0.0000	0.0000	2.1038	10.00	0.4200	0.9200
REG0009	Low Flow Bath Faucet Aerators - Education (1.0 GPM) - Gas	0.0000	0.0000	0.4681	10.00	0.3400	0.9200
REG0011	Window Insulation Kit (90.42 sq ft) - Gas	0.0000	0.0000	9.5037	1.00	0.3600	0.9200
REG0012	Door Weatherstripping - Gas	0.0000	0.0000	0.2301	5.00	0.5600	0.9200

Note: Measure names are as they appear in eTracker.

Table 102 documents first year and lifetime kWh savings, Table 103 documents first year kW savings, and Table 104 documents first year and lifetime MCF savings.

Table 102. Certified Participation and kWh Savings by Measure (Think! Energy)

Consumers Energy Measure ID	Verified Participation	Reported Gross kWh Savings	Verified Gross kWh Savings	Verified Net kWh Savings	Lifetime kWh Savings	Realization Rate
REE0005	31,965	703,230	703,230	595,214	7,142,566	84.64%
REE0006	126,459	3,604,082	3,604,082	2,951,022	11,804,088	81.88%
REE0007	3,569	274,813	274,813	171,923	859,615	62.56%
REE0010	18,968	2,632,411	2,632,411	871,855	871,855	33.12%
REE0011	6,775	27,088	27,088	13,956	69,780	51.52%
REE0012	10,831	1,181,662	1,181,748	478,371	4,783,715	40.48%
REE0013	4,692	1,309,068	1,309,068	457,650	4,576,502	34.96%
REE0014	5,292	2,598,372	2,598,372	1,004,011	10,040,109	38.64%
REE0015	31,752	1,619,352	1,619,352	789,596	11,843,941	48.76%
REE0016	993	38,727	38,727	31,710	380,516	81.88%
Total	241,296	13,988,805	13,988,891	7,365,308	52,372,686	52.65%

CADMUS

Table 103. Certified Participation and kW Savings by Measure (Think! Energy)

Consumers Energy Measure ID	Verified Participation	Reported Gross kW Savings	Verified Gross kW Savings	Verified Net kW Savings	Realization Rate
REE0006	126,459	429.96	429.96	352.05	81.88%
REE0007	3,569	33.19	33.19	20.76	62.56%
REE0012	10,831	129.97	135.39	54.80	42.17%
REE0013	4,692	150.14	150.14	52.49	34.96%
REE0014	5,292	206.39	206.39	79.75	38.64%
REE0015	31,752	184.16	184.16	89.80	48.76%
REE0016	993	4.57	4.57	3.74	81.88%
Total	183,588	1,138.39	1,143.80	653.40	57.40%

Table 104. Certified Participation and MCF Savings by Measure (Think! Energy)

Consumers Energy Measure ID	Verified Participation	Reported Gross MCF Savings	Verified Gross MCF Savings	Verified Net MCF Savings	Lifetime MCF Savings	Realization Rate
REG0002	155,946	39,485.53	39,485.53	19,253.14	288,797.15	48.76%
REG0005	23,052	27,616.30	27,616.30	9,654.66	96,546.57	34.96%
REG0008	25,991	54,679.87	54,679.87	21,128.30	211,283.00	38.64%
REG0009	53,238	24,920.71	24,920.71	7,795.20	77,951.97	31.28%
REG0011	18,744	178,137.35	178,137.35	58,999.09	58,999.09	33.12%
REG0012	4,711	1,084.00	1,084.00	558.48	2,792.39	51.52%
Total	281,682	325,923.75	325,923.75	117,388.87	736,370.17	36.02%

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

JEREMIAH J. KRAFT

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Jeremiah J. Kraft. My business address is 807 E Roy Street, Suite 301, Seattle,
3 WA 98102.

4 **Q. Please describe your position and responsibilities.**

5 A. I currently serve as a Director in the Advanced Energy team at TRC Companies (“TRC”),
6 a global engineering and consulting firm. The Advanced Energy team is comprised of over
7 600 staff specializing in renewable energy, energy efficiency, and demand response. My
8 responsibilities include client engagement, project development, as well as technical
9 direction on several of our key projects. Since 2013, I have overseen the team that conducts
10 evaluation research for all of the commercial and industrial (“C&I”) programs in
11 Consumers Energy Company’s (“Consumers Energy” or the “Company”) Energy Waste
12 Reduction (“EWR”) portfolio. This includes: (i) process evaluations to assess customer
13 perceptions of program delivery; (ii) impact evaluations to assess energy savings, verify
14 installation and operation, and estimate net-to-gross ratios; and (iii) market assessments to
15 identify baseline characteristics and assess changes in the marketplace stimulated by the
16 offering of EWR programs.

17 **Q. Please describe your education and professional experience.**

18 A. I hold a bachelor’s degree in Sociology with a Concentration on Analysis and Research
19 from the University of Wisconsin - Madison. I have a broad perspective on energy
20 efficiency program evaluation that draws upon the disciplines of sociology, economics,
21 engineering, and behavioral sciences. I began my career at the University of Wisconsin
22 Survey Center, designing social science research for the public sector. In 2008, I joined
23 Tetra Tech (then PA Consulting) in their Demand Side Management program evaluation

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 office as a consultant. At Tetra Tech, I managed evaluation projects, designing evaluation
2 plans and interpreting results for utilities and public service commissions across the
3 country.

4 I joined EMI Consulting in 2011. On January 15, 2021, TRC acquired EMI
5 Consulting, including our full evaluation team, integrating it with the Advanced Energy
6 team at TRC. This team includes staff with master's and doctorate degrees in Engineering,
7 Economics, Urban Planning, Energy Policy, Education, Psychology, and Program
8 Evaluation. Our team has completed over 200 engagements related to energy efficiency
9 strategy, program design, and program evaluation. My areas of specialty include program
10 evaluation (process, impact, and market), regulatory strategy, and pilot program
11 development. We are currently working on or have recently completed program evaluation
12 projects in jurisdictions across the U.S., including Michigan, Minnesota, Colorado,
13 Connecticut, New York, Indiana, Ohio, Wisconsin, California, New York, Oregon, and
14 Washington. I have presented papers at professional conferences sponsored by the
15 American Evaluation Association and the International Energy Program Evaluation
16 Conference.

17 **Q. Have you previously testified before the Michigan Public Service Commission**
18 **(“MPSC” or “the Commission”)?**

19 **A.** Yes, I have provided testimony in Consumers Energy's 2016 Energy Optimization
20 Reconciliation, Case No. U-18331; the Company's 2017 EWR Reconciliation, Case No.
21 U-20028; the Company's 2018 EWR Reconciliation, Case No. U-20365; the Company's
22 2019 EWR Reconciliation, Case No. U-20702; the Company's 2020 EWR Reconciliation,
23 Case No. U-20865; and the Company's 2021 EWR Reconciliation, Case No. U-21205.

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 **Q. What is the purpose of your testimony in this proceeding?**

2 A. The purpose of my testimony is to present TRC's certification of the C&I energy savings
3 presented by Consumers Energy for the 2022 program year.

4 **Q. Are you sponsoring any exhibits with your direct testimony?**

5 A. Yes, I am sponsoring one exhibit – Exhibit A-10 (JJK-1) – Business Energy Waste
6 Reduction Certification Report - Program Year 2022. This is a 117-page report and
7 appendix produced by TRC that audits and certifies the 2022 C&I electric and gas energy
8 savings achieved by the Company's EWR plan.

9 **Q. Was this exhibit prepared by you or under your supervision?**

10 A. Yes.

11 **Q. How has TRC certified energy savings for the Company?**

12 A. TRC employed a rigorous process to certify energy savings for the Company's C&I EWR
13 programs that included:

- 14 • Comparison of reported savings results to data maintained by Consumers
15 Energy and implementation contractor tracking systems to ensure utilization of
16 an accurate process for calculating total savings values by measure, program,
17 and the total portfolio; and
- 18 • Verification that the correct factors were used to calculate savings, including:
19 Michigan Energy Measures Database saving values; evaluation derived
20 installation rates and engineering adjustments; and appropriate net-to-gross
21 factors.

22 **Q. What are TRC's qualifications for certifying the C&I energy savings?**

23 A. The C&I evaluation team led by TRC includes our own staff, plus several of the most
24 reputable evaluation, research, and engineering firms in the energy industry. These include
25 AEG, Driftless Energy, Wirtshafter Associates, Escalent, BW Research, and PWP
26 Consulting. All firms on the evaluation team have conducted independent impact, process,
27 and engineering analyses for utilities and regulatory commissions throughout the U.S. for

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 well over 10 years. Evaluation team members have specific experience in evaluating the
2 unique needs of C&I energy efficiency utility programs.

3 **Q. What were TRC's conclusions regarding the amount of 2022 C&I EWR program**
4 **electric energy savings?**

5 A. TRC's conclusions are set forth in Exhibit A-10 (JJK-1). Table 1-1 in that report shows
6 that the Company delivered 441,301,267 kWh (441,301 MWh) of net nonresidential
7 first-year electric energy savings and 5,640,033,941 kWh (5,640,034 MWh) of net
8 nonresidential lifetime electric energy savings. Table 1-8 of the report shows the
9 self-directed energy savings reported to the Company of 4,134 MWh by customers who
10 implemented self-directed EWR plans.

11 **Q. What were TRC's conclusions regarding the amount of 2022 C&I EWR program**
12 **electric demand savings?**

13 A. Exhibit A-10 (JJK-1), Table 1-2, shows that the Company delivered 73,626 kW of net
14 nonresidential electric demand savings.

15 **Q. What are TRC's conclusions regarding the amount of 2022 C&I EWR program gas**
16 **energy savings?**

17 A. Exhibit A-10 (JJK-1), Table 1-3, shows that the Company delivered 1,488,781 Mcf of net
18 nonresidential first-year natural gas savings and 20,947,356 Mcf of net nonresidential
19 lifetime natural gas savings.

20 **Q. Do the total electric and natural gas savings reported in Exhibit A-10 (JJK-1) include**
21 **utility shared savings?**

22 A. Yes.

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 **Q. What are “utility shared savings”?**

2 A. Each year, utilities in Michigan perform EWR-related work that generates both electric and
3 gas savings at premises where they only provide single fuel service. Historically, utilities
4 have only claimed savings based on the service they provide, despite quantifiable savings
5 being realized for both fuel types. Utility shared savings are those savings that were created
6 by an “originating” utility but remain unquantified and unclaimed by the utility providing
7 the alternative fuel service (the “receiving” utility). For the purposes of this testimony,
8 utility shared savings represent savings created by DTE Energy Company (“DTE”)
9 (originating utility) in areas where Consumers Energy and DTE have overlapping service
10 territory.

11 **Q. Which projects and activities are considered eligible when quantifying utility shared**
12 **savings?**

13 A. Utility shared savings-eligible projects must occur in the originating utility’s single-fuel
14 service territory and generate savings of the secondary fuel type (e.g. the project occurs in
15 the originating utility’s electric-only service territory but saves gas supplied by the
16 receiving utility).

17 **Q. What methodology was used to quantify utility shared savings created by DTE and**
18 **claimed by Consumers Energy?**

19 A. TRC reviewed input data and calculations performed by DTE’s third-party evaluation
20 contractor. To determine verified net utility shared savings, DTE’s evaluator used a
21 four-step approach.

- 22 1. To allocate eligible projects to each utility jurisdiction, DTE’s evaluator
23 conducted a jurisdictional allocation process. The jurisdictional allocation
24 identifies which projects are eligible for shared savings and maps the
25 originating utility’s projects to the receiving utility’s service territory shape file

JEREMIAH J. KRAFT
DIRECT TESTIMONY

(i.e. map). In 2022, to determine project eligibility based on utility jurisdiction, DTE's evaluator mapped all single-fuel projects against a map of Consumers Energy's electric and gas service territories. DTE projects that were within Consumers Energy's service territory and created unclaimed savings for the fuel supplied by Consumers Energy were eligible for shared savings. For example, a prescriptive insulation project in DTE's electric-only territory is eligible for shared savings only if that project was also within Consumers Energy's gas-only service territory.

2. To account for residential customers that use propane as their primary fuel, DTE's evaluator applied a delivered fuels adjustment factor. This factor is based on estimates from the U.S. Energy Information Administration of the number of Michigan households (approximately 320,000) using propane as their primary heating fuel and represents approximately 8% of the households in the state. To account for this, gas utility shared savings values resulting from residential and income-qualified programs were reduced by 8%.
3. To determine verified gross utility shared savings, DTE's evaluator applied measure-level in-service rate adjustment factors to account for measures that were not installed and operating. The in-service rate adjustment factors were provided by DTE's evaluator and were based on their evaluation of DTE's EWR programs.
4. Consistent with Consumers Energy's commercialized EWR programs, TRC provided DTE's evaluator the appropriate deemed net-to-gross ratio, which they used to determine verified net utility shared savings.

Q. Were all projects and programs reviewed as part of the utility shared savings analysis?

A. No. Residential behavior and business custom programs were not included in the 2022 utility shared savings analysis.

Q. What are Consumers Energy's verified net utility shared electric energy savings associated with the 2022 EWR programs?

A. Exhibit A-10 (JJK-1), Table 1-7, shows that the verified net annual utility shared electric energy savings for the 2022 EWR program were 988,065 kWh (988 MWh) and the verified net lifetime utility shared electric energy savings were 12,098,386 kWh (12,098 MWh).

JEREMIAH J. KRAFT
DIRECT TESTIMONY

1 **Q. What are Consumers Energy's verified net utility shared electric demand savings**
2 **associated with the 2022 EWR program?**

3 A. Exhibit A-10 (JJK-1), Table 1-7, shows that the verified net annual utility shared electric
4 demand savings for the 2022 EWR program were 40.72 kW.

5 **Q. What are Consumers Energy's verified net utility shared gas energy savings**
6 **associated with the 2022 EWR program?**

7 A. Exhibit A-10 (JJK-1), Table 1-7, shows that the verified net annual utility shared gas
8 energy savings for the 2022 EWR program were 73,457 Mcf and the verified net lifetime
9 utility shared gas energy savings were 936,603 Mcf.

10 **Q. Does that conclude your direct testimony?**

11 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBIT
OF
JEREMIAH J. KRAFT
ON BEHALF OF
CONSUMERS ENERGY COMPANY

May 2023



May 17, 2023



Consumers Energy

Business Energy Waste Reduction Certification Report Program Year 2022

Prepared for:

Consumers Energy / Joseph Forcillo
One Energy Plaza, Jackson, MI 49201

Prepared by:

TRC / Katie Cary
807 E Roy St. Suite 301, Seattle, WA 98102
kcary@trccompanies.com / 206.388.0987

Consumers Energy
2022 Business Energy Waste Reduction Certification Report



Project Acknowledgements

This report is a deliverable submitted to Consumers Energy as part of a multiyear, independent evaluation contract to conduct impact, process, and market assessment studies of business energy waste reduction products administered by Consumers Energy.

The independent evaluation team includes the following firms:

- ◆ TRC, Contract Lead
- ◆ AEG
- ◆ Driftless Energy
- ◆ PWP Consulting
- ◆ Wirtshafter & Associates
- ◆ Escalent
- ◆ BW Research

The primary project team on this work included:

- ◆ Sagar Deo, Senior Consultant, TRC
- ◆ Bilsay Varcin, Senior Researcher, TRC
- ◆ Jake Scheffrin, Research Associate, TRC
- ◆ Jeremiah Kraft, Director, TRC
- ◆ Lia Tang, Analyst, AEG
- ◆ Katie Chiccarelli, Manager, AEG
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Consumers Energy
2022 Business Energy Waste Reduction Certification Report



Table of Contents

Project Acknowledgements i

Table of Contents ii

Glossary of Termsiv

Certification Letter v

1 Overview 1

 1.1 Objectives and Scope 1

 1.2 Summary of Certified Savings 2

 1.2.1 Measure Life and Lifetime Savings 10

2 Methodology 12

 2.1 Task 1: Verify Per-Unit Savings 12

 2.2 Task 2: Calculate Adjusted Reported Gross Savings 13

 2.3 Task 3: Calculate Verified Annual Net Savings 15

 2.4 Task 4: Calculate Verified Lifetime Savings 16

3 Summary of Savings Variances 17

 3.1 Business Solutions 17

 3.1.1 Small Business Solutions 25

 3.1.2 C&I Multifamily Product 31

Tables

Table 1-1. PY2022 Certified Annual Electric Energy (kWh) Savings by Sector 3

Table 1-2. PY2022 Certified Electric Demand (kW) Savings by Sector 5

Table 1-3. PY2022 Certified Mcf Savings by Sector 7

Table 1-4. PY2022 Percentage of Reported Net kWh Savings Verified 8

Table 1-5. PY2022 Percentage of Reported Net kW Savings Verified 9

Table 1-6. PY2022 Percentage of Reported Net Mcf Savings Verified 9

Table 1-7 PY2022 Utility Shared Savings 10

Table 1-8. PY2022 MWh Savings from Self-Direct Projects – Not Verified 10

Table 1-9. PY2022 Lifetime Savings and Weighted-Average Measure Life 11

Table 3-1. PY2022 Business Solutions Per-Unit Electric Energy (kWh) Savings
 Variances 18

Consumers Energy
2022 Business Energy Waste Reduction Certification Report



Table 3-2. PY2022 Business Solutions Per-Unit Electric Demand (kW) Savings	
Variances	20
Table 3-3. PY2022 Business Solutions Per-Unit Mcf Savings Variances.....	23
Table 3-4. PY2022 Small Business Solutions Per-Unit Electric Energy (kWh) Savings	
Variances	26
Table 3-5. PY2022 Small Business Solutions Per-Unit Electric Demand (kW) Savings	
Variances	27
Table 3-6. PY2022 Small Business Solutions Per-Unit Mcf Savings Variances.....	29
Table 3-7. PY2022 C&I Multifamily Product Per-Unit Electric Demand (kW) Savings	
Variances	31

Figures

Figure 1-1. PY2022 Verified Annual Net Electric Energy (kWh) Savings by Sector	4
Figure 1-2. PY2022 Verified Annual Net Electric Demand (kW) Savings by Sector	6
Figure 1-3. PY2022 Verified Annual Net Mcf Savings by Sector	8
Figure 2-1. Primary Tasks to Verify EWR Products' Total Savings.....	12
Figure 2-2. Adjusted Reported Savings Methodology.....	14

Appendices

Appendix A: Validated Savings	A-1
Appendix B: Measure Lives	B-1



Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

Glossary of Terms

Term	Definition
C&I	Commercial and industrial
EWR	Energy waste reduction
EM&V	Evaluation, measurement, & verification
GAF	Gross adjustment factor
kWh	Kilowatt-hour
LED	Light-emitting diodes
Mcf	Thousand cubic feet
Measure	Refers to any equipment or service that aims to save energy. Example: smart thermostat (equipment) or energy assessment (service).
MEMD	Michigan Energy Measure Database. This is a database of approved, prescriptive savings. The measures in this database are approved by the Michigan Public Service Commission and have defined savings, measure lives, and incremental costs.
MPSC	Michigan Public Service Commission. This is the regulatory agency for energy waste deduction products.
NTG	Net-to-gross
NTGAF	Net-to-gross adjustment factor
PY	Product year

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



Certification Letter

May 17, 2023

Consumers Energy Company
1 Energy Plaza Drive
Jackson, MI 49201-2357

RE: PY2022 Verification of Net Savings for the Consumers Energy Business Energy Waste Reduction Products

This document reports the verified net electric energy, electric demand, and natural gas savings for the Consumers Energy Business Energy Waste Reduction (EWR) products for product year (PY) 2022. The verification of net savings was conducted by the independent certification team led by TRC. The objective of this verification was to review the accuracy of the electric energy (kWh), electric demand (kW), and natural gas (Mcf) savings achieved through the PY2022 Consumers Energy Business products. As indicated in the attached report, the TRC team (which includes AEG) hereby verifies the following:

1. Verified net electric **energy savings of 440,313,202 kWh** and verified **net lifetime savings of 5,627,935,556 kWh**.
2. Verified net **electric demand savings of 73,585 kW**.
3. Verified net **natural gas savings of 1,415,324 Mcf** and verified **net lifetime savings of 20,010,753 Mcf**.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeremy Kraft", with a stylized flourish at the end.

Jeremy Kraft
Director, Advanced Energy

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



1 Overview

1 Overview

This report presents certified energy savings from all 2022 business EWR products administered by Consumers Energy. The TRC team reviewed and verified energy savings as part of a comprehensive evaluation of Consumers Energy's business EWR portfolio.

1.1 Objectives and Scope

The purpose of the savings certification was to review the PY2022 reported gross electric energy (kWh), electric demand (kW), and natural gas (Mcf) savings tracked by Consumers Energy and its implementation contractors for the business energy efficiency products and initiatives. This certification also assesses electric energy (kWh) and natural gas (Mcf) lifetime savings.

Throughout this report, most certification results are presented at the business sector level, though some results are presented at the product level, where appropriate. The business products covered by this certification effort include the following:

1. Business Solutions
 - a. Business Solutions: Prescriptive
 - b. Business Solutions: Custom
 - c. Commercial and Industrial (C&I) Request for Proposals
 - d. Midstream Product
2. Small Business Solutions
 - a. Small Business Core Product
 - b. Residential Lighting Carryover
 - c. Online Marketplace
 - d. Small Business Assessment Product
 - e. Business Energy Analysis Product
3. C&I Multifamily Product¹

For this certification, the TRC team completed several actions:

- ◆ Verified that the per-unit savings values for kilowatt-hour (kWh) savings, Mcf savings, annual demand reduction (kW) attributed to individual product measures accurately reflect:
 - ◆ Values maintained in the 2022 Michigan Energy Measures Database (MEMD).
 - ◆ Weighted values for weather-sensitive measures, which a third-party contractor independently calculated based on building type, average measures size, and climate zone.
 - ◆ Custom savings or workpapers prepared by implementation contractors and approved by the independent evaluation team.

¹ The Residential Multifamily Program certification is completed by Cadmus. Results are presented in the Residential Certification Report.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



1 Overview

- ◆ Verified the calculation of the claimed savings (reported gross savings) in the Consumers Energy eTracker database, noting any changes, updates, and differences.
- ◆ Verified the correct application of appropriate gross adjustment factors (GAFs) as established by evaluation, measurement, and verification research.
- ◆ Verified the correct application of net-to-gross (NTG) values as established and approved by the Michigan Public Service Commission (MPSC) to accurately calculate net savings for each measure.
- ◆ Verified the measure life values for each measure entered in the product tracking database, eTracker, matched those included in the MEMD, or other relevant supporting documentation, and calculated lifetime savings.

1.2 Summary of Certified Savings

This section summarizes annual and lifetime savings calculations for Consumers Energy's business EWR products. Table 1-1 summarizes the verified annual and lifetime electric energy (kWh) savings for each sector, while Figure 1-1 shows the percentage of annual net savings associated with each sector.



Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

Table 1-1. PY2022 Certified Annual Electric Energy (kWh) Savings by Sector

Sector	2022 Reported Gross kWh Savings	2022 Adjusted Reported Gross kWh Savings	2022 Verified Gross kWh Savings Adjustment Factor ^a	2022 Verified Gross kWh Savings	Deemed kWh NTG Adjustment Factor ^b	2022 Verified Annual Net kWh Savings	2022 kWh Realization Rate	2022 Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [B x C]	[E]	[F] = [D x E]	[G] = [F / A]	[H] = [F x Measure Life] ^c
Business Solutions ^d	406,412,728	410,095,583	0.992	407,004,276	0.92	374,443,934	0.921	5,241,439,610
Small Business Solutions ^e	102,412,728	102,857,788	0.763	78,444,840	0.814	63,873,668	0.624	367,515,868
C&I Multifamily	2,304,923	2,304,923	0.941	2,169,131	0.92	1,995,600	0.866	18,980,078
Utility Shared Savings (USS)	NA	NA	NA	NA	NA	988,065	NA	12,098,386
TOTAL (Without USS)	511,130,379	515,258,293	0.946	487,618,247	0.903	440,313,202	0.861	5,627,935,556
TOTAL (With USS)	NA	NA	NA	NA	NA	441,301,267	NA	5,640,033,941

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- Note that the verified GAFs were derived from prior-year impact evaluations (see Section 2.3).
- The NTG adjustment factor was deemed at 0.920 for all products/initiatives by the MPSC, except for the Residential Lighting Carryover product, which had a NTG adjustment factor of 0.4 for standard LEDs and 0.5 for specialty LEDs. The Small Business Solutions sector's NTG adjustment factor shown here is a weighted average of the adjustment factors for each product.
- The lifetime savings are equal to the annual savings multiplied by the measure life for each measure.
- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



1 Overview

Figure 1-1. PY2022 Verified Annual Net Electric Energy (kWh) Savings by Sector

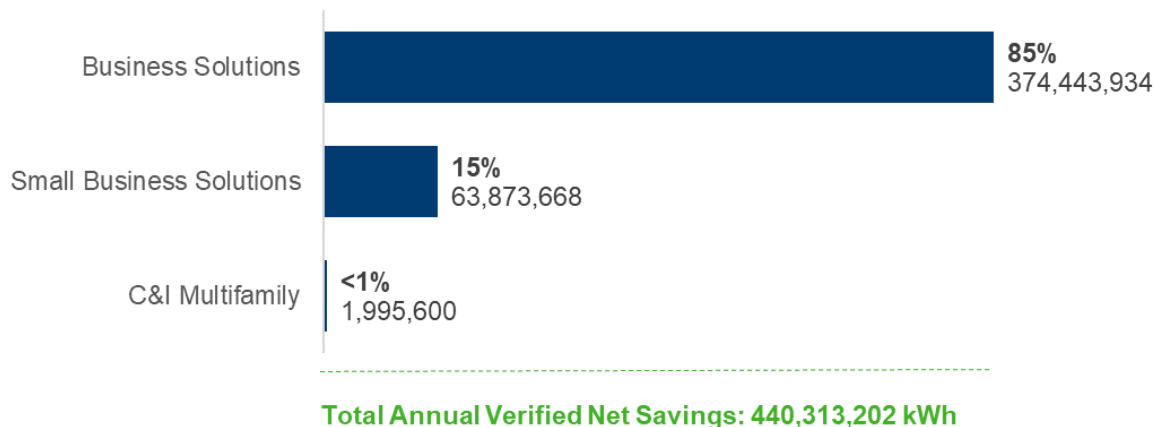


Table 1-2 summarizes the verified annual electric demand (kW) savings for each sector, while Figure 1-2 shows the percentage of annual net savings associated with each sector.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



1 Overview

Table 1-2. PY2022 Certified Electric Demand (kW) Savings by Sector

Sector	2022 Reported Gross kW Savings [A]	2022 Adjusted Reported Gross kW Savings [B]	2022 Verified Gross kW Savings Adjustment Factor ^a [C]	2022 Verified Gross kW Savings [D] = [B x C]	Deemed kW NTG Adjustment Factor ^b [E]	2022 Verified Annual Net kW Savings [F] = [D x E]	2022 kW Realization Rate [G] = [F / A]
Business Solutions ^c	67,100	68,695	0.994	68,306	0.92	62,842	0.937
Small Business Solutions ^d	16,889	17,308	0.759	13,139	0.802	10,542	0.624
C&I Multifamily	222	222	0.986	219	0.92	202	0.91
Utility Shared Savings (USS)	NA	NA	NA	NA	NA	41	NA
TOTAL (Without USS)	84,211	86,225	0.947	81,665	0.901	73,585	0.874
Total (With USS)	NA	NA	NA	NA	NA	73,626	NA

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- Note that the verified GAFs were derived from prior-year impact evaluations (see Section 2.3).
- The NTG adjustment factor was deemed at 0.920 for all products/initiatives by the MPSC, except for the Residential Lighting Carryover product, which had a NTG adjustment factor of 0.4 for standard LEDs and 0.5 for specialty LEDs. The Small Business Solutions product's NTG adjustment factor shown here is a weighted average of the adjustment factors for each product.
- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



1 Overview

Figure 1-2. PY2022 Verified Annual Net Electric Demand (kW) Savings by Sector

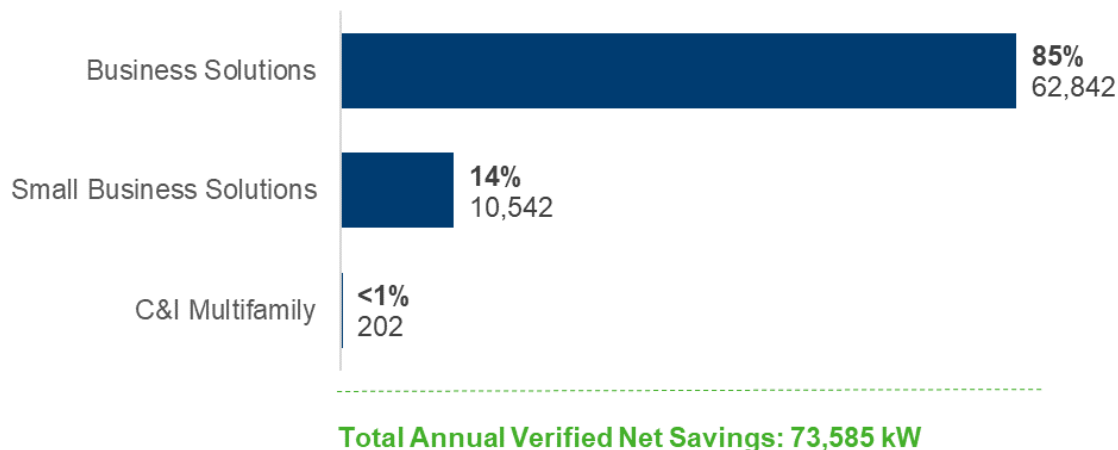


Table 1-3 summarizes the verified annual Mcf savings for each sector, while Figure 1-3 shows the percentage of annual net savings associated with each sector.



Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

Table 1-3. PY2022 Certified Mcf Savings by Sector

Sector	2022 Reported Gross Mcf Savings [A]	2022 Adjusted Reported Gross Mcf Savings [B]	2022 Verified Gross Mcf Savings Adjustment Factor ^a [C]	2022 Verified Gross Mcf Savings [D] = [B x C]	Deemed Mcf NTG Adjustment Factor [E]	2022 Verified Annual Net Mcf Savings [F] = [D x E]	2022 Mcf Realization Rate [G] = [F / A]	2022 Verified Net Lifetime Mcf Savings [H] = [F x Measure Life] ^b
Business Solutions ^c	1,235,603	1,213,319	0.978	1,186,604	0.92	1,091,676	0.884	17,678,934
Small Business Solutions ^d	301,436	303,526	0.987	299,548	0.92	275,585	0.914	2,131,865
C&I Multifamily	72,845	72,845	0.717	52,243	0.92	48,064	0.66	199,954
Utility Shared Savings (USS)	NA	NA	NA	NA	NA	73,457	NA	936,603
TOTAL (without USS)	1,609,883	1,589,691	0.968	1,538,396	0.92	1,415,324	0.879	20,010,753
TOTAL (With USS)	NA	NA	NA	NA	NA	1,488,781	NA	20,947,356

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- Note that the verified GAFs were derived from prior-year impact evaluations (see Section 2.3).
- The lifetime savings are equal to the annual savings multiplied by the measure life for each measure.
- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

1 Overview

Figure 1-3. PY2022 Verified Annual Net Mcf Savings by Sector

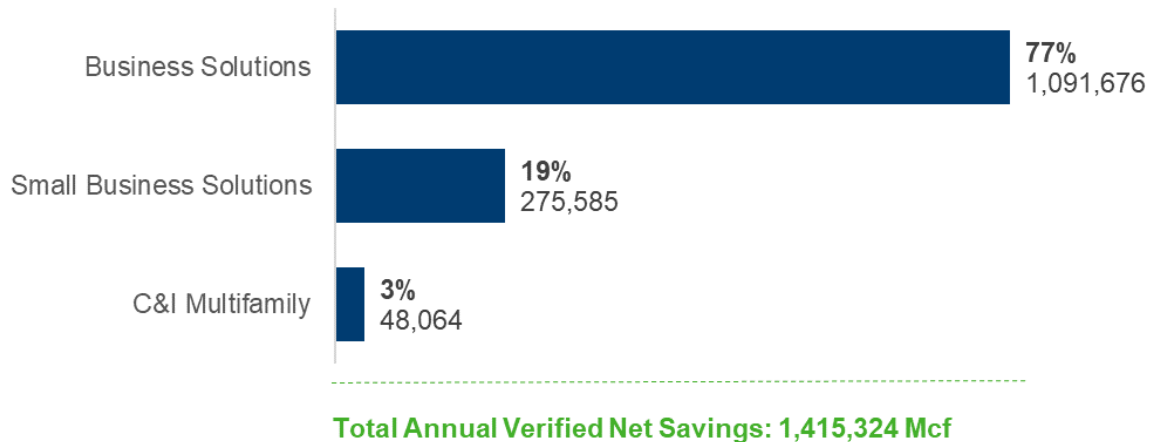


Table 1-4, Table 1-5, and Table 1-6 each present the reported net savings, verified net savings, and percentage of reported net savings verified through the PY2022 certification process for electric energy, electric demand, and natural gas, respectively. These tables reflect findings from the TRC team's review.

Table 1-4. PY2022 Percentage of Reported Net kWh Savings Verified

Sector	2022 Reported Net Annual kWh	2022 Verified Net Annual kWh	Percent of Reported Net Annual kWh Savings Verified
Business Solutions ^a	370,023,169	374,443,934	101.19%
Small Business Solutions ^b	63,446,564	63,873,668	100.67%
C&I Multifamily	2,090,087	1,995,600	95.48%
TOTAL	435,559,819	440,313,202	101.09%

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- The Business Solutions is comprised of the Business Solutions – Custom, Business Solutions – Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

1 Overview

Table 1-5. PY2022 Percentage of Reported Net kW Savings Verified

Sector	2022 Reported Net Annual kW Savings	2022 Verified Net kW Savings	Percent of Reported Net Annual kW Savings Verified
Business Solutions ^a	61,858	62,842	101.59%
Small Business Solutions ^b	10,271	10,542	102.64%
C&I Multifamily Product	201	202	100.28%
TOTAL	72,330	73,585	101.74%

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Table 1-6. PY2022 Percentage of Reported Net Mcf Savings Verified

Sector	2022 Reported Net Annual Mcf Savings	2022 Verified Net Annual Mcf Savings	Percent of Reported Net Annual Mcf Savings Verified
Business Solutions ^a	1,106,482	1,091,676	98.66%
Small Business Solutions ^b	269,195	275,585	102.37%
C&I Multifamily	66,920	48,064	71.82%
TOTAL	1,442,596	1,415,324	98.11%

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and the Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.

Table 1-7 presents the utility shared savings. These savings arise from measures installed at premises where both gas and electric savings are realized and Consumers Energy and DTE Energy each provide single fuel service. The savings included in this report arise from projects completed by DTE Energy (originating utility) in areas where both Consumers Energy and DTE have overlapping territory.

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

1 Overview

TRC and DTE's third party evaluation contractor worked together to develop the methodology used to calculate the shared savings estimates. DTE's evaluator then applied this methodology to develop the shared savings estimates presented here. DTE's evaluator performed the analysis using the steps listed below:

- ◆ Identified projects with both gas and electric savings that were implemented in territory where Consumers Energy provided either gas or electricity.
- ◆ Applied a measure level GAF for applicable measures.
- ◆ Applied the appropriate deemed net-to-gross value that TRC provided.

Table 1-7 PY2022 Utility Shared Savings

Product	2022 Verified Annual Net kWh Savings	2022 Verified Net Lifetime kWh Savings	Average kWh Measure Life (In Years) ^a	2022 Verified Annual Net kW Savings	2022 Verified Annual Net Mcf Savings	2022 Verified Net Lifetime Mcf Savings	Average Mcf Measure Life (In Years) ^a
Utility Shared Savings	988,065	12,098,386	12.24	40.72	73,457	936,603	12.75

a. Weighted-average measure life values calculated by dividing lifetime savings by annual net savings.

In addition to these products funded through the EWR surcharge, qualifying customers had the choice to opt out of paying the surcharge and implement their own energy efficiency projects. Table 1-8 provides a summary of the reported savings for these "self-direct" projects. The savings numbers were provided by Consumers Energy and were not reviewed as part of this certification process.

Table 1-8. PY2022 MWh Savings from Self-Direct Projects – Not Verified

Product	Reported Gross MWh Savings
Self-Direct Projects	4,134

1.2.1 Measure Life and Lifetime Savings

The TRC team calculated lifetime savings and the weighted-average measure life for each sector. To do so, the certification team verified that appropriate measure life values from the MEMD, workpapers, or custom measure lives were used for each measure. Table 1-9 summarizes the lifetime kWh and Mcf savings for each sector and provides the weighted-average measure life by fuel type, where each project's measure life is weighted by project net first-year savings.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

1 Overview

Table 1-9. PY2022 Lifetime Savings and Weighted-Average Measure Life

Sector	2022 Verified Net Lifetime kWh Savings	2022 Verified Net Lifetime Mcf Savings	Average kWh Measure Life (In Years) ^a	Average Mcf Measure Life (In Years) ^a
Business Solutions ^b	5,241,439,610	17,678,934	14.00	16.19
Small Business Solutions ^c	367,515,868	2,131,865	5.75	7.74
C&I Multifamily	18,980,078	199,954	9.51	4.16
TOTAL	5,627,935,556	20,010,753	12.78^d	14.14^d

Columns may not sum to total due to rounding. Adjustment factors and realization rates in total row are weighted averages and may not calculate due to rounding.

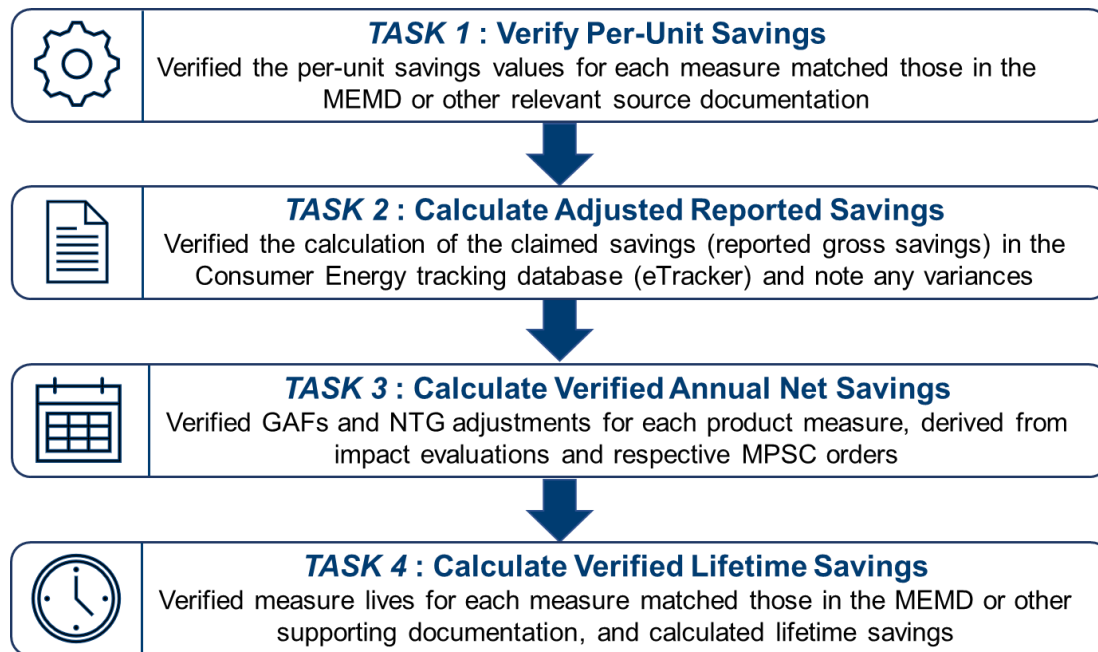
- Weighted-average measure life values calculated by dividing lifetime savings by annual net savings.
- The Business Solutions is comprised of the Business Solutions: Custom, Business Solutions: Prescriptive, C&I Request for Proposals, and Midstream products.
- The Small Business Solutions is comprised of the Online Marketplace, Residential Lighting Carryover, Small Business Core, Small Business Assessment, and Business Energy Analysis products.
- Columns will not sum as the value shown is the weighted-average measure life for the entire portfolio.

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

2 Methodology

The TRC team conducted four primary tasks to verify energy savings for each business EWR product. Each sector appendix summarizes total savings verified by the TRC team.

Figure 2-1. Primary Tasks to Verify EWR Products' Total Savings



Details on each of these tasks are discussed below. It is important to note that for the past couple of years, TRC has not conducted a separate application review, as it was identified as a duplicative process that did not add to the rigor of the certification of savings. Any differences in quantity installed or issues related to energy savings are derived from impact evaluations and are applied as part the verified GAFs (Task 3). Thus, applying an adjustment factor derived from an application review, along with the verified gross savings adjustment factors, would effectively double count any adjustment to reported savings.

2.1 Task 1: Verify Per-Unit Savings

The first task in the certification process involved verifying the reported per-unit savings value of each measure found in the Consumers Energy product-tracking database. This was not a sampling effort but, instead, it entailed a line-by-line assessment of all records contained in eTracker, for each measure for each product.

The TRC team mapped each product measure to the appropriate source data. This included:

- **Mapping non-weather-sensitive measures to the 2022 MEMD.**
- **Mapping weather-sensitive measures to databases developed independently by Cadmus.** Cadmus calculated weighted kWh, kW, and Mcf savings for each weather-

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

2 Methodology

sensitive measure according to the characteristics of product measure installations (such as geographic distribution, building type, and average measure size). Results from Cadmus's analysis represented product-specific kWh, kW, and Mcf savings for each unique weather-sensitive measure installed during the 2022 product year.

- **Mapping workpaper and custom measures to appropriate savings approved by the evaluation team.** The TRC team periodically reviews any custom and workpaper savings for accuracy and alignment with the MEMD.

After mapping each measure to an appropriate data source, the TRC team verified the kWh, kW, and Mcf savings per-unit of measure. The team documented and corrected any discrepancies, as necessary.

The certification team verified all savings values for all the measures to the accuracy of four significant digits. However, results in some tables throughout this report are rounded to the nearest whole number to allow tables to fit on the printed page.

2.2 Task 2: Calculate Adjusted Reported Gross Savings

The second task in the certification process involved replicating the calculations used to derive reported gross savings for each measure for each product, based on the information from Task 1. These calculations resulted in the adjusted reported gross savings.

The calculations for adjusted reported savings depend on the type of measure. There are four types of measures in the Consumers Energy business EWR portfolio:

- ◆ **Deemed Savings:** These are measures with defined, per-unit savings. The savings may be sourced from the MEMD or from workpapers (which are reviewed and approved by the independent evaluation team).
- ◆ **Custom Savings:** These are measures with custom-calculated savings. For these measures, the TRC team periodically conducts impact evaluations to independently verify these custom calculations; any adjustments are then accounted for as part of Gross Adjustment Factors (GAFs) in Task 3.
- ◆ **Performance Savings:** There are two types of performance savings:
 - ◆ **Unit Adjustments:** These are measures where Consumers Energy's tracking database (eTracker) uses different units than the MEMD, so the savings need to be adjusted to account for both the quantity in eTracker and the MEMD quantity.
 - ◆ **Incremental Savings:** These are measures where the unit provides additional savings *beyond* the MEMD savings due to increases in measure efficiency. In these cases, the TRC team validates both the initial savings and incremental savings for increases in efficiency.

The methods for calculating adjusted reported savings for each of these types of measures is summarized in Figure 2-2.

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

2 Methodology

Figure 2-2. Adjusted Reported Savings Methodology

DEEMED SAVINGS

For prescriptive measure or workpaper measures (with defined per-unit savings):

$$\text{Adjusted Reported Savings (Task 2)} = \text{Verified Per-Unit Savings (Task 1)} * \text{Quantity}$$

Used for **most measures** in the business portfolio, including measures in:

- Business Solutions - Prescriptive
- C&I Request for Proposals
- Midstream
- C&I Multifamily
- Small Business Assessments
- Business Energy Analysis
- Residential Lighting Carryover

CUSTOM SAVINGS

For custom measures, GAFs include any adjustments needed to ensure accuracy of gross savings. Therefore, to avoid double counting any errors, TRC does not apply adjustments to reported savings in this step:

$$\text{Adjusted Reported Savings (Task 2)} = \text{Reported Savings}$$

Used for custom measures in:

- Business Solutions - Custom
- Small Business Core
- C&I Multifamily

PERFORMANCE SAVINGS

There are two types of performance measures; each is listed below.

UNIT ADJUSTMENT

For these measures, the units differ between the MEMD and eTracker, so the adjusted reported savings include both MEMD & eTracker quantities.

$$\text{Adjusted Reported Savings (Task 2)} = \text{Per-Unit Savings (MEMD)} * \text{Quantity (eTracker)} * \text{Adjusted Units (MEMD)}$$

Used for a few select measures in:

- Business Solutions - Prescriptive

Example:

MEMD units are in square feet controlled by a sensor, but eTracker units are per sensor.

$$\text{Adjusted Reported Savings} = \text{MEMD savings (per square ft controlled)} * \text{Number of Sensors Installed} * \text{Square Feet Controlled (per sensor)}$$

INCREMENTAL SAVINGS

For these measures, the unit provides additional savings *beyond* the MEMD savings due to incremental increases in unit efficiency.

$$\text{Adjusted Reported Savings (Task 2)} = \text{Per-Unit Savings} * \text{Quantity} + \text{Incremental Savings*}$$

Used for a few select measures in:

- Business Solutions - Prescriptive

Incremental Savings determined by this formula:

$$\text{Incremental Savings} = \text{Quantity} * (\text{Efficiency of Measure} - \text{Baseline Efficiency}) / \text{Performance Increment} * \text{Per-Unit Savings}$$

Key:

- Business Solutions
- Small Business Solutions
- C&I Multifamily

Consumers Energy 2022 C&I Energy Waste Reduction Certification Report

2 Methodology

2.3 Task 3: Calculate Verified Annual Net Savings

Following Task 2, the certification team applied two adjustment factors to derive verified net savings: 1) the verified GAF, and 2) the NTG adjustment factor. TRC confirmed GAFs based on product evaluations conducted by TRC (formerly EMI Consulting) and Cadmus.

The first adjustment factor, the *verified gross savings adjustment factor*, incorporates the in-service rates and, where applicable, engineering adjustment factors for each product resulting from previous years' product evaluations.

The ***in-service rates*** account for issues such as, but not limited to:

- Incented measures that were not installed.
- Measures that were installed but later removed.
- Measures that were improperly installed or no longer operable.
- Measures that did not match those identified in the Consumers Energy's tracking system, eTracker.
- Measures that were installed but were not eligible according to product guidelines.

The ***engineering adjustment factors*** account for issues such as:

- Incorrect assumptions used to estimate project impacts (e.g., coincidence factor, baseline specifications, operating characteristics, operating hours, efficiency performance specifications, capacity, and load).
- Errors in the algorithm used to estimate reported impacts.

The derivation of the verified GAFs differs for custom and prescriptive measures. For measures with custom-calculated savings, the verified GAFs incorporate the product-level in-service rates and engineering adjustment factors; for prescriptive measures, the measure savings are all deemed in the MEMD, and only in-service rates are required (i.e., no engineering adjustments are applied). Thus, for prescriptive measures, the verified GAFs are the same as the in-service rates derived from the impact evaluations. For custom measures, the verified GAFs are equal to the in-service rates multiplied by the engineering adjustment factors.

For each measure, j , in each product, i , the appropriate verified GAFs were applied to adjusted reported gross savings to derive verified gross savings in accordance with the following:

$$\begin{aligned} & \text{Verified Gross Savings}_{i,j} \\ &= \text{Adjusted Reported Gross Savings}_{i,j} \times \text{Verified Gross Savings Adjustment Factor}_{i,j} \end{aligned}$$

The second adjustment factor applied to these certification results was the NTG rate. The NTG rates are assumed to be 0.92 for all business measures *except* upstream lighting installed through the Residential Lighting Carryover Product (which received a NTG adjustment of 0.4 for standard LED bulbs and 0.5 for specialty LED bulbs), as mandated by the MPSC ruling on Case No. U-20875. The deemed NTG adjustment factor was applied to verified gross savings to derive verified net savings:

$$\text{Verified Net Savings}_{i,j} = \text{Verified Gross Savings}_{i,j} \times \text{Deemed NTG Adjustment Factor}_{i,j}$$

Consumers Energy

2022 C&I Energy Waste Reduction Certification Report

2 Methodology

The final realization rates are equal to the verified net savings divided by the reported gross savings:

$$Realization Rate_{i,j} = \frac{Verified Net Savings_{i,j}}{Reported Gross Savings_{i,j}}$$

All calculations were conducted at the measure level and then aggregated to the sector or product level for reporting purposes.

2.4 Task 4: Calculate Verified Lifetime Savings

Finally, TRC calculated net lifetime savings by validating measure lives (using the source information described in Task 1) and applying to the annual net savings from Task 3. We multiplied the verified measure lives for each measure, j , in each product, i , to calculate verified net lifetime savings:

$$Lifetime Verified Net Savings_{i,j} = Annual Verified Net Savings_{i,j} \times Verified Measure Life_{i,j}$$

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report

3 Summary of Savings Variances

3 Summary of Savings Variances

This section summarizes the per-unit savings variances that resulted from the independent certification of adjusted reported gross savings as compared to reported gross savings. All calculations were conducted using per-unit savings rounded to four decimal places² and adjustment factors are rounded to three decimal places.³ Resulting net savings estimates are rounded to two decimal places.

3.1 Business Solutions

This section presents variances in per-unit savings found by the TRC team for Business Solutions measures. The tables below contain two types of variances: 1) variances in prescriptive measures, which use a standard per-unit savings, and 2) variances in performance-based measures, which use alternate formulas to calculate adjustments in unit sizes or incremental savings. Because the performance-based measures are calculated savings and not all claimed inputs are provided, TRC cannot determine where the error in the calculation occurred for these measures. See Figure 2-2 for more detail on how performance-based measures are calculated.

Table 3-1 summarizes the variances for electric energy (kWh) savings, Table 3-2 summarizes the variances detected by the certification team for electric demand (kW), and Table 3-3 summarizes the variances detected by the certification team for Mcf savings.

² Rounding to four decimal places can result in very small variances when comparing the reported gross and adjusted reported gross savings. These are noted as “rounding differences” throughout this section.

³ The GAFs are rounded to three digits, as they are a result of the annual impact evaluations, which are designed to reach precision to three decimal points.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Table 3-1. PY2022 Business Solutions Per-Unit Electric Energy (kWh) Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kWh	Variance Description
Business Solutions Prescriptive	CHE0001	AC LT 65,000 Btuh (5.4 tons)	908.92	58.34	Consumers Energy claimed 97.7125 kWh for 17 units, 101.1443 kWh for 0.76 units. Verified per-unit kWh is 101.1444.
Business Solutions Prescriptive	CHE0028	AC Units GT 65,000 Btuh (5.4 tons) and LT =120,000 Btuh (10 tons)	1,232.03	-171.51	Consumers Energy claimed 36.7618 kWh for 38 units. Verified per-unit kWh is 32.2483.
Business Solutions Prescriptive	CHE0156	Air-Cooled Chillers LT 150 ton - PATH A	562.60	-1,755.43	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0157	Air-Cooled Chillers LT 150 ton - PATH B	146.90	-2,110.90	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0158	Air-Cooled Chillers GT= 150 ton - PATH A	357.30	-20,814.34	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0159	Air-Cooled Chillers GT= 150 ton - PATH B	2,524.60	9,163.80	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0170	Water-Cooled Centrifugal Chiller GT= 150 ton and LT 300-ton Path A - 0.01 kW/ton	232.60	-1,562.09	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0183	Water-Cooled Screw Chiller GT= 300 ton and LT 600-ton Path B - 0.01 kW/ton IPLV Reduction	950.00	2,276.21	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CHE0186	Water-Cooled Screw Chiller GT= 75 ton and LT 150-ton Path A - 0.01 kW/ton FLV Reduction	1,400.00	-214.72	Difference in kWh performance adjustment.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kWh	Variance Description
Business Solutions Prescriptive	CHE0187	Water-Cooled Screw Chiller GT= 75 ton and LT 150-ton Path B - 0.01 kW/ton IPLV Reduction	2,080.00	20,740.27	Difference in kWh performance adjustment.
Business Solutions Prescriptive	CME0014	EC Motors	643.26	-5.39	Consumers Energy claimed 1347.8554 kWh for 18.65 units, 1482.8 kWh for 0.02 units, 1527.7333 kWh for 0.03 units. Verified per-unit kwh is 1348.
Business Solutions Prescriptive	CWE0029	Air and Water-Cooled Chiller Tune-up (1000+ Tons)	23.00	3,992,405.41	This is a performance measure, but additional performance savings were not claimed (which includes multiplying by equipment size) into account; this led to large variances across all projects for both kWh and kW savings.
Midstream	CPC0007	DCV 8,001-24,000 sq ft	5.00	44,715.00	Savings of 596.2 kWh per-unit were claimed. Verified per-unit kWh is 9539.2 kWh.
Midstream	CPE0005	LED BR-Series	9,157.00	-359,870.10	Consumers Energy claimed 85.65 kWh per-unit. Verified per-unit kWh is 46.35.
TOTAL				3,682,854.55	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Table 3-2. PY2022 Business Solutions Per-Unit Electric Demand (kW) Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Business Solutions Prescriptive	CHE0001	AC LT 65,000 Btuh (5.4 tons)	908.92	-0.01	kW rounding difference.
Business Solutions Prescriptive	CHE0028	AC Units GT 65,000 Btuh (5.4 tons) and LT =120,000 Btuh (10 tons)	1,232.03	-0.29	Consumers Energy claimed 0.0528 kW for 38 units. Verified per-unit kW is 0.0451.
Business Solutions Prescriptive	CHE0156	Air-Cooled Chillers LT 150 ton - PATH A	562.60	-2.18	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0157	Air-Cooled Chillers LT 150 ton - PATH B	146.90	-2.84	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0158	Air-Cooled Chillers GT= 150 ton - PATH A	357.30	-27.06	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0159	Air-Cooled Chillers GT= 150 ton - PATH B	2,524.60	-51.86	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0170	Water-Cooled Centrifugal Chiller GT= 150 ton and LT 300-ton Path A - 0.01 kW/ton	232.60	-4.73	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0183	Water-Cooled Screw Chiller GT= 300 ton and LT 600-ton Path B - 0.01 kW/ton IPLV Reduction	950.00	-0.52	Difference in kW performance adjustment.
Business Solutions Prescriptive	CHE0187	Water-Cooled Screw Chiller GT= 75 ton and LT 150-ton Path B - 0.01 kW/ton IPLV Reduction	2,080.00	15.20	Difference in kW performance adjustment.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Business Solutions Prescriptive	CLE0181	LED Grow Lights - New Construction	10,090,649.00	-1,758.92	Consumers Energy claimed 0.001 kW for 8794577 units. Verified per-unit kW is 0.0008.
Business Solutions Prescriptive	CLE0182	LED Grow Light - Tier 2 - New Construction	2,010,500.00	-343.42	Consumers Energy claimed 0.001 kW for 1717106 units. Verified per-unit kW is 0.0008.
Business Solutions Prescriptive	CSE0179	Trim Kits	1,302.00	4.43	Consumers Energy claimed 0.0157 kW per-unit. Verified per-unit kW is 0.0191.
Business Solutions Prescriptive	CWE0029	Air and Water-Cooled Chiller Tune-up (1000+ Tons)	23.00	2,538.29	This is a performance measure, but Consumers Energy did not claim the additional performance savings (which includes multiplying by equipment size) into account; this led to large variances across all projects for both kWh and kW savings.
Midstream	CPC0007	DCV 8,001-24,000 sq ft	5.00	11.22	Consumers Energy claimed 0.1496 kW per-unit. Verified per-unit kW is 2.3934.
Midstream	CPE0001	LED PAR	7,801.00	26.52	Consumers Energy claimed 0.0157 kW per-unit. Verified per-unit kW is 0.0191.
Midstream	CPE0002	LED MR16	1,381.00	2.35	Consumers Energy claimed 0.0077 kW per-unit. Verified per-unit kW is 0.0094.
Midstream	CPE0003	LED A-Series	98,158.00	294.47	Consumers Energy claimed 0.0137 kW per-unit. Verified per-unit is 0.0167.
Midstream	CPE0004	LED Candelabra and Globe	2,982.00	5.37	Consumers Energy claimed 0.0085 kW per-unit. Verified per-unit is 0.0103.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Midstream	CPE0005	LED BR-Series	9,157.00	-49.45	Consumers Energy claimed 0.0157 kW per-unit. Verified per-unit kW is 0.0103.
Midstream	CPE0007	Trim Kit	6,661.00	22.65	Consumers Energy claimed 0.0155 kW for 2 units, 0.0157 kW for 6733 units. Verified per-unit kW is 0.0191. Additional kW rounding difference.
Midstream	CPE0061	2ft LED Tubes	7,664.00	6.90	Consumers Energy claimed 0.0041 kW per-unit. Verified per-unit kW is 0.005.
Midstream	CPE0063	4ft LED Tubes	454,482.00	908.96	Consumers Energy claimed 0.0091 kW per-unit. Verified per-unit kW is 0.0111.
TOTAL				1,595.08	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Table 3-3. PY2022 Business Solutions Per-Unit Mcf Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported Mcf	Variance Description
Business Solutions Custom	CBE0300	Smart Buildings - Electric	72.00	-409.00	Consumers Energy claimed 409 Mcf for 1 unit. Verified per-unit Mcf is 0 Mcf.
Business Solutions Prescriptive	CHG0019	Gas Furnace or RTU Tune-up (GT or EQ 40)	37.00	-2,040.40	Difference in Mcf performance adjustment.
Business Solutions Prescriptive	CHG0028	Level 6 - Process Boiler Tune-up (GT or EQ 1,200 MBH)	29.00	-19,675.41	Difference in Mcf performance adjustment.
Business Solutions Prescriptive	CHG0029	Process Boiler Tune-up Level 5 (GT or EQ 500 and	4.00	-718.55	Consumers Energy claimed 179.7251 Mcf per-unit. Verified per-unit Mcf is 0.0867.
Business Solutions Prescriptive	CHG0030	Process Boiler Tune-up Level 4 (GT or EQ 300 and	1.00	-27.82	Consumers Energy claimed 27.909 Mcf per-unit. Verified per-unit Mcf is 0.0867.
Business Solutions Prescriptive	CHG0226	Level 9 - Process Burner Tune-up (GT or EQ 1,200 MBH)	3.00	-660.81	Consumers Energy claimed 220.314 Mcf per-unit. Verified per-unit Mcf is 0.0439.
Business Solutions Prescriptive	CHG0250	Level 10 - Pool and Spa Boiler Tune-Up (300-499 MBH)	2.00	-94.92	Consumers Energy claimed 47.618 Mcf per-unit. Verified per-unit Mcf is 0.1602.
Business Solutions Prescriptive	CHG0251	Level 11 - Pool and Spa Boiler Tune-Up (500-1,999 MBH)	1.00	-122.99	Consumers Energy claimed 123.15 Mcf per-unit. Verified per-unit Mcf is 0.1602.
Business Solutions Prescriptive	CHG0276	High Efficiency Furnace d120 MBH 92% AFUE (EOY Incentive)	104.00	15.31	Consumers Energy claimed 0 Mcf per-unit. Verified per-unit Mcf is 0.1472.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported Mcf	Variance Description
Business Solutions Prescriptive	CHG0279	High Efficiency Furnace d120 MBH 95% AFUE	81.00	-1,300.08	Consumers Energy claimed 0 Mcf for 2 units, 7.6986 Mcf for 4 units, 8.4882 Mcf for 3 units, 11.6466 Mcf for 5 units, 15.5946 Mcf for 32 units, 17.1738 Mcf for 2 units, 19.1478 Mcf for 1 unit, 19.5426 Mcf for 24 units, 21.5166 Mcf for 4 units, 23.4906 Mcf for 4 units. Verified per-unit Mcf is 0.1974.
Business Solutions Prescriptive	CHG0280	High Efficiency Furnace GT120 MBH 95% AFU (EOY Incentive)	133.00	-0.85	Consumers Energy claimed 0 Mcf for 132 units, 19.6824 Mcf for 1 unit. Verified per-unit Mcf is 0.1416.
Business Solutions Prescriptive	CHG0283	Process Boiler Tune-up Level 6 (GT or EQ 10,000 MBH)	11,726.00	-1,107.28	Consumers Energy claimed 0.0886 Mcf for 11725 units, 1085.0842 Mcf for 1 unit. Verified per-unit Mcf is 0.0867.
Business Solutions Prescriptive	CHG0285	Process Boiler Tune-up Level 4 (300 to 2,999 MBH)	2.00	-315.33	Consumers Energy claimed 157.7523 Mcf per-unit. Verified per-unit Mcf is 0.0867.
Midstream	CPC0004	DCV 0-2,000	1.00	44.57	Consumers Energy claimed 22.6971 Mcf per-unit. Verified per-unit Mcf is 67.2686.
Midstream	CPC0007	DCV 8,001-24,000 sq ft	5.00	4,130.29	Consumers Energy claimed 63.0727 Mcf for 3 units, 363.1542 Mcf for 2 units. Verified per-unit Mcf is 1009.163.
TOTAL				-22,283.27	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

3.2 Small Business Solutions

The results presented in this section of the report summarize variances found by the certification team associated with the PY2022 Small Business Solutions sector. As a note, the Small Business Core product uses custom savings; as previously discussed, any inputs to the custom savings are not assessed here, as they are covered as part of impact evaluations (the results of which are applied as GAFs).

Table 3-4 summarizes the variances for electric energy (kWh) savings, Table 3-5 summarizes the variances for electric demand (kW) savings, and Table 3-6 summarizes the variances for Mcf savings for this product.

Table 3-4. PY2022 Small Business Solutions Per-Unit Electric Energy (kWh) Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kWh	Variance Description
Online Marketplace	CDE0394	15W A19 2700K LED - 6pk	70.00	0.05	Consumers Energy claimed 995.8001 kWh per-unit. Verified per-unit kWh is 995.8008.
Online Marketplace	CDE0410	Ultra Performance Pre-rinse Sprayer (Electric)	318.00	-14,605.74	Consumers Energy claimed 1527.78 kWh per-unit. Verified per-unit kWh is 1481.85.
Online Marketplace	CDE0422	0.5 gpm Bath Aerator - Electric	3,527.00	110,089.31	Consumers Energy claimed 1149.5603 kWh per-unit. Verified per-unit kWh is 1180.7736.
Online Marketplace	CDE0423	1 gpm Bath Aerator - Electric	25.00	-813.48	Consumers Energy claimed 1238.85 kWh per-unit. Verified per-unit kWh is 1206.3108.
Small Business Assessment	CDC0058	Programmable Thermostats -- Combination Customers	44.00	19,919.04	Savings were not appropriately weighted to reflect Q4 values.
Small Business Assessment	CDE0058	Programmable Thermostats	150.00	277,689.39	Savings were not appropriately weighted to reflect Q4 values.
Small Business Assessment	CDE0111	Electric Low-Flow Faucet Aerators LT 1.5 gpm (Kitchen)	437.00	47,781.58	Consumers Energy claimed 169.66 kWh per-unit. Verified per-unit kWh is 279.
Small Business Assessment	CDE0418	0.5 gpm Private Bath Aerator - Electric	141.00	896.76	Consumers Energy claimed 234 kWh per-unit. Verified per-unit kWh is 240.36.
Small Business Assessment	CDE0420	1 gpm Bath Aerator - Electric	122.00	4,102.86	Consumers Energy claimed 1238.85 kWh per-unit. Verified per-unit kWh is 1272.48.
TOTAL				445,059.77	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker.

Table 3-5. PY2022 Small Business Solutions Per-Unit Electric Demand (kW) Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Online Marketplace	CDE0351	3/4" W X 1/2"" Pipe Insulation (6 Pieces) - Electric	637.00	-0.06	Consumers Energy claimed 0.0918 kW per-unit. Verified per-unit kW is 0.0917.
Online Marketplace	CDE0352	3/4" W X 3/4"" Pipe Insulation (6 Pieces) - Electric	747.00	-0.07	Consumers Energy claimed 0.0918 kW per-unit. Verified per-unit kW is 0.0917.
Online Marketplace	CDE0391	5W Candelabra 2700K LED - 6pk	72.00	1.32	Consumers Energy claimed 0.0852 kW per-unit. Verified per-unit kW is 0.1036.
Online Marketplace	CDE0392	6W Globe 2700K LED - 4pk	17.00	0.24	Consumers Energy claimed 0.0648 kW per-unit. Verified per-unit kW is 0.0788.
Online Marketplace	CDE0393	11W A19 4000K LED - 6pk	150.00	3.59	Consumers Energy claimed 0.1104 kW per-unit. Verified per-unit kW is 0.1343.
Online Marketplace	CDE0404	9W A19 LED (60W equiv.) 2700K - 6pk	673.00	16.08	Consumers Energy claimed 0.1104 kW per-unit. Verified per-unit kW is 0.1343.
Online Marketplace	CDE0405	9W A19 LED (60W equiv.) 4000K - 6pk	1,330.00	31.79	Consumers Energy claimed 0.1104 kW per-unit. Verified per-unit kW is 0.1343.
Online Marketplace	CDE0406	11W A19 LED (75W equiv.) 2700K - 6pk	530.00	12.67	Consumers Energy claimed 0.1104 kW per-unit. Verified per-unit kW is 0.1343.
Online Marketplace	CDE0407	1L 4' LED Tube - 10pk	26.00	0.60	Consumers Energy claimed 0.107 kW per-unit. Verified per-unit kW is 0.1301.
Online Marketplace	CDE0423	1 gpm Bath Aerator - Electric	25.00	-0.18	Consumers Energy claimed 0.141 kW per-unit. Verified per-unit kW is 0.1337.
Online Marketplace	CDE0437	Direct Install Kits 2022	46,601.00	205.04	Consumers Energy claimed 0.1855 kW per-unit. Verified per-unit kW is 0.1899.

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Residential Lighting Carryover	CDE0204	LED Globe	3,893.00	13.63	Consumers Energy claimed 0.0162 kW per-unit. Verified per-unit kW is 0.0197.
Residential Lighting Carryover	CDE0207	LED Candelabra	10,919.00	33.85	Consumers Energy claimed 0.0142 kW per-unit. Verified per-unit kW is 0.0173.
Small Business Assessment	CDC0058	Programmable Thermostats -- Combination Customers	44.00	1.13	Savings were not appropriately weighted to reflect Q4 values.
Small Business Assessment	CDE0045	LED Lighting - 11 W LED Flood Lamp	3,047.00	17.98	Consumers Energy claimed 0.0275 kW per-unit. Verified per-unit kW is 0.0334.
Small Business Assessment	CDE0058	Programmable Thermostats	150.00	0.90	Savings were not appropriately weighted to reflect Q4 values.
Small Business Assessment	CDE0090	3.5 W LED Candelabra	1,262.00	3.91	Consumers Energy claimed 0.0142 kW per-unit. Verified per-unit kW is 0.0173.
Small Business Assessment	CDE0102	LED Lighting - 9.5 W LED Lamps Replacing Incandescent Lights	5,629.00	22.52	Consumers Energy claimed 0.0184 kW per-unit. Verified per-unit kW is 0.0224.
Small Business Assessment	CDE0103	LED Lighting - 6 W LED Lamps Replacing Incandescent Lights	103.00	0.41	Consumers Energy claimed 0.0184 kW per-unit. Verified per-unit kW is 0.0224.
Small Business Assessment	CDE0111	Electric Low-Flow Faucet Aerators LT 1.5 gpm (Kitchen)	437.00	5.72	Consumers Energy claimed 0.0189 kW per-unit. Verified per-unit kW is 0.032.
Small Business Assessment	CDE0210	1L 4' LED Tube Replacing T8 1L 4' Lamp	21,934.00	43.87	Consumers Energy claimed 0.0091 kW per-unit. Verified per-unit kW is 0.0111.
Small Business Assessment	CDE0213	LED Globe	979.00	3.43	Consumers Energy claimed 0.0162 kW per-unit. Verified per-unit kW is 0.0197.
Small Business Assessment	CDE0418	0.5 gpm Private Bath Aerator - Electric	141.00	-0.04	Consumers Energy claimed 0.027 kW per-unit. Verified per-unit kW is 0.0267.

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported kW	Variance Description
Small Business Assessment	CDE0420	1 gpm Bath Aerator - Electric	122.00	0.05	Consumers Energy claimed 0.141 kW per-unit. Verified per-unit kW is 0.1414.
TOTAL				418.38	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker

Table 3-6. PY2022 Small Business Solutions Per-Unit Mcf Savings Variances

Product	Measure Code	Measure Description ^a	Install Quantity	Effect on Reported Mcf	Variance Description
Online Marketplace	CDG0144	3/4" W X 1/2" Pipe Insulation (18 ft) - Gas	324.00	0.16	Consumers Energy claimed 4.3988 Mcf per-unit. Verified per-unit Mcf is 4.3993.
Online Marketplace	CDG0145	3/4" W X 3/4" Pipe Insulation (18 ft) - Gas	351.00	0.18	Consumers Energy claimed 4.3988 Mcf per-unit. Verified per-unit Mcf is 4.3993.
Online Marketplace	CDG0168	1 gpm Bath Aerator - Gas	99.00	-25.97	Consumers Energy claimed 5.0434 Mcf per-unit. Verified per-unit Mcf is 4.7811.
Online Marketplace	CDG0169	Insulating Wraps, 25 Sq Ft	29.00	1.26	Consumers Energy claimed 34.29 Mcf per-unit. Verified per-unit Mcf is 34.3335.
Small Business Assessment	CDC0058	Programmable Thermostats -- Combination Customers	44.00	1,909.67	Savings were not appropriately weighted to reflect Q4 values.
Small Business Assessment	CDG0028	Gas Low-Flow Faucet Aerators LT 1.5gpm (Kitchen)	226.00	118.79	Consumers Energy claimed 0.6724 Mcf per-unit. Verified per-unit Mcf is 1.198.
Small Business Assessment	CDG0058	Programmable Thermostat - Gas Customers	102.00	315.57	Consumers Energy claimed 34.3454 Mcf for 7 units, 35.4734 Mcf for 95 units. Verified per-unit Mcf is 38.4898.
Small Business Assessment	CDG0160	Hot Water Heater Blankets Tier 1 (20-40 gal) - Gas	20.00	-228.83	Consumers Energy claimed 41.6164 Mcf per-unit. Verified per-unit Mcf is 30.1751.
Small Business Assessment	CDG0161	Hot Water Heater Blankets Tier 2 (41-60 gal) - Gas	26.00	-0.29	Consumers Energy claimed 41.6164 Mcf per-unit. Verified per-unit Mcf is 41.6051.
TOTAL				2,090.54	

Table Notes:

- a. Measure descriptions included in the report are taken directly from eTracker.

Consumers Energy
2022 C&I Energy Waste Reduction Certification Report



3 Summary of Savings Variances

3.3 C&I Multifamily Product

The results presented in this section of the report summarize variances found by the certification team associated with the PY2022 C&I Multifamily Product. Table 3-7 summarizes the variances for electric demand (kW) savings for this product. The TRC team found no variances in kWh or Mcf savings for the C&I Multifamily sector.

Table 3-7. PY2022 C&I Multifamily Product Per-Unit Electric Demand (kW) Savings Variances

Product	Measure Code	Measure Description	Install Quantity	Effect on Reported kW	Variance Description
C&I Multifamily	CTE0160	LED A-Series Lamp-50-79W Replacement	136.00	0.54	Consumers Energy claimed 0.0184 kW per-unit. Verified per-unit kW is 0.0224.
C&I Multifamily	CTE0287	LED A-Series Lamp-50-79W Replacement	27.00	0.11	Consumers Energy claimed 0.0184 kW per-unit. Verified per-unit kW is 0.0224.
TOTAL				0.65	

Table Notes:

- Measure descriptions included in the report directly from eTracker.



May 17, 2022



Consumers Energy

Business Energy Waste Reduction Certification Report, Program Year 2022 – Appendices

Prepared for:

Consumers Energy / Joseph Forcillo
One Energy Plaza, Jackson, MI 49201

Prepared by:

TRC / Katie Cary
807 E Roy St. Suite 301, Seattle, WA 98102
kcary@trccompanies.com / 206.388.0987



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This appendix is a deliverable submitted to Consumers Energy as part of a multiyear, independent evaluation contract to conduct impact, process, and market assessment studies of business energy waste reduction products administered by Consumers Energy.

The independent evaluation team includes the following firms:

- ◆ TRC, Contract Lead
- ◆ AEG
- ◆ Driftless Energy
- ◆ PWP Consulting
- ◆ Wirtshafter & Associates
- ◆ Escalent
- ◆ BW Research

The primary project team on this work included:

- ◆ Sagar Deo, Senior Consultant, TRC
- ◆ Bilsay Varcin, Senior Researcher, TRC
- ◆ Jake Scheffrin, Research Associate, TRC
- ◆ Jeremiah Kraft, Director, TRC
- ◆ Lia Tang, Analyst, AEG
- ◆ Katie Chiccarelli, Manager, AEG
- ◆ Natasha Keur, Sr. Project Manager, TRC
- ◆ Angel Moreno, Associate Director, TRC
- ◆ Katie Cary, Managing Consultant, TRC

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Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table of Contents

Table of Contents.....	i
Glossary of Terms.....	iii
A.1 Business Solutions – Custom	A-1
A.2 Business Solutions – Prescriptive.....	A-3
A.3 C&I Request for Proposals	A-26
A.4 Midstream	A-27
A.5 Business Energy Analysis	A-32
A.6 Online Marketplace.....	A-33
A.7 Residential Lighting Carryover.....	A-38
A.8 Small Business Assessments.....	A-39
A.9 Small Business Core	A-44
A.10 C&I Multifamily	A-46
B.1 Measure Details across Sectors	B-1

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Glossary of Terms

Term	Definition
C&I	Commercial and industrial
EWR	Energy waste reduction
EM&V	Evaluation, measurement, and verification
GAF	Gross adjustment factor
kWh	Kilowatt-hour
LED	Light-emitting diodes
Mcf	Thousand cubic feet
Measure	Refers to any equipment or service that aims to save energy. Example: smart thermostat (equipment) or energy assessment (service).
MEMD	Michigan Energy Measure Database. This is a database of approved, prescriptive savings. The measures in this database are approved by the Michigan Public Service Commission and have defined savings, measure lives, and incremental costs.
MPSC	Michigan Public Service Commission. This is the regulatory agency for energy waste reduction programs.
NTG	Net-to-gross
NTGAF	Net-to-gross adjustment factor
PY	Program year

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Appendix A: Savings By Program

Appendix A presents the verified net annual and lifetime savings for each measure installed through each program component within each sector. TRC developed three tables each for every program component, showing the electric energy savings (kWh), demand savings (kW) and gas energy savings (Mcf). The tables also show the Gross Adjustment Factors (GAFs), measure life values, and Net to Gross Adjustment Factors (NTGAFs) used to develop the verified savings for each measure.

A.1 Business Solutions – Custom

Table A-1. Validated Electric Energy (kWh) Savings by Measure (Business Solutions – Custom)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CBE0001	19,026,821	1.142	0.920	19,990,339	14	276,328,317
CBE0300	7,028,240	0.937	0.920	6,058,624	5	30,293,120
CJE0001	588,895	0.937	0.920	507,651	15	7,455,300
CJE0002	70,488	0.937	0.920	60,764	11	693,731
Total	26,714,444			26,617,378		314,770,468

Note: Columns may not sum due to rounding.

Table A-2. Validated Electric Demand (kW) Savings by Measure (Business Solutions – Custom)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CBE0001	2,050.87	1.269	0.920	2,394.35
CBE0300	3.80	0.941	0.920	3.29
CJE0001	53.89	0.941	0.920	46.65
CJE0002	3.90	0.941	0.920	3.38
Total	2,112.46			2,447.67

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-3: Validated Natural Gas (Mcf) Savings by Measure (Business Solutions – Custom)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	$[D] = [A \times B \times C]$	[E]	$[F] = [D \times E]$
CBG0001	324,741	0.970	0.920	289,798	17	4,939,777
CBG0300	12,436	0.986	0.920	11,281	5	56,405
Total	337,177			301,079		4,996,182

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.2 Business Solutions – Prescriptive

Table A-4. Validated Electric Energy (kWh) Savings by Measure (Business Solutions – Prescriptive)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CAE0001	1,314,940	0.937	0.920	1,133,531	15	17,002,963
CAE0002	43,587	0.937	0.920	37,574	10	375,739
CAE0003	76,360	0.937	0.920	65,825	25	1,645,634
CAE0004	14,234	0.937	0.920	12,270	10	122,703
CAE0005	27,261	0.937	0.920	23,500	5	117,500
CAE0007	1,423,081	0.937	0.920	1,226,753	1	1,226,753
CAE0009	5,915	0.937	0.920	5,099	10	50,991
CAE0011	96,649	0.937	0.920	83,315	10	833,151
CAE0012	79,775	0.937	0.920	68,769	10	687,692
CAE0015	88,400	0.937	0.920	76,204	13	990,656
CAE0016	14,459	0.937	0.920	12,464	15	186,967
CAE0017	298,066	0.937	0.920	256,945	15	3,854,173
CAE0021	23,912	0.937	0.920	20,613	10	206,131
CAE0022	5,705	0.937	0.920	4,918	15	73,763
CAE0023	253,226	0.937	0.920	218,291	15	3,274,370
CAE0024	215,521	0.937	0.920	185,788	15	2,786,819
CAE0029	85,404	0.937	0.920	73,622	15	1,104,331
CAE0031	56,619	0.937	0.920	48,808	5	244,039
CAE0032	259,972	0.937	0.920	224,106	15	3,361,595
CAE0034	40,022	0.937	0.920	34,500	10	345,004
CAE0037	117,480	0.937	0.920	101,272	10	1,012,725
CAE0038	2,105,200	0.937	0.920	1,814,767	1	1,814,767
CAE0039	2,858,466	0.937	0.920	2,464,112	15	36,961,674

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CAE0041	392,931	0.937	0.920	338,722	15	5,080,834
CAE0042	173,600	0.937	0.920	149,650	15	2,244,752
CAE0046	13,365	0.937	0.920	11,521	15	172,817
CAE0054	45,105	0.937	0.920	38,882	15	583,235
CAE0065	255,140	0.937	0.920	219,940	25	5,498,511
CAE0067	1,416,062	0.937	0.920	1,220,702	1	1,220,702
CAE0068	3,860,519	0.937	0.920	3,327,922	1	3,327,922
CAE0070	18,040	0.937	0.920	15,551	15	233,268
CAE0071	77,809	0.937	0.920	67,074	15	1,006,117
CAE0072	76,670	0.937	0.920	66,093	15	991,389
CAE0074	306,714	0.937	0.920	264,400	15	3,965,996
CAE0075	324,744	0.937	0.920	279,942	15	4,199,135
CAE0076	35,127,774	0.937	0.920	30,281,546	15	454,223,194
CAE0080	974,256	0.937	0.920	839,848	15	12,597,715
CAE0085	1,177,251	0.937	0.920	1,014,837	1	1,014,837
CAE0086	3,622,941	0.937	0.920	3,123,120	1	3,123,120
CAE0087	27,450	0.937	0.920	23,663	20	473,260
CAE0088	17,800	0.937	0.920	15,344	15	230,165
CAE0089	96,120	0.937	0.920	82,859	15	1,242,889
CAE0090	120,955	0.937	0.920	104,268	15	1,564,021
CAE0095	130,802	0.937	0.920	112,756	10	1,127,562
CAE0096	56,831	0.937	0.920	48,991	10	489,906
CAE0097	6,315	0.937	0.920	5,443	10	54,434
CAE0098	1,930,457	0.937	0.920	1,664,131	10	16,641,308
CBC0003	3,111	0.937	0.920	2,682	4	10,727

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CBC0004	8,308	0.937	0.920	7,162	4	28,648
CBC0302	1,190,241	0.937	0.920	1,026,035	5	5,130,177
CBE0002	9,629	0.937	0.920	8,301	20	166,013
CBE0003	32,040	0.937	0.920	27,620	20	552,394
CBE0301	114,809	0.937	0.920	98,970	5	494,850
CBE0304	1,203,945	0.937	0.920	1,037,849	5	5,189,244
CEB0004	-64,495	0.937	0.920	-55,597	15	-833,956
CEB0007	1,117,761	0.937	0.920	963,555	10	9,635,548
CEE0005	119,821	0.937	0.920	103,291	9	929,616
CEE0006	163,464	0.937	0.920	140,912	15	2,113,687
CFE0006	13,648	0.937	0.920	11,765	6	70,591
CFE0009	113,323	0.937	0.920	97,689	13	1,269,957
CHC0014	168,195	0.937	0.920	144,991	15	2,174,868
CHC0017	3,936,516	0.937	0.920	3,393,434	20	67,868,689
CHC0018	19,251	0.937	0.920	16,595	15	248,921
CHC0072	546	0.937	0.920	470	9	4,234
CHC0074	6,356	0.937	0.920	5,479	15	82,183
CHC0082	275,394	0.937	0.920	237,401	15	3,561,013
CHE0001	91,932	0.937	0.920	79,249	15	1,188,738
CHE0003	64,110	0.937	0.920	55,265	15	828,981
CHE0004	97,450	0.937	0.920	84,006	15	1,260,087
CHE0027	-7,118	0.937	0.920	-6,136	15	-92,039
CHE0028	39,731	0.937	0.920	34,250	15	513,744
CHE0029	22,523	0.937	0.920	19,415	15	291,231
CHE0061	72,232	0.937	0.920	62,267	15	934,005

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CHE0063	32,647	0.937	0.920	28,143	15	422,139
CHE0065	713,059	0.937	0.920	614,685	5	3,073,425
CHE0066	52,744	0.937	0.920	45,467	5	227,337
CHE0067	1,182,600	0.937	0.920	1,019,449	20	20,388,972
CHE0069	58,984	0.937	0.920	50,847	15	762,699
CHE0070	64,575	0.937	0.920	55,667	15	834,999
CHE0113	43,184	0.937	0.920	37,227	15	558,400
CHE0114	54,032	0.937	0.920	46,578	15	698,666
CHE0118	161,372	0.937	0.920	139,109	15	2,086,636
CHE0121	7,296	0.937	0.920	6,289	15	94,342
CHE0122	41,076	0.937	0.920	35,409	15	531,137
CHE0123	36,516	0.937	0.920	31,478	15	472,174
CHE0129	2,624	0.937	0.920	2,262	9	20,356
CHE0135	192,653	0.937	0.920	166,074	15	2,491,115
CHE0136	5,286	0.937	0.920	4,557	15	68,353
CHE0141	1,978	0.937	0.920	1,705	15	25,571
CHE0142	283,005	0.937	0.920	243,962	15	3,659,424
CHE0144	1,123	0.937	0.920	968	10	9,678
CHE0145	465,996	0.937	0.920	401,707	5	2,008,534
CHE0146	6,593,747	0.937	0.920	5,684,074	5	28,420,370
CHE0148	532	0.937	0.920	458	15	6,876
CHE0150	1,704	0.937	0.920	1,469	10	14,692
CHE0156	24,692	0.937	0.920	21,285	20	425,707
CHE0157	6,582	0.937	0.920	5,674	20	113,484
CHE0158	51,620	0.937	0.920	44,499	20	889,977

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CHE0159	301,840	0.937	0.920	260,198	20	5,203,961
CHE0170	9,417	0.937	0.920	8,118	20	162,351
CHE0183	91,654	0.937	0.920	79,010	20	1,580,196
CHE0186	14,266	0.937	0.920	12,298	20	245,955
CHE0187	102,860	0.937	0.920	88,669	20	1,773,384
CHE0189	2,389	0.937	0.920	2,059	15	30,887
CHE0194	102,599	0.937	0.920	88,444	15	1,326,661
CHE0195	16,390	0.937	0.920	14,129	15	211,933
CHE0202	471	0.937	0.920	406	15	6,090
CHG0221	776	0.937	0.920	669	15	10,040
CHG0222	2,271,152	0.937	0.920	1,957,824	15	29,367,358
CLE0017	50,828	0.937	0.920	43,815	10	438,155
CLE0030	454,111	0.937	0.920	391,462	15	5,871,930
CLE0031	60,277	0.937	0.920	51,961	15	779,418
CLE0033	230,745	0.937	0.920	198,911	12	2,386,933
CLE0050	62,916	0.937	0.920	54,237	8	433,892
CLE0056	3,284	0.937	0.920	2,831	18	50,957
CLE0057	10,022	0.937	0.920	8,639	18	155,505
CLE0058	675,413	0.937	0.920	582,233	18	10,480,193
CLE0059	1,552,399	0.937	0.920	1,338,230	18	24,088,134
CLE0060	53,815	0.937	0.920	46,390	18	835,025
CLE0062	34,218	0.937	0.920	29,497	18	530,947
CLE0065	17,683	0.937	0.920	15,243	9	137,189
CLE0066	244	0.937	0.920	210	8	1,680
CLE0069	5,417,311	0.937	0.920	4,669,939	11	51,369,327

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CLE0072	445,954	0.937	0.920	384,430	16	6,150,884
CLE0083	146,870	0.937	0.920	126,608	18	2,278,942
CLE0085	4,037,929	0.937	0.920	3,480,857	16	55,693,705
CLE0086	9,239,057	0.937	0.920	7,964,437	16	127,430,991
CLE0087	374,296	0.937	0.920	322,658	18	5,807,846
CLE0088	13,490	0.937	0.920	11,629	18	209,323
CLE0095	78,196	0.937	0.920	67,408	10	674,081
CLE0097	183,867	0.937	0.920	158,500	18	2,853,008
CLE0098	143,252	0.937	0.920	123,489	18	2,222,804
CLE0099	73	0.937	0.920	63	18	1,135
CLE0100	12,707	0.937	0.920	10,954	18	197,168
CLE0102	170,431	0.937	0.920	146,918	16	2,350,694
CLE0103	1,235,653	0.937	0.920	1,065,182	16	17,042,919
CLE0104	11,765,570	0.937	0.920	10,142,392	16	162,278,270
CLE0105	13,314,328	0.937	0.920	11,477,483	16	183,639,735
CLE0106	71,321	0.937	0.920	61,482	18	1,106,668
CLE0107	5,516,513	0.937	0.920	4,755,455	18	85,598,194
CLE0108	11,731,664	0.937	0.920	10,113,163	6	60,678,980
CLE0109	1,768,153	0.937	0.920	1,524,219	6	9,145,314
CLE0110	2,828,704	0.937	0.920	2,438,456	6	14,630,736
CLE0181	36,124,523	0.937	0.920	31,140,784	11	342,548,626
CLE0182	10,816,490	0.937	0.920	9,324,247	8	70,864,278
CMC0002	2,173,794	0.937	0.920	1,873,898	20	37,477,951
CME0006	1,048,080	0.937	0.920	903,487	15	13,552,306
CME0013	486,543	0.937	0.920	419,419	15	6,291,289

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CME0014	867,114	0.937	0.920	747,487	20	14,949,747
CME0015	176,092	0.937	0.920	151,798	15	2,276,975
CME0020	150,742	0.937	0.920	129,946	15	1,949,186
CME0032	5,980	0.937	0.920	5,155	15	77,325
CME0033	58,500	0.937	0.920	50,429	15	756,440
CME0034	10,875	0.937	0.920	9,375	15	140,620
CME0035	6,944	0.937	0.920	5,986	15	89,790
CME0044	33,729	0.937	0.920	29,076	15	436,139
CME0052	70,688	0.937	0.920	60,935	10	609,355
CME0054	733,658	0.937	0.920	632,443	15	9,486,639
CME0055	137,611	0.937	0.920	118,626	15	1,779,389
CME0056	394,742	0.937	0.920	340,284	15	5,104,257
CME0057	738,012	0.937	0.920	636,196	15	9,542,940
CME0058	23,900	0.937	0.920	20,603	15	309,041
CME0060	9,420	0.937	0.920	8,120	15	121,806
CME0062	189,126	0.937	0.920	163,034	15	2,445,507
CME0064	224,620	0.937	0.920	193,631	15	2,904,468
CME0065	7,756	0.937	0.920	6,686	15	100,290
CME0066	2,057	0.937	0.920	1,773	15	26,593
CME0067	21,375	0.937	0.920	18,426	12	221,113
CME0071	37,740	0.937	0.920	32,533	15	488,001
CME0072	388,836	0.937	0.920	335,192	20	6,703,840
CME0073	6,216	0.937	0.920	5,358	10	53,584
CME0074	110,712	0.937	0.920	95,438	15	1,431,573
CME0075	538,054	0.937	0.920	463,824	20	9,276,483

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CRC0011	17,418	0.937	0.920	15,015	15	225,225
CSC0039	730	0.937	0.920	630	30	18,890
CSC0042	94,138	0.937	0.920	81,151	5	405,754
CSC0051	9,121	0.937	0.920	7,863	15	117,943
CSC0106	4,325	0.937	0.920	3,728	30	111,852
CSE0001	6,400	0.937	0.920	5,517	10	55,171
CSE0002	207,204	0.937	0.920	178,618	8	1,428,945
CSE0007	12,159	0.937	0.920	10,482	5	52,409
CSE0010	11,370	0.937	0.920	9,802	7	68,612
CSE0011	96,149	0.937	0.920	82,884	12	994,609
CSE0012	64	0.937	0.920	55	5	276
CSE0013	350,616	0.937	0.920	302,245	16	4,835,920
CSE0017	7,190,649	0.937	0.920	6,198,627	15	92,979,406
CSE0020	31,312	0.937	0.920	26,992	15	404,883
CSE0026	13,860	0.937	0.920	11,948	5	59,739
CSE0027	61,992	0.937	0.920	53,440	12	641,275
CSE0045	61,846	0.937	0.920	53,314	20	1,066,275
CSE0046	29,200	0.937	0.920	25,172	20	503,431
CSE0047	10,752	0.937	0.920	9,269	20	185,373
CSE0049	1,100,606	0.937	0.920	948,767	12	11,385,201
CSE0067	332,039	0.937	0.920	286,231	12	3,434,771
CSE0087	3,465	0.937	0.920	2,987	5	14,935
CSE0088	796,320	0.937	0.920	686,460	15	10,296,895
CSE0089	2,042,040	0.937	0.920	1,760,320	15	26,404,802
CSE0090	23,535	0.937	0.920	20,288	5	101,438

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CSE0092	143,368	0.937	0.920	123,589	5	617,946
CSE0094	39,207	0.937	0.920	33,798	10	337,980
CSE0098	32,884	0.937	0.920	28,348	10	283,475
CSE0102	12,488	0.937	0.920	10,765	15	161,471
CSE0104	86,336	0.937	0.920	74,425	7	520,978
CSE0105	17,506	0.937	0.920	15,091	7	105,639
CSE0106	580,260	0.937	0.920	500,207	7	3,501,452
CSE0110	105,336	0.937	0.920	90,804	10	908,038
CSE0112	748,961	0.937	0.920	645,634	12	7,747,608
CSE0113	4,871,823	0.937	0.920	4,199,706	5	20,998,531
CSE0121	320,315	0.937	0.920	276,125	15	4,141,868
CSE0129	1,434,111	0.937	0.920	1,236,261	20	24,725,216
CSE0130	2,561,922	0.937	0.920	2,208,479	20	44,169,585
CSE0131	17,370	0.937	0.920	14,974	10	149,736
CSE0132	74,091	0.937	0.920	63,869	20	1,277,380
CSE0133	2,394,609	0.937	0.920	2,064,249	20	41,284,983
CSE0144	1,042,805	0.937	0.920	898,940	20	17,978,792
CSE0148	109,798	0.937	0.920	94,650	15	1,419,750
CSE0149	11,453	0.937	0.920	9,873	15	148,091
CSE0161	30,060	0.937	0.920	25,913	15	388,694
CSE0163	3,792	0.937	0.920	3,269	15	49,033
CSE0166	4,617	0.937	0.920	3,980	10	39,804
CSE0168	9,904	0.937	0.920	8,537	15	128,059
CSE0171	329,939	0.937	0.920	284,420	10	2,844,204
CSE0172	1,122,157	0.937	0.920	967,344	10	9,673,444

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CSE0173	170,789	0.937	0.920	147,227	10	1,472,272
CSE0178	685	0.937	0.920	590	5	2,952
CSE0179	111,516	0.937	0.920	96,132	3	288,395
CSE0183	753	0.937	0.920	649	10	6,494
CSE0184	2,732	0.937	0.920	2,355	10	23,548
CSE0186	7,268,869	0.937	0.920	6,266,056	10	62,660,561
CSE0187	10,522,356	0.937	0.920	9,070,692	11	99,777,610
CSE0188	930,246	0.937	0.920	801,910	8	6,094,512
CSE0189	217,080	0.937	0.920	187,132	20	3,742,633
CSE0190	56,404	0.937	0.920	48,622	20	972,449
CSG0029	30,880	0.937	0.920	26,620	12	319,438
CSG0031	3,804	0.937	0.920	3,279	15	49,192
CSG0032	8,023	0.937	0.920	6,916	30	207,475
CSG0034	207	0.937	0.920	179	30	5,363
CSG0040	100	0.937	0.920	86	30	2,587
CSG0042	97	0.937	0.920	84	30	2,511
CSG0044	44	0.937	0.920	38	30	1,141
CSG0049	2,397	0.937	0.920	2,066	15	30,993
CWE0025	15,030	0.937	0.920	12,956	15	194,347
CWE0026	10,016	0.937	0.920	8,634	15	129,513
CWE0029	3,995,176	0.937	0.920	3,444,002	5	17,220,010
Total	260,814,919			224,832,893		2,723,599,275

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-5. Validated Electric Demand (kW) Savings by Measure (Business Solutions – Prescriptive)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CAE0001	182.58	0.941	0.920	158.06
CAE0002	6.65	0.941	0.920	5.76
CAE0003	10.58	0.941	0.920	9.16
CAE0004	1.98	0.941	0.920	1.71
CAE0005	3.78	0.941	0.920	3.28
CAE0007	197.14	0.941	0.920	170.67
CAE0009	0.82	0.941	0.920	0.71
CAE0011	15.55	0.941	0.920	13.46
CAE0012	12.64	0.941	0.920	10.95
CAE0015	12.20	0.941	0.920	10.56
CAE0016	2.00	0.941	0.920	1.73
CAE0017	41.40	0.941	0.920	35.84
CAE0021	7.78	0.941	0.920	6.74
CAE0022	1.95	0.941	0.920	1.69
CAE0023	86.43	0.941	0.920	74.82
CAE0024	22.35	0.941	0.920	19.35
CAE0029	11.84	0.941	0.920	10.25
CAE0031	7.86	0.941	0.920	6.80
CAE0032	35.99	0.941	0.920	31.16
CAE0034	41.64	0.941	0.920	36.05
CAE0037	16.28	0.941	0.920	14.09
CAE0038	291.65	0.941	0.920	252.49
CAE0039	314.08	0.941	0.920	271.90
CAE0041	85.11	0.941	0.920	73.68

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CAE0042	26.88	0.941	0.920	23.27
CAE0046	2.90	0.941	0.920	2.51
CAE0054	16.92	0.941	0.920	14.64
CAE0065	35.42	0.941	0.920	30.66
CAE0067	196.29	0.941	0.920	169.93
CAE0068	526.61	0.941	0.920	455.90
CAE0070	6.77	0.941	0.920	5.86
CAE0071	19.46	0.941	0.920	16.85
CAE0072	14.38	0.941	0.920	12.45
CAE0074	115.02	0.941	0.920	99.58
CAE0075	81.19	0.941	0.920	70.29
CAE0076	6,586.70	0.941	0.920	5,702.24
CAE0080	182.66	0.941	0.920	158.14
CAE0085	163.15	0.941	0.920	141.24
CAE0086	502.21	0.941	0.920	434.77
CAE0087	3.80	0.941	0.920	3.29
CAE0088	7.40	0.941	0.920	6.41
CAE0089	19.98	0.941	0.920	17.30
CAE0090	12.58	0.941	0.920	10.89
CAE0095	196.04	0.941	0.920	169.72
CAE0096	70.98	0.941	0.920	61.45
CAE0097	6.76	0.941	0.920	5.85
CAE0098	1,808.30	0.941	0.920	1,565.48
CBC0003	0.32	0.941	0.920	0.28
CBC0004	0.85	0.941	0.920	0.74

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B x C]
CBE0002	6.77	0.941	0.920	5.86
CEB0007	162.14	0.941	0.920	140.36
CEE0006	-18.29	0.941	0.920	-15.83
CFE0009	25.48	0.941	0.920	22.05
CHC0017	223.56	0.941	0.920	193.54
CHC0082	60.70	0.941	0.920	52.55
CHE0001	35.54	0.941	0.920	30.77
CHE0003	94.81	0.941	0.920	82.08
CHE0004	99.31	0.941	0.920	85.98
CHE0028	55.57	0.941	0.920	48.10
CHE0029	77.96	0.941	0.920	67.49
CHE0065	84.82	0.941	0.920	73.43
CHE0066	0.16	0.941	0.920	0.14
CHE0067	167.80	0.941	0.920	145.27
CHE0069	-0.03	0.941	0.920	-0.02
CHE0070	0.02	0.941	0.920	0.02
CHE0113	5.68	0.941	0.920	4.91
CHE0114	7.09	0.941	0.920	6.14
CHE0136	1.19	0.941	0.920	1.03
CHE0144	0.16	0.941	0.920	0.14
CHE0145	170.48	0.941	0.920	147.59
CHE0146	4,421.63	0.941	0.920	3,827.89
CHE0150	0.50	0.941	0.920	0.43
CHE0159	21.91	0.941	0.920	18.97
CHE0170	3.52	0.941	0.920	3.05

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B x C]
CHE0183	19.66	0.941	0.920	17.02
CHE0186	10.92	0.941	0.920	9.45
CHE0187	19.53	0.941	0.920	16.91
CHE0189	2.12	0.941	0.920	1.84
CHE0194	19.08	0.941	0.920	16.51
CHE0195	3.81	0.941	0.920	3.30
CHE0202	0.12	0.941	0.920	0.11
CLE0030	103.27	0.941	0.920	89.40
CLE0031	11.12	0.941	0.920	9.62
CLE0033	55.33	0.941	0.920	47.90
CLE0056	0.73	0.941	0.920	0.63
CLE0057	2.24	0.941	0.920	1.94
CLE0058	151.71	0.941	0.920	131.34
CLE0059	348.61	0.941	0.920	301.80
CLE0060	12.04	0.941	0.920	10.42
CLE0062	7.64	0.941	0.920	6.62
CLE0065	1.84	0.941	0.920	1.59
CLE0069	1,236.83	0.941	0.920	1,070.75
CLE0072	50.91	0.941	0.920	44.07
CLE0083	32.75	0.941	0.920	28.35
CLE0085	137.78	0.941	0.920	119.28
CLE0086	677.46	0.941	0.920	586.49
CLE0087	85.66	0.941	0.920	74.15
CLE0088	3.08	0.941	0.920	2.66
CLE0097	33.67	0.941	0.920	29.15

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CLE0098	26.29	0.941	0.920	22.76
CLE0099	0.01	0.941	0.920	0.01
CLE0100	2.34	0.941	0.920	2.03
CLE0102	40.97	0.941	0.920	35.47
CLE0103	297.03	0.941	0.920	257.15
CLE0104	2,828.26	0.941	0.920	2,448.48
CLE0106	16.03	0.941	0.920	13.88
CLE0107	1,240.13	0.941	0.920	1,073.61
CLE0108	1,339.23	0.941	0.920	1,159.40
CLE0109	201.84	0.941	0.920	174.74
CLE0110	353.59	0.941	0.920	306.11
CLE0181	8,072.52	0.941	0.920	6,988.54
CLE0182	1,608.40	0.941	0.920	1,392.42
CME0006	221.40	0.941	0.920	191.67
CME0013	99.15	0.941	0.920	85.83
CME0014	78.48	0.941	0.920	67.94
CME0015	36.41	0.941	0.920	31.52
CME0020	18.56	0.941	0.920	16.07
CME0032	4.67	0.941	0.920	4.04
CME0033	15.22	0.941	0.920	13.17
CME0034	8.48	0.941	0.920	7.34
CME0035	1.81	0.941	0.920	1.57
CME0044	3.85	0.941	0.920	3.33
CME0052	73.55	0.941	0.920	63.67
CME0054	114.96	0.941	0.920	99.53

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B x C]
CME0055	20.88	0.941	0.920	18.07
CME0056	26.43	0.941	0.920	22.88
CME0057	42.05	0.941	0.920	36.40
CME0058	8.23	0.941	0.920	7.12
CME0060	1.65	0.941	0.920	1.43
CME0062	53.54	0.941	0.920	46.35
CME0067	2.97	0.941	0.920	2.57
CME0071	11.87	0.941	0.920	10.27
CME0072	88.23	0.941	0.920	76.38
CME0073	1.40	0.941	0.920	1.21
CME0074	50.12	0.941	0.920	43.39
CME0075	113.52	0.941	0.920	98.28
CRC0011	44.57	0.941	0.920	38.59
CSC0042	10.75	0.941	0.920	9.30
CSE0001	0.34	0.941	0.920	0.29
CSE0002	16.37	0.941	0.920	14.17
CSE0010	0.26	0.941	0.920	0.22
CSE0011	0.37	0.941	0.920	0.32
CSE0013	29.22	0.941	0.920	25.29
CSE0017	1,616.48	0.941	0.920	1,399.42
CSE0020	3.21	0.941	0.920	2.78
CSE0026	1.44	0.941	0.920	1.24
CSE0027	12.96	0.941	0.920	11.22
CSE0067	34.11	0.941	0.920	29.53
CSE0087	0.36	0.941	0.920	0.31

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CSE0089	210.04	0.941	0.920	181.83
CSE0090	2.69	0.941	0.920	2.33
CSE0094	7.73	0.941	0.920	6.69
CSE0098	12.04	0.941	0.920	10.42
CSE0102	14.58	0.941	0.920	12.62
CSE0104	27.38	0.941	0.920	23.70
CSE0105	5.54	0.941	0.920	4.80
CSE0106	184.05	0.941	0.920	159.34
CSE0112	187.01	0.941	0.920	161.90
CSE0113	1,171.65	0.941	0.920	1,014.32
CSE0121	105.71	0.941	0.920	91.52
CSE0129	302.56	0.941	0.920	261.93
CSE0130	539.35	0.941	0.920	466.93
CSE0131	1.39	0.941	0.920	1.20
CSE0132	6.96	0.941	0.920	6.02
CSE0133	332.70	0.941	0.920	288.02
CSE0148	12.59	0.941	0.920	10.90
CSE0161	42.80	0.941	0.920	37.05
CSE0166	0.31	0.941	0.920	0.26
CSE0168	1.91	0.941	0.920	1.66
CSE0171	8.93	0.941	0.920	7.73
CSE0172	30.37	0.941	0.920	26.29
CSE0173	4.65	0.941	0.920	4.02
CSE0179	24.87	0.941	0.920	21.53
CSE0183	0.68	0.941	0.920	0.59

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CSE0184	2.46	0.941	0.920	2.13
CSE0186	946.72	0.941	0.920	819.60
CSE0187	1,921.89	0.941	0.920	1,663.82
CSE0188	141.59	0.941	0.920	122.58
CSE0189	45.24	0.941	0.920	39.17
CSE0190	11.93	0.941	0.920	10.33
CSG0029	3.52	0.941	0.920	3.05
CSG0032	12.77	0.941	0.920	11.06
CWE0025	3.42	0.941	0.920	2.96
CWE0026	2.28	0.941	0.920	1.97
CWE0029	2,540.06	0.941	0.920	2,198.98
Total	48,515.08			42,000.47

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-6: Validated Natural Gas (Mcf) Savings by Measure (Business Solutions – Prescriptive)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B x C]	[E]	[F] = [D x E]
CAG0006	2,215	0.986	0.920	2,010	15	30,145
CBC0302	5,875	0.986	0.920	5,329	5	26,647
CBE0002	-129	0.986	0.920	-117	20	-2,334
CBG0002	282	0.986	0.920	256	12	3,074
CBG0301	17,181	0.986	0.920	15,585	5	77,926
CBG0304	12,393	0.986	0.920	11,242	5	56,210
CEB0004	9,650	0.986	0.920	8,754	15	131,307
CEB0007	18,245	0.986	0.920	16,550	10	165,504
CHC0014	3,474	0.986	0.920	3,151	15	47,263
CHC0017	36,441	0.986	0.920	33,056	20	661,126
CHC0018	885	0.986	0.920	803	15	12,043
CHC0072	28	0.986	0.920	26	9	233
CHC0074	3,317	0.986	0.920	3,009	15	45,132
CHC0082	3,695	0.986	0.920	3,352	15	50,277
CHG0005	3,094	0.986	0.920	2,807	15	42,101
CHG0010	8,090	0.986	0.920	7,339	15	110,081
CHG0012	2,371	0.986	0.920	2,150	8	17,203
CHG0013	3,109	0.986	0.920	2,820	15	42,306
CHG0016	31,976	0.986	0.920	29,006	20	580,120
CHG0017	594	0.986	0.920	539	15	8,085
CHG0019	1	0.986	0.920	1	2	2
CHG0021	61	0.986	0.920	56	2	111
CHG0023	515	0.986	0.920	468	2	935
CHG0024	2,139	0.986	0.920	1,941	2	3,882

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net Mcf Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime Mcf Savings [F] = [D x E]
CHG0025	13,650	0.986	0.920	12,382	2	24,764
CHG0026	968	0.986	0.920	878	20	17,565
CHG0028	3	0.986	0.920	2	2	5
CHG0053	23,609	0.986	0.920	21,417	15	321,249
CHG0055	31,395	0.986	0.920	28,479	20	569,581
CHG0059	447	0.986	0.920	405	15	6,076
CHG0060	5,938	0.986	0.920	5,387	20	107,735
CHG0116	898	0.986	0.920	815	15	12,225
CHG0207	21,864	0.986	0.920	19,833	15	297,495
CHG0208	24,348	0.986	0.920	22,087	15	331,298
CHG0209	430	0.986	0.920	390	15	5,853
CHG0210	170	0.986	0.920	154	15	2,316
CHG0211	8,945	0.986	0.920	8,114	15	121,709
CHG0212	6,024	0.986	0.920	5,464	20	109,283
CHG0216	22	0.986	0.920	20	15	301
CHG0221	19	0.986	0.920	17	15	261
CHG0230	601	0.986	0.920	545	9	4,904
CHG0232	849	0.986	0.920	770	5	3,849
CHG0233	27,717	0.986	0.920	25,143	15	377,142
CHG0234	3,349	0.986	0.920	3,038	15	45,576
CHG0235	11,285	0.986	0.920	10,237	15	153,555
CHG0237	8	0.986	0.920	7	10	69
CHG0238	1,974	0.986	0.920	1,790	6	10,742
CHG0257	4,064	0.986	0.920	3,686	6	22,117
CHG0271	3,181	0.986	0.920	2,886	6	17,313

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net Mcf Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime Mcf Savings [F] = [D x E]
CHG0276	15	0.986	0.920	14	15	208
CHG0279	16	0.986	0.920	15	15	218
CHG0280	19	0.986	0.920	17	15	256
CHG0282	1,253	0.986	0.920	1,137	15	17,056
CHG0283	1,017	0.986	0.920	922	2	1,844
CMC0002	13,324	0.986	0.920	12,086	20	241,729
CRC0011	2,572	0.986	0.920	2,333	15	34,992
CRG0006	10,078	0.986	0.920	9,142	15	137,125
CRG0008	8,732	0.986	0.920	7,921	15	118,816
CRG0014	1,377	0.986	0.920	1,249	15	18,734
CSC0039	118	0.986	0.920	107	30	3,223
CSC0042	609	0.986	0.920	553	5	2,764
CSC0051	1,579	0.986	0.920	1,433	15	21,490
CSC0106	1,584	0.986	0.920	1,437	30	43,102
CSG0001	20,437	0.986	0.920	18,538	10	185,384
CSG0004	4,695	0.986	0.920	4,259	5	21,295
CSG0006	63	0.986	0.920	57	30	1,720
CSG0012	47	0.986	0.920	43	30	1,288
CSG0024	788	0.986	0.920	715	15	10,728
CSG0025	662	0.986	0.920	600	15	9,006
CSG0027	305	0.986	0.920	276	5	1,382
CSG0031	1,838	0.986	0.920	1,667	15	25,005
CSG0032	1,124	0.986	0.920	1,020	30	30,593
CSG0033	2,618	0.986	0.920	2,375	30	71,257
CSG0034	111	0.986	0.920	101	30	3,025

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net Mcf Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime Mcf Savings [F] = [D x E]
CSG0035	388	0.986	0.920	352	30	10,567
CSG0037	364	0.986	0.920	330	30	9,906
CSG0039	167	0.986	0.920	151	30	4,536
CSG0040	29	0.986	0.920	27	30	801
CSG0041	722	0.986	0.920	655	30	19,642
CSG0042	26	0.986	0.920	24	30	721
CSG0043	524	0.986	0.920	475	30	14,249
CSG0044	24	0.986	0.920	21	30	640
CSG0045	427	0.986	0.920	387	30	11,610
CSG0049	842	0.986	0.920	764	15	11,462
CSG0051	41,372	0.986	0.920	37,529	5	187,647
CSG0054	31	0.986	0.920	28	10	281
CSG0058	570	0.986	0.920	517	20	10,346
CSG0059	857	0.986	0.920	778	20	15,555
CSG0060	18,269	0.986	0.920	16,572	15	248,580
CSG0065	4,163	0.986	0.920	3,777	25	94,413
CSG0071	2,060	0.986	0.920	1,869	20	37,372
CSG0072	2,351	0.986	0.920	2,132	20	42,648
CSG0076	17,637	0.986	0.920	15,999	20	319,979
CSG0077	8,637	0.986	0.920	7,834	20	156,687
CSG0078	8,316	0.986	0.920	7,543	20	150,863
CSG0087	614	0.986	0.920	557	20	11,141
CSG0098	4,157	0.986	0.920	3,771	15	56,565
CSG0109	17	0.986	0.920	16	15	237
CWG0002	601	0.986	0.920	545	13	7,082

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net Mcf Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime Mcf Savings [F] = [D x E]
CWG0006	10	0.986	0.920	9	7	63
CWG0007	237	0.986	0.920	215	15	3,231
CWG0016	437	0.986	0.920	397	2	793
CWG0017	1,444	0.986	0.920	1,310	2	2,620
CWG0019	513	0.986	0.920	465	2	930
CWG0023	23	0.986	0.920	21	20	420
CWG0029	4,102	0.986	0.920	3,721	13	48,374
CWG0033	10	0.986	0.920	9	13	123
CWG0034	273	0.986	0.920	248	13	3,225
Total	552,460			501,148		7,157,916

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.3 C&I Request for Proposals

Table A-7. Validated Electric Energy (kWh) Savings by Measure (C&I Request for Proposals)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CQE0001	78,327,780	1.142	0.920	82,294,298	20	1,642,544,063
Total	78,327,780			82,294,298		1,642,544,063

Note: Columns may not sum due to rounding.

Table A-8. Validated Electric Demand (kW) Savings by Measure (C&I Request for Proposals)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CQE0001	8,600.46	1.269	0.920	10,040.87
Total	8,600.46			10,040.87

Note: Columns may not sum due to rounding.

Table A-9: Validated Natural Gas (Mcf) Savings by Measure (C&I Request for Proposals)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CQG0001	302,147	0.970	0.920	269,636	19	5,246,907
Total	302,147			269,636		5,246,907

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.4 Midstream

Table A-10. Validated Electric Energy (kWh) Savings by Measure (Midstream)

Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CPC0004	523	1.000	0.920	481	15	7,216
CPC0007	47,696	1.000	0.920	43,880	15	658,205
CPE0001	668,156	1.000	0.920	614,703	3	1,844,110
CPE0002	57,726	1.000	0.920	53,108	3	159,323
CPE0003	7,332,403	1.000	0.920	6,745,810	2	13,491,621
CPE0004	138,216	1.000	0.920	127,158	3	381,475
CPE0005	424,427	1.000	0.920	390,473	3	1,171,418
CPE0007	570,515	1.000	0.920	524,873	3	1,574,620
CPE0011	4,410	1.000	0.920	4,057	12	48,686
CPE0012	11,952	1.000	0.920	10,996	12	131,950
CPE0013	12,985	1.000	0.920	11,946	12	143,354
CPE0014	2,765	1.000	0.920	2,544	12	30,526
CPE0015	848	1.000	0.920	780	12	9,362
CPE0016	13,075	1.000	0.920	12,029	12	144,348
CPE0017	21,640	1.000	0.920	19,909	12	238,906
CPE0019	11,188	1.000	0.920	10,293	12	123,516
CPE0021	13,139	1.000	0.920	12,088	12	145,055
CPE0022	379,250	1.000	0.920	348,910	12	4,186,920
CPE0024	19,824	1.000	0.920	18,238	12	218,857
CPE0025	242,788	1.000	0.920	223,365	12	2,680,380
CPE0026	12,152	1.000	0.920	11,180	9	95,029
CPE0027	3,490	1.000	0.920	3,211	9	27,292
CPE0028	1,074	1.000	0.920	988	9	8,399
CPE0030	850	1.000	0.920	782	12	9,384
CPE0031	2,600	1.000	0.920	2,392	12	28,704

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CPE0032	3,240	1.000	0.920	2,981	12	35,770
CPE0033	606	1.000	0.920	558	12	6,690
CPE0036	6,372	1.000	0.920	5,862	12	70,347
CPE0040	31,943	1.000	0.920	29,388	12	352,651
CPE0041	202,752	1.000	0.920	186,532	12	2,238,382
CPE0042	209,241	1.000	0.920	192,502	15	2,887,526
CPE0051	38,923	1.000	0.920	35,809	15	537,133
CPE0060	161,093	1.000	0.920	148,205	2	296,411
CPE0061	171,444	1.000	0.920	157,728	18	2,839,107
CPE0062	187,163	1.000	0.920	172,190	18	3,099,417
CPE0063	22,465,045	1.000	0.920	20,667,842	18	372,021,150
CPE0064	2,862,934	1.000	0.920	2,633,900	18	47,410,193
CPE0065	6,916,682	1.000	0.920	6,363,347	14	89,086,861
CPE0068	25,536	1.000	0.920	23,493	10	234,931
CPE0072	62,676	1.000	0.920	57,662	12	691,943
CPE0073	240,539	1.000	0.920	221,296	12	2,655,548
CPE0074	217,675	1.000	0.920	200,261	12	2,403,130
CPE0079	4,806	1.000	0.920	4,421	15	66,321
CPE0086	63,990	1.000	0.920	58,871	15	883,060
CPE0087	159,975	1.000	0.920	147,177	15	2,207,649
CPE0088	206,419	1.000	0.920	189,905	15	2,848,580
CPE0094	5,698	1.000	0.920	5,242	18	94,352
Total	44,238,440			40,699,365		560,525,804

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-11. Validated Electric Demand (kW) Savings by Measure (Midstream)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CPC0004	0.11	0.959	0.920	0.10
CPC0007	11.97	0.959	0.920	10.56
CPE0001	149.00	0.959	0.920	131.46
CPE0002	12.98	0.959	0.920	11.45
CPE0003	1,639.24	0.959	0.920	1,446.27
CPE0004	30.71	0.959	0.920	27.10
CPE0005	94.32	0.959	0.920	83.21
CPE0007	127.23	0.959	0.920	112.25
CPE0011	0.50	0.959	0.920	0.44
CPE0012	1.34	0.959	0.920	1.19
CPE0013	1.48	0.959	0.920	1.31
CPE0014	0.32	0.959	0.920	0.28
CPE0015	0.10	0.959	0.920	0.08
CPE0016	1.50	0.959	0.920	1.32
CPE0017	2.48	0.959	0.920	2.19
CPE0019	2.55	0.959	0.920	2.25
CPE0021	3.16	0.959	0.920	2.79
CPE0022	86.50	0.959	0.920	76.32
CPE0024	3.64	0.959	0.920	3.21
CPE0025	44.16	0.959	0.920	38.96
CPE0026	1.18	0.959	0.920	1.04
CPE0027	0.33	0.959	0.920	0.29
CPE0028	0.10	0.959	0.920	0.09
CPE0030	0.10	0.959	0.920	0.08

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CPE0031	0.30	0.959	0.920	0.26
CPE0032	0.37	0.959	0.920	0.33
CPE0033	0.07	0.959	0.920	0.06
CPE0036	0.73	0.959	0.920	0.64
CPE0040	7.29	0.959	0.920	6.43
CPE0041	46.20	0.959	0.920	40.76
CPE0042	23.94	0.959	0.920	21.12
CPE0051	38.88	0.959	0.920	34.30
CPE0060	29.83	0.959	0.920	26.32
CPE0061	38.32	0.959	0.920	33.81
CPE0062	34.48	0.959	0.920	30.42
CPE0063	5,044.75	0.959	0.920	4,450.88
CPE0064	525.50	0.959	0.920	463.64
CPE0065	1,340.73	0.959	0.920	1,182.90
CPE0079	1.63	0.959	0.920	1.44
CPE0086	17.54	0.959	0.920	15.48
CPE0087	43.86	0.959	0.920	38.69
CPE0088	56.59	0.959	0.920	49.93
CPE0094	1.05	0.959	0.920	0.92
Total	9,467.05			8,352.59

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-12. Validated Gas (Mcf) Savings by Measure (Midstream)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B x C]	[E]	[F] = [D x E]
CPC0004	67	1.000	0.920	62	15	928
CPC0007	5,046	1.000	0.920	4,642	15	69,632
CPG0004	11	1.000	0.920	10	5	52
CPG0021	4,263	1.000	0.920	3,922	12	47,059
CPG0022	3,278	1.000	0.920	3,016	12	36,194
CPG0023	2,473	1.000	0.920	2,275	12	27,301
CPG0024	101	1.000	0.920	93	12	1,112
CPG0025	617	1.000	0.920	568	12	6,816
CPG0026	541	1.000	0.920	498	12	5,973
CPG0027	1,517	1.000	0.920	1,396	12	16,752
CPG0028	15	1.000	0.920	13	12	160
CPG0029	485	1.000	0.920	447	20	8,932
CPG0030	18	1.000	0.920	16	10	161
CPG0036	33	1.000	0.920	31	12	367
CPG0057	609	1.000	0.920	560	20	11,202
CPG0066	2,461	1.000	0.920	2,264	20	45,286
Total	21,536			19,813		277,929

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.5 Business Energy Analysis

Table A-13. Validated Gas (Mcf) Savings by Measure (Business Energy Analysis)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CDG1000	11,419	1.000	0.920	10,506	5	52,529
CDG1001	122,578	1.000	0.920	112,772	10	1,127,717
CDG1002	2,839	1.000	0.920	2,612	10	26,115
CDG1003	23,493	1.000	0.920	21,614	10	216,135
CDG1004	214	1.000	0.920	197	20	3,933
CDG1005	21,581	1.000	0.920	19,855	10	198,548
CDG1006	43,907	1.000	0.920	40,394	1	40,394
CDG1007	60	1.000	0.920	55	9	497
CDG1008	188	1.000	0.920	173	20	3,457
CDG1009	521	1.000	0.920	479	10	4,794
Total	226,799			208,655		1,674,119

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.6 Online Marketplace

Table A-14. Validated Electric Energy (kWh) Savings by Measure (Online Marketplace)

Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CDC0072	36,750	1.000	0.920	33,810	10	338,100
CDE0268	21,105	0.895	0.920	17,378	15	260,668
CDE0269	201	0.895	0.920	166	15	2,483
CDE0280	27,930	1.000	0.920	25,696	10	256,956
CDE0288	27,832	0.895	0.920	22,917	5	114,586
CDE0342	57,663	0.895	0.920	47,479	12	569,752
CDE0343	249,818	0.895	0.920	205,700	12	2,468,406
CDE0351	512,521	0.895	0.920	422,010	20	8,440,204
CDE0352	601,026	0.895	0.920	494,885	20	9,897,696
CDE0353	78,891	0.895	0.920	64,959	10	649,588
CDE0362	640,236	0.895	0.920	527,170	10	5,271,700
CDE0363	475,294	0.895	0.920	391,357	10	3,913,567
CDE0364	225,500	0.895	0.920	185,677	15	2,785,151
CDE0365	230,010	0.895	0.920	189,390	15	2,840,854
CDE0369	5,242	0.895	0.920	4,316	12	51,791
CDE0370	96,262	0.895	0.920	79,262	12	951,150
CDE0371	19,510	0.895	0.920	16,065	12	192,778
CDE0372	8,254	0.895	0.920	6,796	3	20,388
CDE0374	45,251	0.895	0.920	37,259	3	111,778
CDE0389	123,388	0.895	0.920	101,598	3	304,793
CDE0390	53,204	0.895	0.920	43,808	3	131,425
CDE0391	33,473	0.895	0.920	27,562	3	82,686
CDE0392	6,018	0.895	0.920	4,955	3	14,866

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B x C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CDE0393	90,342	0.895	0.920	74,388	2	148,775
CDE0394	69,706	0.895	0.920	57,396	2	114,792
CDE0402	86,565	0.895	0.920	71,278	3	213,833
CDE0403	4,478	0.895	0.920	3,687	3	11,060
CDE0404	405,334	0.895	0.920	333,752	2	667,504
CDE0405	801,032	0.895	0.920	659,570	2	1,319,139
CDE0406	319,208	0.895	0.920	262,836	2	525,672
CDE0407	15,107	0.895	0.920	12,439	18	223,908
CDE0408	5,529	0.895	0.920	4,553	3	13,658
CDE0409	17,460	0.895	0.920	14,377	3	43,130
CDE0410	471,228	0.895	0.920	388,009	5	1,940,047
CDE0411	9,237	0.895	0.920	7,606	4	30,422
CDE0412	27,392	0.895	0.920	22,555	18	405,982
CDE0413	105,256	0.895	0.920	86,668	18	1,560,020
CDE0414	1,451	0.895	0.920	1,195	3	3,585
CDE0415	71,878	0.895	0.920	59,184	9	532,659
CDE0416	528,278	0.895	0.920	434,984	9	3,914,853
CDE0417	403,560	0.895	0.920	332,291	9	2,990,622
CDE0422	4,164,588	0.895	0.920	3,429,122	10	34,291,222
CDE0423	30,158	0.895	0.920	24,832	2	61,583
CDE0437	48,636,998	0.540	0.920	24,162,860	3	72,488,581
CDE0438	27,027	0.895	0.920	22,254	3	66,761
CDE0440	363,300	0.895	0.920	299,141	15	4,487,118
Total	60,230,490			33,715,190		165,726,289

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-15. Validated Electric Demand (kW) Savings by Measure (Online Marketplace)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CDE0268	2.42	0.895	0.920	1.99
CDE0269	0.02	0.895	0.920	0.02
CDE0351	58.41	0.895	0.920	48.10
CDE0352	68.50	0.895	0.920	56.40
CDE0353	2.13	0.895	0.920	1.75
CDE0362	71.07	0.895	0.920	58.52
CDE0363	52.76	0.895	0.920	43.44
CDE0364	169.15	0.895	0.920	139.28
CDE0365	172.53	0.895	0.920	142.06
CDE0369	1.26	0.895	0.920	1.04
CDE0370	23.14	0.895	0.920	19.05
CDE0371	4.69	0.895	0.920	3.86
CDE0372	1.52	0.895	0.920	1.25
CDE0374	8.30	0.895	0.920	6.84
CDE0389	22.67	0.895	0.920	18.67
CDE0390	9.78	0.895	0.920	8.05
CDE0391	7.46	0.895	0.920	6.14
CDE0392	1.34	0.895	0.920	1.10
CDE0393	20.15	0.895	0.920	16.59
CDE0394	12.81	0.895	0.920	10.55
CDE0402	15.87	0.895	0.920	13.07
CDE0403	0.82	0.895	0.920	0.68
CDE0404	90.38	0.895	0.920	74.42
CDE0405	178.62	0.895	0.920	147.07

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CDE0406	71.18	0.895	0.920	58.61
CDE0407	3.38	0.895	0.920	2.79
CDE0408	1.01	0.895	0.920	0.84
CDE0409	3.20	0.895	0.920	2.64
CDE0410	52.15	0.895	0.920	42.94
CDE0411	1.69	0.895	0.920	1.39
CDE0412	5.02	0.895	0.920	4.14
CDE0413	19.35	0.895	0.920	15.93
CDE0414	0.27	0.895	0.920	0.22
CDE0415	8.22	0.895	0.920	6.77
CDE0416	60.34	0.895	0.920	49.68
CDE0417	46.10	0.895	0.920	37.96
CDE0422	463.10	0.895	0.920	381.31
CDE0423	3.34	0.895	0.920	2.75
CDE0437	8,849.53	0.540	0.920	4,396.45
CDE0438	4.97	0.895	0.920	4.09
CDE0440	42.00	0.895	0.920	34.58
Total	10,630.65			5,863.02

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-16. Validated Gas (Mcf) Savings by Measure (Online Marketplace)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CDC0072	1,268	1.000	0.920	1,166	10	11,661
CDG0137	558	1.000	0.920	513	10	5,131
CDG0144	1,425	0.885	0.920	1,161	20	23,211
CDG0145	1,544	0.885	0.920	1,257	20	25,145
CDG0154	1,775	0.885	0.920	1,446	10	14,456
CDG0155	1,609	0.885	0.920	1,310	10	13,103
CDG0162	2,252	0.885	0.920	1,834	5	9,170
CDG0167	19,305	0.885	0.920	15,718	10	157,179
CDG0168	473	0.885	0.920	385	2	956
CDG0169	996	0.885	0.920	811	15	12,160
Total	31,206			25,601		272,172

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.7 Residential Lighting Carryover

Table A-17. Validated Electric Energy (kWh) Savings by Measure (Residential Lighting Carryover)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CDE0204	344,531	1.000	0.500	172,265	3	516,796
CDE0207	846,223	1.000	0.500	423,111	3	1,269,334
CDE0208	12,201,055	1.000	0.400	4,880,422	3	14,641,266
CDE0225	1,783,950	1.000	0.400	713,580	3	2,140,740
CDE0290	1,006,280	1.000	0.400	402,512	3	1,207,536
Total	16,182,038			6,591,890		19,775,671

Note: Columns may not sum due to rounding.

Table A-18. Validated Electric Demand (kW) Savings by Measure (Residential Lighting Carryover)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CDE0204	76.69	1.000	0.500	38.35
CDE0207	188.90	1.000	0.500	94.45
CDE0208	2,246.50	1.000	0.400	898.60
CDE0225	327.06	1.000	0.400	130.82
CDE0290	184.79	1.000	0.400	73.92
Total	3,023.94			1,236.13

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.8 Small Business Assessments

Table A-19. Validated Electric Energy (kWh) Savings by Measure (Small Business Assessments)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B x C]	[E]	[F] = [D x E]
CDC0058	31,084	0.997	0.920	28,512	9	256,606
CDC0064	1,897	0.997	0.920	1,740	20	34,798
CDC0073	3,430	1.000	0.920	3,156	10	31,556
CDC0074	5,390	1.000	0.920	4,959	10	49,588
CDC0075	24,174	0.997	0.920	22,173	8	177,387
CDC0076	1,422	0.997	0.920	1,304	8	10,435
CDC0083	3,138	1.000	0.920	2,887	10	28,872
CDC0092	31,850	1.000	0.920	29,302	10	293,020
CDE0006	9,636	0.997	0.920	8,838	5	44,191
CDE0045	456,745	0.997	0.920	418,945	3	1,256,835
CDE0058	323,037	0.997	0.920	296,302	9	2,666,722
CDE0090	97,805	0.997	0.920	89,711	3	269,132
CDE0101	130,851	0.997	0.920	120,022	15	1,800,327
CDE0102	565,152	0.997	0.920	518,380	2	1,036,759
CDE0103	10,341	0.997	0.920	9,485	2	18,971
CDE0111	121,923	0.997	0.920	111,833	10	1,118,327
CDE0113	7,429	0.997	0.920	6,814	20	136,283
CDE0210	1,084,198	0.997	0.920	994,469	18	17,900,450
CDE0211	35,200	0.997	0.920	32,287	10	322,868
CDE0213	86,642	0.997	0.920	79,471	3	238,413
CDE0239	65,109	0.997	0.920	59,720	10	597,203
CDE0250	17,084	0.997	0.920	15,670	20	313,397
CDE0285	134,801	0.997	0.920	123,645	5	618,226

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CDE0286	980	1.000	0.920	902	10	9,016
CDE0287	12,250	1.000	0.920	11,270	10	112,700
CDE0347	101,374	0.997	0.920	92,984	8	743,874
CDE0379	8,369	1.000	0.920	7,699	10	76,993
CDE0386	1,690,066	1.000	0.920	1,554,861	5	7,774,305
CDE0399	15,190	1.000	0.920	13,975	10	139,748
CDE0400	365,376	0.997	0.920	335,137	15	5,027,062
CDE0401	566,748	0.997	0.920	519,844	15	7,797,659
CDE0418	33,891	0.997	0.920	31,086	10	310,860
CDE0419	1,344,504	0.997	0.920	1,233,233	10	12,332,328
CDE0420	155,243	0.997	0.920	142,395	2	284,789
CDE0439	17,150	1.000	0.920	15,778	10	157,780
Total	7,559,477			6,938,789		63,987,480

Note: Columns may not sum due to rounding.

Table A-20. Validated Electric Demand (kW) Savings by Measure (Small Business Assessments)

Measure Code	Adjusted Reported Gross kW Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kW Savings [D] = [A x B X C]
CDC0058	0.97	0.997	0.920	0.89
CDC0064	0.23	0.997	0.920	0.21
CDC0075	9.49	0.997	0.920	8.70
CDC0076	0.56	0.997	0.920	0.51
CDE0006	1.04	0.997	0.920	0.95
CDE0045	101.77	0.997	0.920	93.35

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CDE0058	0.50	0.997	0.920	0.45
CDE0090	21.83	0.997	0.920	20.03
CDE0101	14.97	0.997	0.920	13.73
CDE0102	126.09	0.997	0.920	115.65
CDE0103	2.31	0.997	0.920	2.12
CDE0111	13.98	0.997	0.920	12.83
CDE0113	0.84	0.997	0.920	0.77
CDE0210	243.47	0.997	0.920	223.32
CDE0211	1.85	0.997	0.920	1.70
CDE0213	19.29	0.997	0.920	17.69
CDE0239	7.23	0.997	0.920	6.63
CDE0250	1.95	0.997	0.920	1.79
CDE0347	8.01	0.997	0.920	7.35
CDE0386	237.95	1.000	0.920	218.91
CDE0400	42.24	0.997	0.920	38.74
CDE0401	65.52	0.997	0.920	60.10
CDE0418	3.76	0.997	0.920	3.45
CDE0419	153.59	0.997	0.920	140.88
CDE0420	17.25	0.997	0.920	15.82
Total	1,096.67			1,006.56

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-21. Validated Gas (Mcf) Savings by Measure (Small Business Assessments)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B x C]	[E]	[F] = [D x E]
CDC0058	2,775	0.963	0.920	2,458	9	22,126
CDC0059	14,909	1.000	0.920	13,717	1	13,717
CDC0064	67	0.963	0.920	60	20	1,193
CDC0065	564	1.000	0.920	519	1	519
CDC0073	118	1.000	0.920	109	10	1,088
CDC0074	186	1.000	0.920	171	10	1,710
CDC0075	606	0.963	0.920	537	8	4,295
CDC0076	36	0.963	0.920	32	8	253
CDC0083	55	1.000	0.920	50	10	502
CDC0090	6,089	1.000	0.920	5,601	1	5,601
CDC0092	1,099	1.000	0.920	1,011	10	10,106
CDG0026	52	0.963	0.920	47	5	233
CDG0028	271	0.963	0.920	240	10	2,399
CDG0058	3,926	0.963	0.920	3,478	9	31,304
CDG0091	4,712	1.000	0.920	4,335	1	4,335
CDG0123	610	0.963	0.920	540	10	5,404
CDG0124	69	0.963	0.920	62	20	1,231
CDG0125	257	1.000	0.920	237	1	237
CDG0142	85	1.000	0.920	78	10	777
CDG0143	101	1.000	0.920	93	10	933
CDG0148	109	1.000	0.920	100	10	1,005
CDG0149	127	1.000	0.920	117	10	1,172
CDG0157	703	1.000	0.920	647	1	647
CDG0159	220	1.000	0.920	202	10	2,021

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net Mcf Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime Mcf Savings [F] = [D x E]
CDG0160	604	0.963	0.920	535	15	8,020
CDG0161	1,082	0.963	0.920	958	15	14,376
CDG0163	62	0.963	0.920	55	10	549
CDG0164	5,523	0.963	0.920	4,893	10	48,928
CDG0165	504	0.963	0.920	447	2	894
Total	45,521			41,328		185,575

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.9 Small Business Core

Table A-22. Validated Electric Energy (kWh) Savings by Measure (Small Business Core)

Measure Code	Adjusted Reported Gross kWh Savings [A]	Verified GAF [B]	Verified NTGAF [C]	Verified Net kWh Savings [D] = [A x B X C]	Verified Measure Life [E]	Verified Net Lifetime kWh Savings [F] = [D x E]
CDE0059	74,944	0.957	0.920	65,984	12	791,804
CDE0080	36,256	0.957	0.920	31,921	15	478,818
CDE0081	421,806	0.957	0.920	371,375	15	5,570,623
CDE0085	70,290	0.957	0.920	61,886	5	309,431
CDE0105	160,681	0.957	0.920	141,470	12	1,697,645
CDE0106	28,769	0.957	0.920	25,329	10	253,292
CDE0108	10,348,869	0.957	0.920	9,111,558	3	27,334,675
CDE0201	133,627	0.957	0.920	117,651	15	1,764,763
CDE0212	91,444	0.957	0.920	80,511	4	281,788
CDE0222	4,941,077	0.957	0.920	4,350,322	12	52,203,859
CDE0224	22,790	0.957	0.920	20,065	18	361,166
CDE0233	1,716	0.957	0.920	1,511	16	24,173
CDE0234	741,209	0.957	0.920	652,590	15	9,788,855
CDE0235	139,347	0.957	0.920	122,687	12	1,472,238
CDE0236	6,683	0.957	0.920	5,884	16	94,144
CDE0275	323,957	0.957	0.920	285,225	16	4,563,595
CDE0282	90,227	0.957	0.920	79,439	4	317,757
CDE0283	33,051	0.957	0.920	29,100	4	116,398
CDE0340	12,789	0.957	0.920	11,260	12	135,118
CDE0430	222,755	0.957	0.920	196,122	4	784,489
CDE0431	173,292	0.957	0.920	152,573	4	610,292
CDE0432	193,640	0.957	0.920	170,488	15	2,557,326
CDE0436	616,565	0.957	0.920	542,848	12	6,514,178
Total	18,885,783			16,627,799		118,026,428

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Table A-23. Validated Electric Demand (kW) Savings by Measure (Small Business Core)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CDE0059	0.53	1.036	0.920	0.50
CDE0080	3.72	1.036	0.920	3.55
CDE0081	42.91	1.036	0.920	40.90
CDE0085	7.28	1.036	0.920	6.94
CDE0108	2,152.69	1.036	0.920	2,051.77
CDE0201	29.32	1.036	0.920	27.95
CDE0212	22.40	1.036	0.920	21.35
CDE0222	5.68	1.036	0.920	5.42
CDE0224	2.31	1.036	0.920	2.21
CDE0234	184.50	1.036	0.920	175.85
CDE0236	0.68	1.036	0.920	0.65
CDE0275	27.07	1.036	0.920	25.80
CDE0282	9.24	1.036	0.920	8.80
CDE0283	3.39	1.036	0.920	3.23
CDE0430	22.80	1.036	0.920	21.73
CDE0431	17.79	1.036	0.920	16.95
CDE0432	19.98	1.036	0.920	19.04
CDE0436	3.97	1.036	0.920	3.78
Total	2,556.26			2,436.42

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



A.10 C&I Multifamily

Table A-24. Validated Electric Energy (kWh) Savings by Measure (C&I Multifamily)

Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CTE0157	32,296	1.000	0.920	29,712	15	445,685
CTE0160	13,654	0.943	0.920	11,846	2	23,692
CTE0161	27,702	0.943	0.920	24,033	4	96,133
CTE0190	91,952	1.000	0.920	84,595	16	1,353,526
CTE0222	32,415	0.976	0.920	29,107	10	291,065
CTE0223	91,187	0.976	0.920	81,879	10	818,788
CTE0224	391,442	0.945	0.920	340,320	10	3,403,196
CTE0225	18,087	0.945	0.920	15,725	10	157,249
CTE0236	18,953	0.943	0.920	16,442	4	65,770
CTE0264	24,795	1.000	0.920	22,811	2	45,623
CTE0266	7,128	1.000	0.920	6,558	12	78,693
CTE0282	45,486	0.943	0.920	39,462	4	157,847
CTE0283	1,188	1.000	0.920	1,093	4	4,372
CTE0284	74,196	1.000	0.920	68,260	6	409,562
CTE0287	2,711	0.943	0.920	2,352	2	4,704
CTE0290	2,737	1.000	0.920	2,518	8	20,145
CTE0294	53,261	1.000	0.920	49,000	6	294,000
CTE0295	4,008	1.000	0.920	3,687	15	55,310
CTE0299	22,820	1.000	0.920	20,994	15	314,916
CTE0304	52,156	0.976	0.920	46,831	10	468,315
CTE0305	363	0.976	0.920	326	10	3,261
CTE0306	1,041	0.976	0.920	935	10	9,347

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CTE0307	2,340	0.945	0.920	2,034	10	20,344
CTE0333	1,993	1.000	0.920	1,834	15	27,508
CTE0337	1,241	1.000	0.920	1,142	15	17,124
CTE0339	2,169	1.000	0.920	1,995	15	29,930
CTE0343	39,636	1.000	0.920	36,466	15	546,983
CTE0345	28,781	1.000	0.920	26,479	15	397,179
CTE0366	3,083	1.000	0.920	2,836	15	42,544
CTE0368	3,327	1.000	0.920	3,061	15	45,915
CTE0370	1,004	1.000	0.920	923	15	13,850
CTE0374	8,339	1.000	0.920	7,672	15	115,075
CTE0376	2,279	1.000	0.920	2,097	15	31,453
CTE0377	332	1.000	0.920	305	6	1,832
CTE0378	172,062	1.000	0.920	158,297	15	2,374,456
CTE0379	11,036	1.000	0.920	10,153	12	121,840
CTE0388	827	1.000	0.920	760	2	1,521
CTE0391	12,298	1.000	0.920	11,314	10	113,144
CTE0419	70,633	1.000	0.920	64,982	12	779,788
CTE0424	1,981	1.000	0.920	1,823	3	5,468
CTE0431	285,285	0.640	0.920	167,976	1	167,976
CTE0436	39,882	1.000	0.920	36,691	15	550,372
CTE0439	3,834	1.000	0.920	3,527	15	52,909
CTE0446	19,406	1.000	0.920	17,854	15	267,809
CTE0448	28,864	1.000	0.920	26,555	15	398,329
CTE0449	10,597	1.000	0.920	9,749	15	146,233

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kWh Savings	Verified GAF	Verified NTGAF	Verified Net kWh Savings	Verified Measure Life	Verified Net Lifetime kWh Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CTE0495	6,459	1.000	0.920	5,942	3	17,826
CTE0519	29,691	1.000	0.920	27,316	3	81,948
CTE0520	48,778	1.000	0.920	44,876	3	134,628
CTE0537	3,390	1.000	0.920	3,119	18	56,140
CTE0538	15,067	1.000	0.920	13,862	18	249,513
CTE0565	440,730	1.000	0.920	405,472	9	3,649,244
Total	2,304,923			1,995,600		18,980,078

Note: Columns may not sum due to rounding.

Table A-25. Validated Electric Demand (kW) Savings by Measure (C&I Multifamily)

Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CTE0157	3.89	1.000	0.920	3.58
CTE0160	3.05	0.943	0.920	2.64
CTE0161	3.30	0.943	0.920	2.87
CTE0222	3.81	0.976	0.920	3.42
CTE0223	10.07	0.976	0.920	9.05
CTE0224	30.45	0.945	0.920	26.47
CTE0225	1.44	0.945	0.920	1.25
CTE0236	2.39	0.943	0.920	2.08
CTE0282	5.43	0.943	0.920	4.71
CTE0283	0.14	1.000	0.920	0.13
CTE0284	8.79	1.000	0.920	8.09
CTE0287	0.60	0.943	0.920	0.52

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CTE0294	3.04	1.000	0.920	2.80
CTE0295	0.91	1.000	0.920	0.84
CTE0304	5.74	0.976	0.920	5.16
CTE0305	0.04	0.976	0.920	0.04
CTE0306	0.12	0.976	0.920	0.10
CTE0307	0.18	0.945	0.920	0.16
CTE0333	0.31	1.000	0.920	0.29
CTE0337	0.44	1.000	0.920	0.41
CTE0339	0.93	1.000	0.920	0.86
CTE0343	13.43	1.000	0.920	12.35
CTE0345	10.63	1.000	0.920	9.78
CTE0366	1.09	1.000	0.920	1.01
CTE0368	1.34	1.000	0.920	1.23
CTE0370	0.47	1.000	0.920	0.43
CTE0374	2.52	1.000	0.920	2.32
CTE0376	1.02	1.000	0.920	0.94
CTE0377	0.04	1.000	0.920	0.04
CTE0378	20.33	1.000	0.920	18.71
CTE0391	0.33	1.000	0.920	0.31
CTE0424	0.36	1.000	0.920	0.33
CTE0436	4.54	1.000	0.920	4.17
CTE0439	-1.03	1.000	0.920	-0.95
CTE0446	16.19	1.000	0.920	14.89
CTE0448	3.15	1.000	0.920	2.90
CTE0449	9.59	1.000	0.920	8.82

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross kW Savings	Verified GAF	Verified NTGAF	Verified Net kW Savings
	[A]	[B]	[C]	[D] = [A x B X C]
CTE0495	0.15	1.000	0.920	0.14
CTE0519	0.68	1.000	0.920	0.62
CTE0520	0.56	1.000	0.920	0.51
CTE0538	1.55	1.000	0.920	1.43
CTE0565	50.35	1.000	0.920	46.32
Total	222.37			201.74

Note: Columns may not sum due to rounding.

Table A-26. Validated Gas (Mcf) Savings by Measure (C&I Multifamily)

Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CCG0001	28	1.000	0.920	25	20	506
CTG0011	860	1.000	0.920	791	2	1,582
CTG0020	2,405	1.000	0.920	2,212	2	4,425
CTG0021	6	1.000	0.920	6	2	11
CTG0030	72	1.000	0.920	66	20	1,328
CTG0035	269	1.000	0.920	248	25	6,193
CTG0126	344	1.000	0.920	316	15	4,743
CTG0129	10	1.000	0.920	9	2	19
CTG0130	51	1.000	0.920	47	2	93
CTG0161	195	0.976	0.920	175	10	1,750
CTG0162	67	0.976	0.920	60	10	599
CTG0163	1,087	0.945	0.920	945	10	9,451
CTG0164	323	0.945	0.920	281	10	2,808

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Measure Code	Adjusted Reported Gross Mcf Savings	Verified GAF	Verified NTGAF	Verified Net Mcf Savings	Verified Measure Life	Verified Net Lifetime Mcf Savings
	[A]	[B]	[C]	[D] = [A x B X C]	[E]	[F] = [D x E]
CTG0167	2,645	1.000	0.920	2,434	15	36,505
CTG0170	1,171	1.000	0.920	1,077	15	16,161
CTG0173	578	1.000	0.920	532	20	10,644
CTG0174	74	1.000	0.920	68	20	1,355
CTG0193	1,978	1.000	0.920	1,820	9	16,377
CTG0195	81	0.976	0.920	73	10	727
CTG0196	251	0.976	0.920	225	10	2,250
CTG0198	265	1.000	0.920	244	10	2,439
CTG0199	841	1.000	0.920	774	13	10,056
CTG0228	546	1.000	0.920	502	15	7,537
CTG0248	536	1.000	0.920	494	20	9,871
CTG0250	91	1.000	0.920	84	13	1,093
CTG0255	56,973	0.640	0.920	33,546	1	33,546
CTG0257	26	1.000	0.920	24	5	118
CTG0265	1,073	1.000	0.920	987	18	17,768
Total	72,845			48,064		199,954

Note: Columns may not sum due to rounding.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Appendix B: Measure Details

Appendix B presents the measure description¹, unit definitions and participation counts for each measure installed as a part of the 2022 business portfolio. Table B-1 shows the values for Business Solutions sector, Table B-2 shows the values for Small Business Solutions sector and Table B-3 shows the values for C&I Multifamily sector.

B.1 Measure Details across Sectors

Table B-1. Business Solutions Measure Details

Product	Measure Code	Measure Description	Units	Participation
Business Solutions Custom	CBE0001	Custom Electric Program	Units	38.00
Business Solutions Custom	CBE0300	Smart Buildings - Electric	kWh	72.00
Business Solutions Custom	CBG0001	Custom Gas Program	Units	18.00
Business Solutions Custom	CBG0300	Smart Buildings - Gas	Units	26.00
Business Solutions Custom	CJE0001	Lumens per Watt Improvement per Year	kWh	29.00
Business Solutions Custom	CJE0002	Energy Conservation Improvement per Year	kWh	3.00
Business Solutions Prescriptive	CAE0001	VSD Air Compressor	HP	946.00
Business Solutions Prescriptive	CAE0002	Refrigerated Cycling Thermal Mass Air Dryer	SCFM	8,315.00
Business Solutions Prescriptive	CAE0003	CA123b - Compressed Air Storage Tank (3-5 gal/CFM)	HP	230.00
Business Solutions Prescriptive	CAE0004	Low-Pressure Drop Air Filter	HP	220.00
Business Solutions Prescriptive	CAE0005	Zero Loss Condensate Drain	Units	13.00
Business Solutions Prescriptive	CAE0007	Compressed Air Energy Audit	HP	19.00
Business Solutions Prescriptive	CAE0009	Compressed Air Pressure Flow Controller	HP	80.00
Business Solutions Prescriptive	CAE0011	Refrigerated Cycling - Digital Scroll	SCFM	5,980.00
Business Solutions Prescriptive	CAE0012	Refrigerated Cycling - Variable Speed	SCFM	4,683.00
Business Solutions Prescriptive	CAE0015	Variable Displacement (VD) Air Compressor	HP	200.00
Business Solutions Prescriptive	CAE0016	Heated Blower Purge Desiccant CA Dryer	HP	444.90
Business Solutions Prescriptive	CAE0017	Compressed Air Dryer, Dewpoint Sensor Control	HP	4,500.00
Business Solutions Prescriptive	CAE0021	Variable Speed Controller for Vacuum Pump	HP	40.00
Business Solutions Prescriptive	CAE0022	Variable Speed Controller on Milk Pump with Existing Milk Pre-Cooler	Units	9,768.00
Business Solutions Prescriptive	CAE0023	Variable Speed Controller on Milk Pump with New Milk Pre-Cooler	Units	216,063.50
Business Solutions Prescriptive	CAE0024	Correct Sizing Compressed Air Systems - Electric	HP	3.00

¹ Measure descriptions included in the tables are taken directly from eTracker.

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CAE0029	VSD Air Compressor Replacement (LT 50-HP)A 3 shifts (6,240 hrs/yr)	HP	80.00
Business Solutions Prescriptive	CAE0031	Zero Loss Condensate Drain, Float Style	Units	27.00
Business Solutions Prescriptive	CAE0032	Two Stage Rotary Screw Air Compressor (VSD VD LNL Type)	HP	965.00
Business Solutions Prescriptive	CAE0034	VSD on Ag Irrigation	HP	205.24
Business Solutions Prescriptive	CAE0037	Air Dryer Desiccant to Refrigerated Air Dryers	SCFM	2,200.00
Business Solutions Prescriptive	CAE0038	Compressed Air Energy Audit with Metered Flow - Electric	Units	19.00
Business Solutions Prescriptive	CAE0039	VSD Air Compressor (50 HP to 300 HP) (Multiple Air Compressor System)	HP	1,869.50
Business Solutions Prescriptive	CAE0041	VSD Air Compressor (50 HP to 300 HP) (Single Air Compressor) (GT 2,000 hr/yr)	HP	441.00
Business Solutions Prescriptive	CAE0042	VSD Air Compressor (50 HP to 300 HP) (Multiple Air Compressor System) (GT 4,000hr)	HP	160.00
Business Solutions Prescriptive	CAE0046	VSD Air Compressor (LT 50 HP) (Single Air Compressor System)(GT 2,000 hr	HP	15.00
Business Solutions Prescriptive	CAE0054	Engineered Nozzles Compressed Air, 2,000 hrs, 1/4" Dia.	Units	5.00
Business Solutions Prescriptive	CAE0065	Compressed Air Storage Tank (1-3 gal/CFM)	HP	385.00
Business Solutions Prescriptive	CAE0067	Compressed Air Energy Audit with VSD	HP	21.00
Business Solutions Prescriptive	CAE0068	Compressed Air Energy Audit with Metered Flow with VSD	HP	46.00
Business Solutions Prescriptive	CAE0070	DI Compressed Air Nozzles, 2,000 hrs, 1/8" Dia.	Units	8.00
Business Solutions Prescriptive	CAE0071	DI Compressed Air Nozzles, 3,000 hrs, 1/8" Dia.	Units	23.00
Business Solutions Prescriptive	CAE0072	DI Compressed Air Nozzles, 4,000+ hrs, 1/8" Dia.	Units	17.00
Business Solutions Prescriptive	CAE0074	DI Compressed Air Nozzles, 2,000 hrs, 1/4" Dia.	Units	34.00
Business Solutions Prescriptive	CAE0075	DI Compressed Air Nozzles, 3,000 hrs, 1/4" Dia.	Units	24.00
Business Solutions Prescriptive	CAE0076	DI Compressed Air Nozzles, 4,000+ hrs, 1/4" Dia.	Units	1,947.00
Business Solutions Prescriptive	CAE0080	DI Compressed Air Nozzles, 4,000+ hrs, 3/8" Dia.	Units	24.00
Business Solutions Prescriptive	CAE0085	Compressed Air Audits & Leak Repair-VSD	HP	19.00
Business Solutions Prescriptive	CAE0086	Compressed Air Audits & Leak Repair -Non VSD	HP	53.00
Business Solutions Prescriptive	CAE0087	Air Compressor Outdoor Air Intake (EOY Incentive)	HP	250.00
Business Solutions Prescriptive	CAE0088	VSD Air Compressor Replacement (LT 50-HP), 1 shift (2,080 hrs/yr)	HP	50.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CAE0089	VSD Air Compressor Replacement (LT 50-HP) 2 shifts (4,160 hrs/yr)	HP	135.00
Business Solutions Prescriptive	CAE0090	VSD Air Compressor Replacement (LT 50-HP) 24/7	HP	85.00
Business Solutions Prescriptive	CAE0095	Handheld DI Nozzle - 1/4" Nozzle, 500 Hours	Units	58.00
Business Solutions Prescriptive	CAE0096	Handheld DI Nozzle - 1/4" Nozzle, 600 Hours	Units	21.00
Business Solutions Prescriptive	CAE0097	Handheld DI Nozzle - 1/4" Nozzle, 700 Hours	Units	2.00
Business Solutions Prescriptive	CAE0098	Handheld DI Nozzle - 1/4" Nozzle, 800 Hours	Units	535.00
Business Solutions Prescriptive	CAG0006	Air Compressor Waste Heat Recovery	HP	551.00
Business Solutions Prescriptive	CBC0003	Strip Curtains (Cooler 40F)	Square Feet	36.60
Business Solutions Prescriptive	CBC0004	Strip Curtains (Freezer 0F)	Square Feet	18.30
Business Solutions Prescriptive	CBC0300	Smart Buildings Tier 1 Payment (10% of Project Cost)	Units	7.00
Business Solutions Prescriptive	CBC0301	Smart Buildings Tier 2 Payment (40% of Project Cost)	Units	6.00
Business Solutions Prescriptive	CBC0302	Smart Buildings Tier 3 Payment (50% of Project Cost and savings)	Units	5.00
Business Solutions Prescriptive	CBE0002	Cool (White) Roof	Square Feet	67,715.00
Business Solutions Prescriptive	CBE0003	Cool (White) Roof	Square Feet	563,092.00
Business Solutions Prescriptive	CBE0301	Smart Building Defined Actions - Electric	kWh	1.00
Business Solutions Prescriptive	CBE0302	Smart Buildings Tier 1 Payment (10% of Project Cost)	Units	7.00
Business Solutions Prescriptive	CBE0303	Smart Buildings Tier 2 Payment (40% of Project Cost)	Units	4.00
Business Solutions Prescriptive	CBE0304	Smart Buildings Tier 3 Payment (50% of Project Cost and savings)	Units	5.00
Business Solutions Prescriptive	CBE0400	Buy Michigan (Incentives Only)	Units	14,753.25
Business Solutions Prescriptive	CBE0401	Buy Michigan (Incentives Only)	Units	88,724.35
Business Solutions Prescriptive	CBE0405	Farm Energy Audit as Defined By USDA (Tier 2)	Units	1.00
Business Solutions Prescriptive	CBE0406	Rollover Bonus (Electric Incentives)	Units	41,370.56
Business Solutions Prescriptive	CBE0411	Year-End Bonus (Incentives Only)	Units	441,719.18
Business Solutions Prescriptive	CBG0002	Automatic High-Speed Doors - exterior doors	Square Feet	2,864.00
Business Solutions Prescriptive	CBG0301	Smart Building Defined Actions - Gas	Units	2.00
Business Solutions Prescriptive	CBG0302	Smart Buildings Tier 1 Payment (10% of Project Cost)	Units	2.00
Business Solutions Prescriptive	CBG0303	Smart Buildings Tier 2 Payment (40% of Project Cost)	Units	1.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CBG0304	Smart Buildings Tier 3 Payment (50% of Project Cost and savings)	Units	1.00
Business Solutions Prescriptive	CBG0400	Buy Michigan (Incentives Only)	Units	31,815.40
Business Solutions Prescriptive	CBG0404	Rollover Bonus (Gas Incentives)	Units	858.75
Business Solutions Prescriptive	CBG0409	Year-End Bonus (Incentives Only)	Units	150,426.70
Business Solutions Prescriptive	CEB0004	Demand Control Ventilation - Combination Customers (EOY Incentive)	Square Feet	1,608,349.00
Business Solutions Prescriptive	CEB0007	Enhanced Ventilation Control - Air Conditioning and Natural Gas Heat	Tons	3,002.50
Business Solutions Prescriptive	CEE0005	Web Based Building Automatic Systems (BAS) Non-A C Schools (EOY Incentive)	Square Feet	122,818.00
Business Solutions Prescriptive	CEE0006	Light Commercial Building Automation Systems (EOY Incentive)	Square Feet	182,866.00
Business Solutions Prescriptive	CFE0006	Neon to LED Sign Lighting Retrofit (Continuous Operation)	Watts Removed	1,558.00
Business Solutions Prescriptive	CFE0009	Neon to LED Sign Lighting Retrofit (Commercial Hours)	Watts Removed	42,459.00
Business Solutions Prescriptive	CHC0014	Critical Zone Supply Air Reset Control (Combo)	Tons	653.47
Business Solutions Prescriptive	CHC0017	Optimal Start Stop on Air Handling Units (Combo)	Square Feet	2,235,640.75
Business Solutions Prescriptive	CHC0018	Occupancy Sensor Controls on HVAC Units (Combo)	Square Feet	138,294.00
Business Solutions Prescriptive	CHC0072	EG Programmable Thermostat	Units	5.00
Business Solutions Prescriptive	CHC0074	Demand Control Ventilation and Occupancy Sensors for HVAC - Air Conditioning and	Square Feet	198,616.00
Business Solutions Prescriptive	CHC0082	Infrared Heaters - Combination Customers	MBH	12,915.00
Business Solutions Prescriptive	CHE0001	AC LT 65,000 Btuh (5.4 tons)	Tons	908.92
Business Solutions Prescriptive	CHE0003	AC GT 240,000 Btuh (20 tons) and LT or EQ 760,000 Btuh (63.3 tons)	Tons	2,169.61
Business Solutions Prescriptive	CHE0004	AC GT 760,000 Btuh (63.3 tons)	Tons	1,909.90
Business Solutions Prescriptive	CHE0027	Demand Control Ventilation - Electric Customers	Square Feet	453,369.29
Business Solutions Prescriptive	CHE0028	AC Units GT 65,000 Btuh (5.4 tons) and LT =120,000 Btuh (10 tons)	Tons	1,232.03
Business Solutions Prescriptive	CHE0029	AC Units GT 120,000 Btuh (10 tons) and LT or EQ 240,000 Btuh (20 tons)	Tons	1,192.00
Business Solutions Prescriptive	CHE0061	Air Side Economizer	Tons	158.00
Business Solutions Prescriptive	CHE0063	Occupancy Sensor Controls on HVAC Units (Electric)	Square Feet	117,307.00
Business Solutions Prescriptive	CHE0065	Chilled Water Reset Retrofit (10 degrees) - Electric	Tons	4,635.00
Business Solutions Prescriptive	CHE0066	Chilled Water Reset Retrofit (5 degrees) - Electric	Tons	1,581.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CHE0067	Optimal Start Stop on Air Handling Units	Square Feet	839,021.00
Business Solutions Prescriptive	CHE0069	Critical Zone Supply Air Reset Control	Tons	250.00
Business Solutions Prescriptive	CHE0070	Hydronic HVAC Pump Control	HP	30.00
Business Solutions Prescriptive	CHE0113	Computer Room Air Conditioning (LT or EQ 240 MBH)	MBH	271.60
Business Solutions Prescriptive	CHE0114	Computer Room Air Conditioning (GT 240 MBH)	MBH	307.00
Business Solutions Prescriptive	CHE0118	Web Based Building Automatic Systems (BAS)	Square Feet	924,238.00
Business Solutions Prescriptive	CHE0121	Hydronic Heating (LT 500w)	Units	16.00
Business Solutions Prescriptive	CHE0122	Hydronic Heating (500w to 1000w)	Units	18.00
Business Solutions Prescriptive	CHE0123	Hydronic Heating (GT 1000w)	Units	4.00
Business Solutions Prescriptive	CHE0129	EO Programmable Thermostat	Units	8.00
Business Solutions Prescriptive	CHE0135	Optimized Chiller Plant Sequencing	Tons	4,680.00
Business Solutions Prescriptive	CHE0136	Ductless Air Conditioning Unit or Heat Pump System	Tons	29.60
Business Solutions Prescriptive	CHE0141	Demand Control Ventilation and Occupancy Sensors for HVAC - Air Conditioning (EI)	Square Feet	318,965.00
Business Solutions Prescriptive	CHE0142	Computer Room Air Conditioning - Glycol Economizer	MBH	855.00
Business Solutions Prescriptive	CHE0144	Enhanced Ventilation Control - Air Conditioning (Consumers Energy Electric)	Tons	3.00
Business Solutions Prescriptive	CHE0145	Air and Water-Cooled Chiller Tune-up (20-149 Tons)	Units	66.00
Business Solutions Prescriptive	CHE0146	Air and Water-Cooled Chiller Tune-up (150+ Tons)	Units	124.00
Business Solutions Prescriptive	CHE0148	ECM Fan Motor For Cold Storage Evaporator (Agriculture)	HP	0.99
Business Solutions Prescriptive	CHE0150	Occupancy Sensor Controlled Restroom Exhaust Fan	Units	19.00
Business Solutions Prescriptive	CHE0156	Air-Cooled Chillers LT 150 ton - PATH A	Tons	562.60
Business Solutions Prescriptive	CHE0157	Air-Cooled Chillers LT 150 ton - PATH B	Tons	146.90
Business Solutions Prescriptive	CHE0158	Air-Cooled Chillers GT= 150 ton - PATH A	Tons	357.30
Business Solutions Prescriptive	CHE0159	Air-Cooled Chillers GT= 150 ton - PATH B	Tons	2,524.60
Business Solutions Prescriptive	CHE0170	Water-Cooled Centrifugal Chiller GT= 150 ton and LT 300 ton Path A - 0.01 kW/ton	Tons	232.60
Business Solutions Prescriptive	CHE0183	Water-Cooled Screw Chiller GT= 300 ton and LT 600 ton Path B - 0.01 kW/ton IPLV Reduction	Tons	950.00
Business Solutions Prescriptive	CHE0186	Water-Cooled Screw Chiller GT= 75 ton and LT 150 ton Path A - 0.01 kW/ton FLV Reduction	Tons	1,400.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CHE0187	Water-Cooled Screw Chiller GT= 75 ton and LT 150 ton Path B - 0.01 kW/ton IPLV Reduction	Tons	2,080.00
Business Solutions Prescriptive	CHE0189	Packaged Terminal Air Conditioning (PTAC) 7kBtu/hr - 15kBtu/hr	Tons	32.00
Business Solutions Prescriptive	CHE0194	High Efficiency Pumps Standard Hours	kWh	43.00
Business Solutions Prescriptive	CHE0195	High Efficiency Pumps Low Hours <2000 hours	kWh	5.00
Business Solutions Prescriptive	CHE0202	Packaged Terminal Heat Pump (PTHP) 7kBtu/hr - 15kBtu/hr (EOY Incentive)	Tons	2.00
Business Solutions Prescriptive	CHG0005	Boiler Modulating Burner Control 10 to 1 or 5 to 1 turn-down (retrofit)	Units	99,811.00
Business Solutions Prescriptive	CHG0010	Infrared Heaters - Gas Customer Only	MBH	24,590.00
Business Solutions Prescriptive	CHG0012	Guestroom Energy Management Control - Gas Customer	Units	399.00
Business Solutions Prescriptive	CHG0013	Demand Control Ventilation	Square Feet	914,466.00
Business Solutions Prescriptive	CHG0016	High Efficiency Boiler with AFUE GT or EQ 90%	MBH	308,946.00
Business Solutions Prescriptive	CHG0017	Boiler Oxygen Trim Control	MBH	37,606.00
Business Solutions Prescriptive	CHG0019	Gas Furnace or RTU Tune-up (GT or EQ 40)	Units	37.00
Business Solutions Prescriptive	CHG0021	Gas Furnace or RTU Tune-up (GT or EQ 300 MBH)	Units	6.00
Business Solutions Prescriptive	CHG0023	Boiler Tune-up Level 1 (GT or EQ 110 and 500 kbtu/h)	Units	46.00
Business Solutions Prescriptive	CHG0024	Boiler Tune-up Level 2 (GT or EQ 500)	Units	112.00
Business Solutions Prescriptive	CHG0025	Boiler Tune-up Level 3 (GT or EQ 1200 kbtu/h)	Units	191.00
Business Solutions Prescriptive	CHG0026	High Efficiency Process Boiler Replacement (Water)	MBH	8,226.00
Business Solutions Prescriptive	CHG0028	Level 6 - Process Boiler Tune-up (GT or EQ 1,200 MBH)	Units	29.00
Business Solutions Prescriptive	CHG0029	Process Boiler Tune-up Level 5 (GT or EQ 500 and	Units	4.00
Business Solutions Prescriptive	CHG0030	Process Boiler Tune-up Level 4 (GT or EQ 300 and	Units	1.00
Business Solutions Prescriptive	CHG0053	Optimized Boiler Plant Sequencing	MBH	439,655.00
Business Solutions Prescriptive	CHG0055	Optimal Start Stop on Air Handling Units (Gas)	Square Feet	2,038,637.00
Business Solutions Prescriptive	CHG0059	Occupancy Sensor Controls on HVAC Units (Gas)	Square Feet	74,429.44
Business Solutions Prescriptive	CHG0060	High Efficiency Process Boiler Replacement (Steam)	MBH	78,549.00
Business Solutions Prescriptive	CHG0116	Boiler Reset Control	MBH	15,571.00
Business Solutions Prescriptive	CHG0207	Optimized Boiler Plant Sequencing (Process)	MBH	170,013.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CHG0208	Modulating Burner Control (Process)	MBH	236,848.00
Business Solutions Prescriptive	CHG0209	Boiler Oxygen Trim Control (Process)	MBH	6,280.00
Business Solutions Prescriptive	CHG0210	Linkageless Boiler Control (Process)	MBH	2,485.00
Business Solutions Prescriptive	CHG0211	Direct Fired Makeup	MBH	50,621.00
Business Solutions Prescriptive	CHG0212	HVAC Steam Boilers	MBH	60,968.00
Business Solutions Prescriptive	CHG0216	Destratification Fans	Square Feet	2,513.00
Business Solutions Prescriptive	CHG0221	Hydronic HVAC Pump Control	HP	20.00
Business Solutions Prescriptive	CHG0222	Fan Thermostat Controller	Units	1,432.00
Business Solutions Prescriptive	CHG0226	Level 9 - Process Burner Tune-up (GT or EQ 1,200 MBH)	Units	3.00
Business Solutions Prescriptive	CHG0230	GO Programmable Thermostat	Units	77.00
Business Solutions Prescriptive	CHG0232	Combination Boiler Oxygen Trim Control and Linkageless Boiler Controls (HVAC)	MBH	68,991.00
Business Solutions Prescriptive	CHG0233	Combination Boiler Oxygen Trim Control and Linkageless Boiler Controls (Process)	MBH	404,630.00
Business Solutions Prescriptive	CHG0234	HVAC Boiler Stack Economizers (80-199 degrees)	Units	52,254.00
Business Solutions Prescriptive	CHG0235	Process Boiler Stack Economizers (80-199 degrees)	Units	219,984.00
Business Solutions Prescriptive	CHG0237	Enhanced Ventilation Control - Natural Gas Heat (Consumers Energy Natural Gas)	Tons	1.00
Business Solutions Prescriptive	CHG0238	Steam Traps	Units	68.00
Business Solutions Prescriptive	CHG0250	Level 10 - Pool and Spa Boiler Tune-Up (300-499 MBH)	Units	2.00
Business Solutions Prescriptive	CHG0251	Level 11 - Pool and Spa Boiler Tune-Up (500-1,999 MBH)	Units	1.00
Business Solutions Prescriptive	CHG0257	Steam Traps (Express Application)	Units	140.00
Business Solutions Prescriptive	CHG0271	Steam Traps (Custom)	Units	3.00
Business Solutions Prescriptive	CHG0276	High Efficiency Furnace d120 MBH 92% AFUE (EOY Incentive)	Units	104.00
Business Solutions Prescriptive	CHG0279	High Efficiency Furnace d120 MBH 95% AFUE	Units	81.00
Business Solutions Prescriptive	CHG0280	High Efficiency Furnace GT120 MBH 95% AFU (EOY Incentive)	Units	133.00
Business Solutions Prescriptive	CHG0282	High Efficiency Furnace or Unit Heater (92-94% AFUE) (EOY Incentive)	MBH	7,620.00
Business Solutions Prescriptive	CHG0283	Process Boiler Tune-up Level 6 (GT or EQ 10,000 MBH)	Units	11,726.00
Business Solutions Prescriptive	CHG0285	Process Boiler Tune-up Level 4 (300 to 2,999 MBH)	Units	2.00
Business Solutions Prescriptive	CLE0017	Lighting Occupancy Sensors	Watts Controlled	63,479.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CLE0030	Lamp Removal - Remove 4-foot T12 fluorescent lamp (with T8 ballast retrofit)	Lamps Removed	6,414.00
Business Solutions Prescriptive	CLE0031	Lamp Removal - Remove 8-foot T12 fluorescent lamp (with T8 ballast retrofit)	Lamps Removed	553.00
Business Solutions Prescriptive	CLE0033	Central Lighting Control	Square Feet	276,639.00
Business Solutions Prescriptive	CLE0050	Exterior Multi-Step Dimming Occ Sensor	Watts Controlled	36,410.00
Business Solutions Prescriptive	CLE0056	2-Foot T12 to 2-Foot LED Tube Light	Units	80.00
Business Solutions Prescriptive	CLE0057	2-Foot T8 to 2-Foot LED Tube Light	Units	448.00
Business Solutions Prescriptive	CLE0058	4-Foot T12 to 4-Foot LED Tube Lights	Units	10,114.00
Business Solutions Prescriptive	CLE0059	4-Foot T8 to 4-Foot LED Tube Lights	Units	31,406.00
Business Solutions Prescriptive	CLE0060	8-Foot T12 to Two 4-Foot LED Tube Lights	Units	430.00
Business Solutions Prescriptive	CLE0062	8-Foot T8 to Two 4-Foot LED Tube Lights	Units	388.00
Business Solutions Prescriptive	CLE0065	Stairwell Lighting Controls	Watts Controlled	3,677.00
Business Solutions Prescriptive	CLE0066	Exterior Multi-Step Dimming Controls	Watts Controlled	141.00
Business Solutions Prescriptive	CLE0069	LED Grow Lights	Watts Removed	1,236,829.00
Business Solutions Prescriptive	CLE0072	Parking Garage LED Lighting Retrofit	Watts Removed	50,908.00
Business Solutions Prescriptive	CLE0083	4-Foot T5 to One (1) 4-Foot LED Tube Light	Units	3,032.00
Business Solutions Prescriptive	CLE0085	ALC (Manufacturing, Warehousing, Industrial, and Parking Lots)	kWh	10.00
Business Solutions Prescriptive	CLE0086	ALC (Commercial, Offices, Schools, and Hospitals)	kWh	29.00
Business Solutions Prescriptive	CLE0087	4-Foot T8 to One (1) 4-Foot LED Tube Light (High Bay GT or EQ 15 ft)	Units	7,198.00
Business Solutions Prescriptive	CLE0088	4-Foot T5 to One (1) 4-Foot LED Tube Light (High Bay GT or EQ 15 ft)	Units	98.00
Business Solutions Prescriptive	CLE0095	Exterior Lighting Occupancy Sensors	Watts Controlled	22,600.00
Business Solutions Prescriptive	CLE0097	8-Foot T12 to One (1) 8-Foot LED Tube Light	Lamps Removed	2,053.00
Business Solutions Prescriptive	CLE0098	8-Foot T8 to One (1) 8-Foot LED Tube Light	Lamps Removed	747.00
Business Solutions Prescriptive	CLE0099	3-Foot T12 to 3-Foot LED Tube Light	Lamps Removed	1.00
Business Solutions Prescriptive	CLE0100	3-Foot T8 to 3-Foot LED Tube Light	Lamps Removed	266.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CLE0102	New Linear LED Tube Fixture (High Bay GT OR EQ 15 ft) (EOY Incentive)	Watts Removed	40,969.00
Business Solutions Prescriptive	CLE0103	LED Screw-in Replacing HID	Watts Removed	297,032.00
Business Solutions Prescriptive	CLE0104	Interior LED Lighting (High Bay GT OR EQ 18 ft)	Watts Removed	2,828,262.00
Business Solutions Prescriptive	CLE0105	Exterior LED Lighting Retrofit	Watts Removed	3,082,734.00
Business Solutions Prescriptive	CLE0106	New Linear LED Tube Fixture (Low Bay LT 15 ft) (EOY Incentive)	Watts Removed	26,722.00
Business Solutions Prescriptive	CLE0107	Interior LED Lighting (Low Bay LT 18 ft)	Watts Removed	2,066,884.00
Business Solutions Prescriptive	CLE0108	LED High Bay (per kW reduced) - 24 7 operation	Watts Removed	1,339,231.00
Business Solutions Prescriptive	CLE0109	New Linear LED Tube Fixture (High Bay GT OR EQ 15 ft) (Continuous Operation)	Watts Removed	201,844.00
Business Solutions Prescriptive	CLE0110	Interior LED Lighting (Low Bay LT 15 ft) (Continuous Operation)	Watts Removed	353,588.00
Business Solutions Prescriptive	CLE0181	LED Grow Lights - New Construction	Units	10,090,649.00
Business Solutions Prescriptive	CLE0182	LED Grow Light - Tier 2 - New Construction	Units	2,010,500.00
Business Solutions Prescriptive	CMC0002	Constant Volume AHU to VAV with Hydronic Reheat (Combo)	Square Feet	388,455.00
Business Solutions Prescriptive	CME0006	VFD for Process Pumping, LT or EQ 50 HP	HP	968.50
Business Solutions Prescriptive	CME0013	VFD on Process Pumps (50-250 HP)	HP	3.00
Business Solutions Prescriptive	CME0014	EC Motors	HP	643.26
Business Solutions Prescriptive	CME0015	VFD on Process Fans (LT 50 HP)	HP	331.00
Business Solutions Prescriptive	CME0020	VFD on Process Fans (50-250 HP)	Units	2.00
Business Solutions Prescriptive	CME0032	VFD on Ag Fans (750 - 2,000) - Electric	HP	23.00
Business Solutions Prescriptive	CME0033	VFD on Ag Fans (GT 2,000) - Electric	HP	75.00
Business Solutions Prescriptive	CME0034	VFD on Ag Pumps (750 - 2,000) - Electric	HP	75.00
Business Solutions Prescriptive	CME0035	VFD on Ag Pumps (GT 2,000) - Electric	HP	16.00
Business Solutions Prescriptive	CME0044	VFD on Computer Room Air Condition (CRAC) Units	HP	14.80
Business Solutions Prescriptive	CME0052	VFD on Well Pumps	HP	362.50
Business Solutions Prescriptive	CME0054	VFD on HVAC Supply Fan up to 100 HP	Units	691.30
Business Solutions Prescriptive	CME0055	VFD on HVAC Return Fan up to 100 HP	Units	128.00
Business Solutions Prescriptive	CME0056	VFD on HVAC Chilled Water Pump up to 100 HP	Units	552.90
Business Solutions Prescriptive	CME0057	VFD on HVAC Hydronic Heating Water Pump up to 100 HP	Units	485.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CME0058	VFD for CW HVAC Pumps - Fixed Speed, (54 hz or less)-Bypass	Units	50.00
Business Solutions Prescriptive	CME0060	VFD for HW HVAC Pumps - Fixed Speed, (54 hz or less)-Bypass	Units	10.00
Business Solutions Prescriptive	CME0062	VFD on Cooling Tower Fan	HP	115.00
Business Solutions Prescriptive	CME0064	VFD on Condenser Fan - HVAC	Tons	450.00
Business Solutions Prescriptive	CME0065	VFD on Condenser Fan - Med Temp Refrigeration (33 Degrees F to 50 Degrees F)	HP	5.60
Business Solutions Prescriptive	CME0066	VFD on Condenser Fan - Low Temp Refrigeration (Below 32 Degrees F)	HP	1.40
Business Solutions Prescriptive	CME0067	VFD on Pool Circulation Pump	HP	15.00
Business Solutions Prescriptive	CME0071	VFD on Cooling Tower Fan	HP	85.00
Business Solutions Prescriptive	CME0072	VSD Injection Mold Machines	Tons	3,032.00
Business Solutions Prescriptive	CME0073	VSD for Industrial Vacuum Pump Systems	HP	30.00
Business Solutions Prescriptive	CME0074	Integrated Variable Speed Motor (ECM) for Exterior Condenser Fans	HP	420.48
Business Solutions Prescriptive	CME0075	VSD or Servo Hydraulic Plastic Injection Molder Machines GT= 600A LT 1000 lb/yr/ton	Tons	6,486.80
Business Solutions Prescriptive	CRC0011	Enthalpy Wheels ERUs	CFM	44,570.00
Business Solutions Prescriptive	CRG0006	Boiler Stack Economizer (200F) - Process	MBH	184,912.00
Business Solutions Prescriptive	CRG0008	Process Heating Ventilation Reduction	CFM	47,048.00
Business Solutions Prescriptive	CRG0014	Air-Cooled Condenser - Gas DWH - HVAC or Process Applications	Tons	93.00
Business Solutions Prescriptive	CSC0039	Roof Insulation - Attic Roof (Combo)	Square Feet	3,600.00
Business Solutions Prescriptive	CSC0042	BOC (Combo Customer)	Units	4.00
Business Solutions Prescriptive	CSC0051	Greenhouse Environmental Controls (EOY Incentive)	Square Feet	84,456.00
Business Solutions Prescriptive	CSC0106	Wall Insulation - Combination Customer	Square Feet	4,100.00
Business Solutions Prescriptive	CSE0001	Beverage Vending Machine Controller	Units	8.00
Business Solutions Prescriptive	CSE0002	Guestroom Energy Management Control (electric heat)	Units	186.00
Business Solutions Prescriptive	CSE0007	Night Covers	Linear Feet	724.00
Business Solutions Prescriptive	CSE0010	High Efficiency Clothes Washer (Electric Water Heat, Gas Dryer)	Units	15.00
Business Solutions Prescriptive	CSE0011	AntiSweat Heater Controls	Units	53.00
Business Solutions Prescriptive	CSE0012	Intelligent Surge Protector	Units	1.00
Business Solutions Prescriptive	CSE0013	LED Lighting for Refrigeration Cases	Linear Feet	2,087.00
Business Solutions Prescriptive	CSE0017	Lighting Power Density	Watts Removed	2,694,136.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CSE0020	Case EC Motor	Units	38.00
Business Solutions Prescriptive	CSE0026	Evaporator Fan Control (EC motor)	Units	42.00
Business Solutions Prescriptive	CSE0027	Reach-In Refrigerated Case Door; Medium Temp - Electric Customers	Linear Feet	108.00
Business Solutions Prescriptive	CSE0045	Battery Charger - Continuous	Units	17.00
Business Solutions Prescriptive	CSE0046	Battery Charger - 1 Shift Day	Units	20.00
Business Solutions Prescriptive	CSE0047	Battery Charger - 2 Shift Day	Units	4.00
Business Solutions Prescriptive	CSE0049	Lighting Power Density (Exterior)	Watts Removed	254,829.00
Business Solutions Prescriptive	CSE0067	Lighting Power Density (Parking Garage)	Watts Removed	37,904.00
Business Solutions Prescriptive	CSE0087	Evaporator Fan Control (SP motor)	Units	3.00
Business Solutions Prescriptive	CSE0088	Floating Suction Pressure Control	Units	630.00
Business Solutions Prescriptive	CSE0089	Walk-in EC Motor replacing non-EC Motor	Units	1,496.00
Business Solutions Prescriptive	CSE0090	BOC (Electric Customer)	Units	1.00
Business Solutions Prescriptive	CSE0092	Dairy Refrigeration Tune-up	Units	1,473,467.00
Business Solutions Prescriptive	CSE0094	Interior Lighting Occupancy and Daylight Sensors Controls	Watts Controlled	38,658.00
Business Solutions Prescriptive	CSE0098	High Volume, Low Speed Fans	Units	5.00
Business Solutions Prescriptive	CSE0102	Sprinkler to Drip Irrigation	Units	67.50
Business Solutions Prescriptive	CSE0104	Ag Circulation, Exhaust, or Vent Fans (24 inch to 35 inch Fan blade diam)	Units	232.00
Business Solutions Prescriptive	CSE0105	Ag Circulation, Exhaust, or Vent Fans (36 inch to 47 inch Fan blade diam)	Units	28.00
Business Solutions Prescriptive	CSE0106	Ag Circulation, Exhaust, or Vent Fans (48 inch to 71 inch Fan blade diam)	Units	517.00
Business Solutions Prescriptive	CSE0110	Low-Energy Livestock Waterer	Units	66.00
Business Solutions Prescriptive	CSE0112	Daylight Sensor Controls (Watts)	Watts Controlled	935,032.00
Business Solutions Prescriptive	CSE0113	Barrel Wraps - Injection Molding and Extruders	Square Feet	4,026.30
Business Solutions Prescriptive	CSE0121	Milk Pre-Cooler (Heat Exchanger, Chiller Savings)	Units	264,286.50
Business Solutions Prescriptive	CSE0129	All-Electric Injection Mold Machines	Tons	6,051.10
Business Solutions Prescriptive	CSE0130	Hybrid Injection Mold Machines	Tons	12,258.00
Business Solutions Prescriptive	CSE0131	High-Efficiency Hand Dryer	Units	18.00
Business Solutions Prescriptive	CSE0132	High Performance Glazing in Windows	Square Feet	13,909.80
Business Solutions Prescriptive	CSE0133	Fiber Laser Cutting Replacing Carbon Dioxide Laser Cutting - Three Shift	Units	73.54
Business Solutions Prescriptive	CSE0144	LEED Certified Silver - Electric	Units	7.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CSE0148	No Heat Reach-In Case Doors - Without Anti-Sweat Heater Control	Units	56.00
Business Solutions Prescriptive	CSE0149	No Heat Reach-In Case Doors - With Anti-Sweat Heater Control	Units	32.00
Business Solutions Prescriptive	CSE0161	Welder, Inverter Style	Units	20.00
Business Solutions Prescriptive	CSE0163	Floating Suction Pressure Control (Grocery Store)	Tons	3.00
Business Solutions Prescriptive	CSE0166	Cooler or Freezer Defrost Control	Tons	28.00
Business Solutions Prescriptive	CSE0168	Scroll Refrigeration Compressor	Tons	25.40
Business Solutions Prescriptive	CSE0171	Interior Lighting Occupancy Sensors (LT 150 Sq. Ft.)	Units	3,434.00
Business Solutions Prescriptive	CSE0172	Interior Lighting Occupancy Sensors (GT= 150 and LT= 500 Sq. Ft.)	Units	3,893.00
Business Solutions Prescriptive	CSE0173	Interior Lighting Occupancy Sensors (GT= 500 Sq. Ft.)	Units	237.00
Business Solutions Prescriptive	CSE0178	Snack machine vending miser	Units	2.00
Business Solutions Prescriptive	CSE0179	Trim Kits	Units	1,302.00
Business Solutions Prescriptive	CSE0183	Evaporator Fan Controls with Demand Defrost for Walk-in Freezer	Tons	2.00
Business Solutions Prescriptive	CSE0184	Evaporator Fan Controls with Demand Defrost for Walk-in Cooler	Tons	63.00
Business Solutions Prescriptive	CSE0186	Indoor Agriculture Dehumidification Units (GT 155 pints/day capacity)	Units	326,456.00
Business Solutions Prescriptive	CSE0187	HVAC Reduction in Indoor Agriculture Grow Rooms	Watts Removed	9,609,457.63
Business Solutions Prescriptive	CSE0188	LED Grow Light - Tier 2	Watts Removed	141,590.00
Business Solutions Prescriptive	CSE0189	Fiber Laser Cutting Replacing Carbon Dioxide Laser Cutting - Two Shift	Units	10.00
Business Solutions Prescriptive	CSE0190	VSD or Servo Hydraulic Plastic Injection Molder Machines GT= 400A LT 600 lb/yr/ton	Tons	1,020.00
Business Solutions Prescriptive	CSG0001	Ozone Generation System	Pounds	4,985.00
Business Solutions Prescriptive	CSG0004	Greenhouse Heat Curtains	Square Feet	372,620.00
Business Solutions Prescriptive	CSG0006	Wall Insulation - Gas Customer	Square Feet	1,105.00
Business Solutions Prescriptive	CSG0012	Roof Insulation - Attic Roof	Square Feet	4,508.00
Business Solutions Prescriptive	CSG0024	Fixed-Plate Energy Recovery Unit	CFM	5,705.00
Business Solutions Prescriptive	CSG0025	Enthalpy Wheel Energy Recovery Unit	CFM	6,100.00
Business Solutions Prescriptive	CSG0027	BOC (Gas Customer)	Units	2.00
Business Solutions Prescriptive	CSG0029	Automatic High Speed Doors (Between Cooler to Dock)	Square Feet	160.00
Business Solutions Prescriptive	CSG0031	Snow Melt Controls	Square Feet	32,240.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CSG0032	Roof Insulation R10 to R18	Square Feet	127,749.00
Business Solutions Prescriptive	CSG0033	Roof Insulation R10 to R18	Square Feet	284,612.00
Business Solutions Prescriptive	CSG0034	Roof Insulation R12 to R18	Square Feet	21,378.00
Business Solutions Prescriptive	CSG0035	Roof Insulation R12 to R18	Square Feet	79,248.00
Business Solutions Prescriptive	CSG0037	Roof Insulation R14 to R18	Square Feet	140,000.00
Business Solutions Prescriptive	CSG0039	Roof Insulation R16 to R18	Square Feet	151,540.00
Business Solutions Prescriptive	CSG0040	Roof Insulation R18 to R20	Square Feet	29,418.00
Business Solutions Prescriptive	CSG0041	Roof Insulation R18 to R20	Square Feet	601,485.00
Business Solutions Prescriptive	CSG0042	Roof Insulation R20 to R22	Square Feet	29,418.00
Business Solutions Prescriptive	CSG0043	Roof Insulation R20 to R22	Square Feet	581,775.00
Business Solutions Prescriptive	CSG0044	Roof Insulation R22 to R24	Square Feet	29,418.00
Business Solutions Prescriptive	CSG0045	Roof Insulation R22 to R24	Square Feet	533,280.00
Business Solutions Prescriptive	CSG0049	Refrigeration Waste Heat Recovery Decreasing HVAC Heating Load	Tons	43.00
Business Solutions Prescriptive	CSG0051	Greenhouse Infrared Film replacing double layer with double layer	Square Feet	3,134,252.00
Business Solutions Prescriptive	CSG0054	Gas Dishwasher	Units	3.00
Business Solutions Prescriptive	CSG0058	Greenhouse In-Floor Heating System (Without Heat Curtains)	Square Feet	17,280.00
Business Solutions Prescriptive	CSG0059	Greenhouse In-Floor Heating System (With Heat Curtains)	Square Feet	41,620.00
Business Solutions Prescriptive	CSG0060	Refrigeration Waste Heat Recovery Decreasing HVAC Heating Load	Tons	948.00
Business Solutions Prescriptive	CSG0065	Supply Air Ductwork Insulation (Exterior Space)	Square Feet	11,905.00
Business Solutions Prescriptive	CSG0071	Modulating Burner on Makeup Air Handling Unit (Continuous Operation)	MBH	5,670.00
Business Solutions Prescriptive	CSG0072	Modulating Burner on Makeup Air Handling Unit (GT 100 hrs week Operation)	MBH	8,023.00
Business Solutions Prescriptive	CSG0076	RTO (Recuperative Regenerative Thermal Oxidizers) New Construction 2 Shift	CFM	13,000.00
Business Solutions Prescriptive	CSG0077	RTO (Recuperative Regenerative Thermal Oxidizers) New Construction 3 Shift	CFM	4,843.00
Business Solutions Prescriptive	CSG0078	LEED Certified Silver - Natural Gas	Units	4.00
Business Solutions Prescriptive	CSG0087	Commercial Kitchen Ventilation Control	CFM	22,250.00
Business Solutions Prescriptive	CSG0098	Greenhouse Environmental Controls - Gas	Square Feet	222,306.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Solutions Prescriptive	CSG0109	Engineered Commercial Kitchen Ventilation Control	CFM	100.00
Business Solutions Prescriptive	CWE0025	Domestic Hot Water Recirculation (LT 500w)	Units	15.00
Business Solutions Prescriptive	CWE0026	Domestic Hot Water Recirculation (500w to 1000w)	Units	2.00
Business Solutions Prescriptive	CWE0029	Air and Water-Cooled Chiller Tune-up (1000+ Tons)	Tons	23.00
Business Solutions Prescriptive	CWG0002	Gas Water Heater GT 80 gal	Units	20.00
Business Solutions Prescriptive	CWG0006	High Efficiency Clothes Washer (Gas Water Heat, Gas Dryer)	Units	2.00
Business Solutions Prescriptive	CWG0007	High Efficiency Pool Heater .84+ EF	mBtu	999.00
Business Solutions Prescriptive	CWG0016	Level 10 - Domestic Water Heater Tune-up (199-499 MBH)	Units	26.00
Business Solutions Prescriptive	CWG0017	Level 11 - Domestic Water Heater Tune-up (500-1,999 MBH)	Units	37.00
Business Solutions Prescriptive	CWG0019	Level 12 - Domestic Water Heater Tune-up (GT or EQ 1,200 MBH)	Units	6.00
Business Solutions Prescriptive	CWG0023	Pipe Wrap - Domestic Hot Water - unconditioned space (120F)	Linear Feet	96.00
Business Solutions Prescriptive	CWG0029	Gas Water Heater GT 80 gal	MBH	27,329.00
Business Solutions Prescriptive	CWG0033	High-Efficiency Tank-Style Domestic Water Heater < 55 Gallons (<=75 MBH, >=0.64)	Units	1.00
Business Solutions Prescriptive	CWG0034	High-Efficiency Tank-Style Domestic Water Heater < 55 Gallons (<=75 MBH, >=0.68)	Units	24.00
C&I Request For Proposal	CQE0001	Custom Measure for C and I RFP Program - Electric Only	Units	3.00
C&I Request For Proposal	CQG0001	Custom Measure for C and I RFP Program - Gas Only	Units	2.00
Midstream	CPC0004	DCV 0-2,000	Units	1.00
Midstream	CPC0007	DCV 8,001-24,000 sq ft	Units	5.00
Midstream	CPE0001	LED PAR	Units	7,801.00
Midstream	CPE0002	LED MR16	Units	1,381.00
Midstream	CPE0003	LED A-Series	Units	98,158.00
Midstream	CPE0004	LED Candelabra and Globe	Units	2,982.00
Midstream	CPE0005	LED BR-Series	Units	9,157.00
Midstream	CPE0007	Trim Kit	Units	6,661.00
Midstream	CPE0010	Bonus Electric	Units	169,149.25
Midstream	CPE0011	ENERGY STAR Commercial Solid Door Refrigerators (LT 15 cu ft)	Units	18.00
Midstream	CPE0012	ENERGY STAR Commercial Solid Door Refrigerators (15 - 30 cu ft)	Units	48.00
Midstream	CPE0013	ENERGY STAR Commercial Solid Door Refrigerators (30 - 50 cu ft)	Units	53.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Midstream	CPE0014	ENERGY STAR Commercial Solid Door Refrigerators (GT 50 cu ft)	Units	7.00
Midstream	CPE0015	ENERGY STAR Commercial Solid Door Freezers (LT 15 cu ft)	Units	4.00
Midstream	CPE0016	ENERGY STAR Commercial Solid Door Freezers (15 - 30 cu ft)	Units	25.00
Midstream	CPE0017	ENERGY STAR Commercial Solid Door Freezers (30 - 50 cu ft)	Units	40.00
Midstream	CPE0019	Steam Cookers (3 Pan, Electric)	Units	1.00
Midstream	CPE0021	Steam Cookers (5 Pan, Electric)	Units	1.00
Midstream	CPE0022	Steam Cookers (6 Pan, Electric)	Units	25.00
Midstream	CPE0024	ENERGY STAR Hot Holding Cabinets (Three Quarter Size)	Units	7.00
Midstream	CPE0025	ENERGY STAR Hot Holding Cabinets (Full Size)	Units	46.00
Midstream	CPE0026	Energy Efficient Ice Machines (LT 500 lbs)	Units	31.00
Midstream	CPE0027	Energy Efficient Ice Machines (500 to 1000 lbs)	Units	5.00
Midstream	CPE0028	Energy Efficient Ice Machines (1001 to 1500 lbs)	Units	1.00
Midstream	CPE0030	ENERGY STAR Commercial Glass Door Refrigerators LT 15 cu. ft.	Units	5.00
Midstream	CPE0031	ENERGY STAR Commercial Glass Door Refrigerators 15 to 30 cu. ft.	Units	8.00
Midstream	CPE0032	ENERGY STAR Commercial Glass Door Refrigerators 31 to 50 cu. ft.	Units	6.00
Midstream	CPE0033	ENERGY STAR Commercial Glass Door Refrigerators more than 50 cu. ft.	Units	1.00
Midstream	CPE0036	ENERGY STAR Commercial Glass Door Freezers 31 to 50 cu. ft.	Units	6.00
Midstream	CPE0040	ENERGY STAR Convection Ovens	Units	17.00
Midstream	CPE0041	Combination Ovens	Units	11.00
Midstream	CPE0042	Exit Sign	Units	1,041.00
Midstream	CPE0051	PTAC 7kBtu/hr - 15kBtu/hr	Tons	524.00
Midstream	CPE0060	Pin Based	Units	9,944.00
Midstream	CPE0061	2ft LED Tubes	Units	7,664.00
Midstream	CPE0062	3ft LED Tubes	Units	3,918.00
Midstream	CPE0063	4ft LED Tubes	Units	454,482.00
Midstream	CPE0064	8ft LED Tubes	Units	14,929.00
Midstream	CPE0065	Cogged V-BELTS (1-25 HP)	Units	6,872.00
Midstream	CPE0068	Low-Energy Livestock Waterer	Units	16.00
Midstream	CPE0072	Wallpacks LT50w	Units	360.00
Midstream	CPE0073	Wallpacks 50w-99w	Units	492.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Midstream	CPE0074	Wallpacks 100w-225w	Units	289.00
Midstream	CPE0079	PTHP 7kBtu/hr - 15kBtu/hr	Tons	22.00
Midstream	CPE0086	DCV 2,001-4,400	Units	31.00
Midstream	CPE0087	DCV 4,401-8,000	Units	40.00
Midstream	CPE0088	DCV 8,001-24,000	Units	20.00
Midstream	CPE0094	2x2 LED Flat Panel (GT 3001 lm)	Units	41.00
Midstream	CPG0004	Pre-Rinse Sprayers	Units	4.00
Midstream	CPG0010	Bonus Gas	Units	2,741.25
Midstream	CPG0021	ENERGY STAR Steam Cookers (6 Pan, Gas)	Units	21.00
Midstream	CPG0022	Convection Ovens	Units	110.00
Midstream	CPG0023	Combination Ovens	Units	63.00
Midstream	CPG0024	Rack Oven Single	Units	1.00
Midstream	CPG0025	Rack Oven Double	Units	3.00
Midstream	CPG0026	ENERGY STAR Fryer	Units	11.00
Midstream	CPG0027	Large Vat Fryer	Units	27.00
Midstream	CPG0028	ENERGY STAR Griddles	Units	1.00
Midstream	CPG0029	Energy Star Dishwasher-Commercial	Units	28.00
Midstream	CPG0030	Energy Star Dishwasher-Under Counter	Units	4.00
Midstream	CPG0036	Infrared Salamander Broiler	Units	1.00
Midstream	CPG0057	Commercial Kitchen Ventilation Control	CFM	22,465.00
Midstream	CPG0066	Boiler 300 - 2500 kBtuh	MBH	12,000.00

Table B-2. Small Business Solutions Measure Details

Product	Measure Code	Measure Description	Units	Participation
Business Energy Analysis	CDG1000	Pre Rinse Sprayers - Gas	Units	1,891.00
Business Energy Analysis	CDG1001	Low Flow Faucet Aerator - Public Restroom - .5 gpm - Gas	Units	25,170.00
Business Energy Analysis	CDG1002	Low Flow Faucet Aerator - Private Restroom - 1 gpm - Gas	Units	4,221.00
Business Energy Analysis	CDG1003	Low Flow Showerhead - 1.5 gpm - Gas	Units	8,204.00
Business Energy Analysis	CDG1004	Pipe Wrap - DWH 140F - Unconditioned - Gas Water Heater	Linear Feet	629.00
Business Energy Analysis	CDG1005	Consumers Energy Workpaper Measure - Tier 2 Wi-Fi Programmable Thermostat	Units	1,277.00
Business Energy Analysis	CDG1006	Consumers Energy Workpaper Measure - Audit	Units	4,435.00
Business Energy Analysis	CDG1007	Programmable Thermostat - Gas Only	Units	7.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Business Energy Analysis	CDG1008	Pipe Wrap - DWH 140F - Conditioned - Gas Water Heater	Linear Feet	1,258.50
Business Energy Analysis	CDG1009	Low Flow Faucet Aerator - Private Restroom - .5gpm - Gas	Units	547.00
Online Marketplace	CDC0072	Smart Thermostat	Units	75.00
Online Marketplace	CDE0268	Red LED Exit Sign	Units	105.00
Online Marketplace	CDE0269	Red Exit Sign LED Retrofit Kit	Units	1.00
Online Marketplace	CDE0280	Smart Thermostat	Units	57.00
Online Marketplace	CDE0288	Tier 1 Advanced Power Strip	Units	434.00
Online Marketplace	CDE0342	50W Wall Pack 5000K LED	Units	125.00
Online Marketplace	CDE0343	75W or 80W Wall Pack 5000K LED	Units	314.00
Online Marketplace	CDE0351	3/4" W X 1/2" Pipe Insulation (6 Pieces) - Electric	Units	637.00
Online Marketplace	CDE0352	3/4" W X 3/4" Pipe Insulation (6 Pieces) - Electric	Units	747.00
Online Marketplace	CDE0353	Occupancy Sensor	Units	443.00
Online Marketplace	CDE0356	BT Faucet Aerator (needle spray) - Electric	Units	12.00
Online Marketplace	CDE0362	Low Flow Showerheads 1.5 gpm Type 1 - Electric	Units	885.00
Online Marketplace	CDE0363	Low Flow Showerheads 1.5 gpm Type 2 - Electric	Units	657.00
Online Marketplace	CDE0364	Compressed Air Nozzle (super air nozzle) (1/4)	Units	50.00
Online Marketplace	CDE0365	Compressed Air Nozzle (stainless steel super) (1/4)	Units	51.00
Online Marketplace	CDE0369	High bay corn bulb LED lamp (36W)	Units	12.00
Online Marketplace	CDE0370	High bay corn bulb LED lamp (54W)	Units	130.00
Online Marketplace	CDE0371	High bay corn bulb LED lamp (120W)	Units	14.00
Online Marketplace	CDE0372	9W A19 LED Daylight Sensing	Units	91.00
Online Marketplace	CDE0374	8W BR30 LED Motion Sensing	Units	311.00
Online Marketplace	CDE0389	11W BR30 2700K LED - 4pk	Units	218.00
Online Marketplace	CDE0390	11W BR30 4000K LED - 4pk	Units	94.00
Online Marketplace	CDE0391	5W Candelabra 2700K LED - 6pk	Units	72.00
Online Marketplace	CDE0392	6W Globe 2700K LED - 4pk	Units	17.00
Online Marketplace	CDE0393	11W A19 4000K LED - 6pk	Units	150.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Online Marketplace	CDE0394	15W A19 2700K LED - 6pk	Units	70.00
Online Marketplace	CDE0402	6W A19 LED (40W equiv) 2700K - 6pk	Units	232.00
Online Marketplace	CDE0403	6W A19 LED (40W equiv) 4000K - 6pk	Units	12.00
Online Marketplace	CDE0404	9W A19 LED (60W equiv) 2700K - 6pk	Units	673.00
Online Marketplace	CDE0405	9W A19 LED (60W equiv) 4000K - 6pk	Units	1,330.00
Online Marketplace	CDE0406	11W A19 LED (75W equiv) 2700K - 6pk	Units	530.00
Online Marketplace	CDE0407	1L 4' LED Tube - 10pk	Units	26.00
Online Marketplace	CDE0408	9W Wifi BR30 LED - 2pk	Units	19.00
Online Marketplace	CDE0409	9W Wifi BR30 LED - 4pk	Units	30.00
Online Marketplace	CDE0410	Ultra Performance Pre-rinse Sprayer (Electric)	Units	318.00
Online Marketplace	CDE0411	9W A19 WiFi Smart LED - 4pk	Units	23.00
Online Marketplace	CDE0412	Flat Panel LED (2x2) - 4pk	Units	80.00
Online Marketplace	CDE0413	Flat Panel LED (2x4) - 4pk	Units	236.00
Online Marketplace	CDE0414	9W A19 LED Motion Sensing - 2pk	Units	8.00
Online Marketplace	CDE0415	ENERGY STAR Air Purifier CADR 101-150	Units	166.00
Online Marketplace	CDE0416	ENERGY STAR Air Purifier CADR 201-250	Units	795.00
Online Marketplace	CDE0417	ENERGY STAR Air Purifier CADR Over 250	Units	456.00
Online Marketplace	CDE0422	0.5 gpm Bath Aerator - Electric	Units	3,527.00
Online Marketplace	CDE0423	1 gpm Bath Aerator - Electric	Units	25.00
Online Marketplace	CDE0437	Direct Install Kits 2022	Units	46,601.00
Online Marketplace	CDE0438	6" Thin Wafer Smart Downlight LED	Units	191.00
Online Marketplace	CDE0440	Insulating Wraps, 25 Sq Ft	Units	42.00
Online Marketplace	CDG0131	Standard Faucet Aerator (Needle spray)	Linear Feet	35.00
Online Marketplace	CDG0137	Smart Thermostat	Units	33.00
Online Marketplace	CDG0144	3/4" W X 1/2" Pipe Insulation (18 ft) - Gas	Units	324.00
Online Marketplace	CDG0145	3/4" W X 3/4" Pipe Insulation (18 ft) - Gas	Units	351.00
Online Marketplace	CDG0154	Low Flow Showerheads 1.5 gpm Type 1 - Gas	Units	620.00
Online Marketplace	CDG0155	Low Flow Showerheads 1.5 gpm Type 2 - Gas	Units	562.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Online Marketplace	CDG0162	Ultra Performance Pre-rinse Sprayer (Gas)	Units	373.00
Online Marketplace	CDG0167	0.5 gpm Bath Aerator - Gas	Units	4,165.00
Online Marketplace	CDG0168	1 gpm Bath Aerator - Gas	Units	99.00
Online Marketplace	CDG0169	Insulating Wraps, 25 Sq Ft	Units	29.00
Residential Lighting Carryover	CDE0204	LED Globe	Units	3,893.00
Residential Lighting Carryover	CDE0207	LED Candelabra	Units	10,919.00
Residential Lighting Carryover	CDE0208	LED Bulb Replacing A-Line 43W	Units	134,521.00
Residential Lighting Carryover	CDE0225	LED Replacing A-Line 72W halogen	Units	11,893.00
Residential Lighting Carryover	CDE0290	LED Bulb Replacing A-Line 53W	Units	9,148.00
Small Business Assessment	CDC0058	Programmable Thermostats -- Combination Customers	Units	44.00
Small Business Assessment	CDC0059	Field Assessment and Report - Combination Customers	Units	1,506.00
Small Business Assessment	CDC0064	Gas Pipe Wrap - 140F DHW (conditioned space)	Linear Feet	451.00
Small Business Assessment	CDC0065	Field Assessment and Report - Combo (increased incentive)	Units	57.00
Small Business Assessment	CDC0073	Nest Tier 2 Thermostat - Combo	Units	7.00
Small Business Assessment	CDC0074	Ecobee Tier 2 Thermostat - Combo	Units	11.00
Small Business Assessment	CDC0075	Wired GREM	Units	102.00
Small Business Assessment	CDC0076	Wireless GREM	Units	6.00
Small Business Assessment	CDC0083	Ecobee Tier 3 Smarter Wi-Fi Thermostat	Units	3.00
Small Business Assessment	CDC0090	Field Assessment and Report with Direct Install - Combo	Units	615.00
Small Business Assessment	CDC0092	Smart Thermostat Tier 2 (Sensi) Combo	Units	65.00
Small Business Assessment	CDE0006	1.1 gpm Pre-rinse Sprayers - Electric	Units	61.00
Small Business Assessment	CDE0045	LED Lighting - 11 W LED Flood Lamp	Units	3,047.00
Small Business Assessment	CDE0058	Programmable Thermostats	Units	150.00
Small Business Assessment	CDE0090	3.5 W LED Candelabra	Units	1,262.00
Small Business Assessment	CDE0091	Field Assessment and Report - Electric Customers	Units	3,357.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Small Business Assessment	CDE0101	LED Exit Sign	Units	651.00
Small Business Assessment	CDE0102	LED Lighting - 9.5 W LED Lamps Replacing Incandescent Lights	Units	5,629.00
Small Business Assessment	CDE0103	LED Lighting - 6 W LED Lamps Replacing Incandescent Lights	Units	103.00
Small Business Assessment	CDE0111	Electric Low-Flow Faucet Aerators LT 1.5 gpm (Kitchen)	Units	437.00
Small Business Assessment	CDE0113	Electric Pipe Wrap - 140F DHW (conditioned space)	Linear Feet	528.00
Small Business Assessment	CDE0210	1L 4' LED Tube Replacing T8 1L 4' Lamp	Units	21,934.00
Small Business Assessment	CDE0211	Beverage Vending Machine Controllers	Units	44.00
Small Business Assessment	CDE0213	LED Globe	Units	979.00
Small Business Assessment	CDE0239	Hospitality - Low Flow Showerhead - 1.5 gpm (Electric)	Units	90.00
Small Business Assessment	CDE0250	Electric Pipe Wrap - 140F DHW (unconditioned space)	Linear Feet	189.00
Small Business Assessment	CDE0251	Field Assessment and Report - Electric (increased incentive)	Units	156.00
Small Business Assessment	CDE0285	Smart Power Strip (Tier 1) Leave Behind	Units	2,102.00
Small Business Assessment	CDE0286	Nest Tier 2 Thermostat - Electric	Units	2.00
Small Business Assessment	CDE0287	Ecobee Tier 2 Thermostat - Electric	Units	25.00
Small Business Assessment	CDE0347	Wired GREM	Units	91.00
Small Business Assessment	CDE0379	Ecobee Tier 3 Smarter Wi-Fi Thermostat	Units	8.00
Small Business Assessment	CDE0386	Small & Midsize EE Kit	Units	4,350.00
Small Business Assessment	CDE0387	Field Assessment and Report with Direct Install - Electric	Units	1,372.00
Small Business Assessment	CDE0399	Smart Thermostat Tier 2 (Sensi) EO	Units	31.00
Small Business Assessment	CDE0400	Hot Water Heater Blankets Tier 1 (20-40 gal) - Electric	Units	48.00
Small Business Assessment	CDE0401	Hot Water Heater Blankets Tier 2 (41-60 gal) - Electric	Units	54.00
Small Business Assessment	CDE0418	0.5 gpm Private Bath Aerator - Electric	Units	141.00
Small Business Assessment	CDE0419	0.5 gpm Public Bath Aerator - Electric	Units	1,113.00
Small Business Assessment	CDE0420	1 gpm Bath Aerator - Electric	Units	122.00
Small Business Assessment	CDE0439	Smart Thermostat - DTE Shared - Electric	Units	35.00
Small Business Assessment	CDG0026	1.1 gpm Pre-rinse Sprayers - Gas	Units	77.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Small Business Assessment	CDG0028	Gas Low-Flow Faucet Aerators LT 1.5gpm (Kitchen)	Units	226.00
Small Business Assessment	CDG0058	Programmable Thermostat - Gas Customers	Units	102.00
Small Business Assessment	CDG0091	Field Assessment and Report - Gas Customers	Units	476.00
Small Business Assessment	CDG0123	Hospitality - Low Flow Showerhead - 1.5 gpm (Gas)	Units	213.00
Small Business Assessment	CDG0124	Gas Pipe Wrap - 140F DHW (unconditioned space)	Linear Feet	204.50
Small Business Assessment	CDG0125	Field Assessment and Report - Gas (increased incentive)	Units	26.00
Small Business Assessment	CDG0142	Nest Tier 2 Thermostat - Gas	Units	5.00
Small Business Assessment	CDG0143	Ecobee Tier 2 Thermostat - Gas	Units	6.00
Small Business Assessment	CDG0148	Ecobee Tier 3 Smarter Wi-Fi Thermostat	Units	6.00
Small Business Assessment	CDG0149	Nest Tier 3 Smarter Wi-Fi Thermostat	Units	7.00
Small Business Assessment	CDG0157	Field Assessment and Report with Direct Install - Gas	Units	71.00
Small Business Assessment	CDG0159	Smart Thermostat Tier 2 (Sensi) GO	Units	13.00
Small Business Assessment	CDG0160	Hot Water Heater Blankets Tier 1 (20-40 gal) - Gas	Units	20.00
Small Business Assessment	CDG0161	Hot Water Heater Blankets Tier 2 (41-60 gal) - Gas	Units	26.00
Small Business Assessment	CDG0163	0.5 gpm Private Bath Aerator - Gas	Units	65.00
Small Business Assessment	CDG0164	0.5 gpm Public Bath Aerator - Gas	Units	1,134.00
Small Business Assessment	CDG0165	1 gpm Bath Aerator - Gas	Units	100.00
Small Business Core	CDE0059	Anti-sweat Heater Control	Units	41.00
Small Business Core	CDE0080	ECM Case Motor	Units	44.00
Small Business Core	CDE0081	ECM Walk-in Cooler and Freezer Motor	Units	726.00
Small Business Core	CDE0085	Evaporator Fan Motor Controls on ECM motors	Units	213.00
Small Business Core	CDE0097	\$50 Permit	Units	29.00
Small Business Core	CDE0098	\$100 Permit	Units	3.00
Small Business Core	CDE0099	\$150 Permit	Units	30.00
Small Business Core	CDE0105	Daylight Controls	Watts Controlled	62,969.50
Small Business Core	CDE0106	Occ Sensors	Watts Controlled	31,379.42

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
Small Business Core	CDE0108	LEDs	Units	33,427.00
Small Business Core	CDE0151	Project Completion Bonus	Units	103.00
Small Business Core	CDE0200	Miscellaneous Lighting	Units	4,944.00
Small Business Core	CDE0201	Fixture Removal	Units	421.00
Small Business Core	CDE0212	Screw-In LEDs	Units	517.00
Small Business Core	CDE0222	LEDs	Units	3,300.00
Small Business Core	CDE0224	Fixture Removal	Units	25.00
Small Business Core	CDE0233	Custom Exterior Induction	Units	12.00
Small Business Core	CDE0234	Custom Interior LED	Units	1,889.00
Small Business Core	CDE0235	Custom Exterior LED	Units	165.00
Small Business Core	CDE0236	Custom Interior T8 T5	Units	16.00
Small Business Core	CDE0275	LED Lighting for Refrigeration Cases	Linear Feet	1,981.00
Small Business Core	CDE0282	Strip Curtains (40 Degrees)	Square Feet	1,061.49
Small Business Core	CDE0283	Strip Curtains (0 Degrees)	Square Feet	72.80
Small Business Core	CDE0340	Custom Signs Tier 1	Units	34.00
Small Business Core	CDE0425	10% Bonus - Non Lighting	Units	178,391.00
Small Business Core	CDE0430	Strip Curtains (40 Degrees) (After 05-01-2022)	Square Feet	2,620.65
Small Business Core	CDE0431	Strip Curtains (0 Degrees) (After 05-01-2022)	Square Feet	381.70
Small Business Core	CDE0432	ECM Case Motors (After 05-01-2022)	Units	235.00
Small Business Core	CDE0436	Anti-Sweat Heater Controls (After 05-01-2022)	Units	339.00

Table B-3. Multifamily C&I Measure Details

Product	Measure Code	Measure Description	Units	Participation
C&I Multifamily	CCG0001	Bonus-Multifamily Custom-Natural Gas	Units	1.00
C&I Multifamily	CTE0157	LED Fixture-Interior	Units	734.00
C&I Multifamily	CTE0160	LED A-Series Lamp-50-79W Replacement	Units	136.00
C&I Multifamily	CTE0161	LED A-Series Lamp-60W Replacement	Units	972.00
C&I Multifamily	CTE0190	LED (Night Only) Replacing HID Fixture	Watts Removed	21,290.00
C&I Multifamily	CTE0216	Bonus-Limited Time Bonus-Electric	Units	2.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
C&I Multifamily	CTE0222	Low-Flow Bath Aerator-1.5gpm-Electric DHW	Units	762.00
C&I Multifamily	CTE0223	Low-Flow Kitchen Aerator-1.5gpm-Electric DHW	Units	438.00
C&I Multifamily	CTE0224	Low-Flow Showerhead-1.5gpm-Electric DHW	Units	1,171.00
C&I Multifamily	CTE0225	Low-Flow Showerhead-1.75gpm-Electric DHW	Units	72.00
C&I Multifamily	CTE0236	LED A-Series Lamp-60W Replacement	Units	2,660.00
C&I Multifamily	CTE0239	Bonus-Limited Time Bonus-Electric	Units	3,512,733.00
C&I Multifamily	CTE0251	Bonus-Program Incentive Match-Electric	Units	472,705.00
C&I Multifamily	CTE0264	LED Fixture-Exterior	Units	150.00
C&I Multifamily	CTE0266	LED Fixture-Exterior	Units	88.00
C&I Multifamily	CTE0282	LED A-Series Lamp-60W Replacement	Units	1,596.00
C&I Multifamily	CTE0283	LED Lamp-Flood/PAR	Units	22.00
C&I Multifamily	CTE0284	LED Lamp-Globe	Units	2,748.00
C&I Multifamily	CTE0287	LED A-Series Lamp-50-79W Replacement	Units	27.00
C&I Multifamily	CTE0290	Exterior Bilevel Controls (12/7)	Watts Controlled	1,584.00
C&I Multifamily	CTE0294	LED Fixture (24/7) replacing Fluorescent Tube Fixture	Watts Removed	6,080.00
C&I Multifamily	CTE0295	ECM on Domestic Hot Water Recirculation LT100W	Units	4.00
C&I Multifamily	CTE0299	ECM on Hydronic Heating 100-500W	Units	10.00
C&I Multifamily	CTE0304	Low-Flow Bath Aerator-1.0gpm-Electric DHW	Units	718.00
C&I Multifamily	CTE0305	Low-Flow Bath Aerator-Electric DHW	Units	5.00
C&I Multifamily	CTE0306	Low-Flow Kitchen Aerator-1.5gpm-Electric DHW	Units	5.00
C&I Multifamily	CTE0307	Low-Flow Showerhead-1.5gpm-Electric DHW	Units	7.00
C&I Multifamily	CTE0333	Air Source Heat Pump-14.5 SEER-8.7 HSPF	Tons	24.05
C&I Multifamily	CTE0337	Air Source Heat Pump-16 SEER-9.0 HSPF	Tons	4.83
C&I Multifamily	CTE0339	Air Source Heat Pump-17 SEER-9.4 HSPF	Tons	8.00
C&I Multifamily	CTE0343	Air Source Heat Pump-19 SEER-9.7 HSPF	Tons	71.00
C&I Multifamily	CTE0345	Air Source Heat Pump-20 SEER-9.7 HSPF	Tons	46.00
C&I Multifamily	CTE0366	Air Source Heat Pump-16 SEER-9.0 HSPF	Tons	12.00
C&I Multifamily	CTE0368	Air Source Heat Pump-17 SEER-9.4 HSPF	Tons	11.00
C&I Multifamily	CTE0370	Air Source Heat Pump-18 SEER-9.7 HSPF	Tons	2.37
C&I Multifamily	CTE0374	Air Source Heat Pump-20 SEER-9.7 HSPF	Tons	12.83
C&I Multifamily	CTE0376	Air Source Heat Pump-21 SEER-9.7 HSPF	Tons	3.50
C&I Multifamily	CTE0377	LED Candelabra	Units	56.00
C&I Multifamily	CTE0378	LED Fixture-Interior	Units	15,642.00
C&I Multifamily	CTE0379	LED Fixture-Exterior	Units	545.00
C&I Multifamily	CTE0388	LED Fixture-Exterior (RES Code)	Units	20.00
C&I Multifamily	CTE0391	Occupancy Sensor (LT180W)	Units	128.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
C&I Multifamily	CTE0419	LPD Exterior (Com Code)	Watts Removed	16,354.00
C&I Multifamily	CTE0424	LED Fixture - Interior (RES Code)	Units	14.00
C&I Multifamily	CTE0431	Window Insulation Kits (Electric)	Units	848.00
C&I Multifamily	CTE0436	Pipe Wrap R3-DHW-In-Unit (Electric)	Linear Feet	782.00
C&I Multifamily	CTE0439	Split System Air Conditioner-SEER 15-In-Unit	Tons	84.23
C&I Multifamily	CTE0446	Split System Air Conditioner-SEER 14-In-Unit	Tons	490.52
C&I Multifamily	CTE0448	Split System Air Conditioner-SEER 15-In-Unit	Tons	553.39
C&I Multifamily	CTE0449	Split System Air Conditioner-SEER 16-In-Unit	Tons	114.43
C&I Multifamily	CTE0495	LED Fixture-Replacing CFL-12/7 Common Area	Units	134.00
C&I Multifamily	CTE0519	LED Fixture-Replacing CFL-12/7 Common Area	Units	616.00
C&I Multifamily	CTE0520	LED Fixture-Replacing CFL-24/7 Common Area	Units	506.00
C&I Multifamily	CTE0537	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T12-12/7 Common Area	Units	36.00
C&I Multifamily	CTE0538	1 Lamp 4 Foot T8 LED Lamp replacing 1 Lamp 4 Foot T12-24/7 Common Area	Units	80.00
C&I Multifamily	CTE0565	Energy Star Air Purifier CADR Over 250	Units	498.00
C&I Multifamily	CTG0011	Space Heating Boiler Tune-Up	mBtu	13,070.00
C&I Multifamily	CTG0020	Furnace Tune-Up (40-80 MBH)	MBH	624.00
C&I Multifamily	CTG0021	Furnace Tune-Up (GT 80 MBH)	Units	1.00
C&I Multifamily	CTG0030	ENERGY STAR Door (Gas)	Units	44.00
C&I Multifamily	CTG0035	ENERGY STAR Window (Gas)	Square Feet	5,778.00
C&I Multifamily	CTG0126	Furnace Replacement >= 95 AFUE	MBH	42.00
C&I Multifamily	CTG0129	Furnace Tune-Up (40-80 MBH)	Units	3.00
C&I Multifamily	CTG0130	Furnace Tune-Up (GT 80 MBH)	Units	8.00
C&I Multifamily	CTG0161	Low-Flow Bath Aerator-1.5gpm-Natural Gas DHW	Units	1,112.00
C&I Multifamily	CTG0162	Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	Units	77.00
C&I Multifamily	CTG0163	Low-Flow Showerhead-1.5gpm-Natural Gas DHW	Units	775.00
C&I Multifamily	CTG0164	Low-Flow Showerhead-1.75gpm-Natural Gas DHW	Units	307.00
C&I Multifamily	CTG0167	Furnace Replacement GT= 95 AFUE	MBH	396.00
C&I Multifamily	CTG0170	Furnace Replacement 95 AFUE	Units	75.00
C&I Multifamily	CTG0173	ENERGY STAR Door (Gas)	Units	385.00
C&I Multifamily	CTG0174	Instant Hot Water Heater-Common Area	Units	6.00
C&I Multifamily	CTG0176	Bonus-Limited Time Bonus-Natural Gas	Units	10,662,053.00
C&I Multifamily	CTG0179	Bonus-Program Incentive Match-Natural Gas	Units	13,262.00
C&I Multifamily	CTG0193	Wi-Fi Programmable T-stat-In-Unit (Gas)	Units	544.00
C&I Multifamily	CTG0195	Low-Flow Bath Aerator-Natural Gas DHW	Units	268.00

Consumers Energy
2022 Business Energy Waste Reduction Certification Appendices



Product	Measure Code	Measure Description	Units	Participation
C&I Multifamily	CTG0196	Low-Flow Kitchen Aerator-1.5gpm-Natural Gas DHW	Units	289.00
C&I Multifamily	CTG0198	Low-Flow Handheld Showerhead-1.5gpm-Natural Gas DHW	Units	189.00
C&I Multifamily	CTG0199	Large High Efficiency Tank-Style DHW Unit (94 percent TE)	Units	28.00
C&I Multifamily	CTG0228	Vertical Packaged Unit - EER 11 Et 90 - In-Unit	Tons	150.21
C&I Multifamily	CTG0248	Boiler Combination for Space and Water Heating 95% AFUE	MBH	1,796.00
C&I Multifamily	CTG0250	ENERGY STAR High Efficiency Medium Draw Gas Storage Water Heater	Units	51.00
C&I Multifamily	CTG0255	Window Insulation Kits (Gas)	Units	6,236.00
C&I Multifamily	CTG0257	Door weatherstripping-Sweep Only (Gas)	Units	106.00
C&I Multifamily	CTG0265	Duct Sealing (Gas)	Square Feet	766,394.00

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

SVITLANA LYKHITSKA

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

SVITLANA LYKHITSKA
DIRECT TESTIMONY

Q. Please state your name and business address.

A. My name is Svitlana Lykhytska, and my business address is One Energy Plaza, Jackson, Michigan, 49201.

Q. Please describe your position and responsibilities.

A. I am employed by Consumers Energy Company (“Consumers Energy” or the “Company”) as a Principal Accounting Analyst in the General Accounting Department. I am responsible for analyzing financial results for the Company.

Q. Please describe your education and professional experience.

A. I received a bachelor’s degree and a qualification of Engineer - Economist (with a specialization in economics and organization of consumer goods industry) from the Technologic Institute of Light Industry of Kiev, Ukraine in 1988. In 2002, I received a Bachelor of Science in Business Administration degree in Accounting from Michigan State University. In 2002, I started my career at Consumers Energy in the General Accounting Department where I progressed from Accounting Analyst in 2002 to Senior Accounting Analyst Lead in 2014 and Principal Accounting Analyst in 2016. I obtained my Certified Management Accountant and Certified Financial Manager certifications in 2007.

Q. Have you provided testimony before the Michigan Public Service Commission (“MPSC” or the “Commission”)?

A. Yes. I have provided testimony in the following cases:

Case No.	Description
U-17831	2014 Energy Optimization Plan Reconciliation;
U-18025	2015 Energy Optimization Plan Reconciliation;
U-18261	2018 – 2021 Energy Waste Reduction (“EWR”) Plan;

SVITLANA LYKHITSKA
DIRECT TESTIMONY

1	U-18331	2105 Energy Optimization Plan Reconciliation;
2	U-20028	2017 EWR Plan Reconciliation;
3	U-20365	2018 EWR Plan Reconciliation;
4	U-20372	2020 – 2023 EWR Plan;
5	U-20563	2018 Demand Response Reconciliation;
6	U-20702	2019 EWR Plan Reconciliation;
7	U-20766	2019 Demand Response Reconciliation;
8	U-20865	2020 EWR Plan Reconciliation;
9	U-21080	2020 Demand Response Reconciliation
10	U-20875	2022 – 2025 EWR Plan;
11	U-21233	2021 Demand Response Reconciliation; and
12	U-21205	2021 EWR Plan Reconciliation.

13 **Q. What is the purpose of your direct testimony?**

14 A. The purpose of my direct testimony is to describe the methodology and accounting process
15 associated with the Company's electric and natural gas EWR programs. Also, my
16 testimony will discuss the EWR earned financial performance incentive and the collection
17 period for that incentive required under Generally Accepted Accounting Principles
18 ("GAAP").

19 **Q. Are you sponsoring any exhibits with your direct testimony?**

20 A. Yes, I am sponsoring three exhibits.

21	Exhibit A-11 (SL-1)	2022 EWR Electric Cumulative Over (Under)
22		Recovery;

23	Exhibit A-12 (SL-2)	2022 EWR Gas Cumulative Over (Under) Recovery;
24		and

SVITLANA LYKHITSKA
DIRECT TESTIMONY

Exhibit A-13 (SL-3) 2020 EWR Incentive Cumulative (Over)/Under
Recovery.

Q. Have these exhibits been prepared by you or under your supervision?

A. Yes.

Q. What information is provided in these exhibits?

A. Exhibits A-11 (SL-1) and A-12 (SL-2) provide accounting data (by month and customer class) for the electric and gas EWR programs including surcharges billed, costs incurred, and over/under recovery balances with carrying costs. Exhibit A-13 (SL-3) provides the 2020 EWR incentive amount accrued, amount collected, and the over/under recovery balance.

Q. What surcharge amounts were billed to customers in 2022?

A. In 2022, the Company billed \$194,355,459 in total to electric customers (Exhibit A-11 (SL-1), page 1, line 1). These surcharges are split between Residential and Commercial and Industrial ("C&I") classes in the amounts of \$51,258,537 and \$143,096,922, respectively. In 2022, the Company billed \$85,002,272 in total to gas customers (Exhibit A-12 (SL-2), page 1, line 1). These surcharges are split between Residential and C&I customer classes in the amounts of \$44,112,295 and \$40,889,977, respectively.

Q. What program costs were booked in 2022?

A. In 2022, the Company booked \$190,037,932 of program costs for the electric EWR program (Exhibit A-11 (SL-1), page 1, line 2). These costs are split between Residential and C&I customer classes in the amounts of \$66,989,613 and \$123,048,319, respectively. In 2022, the Company booked \$83,290,996 of program costs for the natural gas EWR Program (Exhibit A-12 (SL-2), page 1, line 2). These costs are split between Residential and C&I customer classes in the amounts of \$53,960,987 and \$29,330,009, respectively.

SVITLANA LYKHYTSKA
DIRECT TESTIMONY

1 **Q. Why do total booked costs in your direct testimony differ from the amounts provided**
2 **by Company witness Trenton T. Taylor in his direct testimony in this proceeding?**

3 A. The costs as stated in Mr. Taylor's direct testimony reflect actual costs for the calendar
4 year while the booked costs I reference include estimated accruals. At the end of each year,
5 the Company accrues costs that have been incurred, but are not yet invoiced, on an
6 estimated basis. To close the Company's accounting books in a timely manner, the
7 Company uses the estimated accruals to close its books in accordance with GAAP.

8 **Q. How are over/under recovery amounts calculated?**

9 A. The incremental over/under recovery amount is the difference between Lines 1 and 2.
10 (Exhibits A-11 (SL-1) and A-12 (SL-2), page 1, line 3). This total is added to the prior
11 year-end over/under recovery amount calculated in the same manner plus the prior year
12 interest recorded on the over/under recovery balance. If, since program inception, the
13 Company has collected more in total surcharges than costs incurred, the Company has over
14 recovered. In that case, excess revenues are deferred, and a regulatory liability is recorded.
15 Conversely, if, since program inception, the Company has incurred more costs than
16 surcharges collected, the Company has under-recovered its costs. In that case, excess costs
17 are deferred, and a regulatory asset is recorded.

18 **Q. What are the over/under balances in the regulatory asset and/or regulatory liability**
19 **accounts associated with the EWR Program as of December 31, 2022?**

20 A. In the electric EWR program, for the 2022 reconciliation period, total surcharges exceeded
21 total booked costs resulting in an over recovery in all customer classes in the amount of
22 \$4,317,527 (Exhibit A-11 (SL-1), page 1, line 3). The C&I Program resulted in an over
23 recovery in the amount of \$20,048,603, and the Residential Program resulted in an under

SVITLANA LYKHITSKA
DIRECT TESTIMONY

1 recovery in the amount of \$15,731,076. The prior year over-recovery balance and interest
2 carried forward into 2022 was \$945,941 and \$701, respectively (Exhibit A-11 (SL-1), page
3 1, lines 4 and 5). As a result, the total over-recovery balance as of year-end 2022 is
4 \$5,264,169 (Exhibit A-11 (SL-1), page 1, line 7) split between an under-recovery of
5 \$41,675,977 associated with the Residential Program and an over-recovery of \$46,940,146
6 associated with the C&I Program.

7 In the natural gas EWR Program, 2022 total surcharges exceeded booked cost
8 resulting in an over recovery in the amount of \$1,711,276 (Exhibit A-12 (SL-2), page 1,
9 line 3). The C&I Program resulted in an over recovery in the amount of \$11,559,968, and
10 the Residential Program resulted in an under recovery in the amount of \$9,848,692. The
11 prior year under-recovery balance and interest carried forward into 2022 were \$12,126,097
12 and \$(20) respectively (Exhibit A-12 (SL-2), page 1, lines 4 and 5). As a result, the total
13 under-recovery balance as of year-end 2022 is \$10,414,801 (Exhibit A-12 (SL-2), page 1,
14 line 7) split between an under recovery of \$29,738,911 associated with the Residential
15 Program and an over-recovery of \$19,324,110 associated with the C&I Program.

16 **Q. Why was the prior year electric EWR C&I Program over-recovery balance and**
17 **interest carried forward to 2022 changed from what was presented in Exhibit A-16**
18 **(SL-1) of the Company's 2021 EWR Reconciliation, Case No. U-21205?**

19 A. For the electric EWR Program, the prior year C&I over-recovery balance changed from
20 \$25,235,477 to \$26,889,874 for an increase of \$1,654,397, (Exhibit A-11 (SL-1), page 1,
21 line 4, column (c)), and interest carried forward increased from \$1,540 to \$1,669, (Exhibit
22 A-11 (SL-1), page 1, line 5, column (c)), due to streetlighting per fixture revenue being
23 erroneously excluded from reconciliation exhibits in prior reconciliation cases. The

SVITLANA LYKHITSKA
DIRECT TESTIMONY

1 omitted revenue and related carrying charges were added to the 2021 over-recovery
2 balances.

3 **Q. Have carrying costs on over/under-recovery balances been recorded and at what**
4 **interest rate?**

5 A. Yes, the Company records carrying costs on over/under recovery balances per the
6 Commission's May 26, 2009 Order in Case No. U-15805, page 32. The carrying cost rate
7 used for both over- and under-recovery balances is the Company's short-term borrowing
8 rate. In 2022, carrying costs were recorded for the electric EWR Program in the amount
9 of \$650,556 (Exhibit A-11 (SL-1), page 1, line 8). In 2022, carrying costs were recorded
10 for the natural gas EWR Program in the amount of \$100,416 (Exhibit A-12 (SL-2), page
11 1, line 8).

12 **Q. Was an EWR incentive recorded based on program costs in 2022?**

13 A. Yes, it was. The financial incentive was recorded at 20% of the total spent in 2022. The
14 calculation used total program expenses by electric and gas, \$190,037,932 and \$83,290,996
15 (Exhibits A-11 (SL-1) and A-12 (SL-2), page 1, line 2), respectively, and multiplied that
16 number by 20%. In the electric and natural gas EWR programs, incentives were recorded
17 equal to \$38,007,586 and \$16,658,199, respectively. Because of the previously discussed
18 difference between actual EWR costs for the calendar year and the booked costs which
19 include estimated accruals, the recorded incentives differ slightly from the incentives
20 calculated on Exhibit A-21 (TTT-4).

SVITLANA LYKHITSKA
DIRECT TESTIMONY

1 **Q. Is the EWR incentive revenue classified as normal revenue?**

2 A. No, the EWR incentive revenue falls under an alternative revenue program according to
3 Accounting Standards Codification (“ASC”) 980-605-25.

4 **Q. What are the normal revenue recognition criteria?**

5 A. ASC 606, Revenue Recognition, states that “an entity should recognize revenue to depict
6 the transfer of promised goods or services to customers in an amount that reflects the
7 consideration to which the entity expects to be entitled in exchange for those goods and
8 services.” Generally, the following criteria need to be met: pervasive evidence of
9 arrangements exists, delivery has occurred or services rendered, the seller’s price to the
10 buyer is fixed or determinable, and collectability is reasonably assured.

11 **Q. What is an alternative revenue program?**

12 A. An alternative revenue program is for regulated utilities with alternative revenue pursuant
13 to GAAP.

14 **Q. What is alternative revenue?**

15 A. Alternative revenue is generally segregated into two programs. The first program adjusts
16 billings for the effects of abnormal weather patterns, energy conservation efforts, or from
17 broad external factors such as a general recession. Revenue recorded through decoupling
18 falls under this program. The second program provides for additional billings if the utility
19 achieves certain objectives, such as reducing costs, reaching specified milestones, or
20 improving customer service. Revenue recorded through the EWR Financial Incentive falls
21 under this latter program.

SVITLANA LYKHITSKA
DIRECT TESTIMONY

Q. What are the alternative revenue recognition criteria?

A. ASC 980-605-25 states that revenue recognition is appropriate when all of the following criteria are met:

- Criteria A: The program is established by an order from the utility's regulatory commission that allows for automatic adjustment of future rates. Verification of the adjustment of future rates by the regulator does not preclude the adjustment from being considered automatic.
- Criteria B: The amount of additional revenues for the period is objectively determinable and recovery is probable.
- Criteria C: The additional revenues will be collected within the 24 months following the end of the annual period in which they are recognized.

Q. Does the EWR Financial Incentive in this proceeding meet Criteria A?

A. Yes, Criteria A has been met. The Order in Case No. U-15800 issued by the Commission on December 4, 2008 authorizes Consumers Energy to receive a financial incentive for meeting the energy reduction goals identified in the Company's approved EWR Plan.

Q. Does the EWR incentive in this proceeding meet Criteria B?

A. Yes, the EWR incentive recorded is objectively determinable.

Q. Does the EWR incentive in this proceeding meet Criteria C?

A. Yes, but only if the collection of the incentive occurs within 24 months from the period the incentive was recognized.

Q. What is the Company's proposed collection period for the total EWR incentive revenue?

A. The EWR financial incentive revenue was recognized on Consumers Energy's books in December 2022. In order to comply with the 24-month collection requirement, Criteria C, the incentive of approximately \$55 million needs to be fully collected by December 31, 2024.

SVITLANA LYKHITSKA
DIRECT TESTIMONY

1 **Q. Why is it important to record the incentive revenue in the year with which it is**
2 **associated?**

3 A. It is important to record the incentive revenue in the same period that the EWR expenses
4 are incurred to present a better picture of the true economics of the program. It also allows
5 for consistent financial reporting as incentives will not be allocated over various financial
6 reporting periods.

7 **Q. What are the implications if the revenue is not fully collected by December 31, 2024?**

8 A. If the EWR incentive is not fully collected by December 31, 2024, GAAP would require a
9 determination that the revenue was recorded out of period and should have been recognized
10 when actually billed to the customer. The requirements of ASC 980-605-25 stipulate that
11 the revenue must be collected within 24 months and allow no flexibility. Failing to collect
12 the incentive by December 31, 2024, would then require a reversal of the EWR incentive
13 revenue that was already recognized by the Company in 2022.

14 **Q. Did you have an over/under collection of any previous incentives that should be**
15 **reconciled as a part of this case?**

16 A. Yes, as shown in Exhibit A-13 (SL-3), the 2020 incentive recorded totaled \$41,769,948,
17 consisting of \$27,337,030 for electric and \$14,432,918 for gas. The amount collected for
18 the 2020 incentive totaled \$41,835,098, consisting of \$27,234,162 for electric and
19 \$14,600,936 for gas. The total over recovery for the 2020 incentive totaled \$65,150,
20 consisting of an under recovery of \$102,868 for electric and an over recovery of \$168,018
21 for gas.

SVITLANA LYKHITSKA
DIRECT TESTIMONY

- 1 **Q. How do you propose to handle the under-recovered balance for the 2020 incentives?**
- 2 A. The Company proposes to decrease collection of the 2022 EWR incentive with the over-
- 3 recovered balance of \$65,150 for the 2020 incentive by December 31, 2024, as discussed
- 4 in the direct testimony of Company witness Hubert W. Miller.
- 5 **Q. Does this conclude your direct testimony?**
- 6 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBITS

OF

SVITLANA LYKHITSKA

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

2022 EWR Electric Cumulative Over (Under) Recovery (By Class and Total)

<u>Line</u>	(a) <u>Description</u>	(b) <u>Residential</u>	(c) <u>C&I</u>	(d) <u>Total</u>
<u>Annual Summary</u>				
1	Surcharge Revenue	\$ 51,258,537	\$ 143,096,922	\$ 194,355,459
2	Program Expenses	<u>\$ 66,989,613</u>	<u>\$ 123,048,319</u>	<u>\$ 190,037,932</u>
3	Change in Over (Under) Recovery	\$ (15,731,076)	\$ 20,048,603	\$ 4,317,527
<u>Program Over/(Under) Recovery</u>				
4	Over (Under) Recovery Beginning Balance	\$ (25,943,933)	\$ 26,889,874	\$ 945,941
5	Prior Year Carrying Charges	(968)	1,669	701
6	Change in Balance	<u>(15,731,076)</u>	<u>20,048,603</u>	<u>4,317,527</u>
7	Over (Under) Recovery Ending Balance	\$ (41,675,977)	\$ 46,940,146	\$ 5,264,169
<u>Carrying Charges</u>				
8	Carrying Charges, Cumulative	\$ (401,362)	\$ 1,051,918	\$ 650,556
9	Cumulative Over (Under) Recovery	\$ (42,077,339)	\$ 47,992,064	\$ 5,914,725
10	Annual Interest Rate	1.57%	1.57%	1.57%

2022 EWR Electric Cumulative Over (Under) Recovery (Residential by Month)

Line	(a) Description	(b) Jan	(c) Feb	(d) Mar	(e) Apr	(f) May	(g) Jun	(h) Jul	(i) Aug	(j) Sep	(k) Oct	(l) Nov	(m) Dec	(n) Total	(o) Source
Residential															
1	Surcharge Revenue	\$3,406,649	\$3,383,688	\$3,298,956	\$4,187,344	\$3,968,790	\$4,254,607	\$5,456,777	\$5,668,330	\$5,056,711	\$4,151,649	\$3,886,766	\$4,538,270	\$ 51,258,537	Per Books
2	Program Expenses	<u>\$3,476,048</u>	<u>\$1,869,889</u>	<u>\$4,259,532</u>	<u>\$3,527,818</u>	<u>\$3,201,483</u>	<u>\$4,370,056</u>	<u>\$5,333,396</u>	<u>\$3,707,620</u>	<u>\$4,729,937</u>	<u>\$5,995,666</u>	<u>\$5,293,981</u>	<u>\$21,224,187</u>	<u>\$ 66,989,613</u>	Per Books
3	Change in Over (Under) Recovery	\$ (69,399)	\$ 1,513,799	\$ (960,576)	\$ 659,526	\$ 767,307	\$ (115,449)	\$ 123,381	\$ 1,960,710	\$ 326,774	\$ (1,844,017)	\$ (1,407,215)	\$ (16,685,917)	\$ (15,731,076)	Line 1 - Line 2
Program Over/(Under) Recovery															
4	Over (Under) Recovery Beg.Bal.	\$ (25,943,933)	\$ (26,014,300)	\$ (24,500,501)	\$ (25,461,077)	\$ (24,801,551)	\$ (24,034,244)	\$ (24,149,693)	\$ (24,026,312)	\$ (22,065,602)	\$ (21,738,828)	\$ (23,582,845)	\$ (24,990,060)		Line 7 Prior Month/Year
5	Prior Year Carrying Charges	(968)													Prior Year Ending
6	Change in Balance	<u>(69,399)</u>	<u>1,513,799</u>	<u>(960,576)</u>	<u>659,526</u>	<u>767,307</u>	<u>(115,449)</u>	<u>123,381</u>	<u>1,960,710</u>	<u>326,774</u>	<u>(1,844,017)</u>	<u>(1,407,215)</u>	<u>(16,685,917)</u>		Line 3
7	Over (Under) Recovery Ending Bal.	\$ (26,014,300)	\$ (24,500,501)	\$ (25,461,077)	\$ (24,801,551)	\$ (24,034,244)	\$ (24,149,693)	\$ (24,026,312)	\$ (22,065,602)	\$ (21,738,828)	\$ (23,582,845)	\$ (24,990,060)	\$ (41,675,977)		Line 4 + Line 5 + Line 6
8	Over (Under) Recovery Average Bal.	\$ (25,979,601)	\$ (25,257,401)	\$ (24,980,789)	\$ (25,131,314)	\$ (24,417,898)	\$ (24,091,969)	\$ (24,088,003)	\$ (23,045,957)	\$ (21,902,215)	\$ (22,660,837)	\$ (24,286,453)	\$ (33,333,019)		Line 4 + Line 5 + (Line 6 / 2)
Carrying Charges															
9	Carrying Charges, Monthly	\$ (86)	\$ (129)	\$ (1,002)	\$ (6,172)	\$ (10,208)	\$ (17,847)	\$ (34,329)	\$ (41,986)	\$ (43,270)	\$ (56,608)	\$ (74,831)	\$ (114,894)		Line 8 x Line 13
10	Carrying Charges, Cumulative	\$ (86)	\$ (215)	\$ (1,217)	\$ (7,389)	\$ (17,597)	\$ (35,444)	\$ (69,773)	\$ (111,759)	\$ (155,029)	\$ (211,637)	\$ (286,468)	\$ (401,362)	\$ (401,362)	Cumulative Line 9
11	Cumulative Over (Under) Recovery	\$ (26,014,386)	\$ (24,500,716)	\$ (25,462,294)	\$ (24,808,940)	\$ (24,051,841)	\$ (24,185,137)	\$ (24,096,085)	\$ (22,177,361)	\$ (21,893,857)	\$ (23,794,482)	\$ (25,276,528)	\$ (42,077,339)	\$ (42,077,339)	Line 7 + Line 10
12	Annual Interest Rate	0.0040%	0.0061%	0.0481%	0.2947%	0.5017%	0.8889%	1.7102%	2.1862%	2.3707%	2.9977%	3.6974%	4.1363%	1.5702%	Treasury
13	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%		Line 12/ 12

2022 EWR Electric Cumulative Over (Under) Recovery (C&I by Month)

Line	(a) Description	(b) Jan	(c) Feb	(d) Mar	(e) Apr	(f) May	(g) Jun	(h) Jul	(i) Aug	(j) Sep	(k) Oct	(l) Nov	(m) Dec	(n) Total	(o) Source
<u>C&I</u>															
1	Surcharge Revenue	\$10,996,252	\$10,958,252	\$10,926,854	\$12,405,539	\$12,363,202	\$12,380,421	\$12,260,039	\$12,285,516	\$12,240,677	\$12,139,148	\$12,089,957	\$12,051,065	\$ 143,096,922	Per Books
2	Program Expenses	\$4,166,499	\$3,522,011	\$6,638,838	\$5,237,515	\$7,362,523	\$8,661,870	\$7,617,149	\$8,294,999	\$8,965,940	\$11,873,120	\$12,892,528	\$37,815,327	\$ 123,048,319	Per Books
3	Change in Over (Under) Recovery	\$ 6,829,753	\$ 7,436,241	\$ 4,288,016	\$ 7,168,024	\$ 5,000,679	\$ 3,718,551	\$ 4,642,890	\$ 3,990,517	\$ 3,274,737	\$ 266,028	\$ (802,571)	\$ (25,764,262)	\$ 20,048,603	Line 1 - Line 2
<u>Program Over/(Under) Recovery</u>															
4	Over (Under) Recovery Beg. Bal.	\$26,889,874	\$ 33,721,296	\$ 41,157,537	\$ 45,445,553	\$ 52,613,577	\$ 57,614,256	\$ 61,332,807	\$ 65,975,697	\$ 69,966,214	\$ 73,240,951	\$ 73,506,979	\$ 72,704,408		Line 8 Prior Month/Year
5	Prior Year Carrying Charges	1,669	-	-	-	-	-	-	-	-	-	-	-		Prior Year Ending
6	Change in Balance	6,829,753	7,436,241	4,288,016	7,168,024	5,000,679	3,718,551	4,642,890	3,990,517	3,274,737	266,028	(802,571)	(25,764,262)		Line 3
7	Over (Under) Recovery Ending Bal.	\$ 33,721,296	\$ 41,157,537	\$ 45,445,553	\$ 52,613,577	\$ 57,614,256	\$ 61,332,807	\$ 65,975,697	\$ 69,966,214	\$ 73,240,951	\$ 73,506,979	\$ 72,704,408	\$ 46,940,146		Line 4 + Line 5 + Line 6
8	Over (Under) Recovery Average Bal.	\$ 30,306,420	\$ 37,439,417	\$ 43,301,545	\$ 49,029,565	\$ 55,113,917	\$ 59,473,532	\$ 63,654,252	\$ 67,970,956	\$ 71,603,583	\$ 73,373,965	\$ 73,105,694	\$ 59,822,277		Line 4 + Line 5 + (Line 6 / 2)
<u>Carrying Charges</u>															
9	Carrying Charges, Monthly	\$ 100	\$ 191	\$ 1,736	\$ 12,041	\$ 23,040	\$ 44,057	\$ 90,718	\$ 123,830	\$ 141,458	\$ 183,293	\$ 225,252	\$ 206,202		Line 8 x Line 13
10	Carrying Charges, Cumulative	\$ 100	\$ 291	\$ 2,027	\$ 14,068	\$ 37,108	\$ 81,165	\$ 171,883	\$ 295,713	\$ 437,171	\$ 620,464	\$ 845,716	\$ 1,051,918	\$ 1,051,918	Cumulative Line 9
11	Cumulative Over (Under) Recovery	\$ 33,721,396	\$ 41,157,828	\$ 45,447,580	\$ 52,627,645	\$ 57,651,364	\$ 61,413,972	\$ 66,147,580	\$ 70,261,927	\$ 73,678,122	\$ 74,127,443	\$ 73,550,124	\$ 47,992,064	\$ 47,992,064	Line 7 + Line 10
12	Annual Interest Rate	0.0040%	0.0061%	0.0481%	0.2947%	0.5017%	0.8889%	1.7102%	2.1862%	2.3707%	2.9977%	3.6974%	4.1363%	1.5702%	Treasury
13	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%		Line 12/ 12

2022 EWR Electric Cumulative Over (Under) Recovery (Total by Month)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Line	Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Grand Total													
1	Surcharge Revenue	\$ 14,402,901	\$ 14,341,940	\$ 14,225,810	\$ 16,592,883	\$ 16,331,992	\$ 16,635,028	\$ 17,716,816	\$ 17,953,846	\$ 17,297,388	\$ 16,290,797	\$ 15,976,723	\$ 16,589,335	\$ 194,355,459
2	Program Expenses	\$ 7,642,547	\$ 5,391,900	\$ 10,898,370	\$ 8,765,333	\$ 10,564,006	\$ 13,031,926	\$ 12,950,545	\$ 12,002,619	\$ 13,695,877	\$ 17,868,786	\$ 18,186,509	\$ 59,039,514	\$ 190,037,932
4	Change in Over (Under) Recovery	\$ 6,760,354	\$ 8,950,040	\$ 3,327,440	\$ 7,827,550	\$ 5,767,986	\$ 3,603,102	\$ 4,766,271	\$ 5,951,227	\$ 3,601,511	\$ (1,577,989)	\$ (2,209,786)	\$ (42,450,179)	\$ 4,317,527
	<u>Program Over/(Under) Recovery</u>													
5	Over (Under) Recovery Beg.Bal.	\$ 945,941	\$ 7,706,996	\$ 16,657,036	\$ 19,984,476	\$ 27,812,026	\$ 33,580,012	\$ 37,183,114	\$ 41,949,385	\$ 47,900,612	\$ 51,502,123	\$ 49,924,134	\$ 47,714,348	
6	Prior Year Carrying Charges	701	-	-	-	-	-	-	-	-	-	-	-	
7	Change in Balance	6,760,354	8,950,040	3,327,440	7,827,550	5,767,986	3,603,102	4,766,271	5,951,227	3,601,511	(1,577,989)	(2,209,786)	(42,450,179)	
8	Over (Under) Recovery Ending Bal.	\$ 7,706,996	\$ 16,657,036	\$ 19,984,476	\$ 27,812,026	\$ 33,580,012	\$ 37,183,114	\$ 41,949,385	\$ 47,900,612	\$ 51,502,123	\$ 49,924,134	\$ 47,714,348	\$ 5,264,169	
9	Over (Under) Recovery Average Bal.	\$ 4,326,819	\$ 12,182,016	\$ 18,320,756	\$ 23,898,251	\$ 30,696,019	\$ 35,381,563	\$ 39,566,250	\$ 44,924,999	\$ 49,701,368	\$ 50,713,129	\$ 48,819,241	\$ 26,489,259	
	<u>Carrying Charges</u>													
10	Carrying Charges, Monthly	\$ 14	\$ 62	\$ 734	\$ 5,869	\$ 12,832	\$ 26,210	\$ 56,389	\$ 81,844	\$ 98,188	\$ 126,685	\$ 150,421	\$ 91,308	
11	Carrying Charges, Cumulative	\$ 14	\$ 76	\$ 810	\$ 6,679	\$ 19,511	\$ 45,721	\$ 102,110	\$ 183,954	\$ 282,142	\$ 408,827	\$ 559,248	\$ 650,556	\$ 650,556
12	Cumulative Over (Under) Recovery	\$ 7,707,010	\$ 16,657,112	\$ 19,985,286	\$ 27,818,705	\$ 33,599,523	\$ 37,228,835	\$ 42,051,495	\$ 48,084,566	\$ 51,784,265	\$ 50,332,961	\$ 48,273,596	\$ 5,914,725	\$ 5,914,725
13	Annual Interest Rate	0.0040%	0.0061%	0.0481%	0.2947%	0.5017%	0.8889%	1.7102%	2.1862%	2.3707%	2.9977%	3.6974%	4.1363%	1.5702%
14	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%	

2022 EWR Gas Cumulative Over (Under) Recovery (By Class and Total)

<u>Line</u>	<u>Description</u>	(a) <u>Residential</u>	(b) <u>C&I</u>	(c) <u>Total</u>
<u>Annual Summary</u>				
1	Surcharge Revenue	\$ 44,112,295	\$ 40,889,977	\$ 85,002,272
2	Program Expenses	\$ 53,960,987	\$ 29,330,009	\$ 83,290,996
3	Change in Over (Under) Recovery	\$ (9,848,692)	\$ 11,559,968	\$ 1,711,276
<u>Program Over/(Under) Recovery</u>				
4	Over (Under) Recovery Beginning Balance	\$ (19,889,446)	\$ 7,763,349	\$ (12,126,097)
5	Prior Year Carrying Charges	(773)	793	20
6	Change in Balance	(9,848,692)	11,559,968	1,711,276
7	Over (Under) Recovery Ending Balance	\$ (29,738,911)	\$ 19,324,110	\$ (10,414,801)
<u>Carrying Charges</u>				
8	Carrying Charges, Cumulative	\$ (276,476)	\$ 376,892	\$ 100,416
9	Cumulative Over (Under) Recovery	\$ (30,015,387)	\$ 19,701,002	\$ (10,314,385)
10	Annual Interest Rate	1.57%	1.57%	1.57%

2022 EWR Gas Cumulative Over (Under) Recovery (Residential by Month)

Line	(a) Description	(b) Jan	(c) Feb	(d) Mar	(e) Apr	(f) May	(g) Jun	(h) Jul	(i) Aug	(j) Sep	(k) Oct	(l) Nov	(m) Dec	(n) Total	(o) Source
<u>Residential</u>															
1	Surcharge Revenue	\$5,421,509	\$6,727,314	\$5,924,613	\$6,307,764	\$4,181,733	\$1,592,854	\$982,297	\$883,457	\$911,335	\$1,551,152	\$3,341,642	\$6,286,625	\$ 44,112,295	Per Books
2	Program Expenses	<u>\$4,341,521</u>	<u>\$1,026,701</u>	<u>\$3,110,394</u>	<u>\$3,044,690</u>	<u>\$2,820,908</u>	<u>\$3,667,641</u>	<u>\$3,781,752</u>	<u>\$3,529,601</u>	<u>\$4,191,403</u>	<u>\$5,026,430</u>	<u>\$6,272,945</u>	<u>\$13,147,001</u>	<u>\$ 53,960,987</u>	Per Books
3	Change in Over (Under) Recovery	\$ 1,079,988	\$ 5,700,613	\$ 2,814,219	\$ 3,263,074	\$ 1,360,825	\$ (2,074,787)	\$ (2,799,455)	\$ (2,646,144)	\$ (3,280,068)	\$ (3,475,278)	\$ (2,931,303)	\$ (6,860,376)	\$ (9,848,692)	Line 1 - Line 2
<u>Program Over/(Under) Recovery</u>															
4	Over (Under) Recovery Beg. Bal.	\$ (19,889,446)	\$ (18,810,231)	\$ (13,109,618)	\$ (10,295,399)	\$ (7,032,325)	\$ (5,671,500)	\$ (7,746,287)	\$ (10,545,742)	\$ (13,191,886)	\$ (16,471,954)	\$ (19,947,232)	\$ (22,878,535)		Line 7 Prior Month/Year
5	Prior Year Carrying Charges	(773)	-	-	-	-	-	-	-	-	-	-	-		Prior Year Ending
6	Change in Balance	<u>1,079,988</u>	<u>5,700,613</u>	<u>2,814,219</u>	<u>3,263,074</u>	<u>1,360,825</u>	<u>(2,074,787)</u>	<u>(2,799,455)</u>	<u>(2,646,144)</u>	<u>(3,280,068)</u>	<u>(3,475,278)</u>	<u>(2,931,303)</u>	<u>(6,860,376)</u>		Line 3
7	Over (Under) Recovery Ending Bal.	\$ (18,810,231)	\$ (13,109,618)	\$ (10,295,399)	\$ (7,032,325)	\$ (5,671,500)	\$ (7,746,287)	\$ (10,545,742)	\$ (13,191,886)	\$ (16,471,954)	\$ (19,947,232)	\$ (22,878,535)	\$ (29,738,911)		Line 4 + Line 5 + Line 6
8	Over (Under) Recovery Average Bal.	\$ (19,350,225)	\$ (15,959,925)	\$ (11,702,509)	\$ (8,663,862)	\$ (6,351,913)	\$ (6,708,894)	\$ (9,146,015)	\$ (11,868,814)	\$ (14,831,920)	\$ (18,209,593)	\$ (21,412,884)	\$ (26,308,723)		Line 4 + Line 5 + (Line 6 / 2)
<u>Carrying Charges</u>															
9	Carrying Charges, Monthly	\$ (64)	\$ (82)	\$ (469)	\$ (2,128)	\$ (2,655)	\$ (4,970)	\$ (13,035)	\$ (21,623)	\$ (29,302)	\$ (45,489)	\$ (65,976)	\$ (90,683)		Line 8 x Line 13
10	Carrying Charges, Cumulative	\$ (64)	\$ (146)	\$ (615)	\$ (2,743)	\$ (5,398)	\$ (10,368)	\$ (23,403)	\$ (45,026)	\$ (74,328)	\$ (119,817)	\$ (185,793)	\$ (276,476)	\$ (276,476)	Cumulative Line 9
11	Cumulative Over (Under) Recovery	\$ (18,810,295)	\$ (13,109,764)	\$ (10,296,014)	\$ (7,035,068)	\$ (5,676,898)	\$ (7,756,655)	\$ (10,569,145)	\$ (13,236,912)	\$ (16,546,282)	\$ (20,067,049)	\$ (23,064,328)	\$ (30,015,387)	\$ (30,015,387)	Line 7 + Line 10
12	Annual Interest Rate	0.0040%	0.0060%	0.0480%	0.2950%	0.5020%	0.8890%	1.7100%	2.1860%	2.3710%	2.9980%	3.6970%	4.1360%	1.5702%	Treasury
13	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%		Line 12/ 12

2022 EWR Gas Cumulative Over (Under) Recovery (C&I by Month)

Line	(a) Description	(b) Jan	(c) Feb	(d) Mar	(e) Apr	(f) May	(g) Jun	(h) Jul	(i) Aug	(j) Sep	(k) Oct	(l) Nov	(m) Dec	(n) Total	(o) Source
<u>C&I</u>															
1	Surcharge Revenue	\$5,200,527	\$6,620,801	\$5,923,526	\$5,178,098	\$3,510,147	\$1,682,756	\$1,191,614	\$1,089,892	\$1,168,559	\$1,448,433	\$2,868,630	\$5,006,994	\$ 40,889,977	Per Books
2	Program Expenses	<u>\$741,680</u>	<u>\$1,712,936</u>	<u>\$1,760,343</u>	<u>\$5,089,862</u>	<u>(\$1,618,049)</u>	<u>\$1,657,597</u>	<u>\$2,106,077</u>	<u>\$1,242,589</u>	<u>\$2,409,223</u>	<u>\$2,015,408</u>	<u>\$2,402,334</u>	<u>\$9,810,009</u>	<u>\$ 29,330,009</u>	Per Books
3	Change in Over (Under) Recovery	\$ 4,458,847	\$ 4,907,865	\$ 4,163,183	\$ 88,236	\$ 5,128,196	\$ 25,159	\$ (914,463)	\$ (152,697)	\$ (1,240,664)	\$ (566,975)	\$ 466,296	\$ (4,803,015)	\$ 11,559,968	Line 1 - Line 2
<u>Program Over/(Under) Recovery</u>															
4	Over (Under) Recovery Beg.Bal.	\$7,763,349	\$ 12,222,989	\$ 17,130,854	\$ 21,294,037	\$ 21,382,273	\$ 26,510,469	\$ 26,535,628	\$ 25,621,165	\$ 25,468,468	\$ 24,227,804	\$ 23,660,829	\$ 24,127,125		Line 7 Prior Month/Year
5	Prior Year Carrying Charges	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Prior Year Ending
6	Change in Balance	<u>\$ 4,458,847</u>	<u>\$ 4,907,865</u>	<u>\$ 4,163,183</u>	<u>\$ 88,236</u>	<u>\$ 5,128,196</u>	<u>\$ 25,159</u>	<u>\$ (914,463)</u>	<u>\$ (152,697)</u>	<u>\$ (1,240,664)</u>	<u>\$ (566,975)</u>	<u>\$ 466,296</u>	<u>\$ (4,803,015)</u>		Line 3
7	Over (Under) Recovery Ending Bal.	\$ 12,222,989	\$ 17,130,854	\$ 21,294,037	\$ 21,382,273	\$ 26,510,469	\$ 26,535,628	\$ 25,621,165	\$ 25,468,468	\$ 24,227,804	\$ 23,660,829	\$ 24,127,125	\$ 19,324,110		Line 4 + Line 5 + Line 6
8	Over (Under) Recovery Average Bal.	\$ 9,993,566	\$ 14,676,922	\$ 19,212,446	\$ 21,338,155	\$ 23,946,371	\$ 26,523,049	\$ 26,078,397	\$ 25,544,817	\$ 24,848,136	\$ 23,944,317	\$ 23,893,977	\$ 21,725,618		Line 4 + Line 5 + (Line 6 / 2)
<u>Carrying Charges</u>															
9	Carrying Charges, Monthly	\$ 33	\$ 75	\$ 770	\$ 5,240	\$ 10,010	\$ 19,648	\$ 37,166	\$ 46,538	\$ 49,089	\$ 59,814	\$ 73,622	\$ 74,887		Line 8 x Line 13
10	Carrying Charges, Cumulative	\$ 33	\$ 108	\$ 878	\$ 6,118	\$ 16,128	\$ 35,776	\$ 72,942	\$ 119,480	\$ 168,569	\$ 228,383	\$ 302,005	\$ 376,892	\$ 376,892	Cumulative Line 9
11	Cumulative Over (Under) Recovery	\$ 12,223,022	\$ 17,130,962	\$ 21,294,915	\$ 21,388,391	\$ 26,526,597	\$ 26,571,404	\$ 25,694,107	\$ 25,587,948	\$ 24,396,373	\$ 23,889,212	\$ 24,429,130	\$ 19,701,002	\$ 19,701,002	Line 7 + Line 10
12	Annual Interest Rate	0.0040%	0.0060%	0.0480%	0.2950%	0.5020%	0.8890%	1.7100%	2.1860%	2.3710%	2.9980%	3.6970%	4.1360%	1.5702%	Treasury
13	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%		Line 12/ 12

2022 EWR Gas Cumulative Over (Under) Recovery (Total by Month)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
<u>Line</u>	<u>Description</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Total</u>
	Grand Total													
1	Surcharge Revenue	\$ 10,622,036	\$ 13,348,115	\$ 11,848,139	\$ 11,485,862	\$ 7,691,880	\$ 3,275,610	\$ 2,173,911	\$ 1,973,349	\$ 2,079,894	\$ 2,999,585	\$ 6,210,272	\$ 11,293,619	\$ 85,002,272
2	Program Expenses	\$ 5,083,201	\$ 2,739,637	\$ 4,870,737	\$ 8,134,552	\$ 1,202,859	\$ 5,325,238	\$ 5,887,829	\$ 4,772,190	\$ 6,600,626	\$ 7,041,838	\$ 8,675,279	\$ 22,957,010	\$ 83,290,996
5	Change in Over (Under) Recovery	\$ 5,538,835	\$ 10,608,478	\$ 6,977,402	\$ 3,351,310	\$ 6,489,021	\$ (2,049,628)	\$ (3,713,918)	\$ (2,798,841)	\$ (4,520,732)	\$ (4,042,253)	\$ (2,465,007)	\$ (11,663,391)	\$ 1,711,276
	<u>Program Over/(Under) Recovery</u>													
6	Over (Under) Recovery Beg.Bal.	\$ (12,126,097)	\$ (6,587,242)	\$ 4,021,236	\$ 10,998,638	\$ 14,349,948	\$ 20,838,969	\$ 18,789,341	\$ 15,075,423	\$ 12,276,582	\$ 7,755,850	\$ 3,713,597	\$ 1,248,590	
7	Prior Year Carrying Charges	20	-	-	-	-	-	-	-	-	-	-	-	-
8	Change in Balance	5,538,835	10,608,478	6,977,402	3,351,310	6,489,021	(2,049,628)	(3,713,918)	(2,798,841)	(4,520,732)	(4,042,253)	(2,465,007)	(11,663,391)	
9	Over (Under) Recovery Ending Bal.	\$ (6,587,242)	\$ 4,021,236	\$ 10,998,638	\$ 14,349,948	\$ 20,838,969	\$ 18,789,341	\$ 15,075,423	\$ 12,276,582	\$ 7,755,850	\$ 3,713,597	\$ 1,248,590	\$ (10,414,801)	
10	Over (Under) Recovery Average Bal.	\$ (9,356,660)	\$ (1,283,003)	\$ 7,509,937	\$ 12,674,293	\$ 17,594,459	\$ 19,814,155	\$ 16,932,382	\$ 13,676,003	\$ 10,016,216	\$ 5,734,724	\$ 2,481,094	\$ (4,583,106)	
	<u>Carrying Charges</u>													
11	Carrying Charges, Monthly	\$ (31)	\$ (7)	\$ 301	\$ 3,112	\$ 7,355	\$ 14,678	\$ 24,131	\$ 24,915	\$ 19,787	\$ 14,325	\$ 7,646	\$ (15,796)	
12	Carrying Charges, Cumulative	\$ (31)	\$ (38)	\$ 263	\$ 3,375	\$ 10,730	\$ 25,408	\$ 49,539	\$ 74,454	\$ 94,241	\$ 108,566	\$ 116,212	\$ 100,416	\$ 100,416
13	Cumulative Over (Under) Recovery	\$ (6,587,273)	\$ 4,021,198	\$ 10,998,901	\$ 14,353,323	\$ 20,849,699	\$ 18,814,749	\$ 15,124,962	\$ 12,351,036	\$ 7,850,091	\$ 3,822,163	\$ 1,364,802	\$ (10,314,385)	\$ (10,314,385)
14	Annual Interest Rate	0.0040%	0.0060%	0.0480%	0.2950%	0.5020%	0.8890%	1.7100%	2.1860%	2.3710%	2.9980%	3.6970%	4.1360%	1.5702%
15	Monthly Interest Rate	0.0003%	0.0005%	0.0040%	0.0246%	0.0418%	0.0741%	0.1425%	0.1822%	0.1976%	0.2498%	0.3081%	0.3447%	

MICHIGAN PUBLIC SERVICE COMMISSIONConsumers Energy Company

Case No.: U-21312

Exhibit No.: A-13 (SL-3)

Page: 1 of 3

Witness: SLYkhytska

Date: May 2023

2020 EWR Incentive Cumulative (Over)/Under Recovery

Month	Year	Current Month Collection	Prior Month Cumulative (Over)/Under Collection
(a)	(b)	(c)	(d)
2020 EWR Incentive Regulatory Asset Balance			41,769,948
1 January	2022	(4,442,094)	37,327,854
2 February	2022	(4,998,616)	32,329,238
3 March	2022	(4,677,270)	27,651,968
4 April	2022	(3,961,883)	23,690,085
5 May	2022	(3,355,661)	20,334,424
6 June	2022	(2,726,422)	17,608,002
7 July	2022	(2,685,544)	14,922,458
8 August	2022	(2,685,066)	12,237,392
9 September	2022	(2,619,378)	9,618,014
10 October	2022	(2,639,145)	6,978,869
11 November	2022	(3,085,143)	3,893,726
12 December	2022	(3,921,533)	(27,807)
13 January	2023	(33,213)	(61,020)
14 February	2023	(4,270)	(65,290)
15 March	2023	140	(65,150)
			(41,835,098)

2020 EWR Electric Incentive Cumulative (Over)/Under Recovery

Month	Year	Current Month Collection	Prior Month Cumulative (Over)/Under Collection
(a)	(b)	(c)	(d)
2020 EWR Incentive Regulatory Asset Balance			27,337,030
1 January	2022	(2,331,185)	25,005,845
2 February	2022	(2,331,237)	22,674,608
3 March	2022	(2,311,911)	20,362,697
4 April	2022	(2,224,988)	18,137,709
5 May	2022	(2,194,054)	15,943,655
6 June	2022	(2,230,240)	13,713,415
7 July	2022	(2,355,337)	11,358,078
8 August	2022	(2,385,954)	8,972,124
9 September	2022	(2,303,769)	6,668,355
10 October	2022	(2,185,269)	4,483,086
11 November	2022	(2,147,278)	2,335,808
12 December	2022	(2,217,813)	117,995
13 January	2023	(13,871)	104,124
14 February	2023	(1,741)	102,383
15 March	2023	485	102,868
			(27,234,162)

2020 EWR Gas Incentive Cumulative (Over)/Under Recovery

Month	Year	Current Month Collection	Prior Month Cumulative (Over)/Under Collection
(a)	(b)	(c)	(d)
2020 EWR Incentive Regulatory Asset Balance			14,432,918
1 January	2022	(2,110,909)	12,322,009
2 February	2022	(2,667,379)	9,654,630
3 March	2022	(2,365,359)	7,289,271
4 April	2022	(1,736,895)	5,552,376
5 May	2022	(1,161,607)	4,390,769
6 June	2022	(496,182)	3,894,587
7 July	2022	(330,207)	3,564,380
8 August	2022	(299,112)	3,265,268
9 September	2022	(315,609)	2,949,659
10 October	2022	(453,876)	2,495,783
11 November	2022	(937,865)	1,557,918
12 December	2022	(1,703,720)	(145,802)
13 January	2023	(19,342)	(165,144)
14 February	2023	(2,529)	(167,673)
15 March	2023	(345)	(168,018)
			(14,600,936)

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the Matter of the Application of)	
CONSUMERS ENERGY COMPANY)	
for Authority to Reconcile Its)	
2022 Energy Waste Reduction Plan Costs)	Case No. U-21312
Associated With the Plan Approved in)	
Case No. U- 20875.)	
<hr/>)	

DIRECT TESTIMONY

OF

HUBERT W. MILLER III

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

HUBERT W. MILLER III
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Hubert W. Miller, and my business address is One Energy Plaza, Jackson,
3 Michigan, 49201.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am employed by Consumers Energy Company (“Consumers Energy” or the “Company”)
6 as a Principal Rate Analyst in the Rates and Regulation Department.

7 **Q. Please describe your educational background and business experience.**

8 A. In May 2002, I graduated from the University of Michigan-Flint with a bachelor’s degree
9 in economics. In May 2008, I graduated from Eastern Michigan University with a master’s
10 degree in applied economics and in May 2014 with a master’s degree in mathematics.
11 I have also attended various industry seminars addressing rate design principles, marginal
12 cost pricing, the benefits of financial hedges in power markets, the use of dynamic pricing
13 to promote energy efficiency, and the use of statistically adjusted end-use models to
14 forecast electric deliveries.

15 In September 2002, I accepted the position of Rate Analyst in the Pricing Section
16 of the Rates & Regulation Department with Consumers Energy. In this position, my
17 primary responsibilities included assisting with electric and natural gas rate design research
18 and financial studies. In November 2004, I was promoted to the position of General Rate
19 Analyst, which expanded the scope of my duties to include sponsoring rate design
20 testimony and exhibits in filings with the Michigan Public Service Commission (“MPSC”
21 or the “Commission”). In April 2009, I was promoted to the position of Senior Rate
22 Analyst, which further expanded my responsibilities to include maintaining the electric and
23 natural gas rate design models.

HUBERT W. MILLER III
DIRECT TESTIMONY

1 In February 2012, I accepted a special assignment in the Company's Economic
2 Portfolio Management Department to analyze the benefits of technology investment
3 initiatives for increasing operational efficiency, research the use of algorithms to optimize
4 operational performance, and assist in identifying operational risks to electric and gas
5 distribution assets.

6 In February 2013, I accepted a position as a Principal Analyst in the Sales and
7 Revenue Forecasting Section of the Rates and Regulation Department. In this capacity,
8 I was responsible for preparing the Company's electric and natural gas delivery and
9 customer forecasts, sponsoring these forecasts in regulatory filings, industry research, and
10 various economic studies.

11 In February 2015, I accepted a position in the Regulatory Section of the Energy
12 Efficiency and Renewables Department to provide regulatory and empirical analysis
13 supporting the recovery of the annual energy efficiency program investments, coordinate
14 and maintain the Company's energy efficiency models used in portfolio optimization and
15 benefit-cost analyses, and collaborate with other team members in researching various
16 energy efficiency policies in the electric and natural gas industries. In May 2017, my
17 responsibilities expanded to include coordinating the regulatory filings, reporting, and
18 quality processes associated with the Company's Customer Experience, Voluntary Green
19 Pricing, and Demand Response ("DR") programs.

20 In February 2019, I returned to the Rates and Regulation Department as a Principal
21 Rate Analyst to focus on the rate design initiatives being considered across the industry.
22 This included revamping the Company's electric rate design model to reflect the transition
23 toward more advanced rate designs based on time-of-use and market-based structures and

HUBERT W. MILLER III
DIRECT TESTIMONY

the integration of new distributed energy programs geared toward customers interested in DR and distributed generation.

Q. Have you previously filed testimony with the Commission?

A. I have testified in the following MPSC cases:

Case No.	Description
U-14547	2006 General Natural Gas Rate Case;
U-15001-R	2007 Power Supply Cost Recovery (“PSCR”) Reconciliation;
U-15245	2008 General Electric Rate Case;
U-15415-R	2008 PSCR Reconciliation;
U-15675	2009 PSCR Plan;
U-15744	Stranded Cost Recovery Reconciliation;
U-15805	Public Act 295 Renewable Energy and Energy Optimization Compliance Case;
U-16045	2010 PSCR Plan;
U-16191	2010 General Electric Rate Case;
U-16485	2011 Gas Cost Recovery (“GCR”) Plan;
U-17281	2012 Energy Optimization Plan Reconciliation;
U-17301	2013 Biennial Renewable Energy Plan Review Case;
U-17317	2014 PSCR Plan;
U-17334	2014 GCR Plan;
U-17351	2014 – 2017 Amended Energy Optimization Plan;
U-17429	Certificate of Necessity for the Thetford Generating Plant;
U-17643	2014 General Natural Gas Rate Case;

HUBERT W. MILLER III
DIRECT TESTIMONY

U-17678 2015 PSCR Plan;
U-18331 2016 Energy Efficiency Plan Reconciliation;
U-20134 2018 General Electric Rate Case;
U-20164 2017 DR Reconciliation;
U-20322 2018 General Natural Gas Rate Case;
U-20697 2020 General Electric Rate Case;
U-20963 2021 General Electric Rate Case; and
U-21224 2022 General Electric Rate Case.

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to present a comparison of the actual Energy Waste Reduction (“EWR”) surcharge revenue collected during 2022 to the anticipated 2022 revenue for the Company’s Commission-approved EWR Plan in Case No. U-20875. I will also discuss the Company’s proposal for recovery of the EWR Financial Incentive earned in 2022 and introduce the proposed tariff sheets for the surcharges.

Q. Are you sponsoring any exhibits?

A. Yes, I am sponsoring the following exhibits:

Exhibit A-14 (HWM-1) Electric Energy Waste Reduction Surcharge Incentive Component;

Exhibit A-15 (HWM -2) Gas Energy Waste Reduction Surcharge Incentive Component;

Exhibit A-16 (HWM -3) Proposed Electric Energy Efficiency Tariff Sheet; and

Exhibit A-17 (HWM -4) Proposed Gas Energy Efficiency Tariff Sheet.

Q. Were these exhibits prepared by you or under your supervision?

A. Yes.

HUBERT W. MILLER III
DIRECT TESTIMONY

1 **Q. What amount of EWR revenue was collected during the year 2022?**

2 A. As shown on Exhibit A-11 (SL-1), page 1, the actual 2022 electric EWR surcharge
3 collections of \$194 million were about \$4 million greater than the Company's electric
4 EWR Plan spending of approximately \$190 million. As shown on Exhibit A-12 (SL-2),
5 page 1, the actual 2022 gas EWR surcharge collections of \$85 million were about
6 \$2 million greater than the Company's gas EWR Plan spending of approximately
7 \$83 million.

8 **Q. Is the Company proposing to adjust the EWR Plan component of the surcharges in**
9 **this case?**

10 A. No, the Company does not believe it necessary to propose any adjustments at this time to
11 the EWR Plan component of the surcharges. The EWR Program is funded by surcharges
12 that are levelized over multiple years and re-evaluated with each EWR plan case filing.
13 Therefore, it is not necessary to adjust this component of the surcharges in this
14 reconciliation case.

15 **Q. Did the Company earn an EWR Financial Incentive in 2022?**

16 A. Yes. As shown on Exhibit A-21 (TTT-4), the Company earned a \$37,796,781 financial
17 incentive in 2022 for its electric business and a \$16,825,303 financial incentive in 2022 for
18 its natural gas business.

19 **Q. Please describe the manner in which the Company proposes to recover the earned**
20 **Financial Incentive.**

21 A. Consistent with prior years, the Company proposes to recover the 2022 EWR financial
22 incentive through a 12-month surcharge. In addition to these amounts shown on
23 Exhibit A-21 (TTT-4), the Company will roll-in the cumulative over-collection and under-

HUBERT W. MILLER III
DIRECT TESTIMONY

1 collection amounts from the 2020 incentive surcharges, as shown on Exhibit A-13 (SL-3).

2 The Company is proposing that the 12-month performance incentive surcharge be
3 implemented beginning with the January 2024 billing cycle for a period of 12 months.

4 **Q. Why is the Company proposing to collect the incentive over 12 months?**

5 A. As discussed by Company witness Svitlana Lykhytska, based on accounting rules, the
6 incentive needs to be fully collected no later than December 31, 2024. Ms. Lykhytska
7 discusses this further in her direct testimony.

8 **Q. Is the Company proposing to collect interest on the incentive?**

9 A. No. While the Company feels that spreading the collection of the incentive out over
10 12 months reduces the value of the award due to the time value of money, the Company
11 recognizes that the collection of interest has been rejected in prior EWR Reconciliation
12 cases.

13 **Q. Why is the Company proposing to start recovery of the 12-month financial incentive**
14 **surcharge with the January 2024 billing cycle?**

15 A. The Company is currently recovering its 2021 financial incentive approved in
16 Case No. U-21205 as part of existing EWR surcharges. The Company projects it will
17 recover the 2021 financial incentive by December of 2023. To avoid recovery of two
18 financial incentives simultaneously, and to minimize the monthly amount charged to
19 customers, the Company is proposing to postpone recovery of the 2022 EWR financial
20 incentive until the 2021 financial incentive is recovered.

HUBERT W. MILLER III
DIRECT TESTIMONY

1 **Q. How is the 2022 EWR financial incentive allocated to each customer rate class and in**
2 **what amount?**

3 A. Consistent with prior EWR Reconciliation cases, the Company proposes that allocation of
4 the 2022 EWR financial incentive mirror the allocation approach used to recover the
5 approved EWR low-income expenses in the Company's 2022 through 2025 EWR Plan.
6 As reflected in Exhibit A-14 (HWM-1), lines 1 through 11, column (d), the total electric
7 surcharge obligation of each customer group was established utilizing a proration factor
8 derived from the customer group low-income cost responsibility of the approved EWR
9 Plan. The customer obligation was divided by the forecasted billing determinants
10 (column (e), lines 1 through 11) for each customer group to establish the EWR financial
11 incentive component (column (f), lines 1 through 11) to be added to the base component
12 of the EWR surcharge. Furthermore, the financial incentive surcharges were designed
13 using the same method of recovery as the base component of the EWR surcharges, i.e., the
14 natural gas customers are billed on a per Mcf basis, electric residential customers are billed
15 on a volumetric per kWh basis, and the electric business customers are billed on a per
16 customer meter basis.

17 The calculations of the natural gas customer EWR financial incentive surcharge
18 components are shown on Exhibit A-15 (HWM-2) and follow the same derivation as
19 explained above for the electric surcharges. The Company proposes that any difference
20 between the incentive amount collected and the amount approved be rolled into the
21 following year's EWR Reconciliation filing.

HUBERT W. MILLER III
DIRECT TESTIMONY

1 **Q. What is the expected impact of the proposed 2022 financial incentive surcharge on an**
2 **average residential electric customer's bill?**

3 A. Moving from the 2021 EWR financial incentive surcharge amount to the 2022 EWR
4 financial incentive surcharge would increase the average residential electric customer's bill
5 by about \$0.07/month.

6 **Q. What is the expected impact of the proposed incentive surcharge on an average**
7 **residential natural gas customer's bill?**

8 A. Moving from the 2021 EWR financial incentive surcharge amount to the 2022 EWR
9 financial incentive surcharge would decrease the average residential natural gas customer's
10 bill by about \$0.06/month.

11 **Q. Please describe Exhibits A-16 (HWM-3) and A-17 (HWM-4).**

12 A. Exhibits A-16 (HWM-3) and A-17 (HWM-4) are the Company's proposed tariff sheets
13 implementing the EWR surcharges that have been proposed in this case.

14 **Q. Does this conclude your direct testimony?**

15 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the Matter of the Application of)	
CONSUMERS ENERGY COMPANY)	
for Authority to Reconcile Its)	
2022 Energy Waste Reduction Plan Costs)	Case No. U-21312
Associated With the Plan Approved in)	
Case No. U- 20875.)	
_____)	

EXHIBITS

OF

HUBERT W. MILLER III

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company

Electric Energy Waste Reduction Surcharge Incentive Component
 Calculated Without Interest and Collected over 12 Months

Case No.: U-21312
 Exhibit No.: A-14 (HWM-1)
 Page: 1 of 1
 Witness: HWMiller
 Date: May 2023

Line	(a) Description	(b) Low-Income Cost Responsibility ⁽¹⁾ (\$)	(c) Proration Factor ⁽²⁾	(d) Surcharge Obligation ⁽³⁾ (\$)	(e) Customer Group Surcharge Annual Determinants ⁽⁴⁾ (kWh or Cust.) ⁽⁵⁾	(f) Monthly Electric EWR Surcharge Incentive Component (per kWh or Cust.) ⁽⁵⁾
1	Residential	\$4,794,689	0.2529	\$ 9,585,700	12,772,735,315	\$ 0.000750
2	Business Tier 1 (0 to 2,000 kWh per month)	1,399,919	0.0738	\$ 2,798,764	2,000,549	\$ 1.40
3	Business Tier 2 (2,001 to 5,000 kWh per month)	1,472,747	0.0777	\$ 2,944,365	319,370	\$ 9.22
4	Business Tier 3 (5,001 to 10,000 kWh per month)	1,540,535	0.0813	\$ 3,079,888	151,692	\$ 20.30
5	Business Tier 4 (10,001 to 30,000 kWh per month)	2,924,620	0.1543	\$ 5,846,996	121,560	\$ 48.10
6	Business Tier 5 (30,001 to 50,000 kWh per month)	1,534,649	0.0810	\$ 3,068,120	26,383	\$ 116.29
7	Business Tier 6 (50,001 to 75,000 kWh per month)	1,106,956	0.0584	\$ 2,213,064	12,742	\$ 173.68
8	Business Tier 7 (75,001 to 100,000 kWh per month)	756,066	0.0399	\$ 1,511,551	6,330	\$ 238.79
9	Business Tier 8 (100,001 to 150,000 kWh per month)	927,473	0.0489	\$ 1,854,235	7,007	\$ 264.61
10	Business Tier 9 (150,001 to 250,000 kWh per month)	938,875	0.0495	\$ 1,877,030	6,085	\$ 308.48
11	Business Tier 10 (above 250,000 kWh per month)	1,560,566	0.0823	\$ 3,119,935	9,269	\$ 336.59
12	Total	\$18,957,096	1.0000	\$ 37,899,649 ⁽⁶⁾		

(1) Case No. U-20875, WP-AMG-20, Year 2022

(2) Proration factor developed per customer group share (col. b, lines 1-11) of total (col. b, line 12).

(3) Customer group surcharge obligation based on customer group share (col. c, lines 1-11) of total obligation (col. d, line 12).

(4) Case No. U-20875 WP-AMG-22, WP-AMG-23, WP-AMG-24 for year of implementation

(5) Residential group surcharge on a \$/kWh basis, while C&I customer surcharge on a \$/customer meter basis.

(6) Surcharge obligation of \$37,796,781 per Exhibit A-21 (TTT-4) plus 2022 Under-Recovery of \$102,868 per Exhibit A-13 (SL-3), pg 2

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company

Case No.: U-21312
Exhibit No.: A-15 (HWM-2)
Page: 1 of 1
Witness: HWMiller
Date: May 2023

Gas Energy Waste Reduction Surcharge Incentive Component
Calculated Without Interest and Collected over 12 Months

Line	<u>Description</u>	(b) Low-Income Cost Responsibility ⁽¹⁾ (\$)	(c) Proration Factor ⁽²⁾	(d) Surcharge Obligation ⁽³⁾ (\$)	(e) Customer Group Surcharge Annual Determinants ⁽⁴⁾ (Mcf)	(f) Monthly Gas EWR Surcharge Incentive Component (per Mcf)
1	Residential	\$12,352,812	0.5252	\$ 8,747,653	160,924,189	\$ 0.0544
2	Small C&I (< 100,000 Mcf)	10,942,680	0.4652	\$ 7,749,067	88,134,440	\$ 0.0879
3	Large C&I (> 100,000 Mcf)	<u>226,739</u>	<u>0.0096</u>	<u>\$ 160,566</u>	55,742,371	\$ 0.0029
4	Total	\$23,522,231	1.0000	\$ 16,657,285 ⁽⁵⁾		

(1) Case No. U-20875, WP-AMG-20, Year 2022

(2) Proration factor developed per customer group share (col. b, lines 1-3) of total (col. b, line 4).

(3) Customer group surcharge obligation based on customer group share (col. c, lines 1-3) of total obligation (col. d, line 4).

(4) Case No U-20875, WP-AMG-29 for year of implementation

(5) Surcharge obligation of \$16,825,303 per Exhibit A-21 (TTT-4) plus 2019 Over-Recovery of \$168,018 per Exhibit A-13 (SL-3), pg 3

M.P.S.C. No. 14 – Electric
Consumers Energy Company

Sheet No. D-2.10

SURCHARGES

<u>Rate Schedule</u>	Energy Efficiency Program Surcharge (Case No. U- 21205 <u>21312</u>) Effective beginning the January 2023 <u>2024</u> <u>Billing Month</u> ⁽¹⁾⁽⁶⁾	Energy Efficiency Self-Directed Customer Surcharge (Case No. U- 21205 <u>21312</u>) Effective beginning the January 2023 <u>2024</u> <u>Billing Month</u> ⁽⁶⁾⁽⁷⁾
Residential Rates	\$ 0.005613 <u>0.004956</u> /kWh	NA
Non-Residential Rates ⁽²⁾		
Tier 1: 0 – 2,000 kWh/mo.	\$ 7.91 <u>8.82</u> /billing meter	\$ 0.78 <u>0.82</u> /month
Tier 2: 2,000 – 5,000 kWh/mo.	52.11 <u>58.09</u> /billing meter	5.15 <u>5.42</u> /month
Tier 3: 5,001 – 10,000 kWh/mo.	114.76 <u>127.92</u> /billing meter	11.34 <u>11.93</u> /month
Tier 4: 10,001 – 30,000 kWh/mo.	271.86 <u>303.06</u> /billing meter	26.85 <u>28.24</u> /month
Tier 5: 30,001 – 50,000 kWh/mo.	657.28 <u>732.70</u> /billing meter	65.01 <u>68.37</u> /month
Tier 6: 50,001 – 75,000 kWh/mo.	981.66 <u>1094.31</u> /billing meter	97.09 <u>102.12</u> /month
Tier 7: 75,0001 – 100,000 kWh/mo.	1371.92 <u>1504.52</u> /billing meter	133.48 <u>140.40</u> /month
Tier 8: 100,001 – 150,000 kWh/mo.	1549.09 <u>1667.20</u> /billing meter	147.92 <u>155.58</u> /month
Tier 9: 150,001 – 250,000 kWh/mo.	1912.12 <u>1943.60</u> /billing meter	172.44 <u>181.37</u> /month
Tier 10: >250,000 kWh/mo.	2301.37 <u>2120.73</u> /billing meter	173.84 <u>182.85</u> /month
Rate GSG-2 ⁽⁴⁾	NA	NA
Rate GML ⁽³⁾⁽⁵⁾	NA	NA
Rate GUL ⁽³⁾⁽⁵⁾	\$ 0.27/fixture per month ⁽³⁾	NA
Rate GU-LED	NA	NA
Rate GU	NA	NA
Rate PA	NA	NA
Rate ROA-R, ROA-S, ROA-P	Same as Full Service Delivery Rate Schedule	Same as Full Service Delivery Rate Schedule

The customer's consumption will be reviewed annually in the January bill month. Following the annual review, the customer may be subsequently moved to the Surcharge level for their applicable rate for the next billing period based on the customer's average consumption for the previous year. In situations where no historical consumption is available, the monthly Surcharge level will be based on the lowest consumption category for the secondary rate schedules, or the lowest consumption category for primary rate schedules. No retroactive adjustment will be made due to the application of the Energy Efficiency Program Surcharge associated with the increases or decreases in consumption.

- ⁽¹⁾ This is subject to all general terms and conditions as shown in Rule C12, Energy Efficiency. The Energy Efficiency Program Surcharge amount may vary during specific months as authorized by the Michigan Public Service Commission. The Company will file a new tariff sheet to reflect any change in surcharges once the financial incentive recovery period has been completed.
- ⁽²⁾ Non-Residential Rates include GS, GSTU, GSD, GP, GPTU, GPD, EIP, LTILRR and LED.
- ⁽³⁾ Company-Owned lighting fixture customers served on General Service Unmetered Lighting Rate GUL shall pay this surcharge. Rate codes 1455 and 1460 will not be charged this surcharge.
- ⁽⁴⁾ Additional Rate Schedules can opt-in to the Energy Efficiency Program as described in Rule C12., Energy Efficiency.
- ⁽⁵⁾ Lighting rates that choose to opt-in to the Energy Efficiency Program shall be assessed \$0.27 per fixture per month.
- ⁽⁶⁾ This charge will be shown on the monthly utility bill using the methodology as described in Rule C12, Energy Efficiency.
- ⁽⁷⁾ An eligible customer who files and implements a self-directed plan in compliance with Rule C12 is required to pay the Energy Efficiency Self-Directed Program Surcharge.

Issued XXXXXX XX, 2023 by
Garrick J. Rochow,
President and Chief Executive Officer,
Jackson, Michigan

Effective for bills rendered on and after
the Company's January 2024 Billing Month

Issued under authority of the
Michigan Public Service Commission
dated XXXXXX XX, 2023
in Case No. U-21312

M.P.S.C. No. 3 - Gas
Consumers Energy Company

Sheet No. D-2.00

SURCHARGES

Each Rate Schedule may be subject to Rule No. C8., Customer Attachment Program.

<u>Rate Schedule</u>	Energy Efficiency ⁽¹⁾ Program Surcharge (Case No. U- 21205 <u>21312</u>) Effective beginning the January 2023 - <u>2024</u> <u>Billing Month</u> ^{(2) (3)}
Rate A	\$0.4164 <u>0.3718</u> /Mcf
Rate A-1	0.4164 <u>0.3718</u> /Mcf
Rate GS-1	0.4938 <u>0.5533</u> /Mcf
Rate GS-2	0.4938 <u>0.5533</u> /Mcf
Rate GS-3	
0 – 100,000 / Year	0.4938 <u>0.5533</u> /Mcf
> 100,000 / Year	0.0163 <u>0.0183</u> /Mcf
Rate GL	NA
Rate ST	
0 – 100,000 / Year	0.4938 <u>0.5533</u> /Mcf
> 100,000 / Year	0.0163 <u>0.0183</u> /Mcf
Rate LT	
0 – 100,000 / Year	0.4938 <u>0.5533</u> /Mcf
> 100,000 / Year	0.0163 <u>0.0183</u> /Mcf
Rate XLT	
0 – 100,000 / Year	0.4938 <u>0.5533</u> /Mcf
> 100,000 / Year	0.0163 <u>0.0183</u> /Mcf
Rate XXL	
0 – 100,000 / Year	NA
> 100,000 / Year	0.0163 <u>0.0183</u> /Mcf
Rate CC	Per applicable distribution Rate Schedule

- (1) All surcharges shall be applied on a monthly basis. The customer's consumption will be reviewed annually in the January bill month. Following the annual review, the customer may be subsequently moved to the surcharge level for their applicable rate for the next billing period based on the customer's average consumption for the previous year. No retroactive adjustment will be made due to the application of EE surcharges associated with increases or decreases in consumption.
- (2) An Energy Efficiency Program Surcharge amount may vary during specific months as authorized by the Michigan Public Service Commission. The Company will file a new tariff sheet to reflect any change in surcharges once the financial incentive recovery period has been completed.
- (3) The Energy Efficiency Program Surcharge for each rate will be shown as above on the monthly utility bill under Other Surcharges for all customers.

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M.P.S.C. No. 3 - Gas
Consumers Energy Company

Sheet No. D-2.10

SURCHARGES

Each Rate Schedule may be subject to Rule No. C8., Customer Attachment Program.

**Energy Efficiency
Large Gas Transportation
Opt-Out
Program Surcharge ⁽¹⁾
(Case No. U-~~21205~~ 21312)
Effective beginning the
January ~~2023~~-2024
Billing Month**

Rate Schedule

Rate A	NA
Rate A-1	NA
Rate GS-1	NA
Rate GS-2	NA
Rate GS-3	NA
Rate GL	NA
Rate ST	
> 100,000 / Year	\$0.0038 <u>0.0045</u> /Mcf
Rate LT	
> 100,000 / Year	0.0038 <u>0.0045</u> /Mcf
Rate XLT	
> 100,000 / Year	0.0038 <u>0.0045</u> /Mcf
Rate XXL	
> 100,000 / Year	0.0038 <u>0.0045</u> /Mcf
Rate CC	N/A

- ⁽¹⁾ Gas Transportation customers on Rate ST, LT, XLT, or XXL using more than 100,000 Mcf per year may be eligible to opt-out of the Energy Efficiency program. Eligible customers who elect to opt-out of the Energy Efficiency program will pay the Energy Efficiency Large Gas Transportation Opt-Out Program surcharge per Mcf on a monthly basis. Eligibility is determined solely by the Company and is dependent upon terms and conditions of the Energy Efficiency Large Gas Transportation Customer Opt-Out Program as authorized in the April 17, 2012 order in Case No. U-16670.
- ⁽²⁾ The Energy Efficiency Large Gas Transportation Opt-Out Program Surcharge will be shown on the monthly utility bill under Other Surcharges for all customers.

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dated XXXXXX XX, 2023
in Case No. U-21312

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

ALLISON M. REIS

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

ALLISON M. REIS
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Allison M. Reis, and my business address is One Energy Plaza, Jackson,
3 Michigan 49201.

4 **Q. Please describe your current position and responsibilities.**

5 A. I am a Residential Demand Side Management Manager for Consumers Energy Company
6 (“Consumers Energy” or the “Company”), and I am responsible for the development and
7 implementation of a portfolio of electric and gas residential Energy Waste Reduction
8 (“EWR”) and Demand Response (“DR”) programs.

9 **Q. Please describe your education and professional experience.**

10 A. I hold a bachelor’s degree in Marketing and Management from Niagara University and a
11 Master of Business Administration from Grand Valley State University. In 2015, I began
12 my career at Consumers Energy as an intern within the Strategy Development and
13 Mobilization Division. In 2016, I was hired as a Marketing and Business Development
14 Specialist supporting the Company’s Appliance Service Plan and promoted to Manager of
15 the Customer Experience Strategy team dedicated to improving customers’ core
16 experiences with Consumers Energy in five priority areas— billing, payment, outage, field,
17 and blue sky. In 2018, I accepted the position of Program Manager of the Dynamic Peak
18 Pricing and Gas Smart Thermostat Programs within the Residential DR team. In this role,
19 I was responsible for achievement of all program objectives including customer
20 participation, capacity reduction, customer satisfaction, and cost effectiveness. In 2020, I
21 was promoted to Manager of Economic Development where I was responsible for the
22 Company’s economic development strategy, offerings, and metrics for growth

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DIRECT TESTIMONY

opportunities with business customers. In 2021, I began my current role of Residential Demand Side Manager.

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to (i) provide an overview of the Company's residential EWR programs and (ii) describe the 2022 energy savings and investments associated with these programs.

Q. Are you sponsoring any exhibits with your direct testimony?

A. No.

Q. Please describe the Company's 2022 residential EWR portfolio.

A. The Company's 2022 residential portfolio is designed to provide residential customers with a diverse range of opportunities to reduce their electricity and natural gas usage. The residential portfolio provides EWR participation opportunities for residential customers for all income levels, housing types and across all fuel services.

Q. Were there any changes to the Company's 2022 residential EWR portfolio as compared to the to the approved EWR Plan for 2022 (MPSC Case No. U-20875)?

A. Yes. As described in the testimony of Company witness Lynne McCollum, the Energy Dashboard was supported by education and awareness investment and not implemented as a residential program in 2022.

Q. What EWR residential programs were available during 2022?

A. The Company's EWR residential portfolio comprised the following 14 programs:

- Appliance Recycling;
- Consumers Energy Store;
- ENERGY STAR® Appliances;

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- ENERGY STAR[®] Lighting;
- Home Energy Analysis;
- Home Performance with ENERGY STAR[®];
- Home Energy Report;
- High-Efficiency HVAC¹ and Water Heating Equipment;
- Insulation and Windows;
- Income Qualified Energy Assistance;
- Multifamily and Multifamily Income Qualified;
- Residential New Construction;
- Residential Agriculture; and
- Think! Energy[®] – Energy Education.

Q. Please describe the Appliance Recycling Program.

A. When customers replace a refrigerator or freezer, many of those being replaced still function and often end up as energy guzzling, back-up appliances in basements and garages or are sold in a used appliance market. This program targeted customers with these “second” refrigerators and freezers, providing the benefits of cutting energy consumption and keeping the appliances out of the used market by disposing of them in an environmentally safe manner. Incentives were offered for working refrigerators, freezers, dehumidifiers, and room air conditioners with the addition of compact refrigerators and freezers in 2022. An appliance recycling contractor provided turnkey implementation services that included marketing, verification of customer eligibility, scheduling of pick-up appointments, appliance pick-up, rebate processing, and environmentally safe recycling

¹ HVAC stands for heating, ventilation, and air conditioning.

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1 services. The program continues to offer the well-received no contact collection approach
2 introduced in 2020 in response to the COVID-19 pandemic, in which the appliance is
3 collected outside of the customer's home, such as in a garage, on the porch or other external
4 area, when preferred by the customer.

5 **Q. What results were achieved for the Appliance Recycling Program in 2022?**

6 A. In 2022, there were 24,770 large appliances and 4,099 small appliances recycled that
7 delivered first-year energy savings of 46,929 MWh and lifetime energy savings of 289,610
8 MWh.

9 **Q. Please describe the Company's Consumers Energy Store program.**

10 A. The Consumers Energy Store (also referred to as the Online Marketplace, Marketplace, or
11 Online Store), allows residential customers to purchase energy-efficient products via a
12 website for delivery to their home, including Wi-Fi-enabled thermostats, LED bulbs,
13 dehumidifiers, room air conditioners, and air purifiers. In 2022, Consumers Energy
14 expanded the list of products available through the Consumers Energy Store, adding
15 showerheads, advanced power strips, faucet aerators, window insulation film kits, and
16 electric vehicle chargers. In addition, the program offered two measure giveaways: air
17 purifiers during "Earth Month" in the Spring and advanced power strips as a "Black
18 Friday" promotion—when eligible customers purchased a thermostat. The Company also
19 continued its successful practice of coordinating outreach campaigns with other EWR
20 efforts and the DR Smart Thermostat Program. In 2022, customers purchased 13,970 more
21 measures through the Consumers Energy Store than were purchased in 2021. The
22 Consumers Energy Store generated high customer satisfaction ratings across several
23 aspects of the program, such as usability of the website, the product purchase process, and

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1 shipping and delivery. Looking ahead, the program will continue efforts to identify
2 additional products and savings measures of most interest to customers.

3 **Q. What results were achieved for the Consumers Energy Store in 2022?**

4 A. The Consumers Energy Store delivered first-year energy savings of 3,078 MWh and
5 111,954 Mcf. These first-year savings represent lifetime savings of 23,609 MWh and
6 718,535 Mcf.

7 **Q. Please describe the Company's ENERGY STAR® Appliances Program.**

8 A. The ENERGY STAR® Appliances Program offers rebates on the purchase of qualifying
9 ENERGY STAR home appliances and Wi-Fi thermostats. In 2022, post-purchase rebates
10 on ENERGY STAR certified clothes dryers, heat pump dryers, refrigerators, freezers,
11 bathroom exhaust fans, and televisions were added to the existing product list and instant
12 rebates were expanded to showerheads, advanced power strips, ENERGY STAR air
13 purifiers, bathroom exhaust fans, and room air conditioners in select retail locations. The
14 program continues to focus on increasing options and eligible product offerings to drive
15 adoption of energy and water efficient technologies. Customers are informed about
16 program rebates and the benefits of ENERGY STAR qualified products through point-of-
17 sale education in retail stores, strategic customer marketing, and the program field team
18 and retail associate collaborative efforts. In 2022, the program processed and rebated
19 62,527 measures which was a 507% increase over 2021 participation.

20 **Q. What results were achieved for the ENERGY STAR® Appliances Program in 2022?**

21 A. The ENERGY STAR® Appliances Program delivered first-year energy savings of
22 3,663 MWh and 38,881 Mcf. These first-year savings represent lifetime savings of 33,035
23 MWh and 368,980 Mcf.

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1 **Q. Please describe the Company's ENERGY STAR® Lighting Program.**

2 **A.** The ENERGY STAR® Lighting Program provides incentives to residential customers
3 purchasing ENERGY STAR LED bulbs. The program worked with retailers and LED
4 manufacturers to discount the cost of qualifying products on store shelves. Over 350
5 unique ENERGY STAR® certified lighting products were incentivized in 2022, which
6 resulted in over 2.1 million rebated bulbs, including over 376,000 specialty LED bulbs and
7 fixtures. The Company expects to see program savings and investments continue to decline
8 as standard LED residential products move to full market transformation.

9 **Q. What results were achieved for the ENERGY STAR® Lighting Program in 2022?**

10 **A.** The ENERGY STAR® Lighting Program delivered 23,197 MWh first-year energy savings
11 and 98,965 MWh lifetime energy savings.

12 **Q. Please describe the Company's Home Energy Analysis ("HEA") Program.**

13 **A.** The HEA Program offers Michigan residents a free in-home analysis or a virtual audit,
14 performed by a trained analyst, which provides participating customers with a
15 walk-through energy inspection of their home, direct installation of energy savings
16 measures, and a customized report with energy savings tips and recommendations.
17 Consumers Energy designed the HEA program to introduce its customers to energy
18 efficiency, increase their awareness of additional EWR programs in Consumers Energy's
19 residential portfolio, increase customer satisfaction with the Company, and generate energy
20 savings by providing a free introductory audit and installing free measures. On average,
21 participating customers received \$50 worth of energy saving measures which provided an
22 estimated annual savings of up to \$150.

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1 In 2022, the HEA program made several changes to improve the customer
2 experience including enhancements to the post-audit report for readability and tailoring to
3 individual customer's needs. The program also added window kits and periodic additions
4 of "Bonus Measures" such as air purifiers, smart power strips, or \$15 for the Consumers
5 Energy store.

6 **Q. What results were achieved for the HEA Program in 2022?**

7 A. The HEA Program delivered first-year energy savings of 7,973 MWh and
8 88,080 Mcf. These first-year savings represent lifetime savings of 53,594 MWh and
9 881,755 Mcf.

10 **Q. Please describe the Company's Home Performance with ENERGY STAR® Program.**

11 A. The Home Performance with ENERGY STAR® Program helped customers analyze their
12 energy use and make home improvements that consider the home as a complete system.
13 This was accomplished by emphasizing a holistic approach to making homes safe, healthy,
14 more comfortable, and energy efficient. Building Performance Institute certified
15 contractors offered customers Comprehensive Home Assessments at market-based fees
16 that included diagnostic testing and a visual inspection for health, comfort, and safety
17 issues. Once an inspection was complete, the contractor used energy modeling software to
18 generate a final report that informed the customer of energy savings, costs, and payback.
19 The program targeted residential customers in single-family homes and offered various
20 options to capture energy savings. Financial incentives were available for building shell
21 improvements and energy efficient heating and cooling equipment.

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1 **Q. What results were achieved for the Home Performance with ENERGY STAR®**
2 **Program in 2022?**

3 A. The Home Performance with ENERGY STAR® Program delivered first-year energy
4 savings of 256 MWh and 35,479 Mcf. These first-year savings represent lifetime savings
5 of 4,094 MWh and 545,008 Mcf.

6 **Q. Please describe the Company's Home Energy Report ("HER") Program.**

7 A. The HER is a personalized outbound energy education and engagement solution that
8 utilizes behavioral science to reduce residential customers' energy use. The HER educates
9 customers on their usage habits and trends and leverages normative comparisons to nudge
10 customers to increase their energy efficiency. HERs provide personalized ways to save
11 energy, cross-promote Consumers Energy's other energy-saving programs, and show how
12 energy is consumed throughout the home.

13 Behavioral science research has demonstrated that peer-based comparisons are
14 highly motivating. The HER program employs this approach by comparing each
15 participating residence's energy use with nearby homes of similar size, year built, and
16 heating/cooling types. Two types of home comparison are shown: average household
17 comparison and energy efficient household comparison. Participating customers receive
18 targeted savings tips based on their energy-use patterns, housing characteristics, and
19 demographics. Customers also receive energy efficiency program promotions based on
20 the season and what programs are actively executing marketing campaigns. In 2022, the
21 program continued to implement design improvements and customer research to promote
22 increased engagement. Looking ahead, the Company will continue its focus on program

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1 improvement, evaluation and customer feedback to advance program savings and
2 participation opportunities.

3 **Q. What results were achieved for the HER Program in 2022?**

4 A. The HER Program delivered first-year and lifetime energy savings of 16,570 MWh and
5 92,483 Mcf (HER has a measure life of one year).

6 **Q. Please describe the Company's High-Efficiency HVAC and Water Heating
7 Equipment Program ("HVAC Program").**

8 A. The HVAC Program encourages residential customers to invest in high-efficiency heating,
9 cooling, and water heating equipment. The program enlisted contractor participation to
10 promote the program and ensure equipment purchased was properly sized and correctly
11 installed. Participating HVAC contractors were provided specific value propositions
12 including training, educational materials, and marketing collateral. Financial incentives
13 paid to customers reduced the incremental cost of purchasing qualifying high-efficiency
14 models. Contractors deliver this program through both downstream and midstream
15 channels. Midstream is a "buy-down" program, offering contractors the ability to provide
16 lower upfront costs on equipment to homeowners, making high efficiency boilers and
17 tankless water heaters more affordable.

18 In addition to lingering pandemic-related supply chain issues, federal baseline
19 standard changes for natural gas equipment along with a mild winter had significant impact
20 on program participation resulting in lower than planned gas HVAC savings for 2022. The
21 Company is anticipating continued challenges for the HVAC program in 2023, and is

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1 working with trade ally and program implementation partners to maximize savings
2 opportunities going forward.

3 **Q. What results were achieved for the HVAC Program in 2022?**

4 A. The HVAC Program delivered first-year energy savings of 3,065 MWh and 473,591 Mcf.
5 These first-year savings represent lifetime savings of 41,818 MWh and 6,548,825 Mcf.

6 **Q. Please describe the Company's Insulation and Windows Program.**

7 A. The Insulation and Windows Program provided rebates to customers to encourage them to
8 install qualified energy-saving windows and home insulation. The program is unique in
9 that it provides customers the option to use the services of a contractor or to perform the
10 improvements and apply for rebates themselves. This option was particularly appealing
11 for the do-it-yourself customers. The program is marketed directly to customers and
12 through a network of insulation and window installation contractors. Marketing material
13 is also displayed through point-of-purchase promotional material in "Big Box" retailers
14 throughout the state.

15 **Q. What results were achieved for the Insulation and Windows Program in 2022?**

16 A. The Insulation and Windows Program delivered first-year energy savings of 646 MWh and
17 56,954 Mcf. These first-year savings represent lifetime savings of 15,812 MWh and
18 1,365,626 Mcf.

19 **Q. Please describe the Company's Income Qualified Energy Assistance Program.**

20 A. The Income Qualified Energy Assistance Program identified specific opportunities for
21 low-income customers to lower their energy use by providing each customer with an
22 in-home energy analysis (in person or virtual), educational information designed to
23 increase energy efficiency awareness, and installation of energy efficiency

ALLISON M. REIS
DIRECT TESTIMONY

measures. Customer eligibility is based on the customer being at or below 200%² of the federal poverty level. The program collaborated with Community Action Agencies, Habitat for Humanity, and other nonprofit agencies to leverage their program funding to make homes energy efficient through the installation of targeted measures such as air sealing, insulation, cold climate heat pumps, and heat pump water heaters, as well as furnace, air conditioner and refrigerator replacements. The program's collaborative approach of engaging and cooperating with local agencies fostered greater public awareness of the adoption of energy efficiency practices. The program also continued collaboration with the Company's energy assistance program, which refers all customers in arrears to Helping Neighbors. All outreach communications that are provided to Income Qualified customers contain information for both Energy Assistance and EWR programs, directing customers to sign up for a Helping Neighbors Analysis. In 2022, the program served 13,850 unique customers, of which 3988 were in arrears (defined as having a past-due bill greater than 30 days in 2022).

Q. What results were achieved for the Income Qualified Energy Assistance Program in 2022?

A. This program delivered first-year energy savings of 26,367 MWh and 175,302 Mcf. These first-year savings represent lifetime savings of 246,866 MWh and 2,029,159 Mcf.

Q. Please describe the Company's Multifamily and Multifamily Income Qualified Program.

A. The Multifamily and Multifamily Income Qualified Program produced electric and natural gas energy savings in multifamily buildings through the direct installation of energy-saving

² The Income Qualified Program is able to serve customers up to 250% of the federal poverty level for smaller scale initiatives.

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DIRECT TESTIMONY

1 measures in individual living units and common areas, as well as through prescriptive
2 deemed measures included in the Michigan Energy Measures Database. The program
3 offered a one-stop-shop approach that served income qualified residential and commercial
4 segments through one program, managed by one implementation contractor. The
5 implementation contractor dispatched a crew of installers to targeted buildings to install
6 low-cost energy saving measures free of charge to the property owner and tenants,
7 including LEDs, bath and kitchen water saving aerators, showerheads, thermostats, and
8 insulating pipe wrap. The program also works in collaboration with DTE to complete joint
9 installs for customers who have utility service from both utility providers. The program is
10 also designed to achieve deeper energy savings through the promotion of high efficiency
11 equipment for prescriptive and custom retrofit projects, like lighting, HVAC, building
12 envelope, and water heating. In 2022, the program continued its focus on installing
13 targeted gas and electric measures for Income Qualified customers. Targeted electric
14 measures include cold climate heat pumps, heat pump water heaters, and air sealing and
15 insulation, and targeted gas measures include air sealing and insulation. The Multifamily
16 & Multifamily Income Qualified Program also continued its focus on comprehensive
17 whole building upgrades including heating system replacement, water heating equipment
18 replacement, and/or other whole building custom measures, e.g., major ventilation
19 measures for multifamily buildings, central heating distribution system efficiency
20 improvements, etc.³

³ Specific to the Income Qualified targeted electric and gas measure installation performance incentive metrics described in the testimony of Company witness McCollum, the Multifamily Income Qualified program installed 3544 targeted electric and 4251 targeted gas measures in 2022.

ALLISON M. REIS
DIRECT TESTIMONY

1 **Q. What results were achieved for the Multifamily & Multifamily Income Qualified**
2 **Program in 2022?**

3 A. The Multifamily Program delivered first-year energy savings of 10,488 MWh and 155,111
4 Mcf. These first-year savings represent lifetime savings of 114,000 MWh and 911,258
5 Mcf. The Multifamily Income Qualified Program delivered first-year energy savings of
6 8,439 MWh and 78,274 Mcf. These first-year savings represent lifetime savings of 95,001
7 MWh and 574,706 Mcf.

8 **Q. Did the Income Qualified Energy Assistance Program and Multifamily Income**
9 **Qualified Program continue to administer the Income Qualified Health and Safety**
10 **Pilot approved in Case Nos. U-20372 and U-20875?**

11 A. Yes. In 2022, both the Income Qualified Energy Assistance Program and Multifamily
12 Income Qualified Program continued to administer the Income Qualified Health and Safety
13 Pilot approved in Case Nos. U-20372 and U-20875. The Health and Safety Pilot is
14 designed to enable EWR investments in otherwise untreatable homes, delivering health and
15 safety measures in an integrated way through the single family and multifamily income
16 qualified programs. In 2022, 133 single family and 2004 multifamily customers were
17 served through the Income Qualified Health and Safety Pilot. Additional information
18 including the types of health and safety work performed as part of this pilot is provided in
19 Exhibit A-1 (LM-1), the 2022 EWR Annual Report.

20 **Q. Please describe the Company's Residential New Construction Program.**

21 A. The Residential New Construction Program produced long-term electric and natural gas
22 savings by encouraging the construction of single-family homes, townhomes and duplexes
23 that met the current ENERGY STAR[®] standards. Builders who participated were provided

ALLISON M. REIS
DIRECT TESTIMONY

1 rebates that covered up to approximately 40% of the incremental cost to build and certify
2 each home to ENERGY STAR® standards. In 2022, the program continued to utilize a
3 Home Energy Rating Score (HERS) Program to provide rebates to builders of energy
4 efficient homes that meet or exceed ENERGY STAR® standards with a HERS score of 56
5 or less. The program, which received national recognition in 2022 by both ENERGY
6 STAR® and the Midwest Energy Efficiency Alliance (“MEEA”) for program design and
7 achievement, continues to be touted as an exemplary energy efficiency residential offering.

8 **Q. What results were achieved for the Residential New Construction Program in 2022?**

9 A. The Residential New Construction Program delivered first-year energy savings of
10 1,781 MWh and 62,377 Mcf. These first-year savings represent lifetime savings of
11 35,627 MWh and 1,247,530 Mcf.

12 **Q. Please describe the Company’s Residential Agriculture Program.**

13 A. The Residential Agriculture Program offered residential agriculture customers incentives
14 for energy saving measures in retrofit and major renovation projects. The program
15 continued efforts to collaborate with Michigan State University’s Farm Audit Program to
16 offer incentives to customers who have a United States Department of Agriculture Tier 2
17 audit completed at their facilities. For consistency, the program provided the same level
18 of rebates as the prescriptive and custom incentives from the business EWR program.

19 **Q. What results were achieved for the Residential Agriculture Program in 2022?**

20 A. The Residential Agriculture Program delivered first-year energy savings of 1,042 MWh
21 and 857 Mcf, which represent lifetime savings of 14,122 MWh and 17,953 Mcf.

ALLISON M. REIS
DIRECT TESTIMONY

1 **Q. Please describe the Company's Think! Energy® – Energy Education Program.**

2 A. The Think! Energy® - Energy Education Program influences students and their families, or
3 community members, to take actions that can reduce their home energy use and increase
4 efficiency. In 2022, the Think! Energy program was provided to students in grades 2-3
5 (Bright Kids), 4-6 (traditional) and 7-12 (Innovation). The program was also offered to
6 community and senior citizen groups through the Community in Action and Energy Smart
7 Senior segments. Following in-class or virtual energy efficiency presentations, participants
8 were provided with "take-home" kits that raised awareness about how individual actions
9 and low-cost measures provide reductions in consumption of electricity, natural gas, and
10 water. In 2022, MEEA recognized Think! Energy, awarding the program its Inspiring
11 Efficiency Impact Award.

12 **Q. What results were achieved for the Think! Energy – Energy Education Program in**
13 **2022?**

14 A. The Think! Energy – Energy Education Program delivered first-year energy savings of
15 7,365 MWh and 117,389 Mcf. These first-year savings represent lifetime savings of
16 52,373 MWh and 736,370 Mcf.

17 **Q. What was the overall marketing and outreach strategy for the residential programs**
18 **listed above?**

19 A. The marketing and outreach strategy was to make customers, as well as trade allies and
20 other key market segments, aware of the Company's EWR program offerings and benefits,
21 and to influence customers to begin their energy efficiency journeys by participating in an
22 energy efficiency program. Marketing strategies for each program varied based on factors
23 such as demographics and past participation in energy efficiency programs. Generally,

ALLISON M. REIS
DIRECT TESTIMONY

1 marketing included a mix of television, radio, digital media, social media, print media,
2 email communication, direct contact, direct mail, bill inserts, co-op advertising
3 opportunities for our trade ally networks, and group presentations. Marketing efforts also
4 included cross-promotion across various programs in order to gain marketing efficiencies,
5 improve customer awareness of the breadth of energy efficiency opportunities, and to
6 continue customers on their energy efficiency journeys. Specific outreach and marketing,
7 including communications to customers in arrears, were utilized in a coordinated effort
8 with the Company's energy assistance program.

9 **Q. For each of the residential programs listed above, is there additional information**
10 **available in this filing?**

11 A. Yes. Consumers Energy's 2022 EWR Annual Report, Exhibit A-1 (LM-1), provides a
12 review of the Company's 2022 EWR performance and includes participation, investment,
13 energy savings, and benefit-cost test results associated with the Company's 14 residential
14 programs.

15 **Q. How did Consumers Energy implement its residential EWR programs in 2022?**

16 A. Consumers Energy used the following implementation contractors in 2022 to implement
17 its residential programs:

- 18 • CLEAResult – Appliance Recycling, Home Energy Analysis, and Income
19 Qualified;
- 20 • SEEL – Electric-Only Home Energy Analysis, Electric-Only Income Qualified;
- 21 • DNV – Residential Agriculture;
- 22 • Franklin Energy – Multifamily and Income Qualified Multifamily;
- 23 • ICF International – HVAC and Water Heating, New Home Construction, Home
24 Performance with ENERGY STAR®, ENERGY STAR® Lighting, ENERGY
25 STAR® Appliances, and Insulation and Windows;

ALLISON M. REIS
DIRECT TESTIMONY

- National Energy Foundation – Think! Energy®; and
- Uplight – Home Energy Report, Marketplace

Q. What were the actual total annualized and lifetime MWh, MW, and Mcf savings from the Company’s residential EWR portfolio in 2022?

A. The Company’s EWR residential portfolio, including residential pilots as discussed by Company witness McCollum and shared savings as discussed by Company witness Amy C. Ellsworth, delivered total annualized savings of 161,926 MWh, 15.93 MW, and 1,524,488 Mcf in 2022. Similarly, the Company delivered total lifetime savings of 1,107,347 MWh and 16,639,165Mcf as shown in Exhibit A-1 (LM-1), Table 4-5. Individual residential program savings energy saving results can also be found in Exhibit A-1 (LM-1).

Q. Has the Company certified these electric and gas energy savings?

A. Yes. As detailed in the direct testimony of Company witness Ellsworth, the Company engaged The Cadmus Group, Inc. to certify the residential electric and gas energy savings.

Q. Did the Company achieve its residential electric savings within the residential EWR investment amount approved by the MPSC in the Company’s EWR Plan Case, Case No. U-20875?

A. Yes. The approved 2022 residential electric EWR investment in Case No. U-20875 was \$52.78 million. The Company actually invested \$54.35 million in residential electric programs as shown on Exhibit A-3 (LM-3), page 1, lines 1 through 19 column (d). This variance is within the additional electric investment above approved amounts threshold authorized in Case No. U-20875.

ALLISON M. REIS
DIRECT TESTIMONY

1 **Q. Did the Company achieve its residential gas savings within the residential EWR**
2 **investment amount approved by the Commission in Case No. U-20875?**

3 A. Yes. The approved 2022 gas investment in Case No. U-20875 was \$50.44 million
4 (excluding support services). The Company actually invested \$48.52 million in residential
5 natural gas programs as shown on Exhibit A-3 (LM-3), page 2, lines 1 through 19, column
6 (d).

7 **Q. Why does the actual electric and gas investment vary from the planned electric and**
8 **natural gas investment?**

9 A. The variances arise as a result of the large number of programs available to customers and
10 the timing of program expenses. Because of the size and timing of the investments, the
11 variance between planned spending and actual spending is minimal.

12 **Q. Does that conclude your direct testimony?**

13 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

R. KENNETH SKINNER

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. Please state your name and business address.**

2 A. My name is Dr. R. Kenneth Skinner. I am Vice President of Integral Analytics, Inc.,
3 ("IA"). My business address is One Riverfront Place, 300 Dave Cowens Dr #1010,
4 Newport, KY 41071.

5 **Q. Who is IA?**

6 A. With dozens of utility clients, IA (based in Cincinnati Ohio) is the nation's foremost
7 supplier of demand side management ("DSM") cost effectiveness analysis software. For
8 over 20 years, IA has supplied cost-effectiveness software, analytics, testimony and
9 program planning, reconciliation, and evaluation support for many leading US utilities. As
10 part of its set of software tools, IA developed the DSMore model which is used for valuing
11 the cost-effectiveness of energy efficiency and demand response programs across 30
12 states. IA develops accurate valuations by capturing all avoided costs and the covariance
13 between prices and loads, and values these impacts across 30 years of actual hourly weather
14 patterns, which ensures accuracy in quantifying avoided costs. Focused on operational,
15 planning and market research solutions for the energy industry, IA's team of experts have
16 extensive experience conducting technically defensible cost-effectiveness evaluations of
17 distributed energy resources, including energy efficiency and demand response programs,
18 while concurrently supporting program potential, impact evaluations, conjoint analysis,
19 market segmentation research, and market opportunity assessments. IA's analytical,
20 programming, and statistical methods offer clients more robust evaluation, faster and more
21 affordably. By providing customers with analytical tools and consulting services that are
22 integral to their success, IA can quickly identify whether programs are on track for reaching
23 savings goals rather than waiting a full year to discover if programs are effective. In

R. KENNETH SKINNER
DIRECT TESTIMONY

1 support of this goal, IA depends on a core staff that includes some of the best and brightest
2 engineering, statistical, and operations research talent in the country. Our subject matter
3 experts have testified in over 50 regulatory proceedings and our software has evaluated
4 over \$50B in energy savings nationally for numerous utilities, public utility commission
5 proceedings, and stakeholder filings over the last 20 years.

6 **Q. Can you summarize your educational background and professional qualifications?**

7 A. I earned a Ph.D. in Energy Economics from the Colorado School of Mines. I have
8 published hundreds of energy related papers and served as the technology columnist for
9 Wiley Natural Gas and Electricity Journal. I am a noted speaker on energy related topics
10 for organizations such as the Association of Energy Services Professionals, International
11 Association for Energy Economics, The American Council for an Energy-Efficient
12 Economy, Peak Load Management Alliance, INFORMS, Infocast, EUCI, and SNL
13 Energy. I currently instruct for PGS Energy Training, SNL Energy, Euro-Money and
14 Utility Workshops and have developed several energy related courses.

15 **Q. Can you describe your professional background and experience?**

16 A. I have over thirty years of energy industry experience including conservation, energy
17 efficiency, demand response, and integrated demand side management program design,
18 potential assessment, measurement and verification, risk assessment, and cost-
19 effectiveness analysis. Prior to beginning work with IA in 2006, I worked as an energy
20 consultant leading the economic analysis and modeling of demand side energy projects
21 including energy price forecasting, measurement and verification of energy savings,
22 econometric analysis, optimization, and project risk assessment.

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. Have you previously provided testimony before the Michigan Public Service**
2 **Commission (“MPSC” or the “Commission”)?**

3 A. While I have not provided testimony before the Michigan Public Service Commission
4 (“MPSC” or the “Commission”), I have filed testimony for Xcel Energy in Colorado, Duke
5 Energy in North Carolina, Pacific Gas and Electric and San Diego Gas and Electric in
6 California, and CMS Energy in Texas.

7 **Q. What is the purpose of your direct testimony in this proceeding?**

8 A. The purpose of my direct testimony is to (i) describe how IA helped Consumers Energy
9 model the cost-effectiveness of its 2022 Energy Waste Reduction (“EWR”) programs,
10 (ii) describe the cost-effectiveness modeling for the EWR programs, and (iii) provide the
11 results demonstrating that the EWR portfolio is cost-effective using the Utility System
12 Resource Cost Test (“UCT”) (excluding the low-income customers).

13 **Q. Are you sponsoring any exhibits?**

14 A. No.

15 **Q. Will you describe the services your firm has provided for Consumers Energy?**

16 A. IA provided cost-effectiveness modeling services utilizing the DSMore modeling tool to
17 calculate and report cost effectiveness of the Company’s EWR programs. In addition, IA
18 created and supplied the Michigan Energy Measures Database (“MEMD”) as a basis for
19 development of initial energy efficiency savings calculations and potential savings for
20 energy efficiency programs for use by all Michigan utilities in their cost-effectiveness
21 modeling.

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. How was cost-effectiveness of the Company's EWR programs determined?**

2 A. The DSMore cost analysis tool was used to calculate and report cost-effectiveness for the
3 Company's EWR programs using the UCT, as defined by 2008 PA 295, as amended in
4 2016 PA 342. Consumers Energy's programs must be cost effective utilizing the UCT, but
5 several other cost-effectiveness tests were performed, and their results along with the UCT
6 are tabulated in Company witness Lynne Mccollum's Exhibit A-1 (LM-1).

7 **Q. Please describe the DSMore modeling tool.**

8 A. The DSMore tool is an award-winning modeling software that is nationally recognized and
9 has been used in 30 states to determine cost effectiveness of energy efficiency programs.
10 Developed and licensed by IA, the DSMore cost-effectiveness modeling tool takes hourly
11 prices and hourly energy savings from the specific measures/technologies being considered
12 for each energy efficiency program and then correlates both to weather. The algorithm
13 used by the modeling software looks at over 30 years of historic weather variability to fully
14 capture the weather variances. In turn, this allows the model to capture the low probability
15 but high consequence weather events and apply appropriate value to them. Thus, a more
16 accurate view of the value of the efficiency measure can be captured in comparison to other
17 alternative supply options.

18 **Q. Can you please describe the various tests run in your DSMore modeling?**

19 A. Tables 4-6 and 4-7 in the Appendix to Exhibit A-1 (LM-1) show the cost-effectiveness test
20 results for the Company's electric and natural gas EWR programs in total, by residential

R. KENNETH SKINNER
DIRECT TESTIMONY

and business classes, and for each program. The various test results shown are for the following tests:

- Utility Cost Test: This is the ratio of the benefits of the programs to the program costs incurred by the utility for the programs. For a program to be cost effective, this ratio needs to exceed one (a score of 1.0 or higher indicates a program that is cost-effective).
- Total Resource Cost Test: This is the total avoided cost divided by the program costs plus the participant's costs. Participant costs are the incremental costs over the baseline technology.
- Rate Impact Measure: This is the avoided cost benefits divided by the program costs and lost revenues.
- Participant Test: This is the participant's benefits in energy savings from their bill plus their incentives divided by their costs to participate.

Q. What EWR program costs and savings were used for the cost-effectiveness calculation?

A. IA used the certified energy savings and participation amounts provided, by measure, from the third-party independent evaluators (The Cadmus Group, Inc. and TRC Consulting), as described in the direct testimony of Company witnesses Amy C. Ellsworth and Jeremiah J. Kraft, respectively. Participation results multiplied by the certified savings number over the life of the measure yields the lifetime savings results used in the DSM_{More} model. Program costs and incentives paid were based on actual payments for the 2022 EWR program year. Additional information such as measure life and incremental cost was taken from the 2022 MEMD.

Q. What type of utility information is used in the DSM_{More} modeling tool to determine cost effectiveness of energy efficiency programs?

A. For utility information, DSM_{More} utilizes utility rates; escalation rates; discount rates for the utility, society, and the participant tests; and avoided costs.

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. What is the source of the utility information used for Consumers Energy's DSM**
2 **modeling inputs?**

3 A. The utility inputs were provided to me by Consumers Energy and are consistent with the
4 inputs approved in Case No. U-20875 as part of the Company's 2022-2025 EWR Plan.

5 **Q. What type of program information is used as inputs into the DSM**
6 **model?**

7 A. Inputs into the model include participation rates, incentives paid, energy savings of the
8 measure, life of the measure, implementation costs, administrative costs, and any
9 incremental costs incurred by participants when installing an efficiency measure.

10 **Q. Within the DSM**
11 **model, how are the avoided electric benefits computed?**

12 A. The avoided electric benefits in the Company's analysis utilizes historic hourly price data
13 from the Midcontinent Independent System Operator, Inc. market and hourly weather data
14 to determine the value of the saved electricity. The electric savings, by measure, are
15 applied at specific hours over the year since prices vary by hour. These prices are weighted
16 based on the probability of weather variations over 33 years of weather history so that the
17 full range of weather and prices are properly captured. Each hour has a unique price which
18 is then escalated over time. This assures that the savings reflect the value you would expect
19 to see in the market over time from the avoided energy sales.

20 **Q. Within the DSM**
21 **model, how are the avoided gas benefits calculated?**

22 A. The avoided benefits for natural gas are calculated using weather-adjusted prices, similar
to electric, but are based on natural gas prices from the Henry Hub sales market. Natural
gas prices are based on daily natural gas prices, versus hourly prices for electric. Again
the purpose is to best represent the expected value of the energy savings in the marketplace.

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. What are net benefits?**

2 A. Net benefits are the computed avoided cost benefits, which I described previously, minus
3 the program costs to acquire those benefits. The net benefits (not including Low Income
4 programs) for electric are \$220,209,651 and natural gas are \$77,843,567, for a total net
5 benefit of \$298,053,218 as shown in Exhibit A-5 (LM-5). Once the Performance Incentive
6 is included, the benefits are electric \$182,412,870 and gas \$61,018,263 for a total of
7 \$243,431,134.

8 **Q. Please provide the detailed information on the UCT calculation.**

9 A. As described earlier, the UCT is the ratio of the net benefits of the energy efficiency
10 programs to the program costs incurred by the utility. For an energy efficiency program to
11 be cost effective, this ratio needs to exceed one. The formula for the UCT is:

$$\text{UCT} = \text{Program Benefits} / \text{Program Costs}$$

13 Program Benefits (net of free riders) were calculated by DSMore based on the avoided cost
14 of energy and demand for electric, and the avoided cost of natural gas. The electric energy
15 savings (excluding pilots and self-direct energy savings) were verified by the third-party
16 evaluators and equal to 5,640,034 net Lifetime MWh for business customers and 1,044,801
17 net Lifetime MWh for residential customers as shown in Exhibits A-10 (JJK-1), Table 1-
18 1, and A-9 (ACE-1), Table 10, respectively. Electric demand savings were verified by the
19 third-party evaluators and equal to 73.63 net MW for business customers and 15.93 net
20 MW for residential customers as shown in Exhibits A-10 (JJK-1), Table 1-2, and A-9
21 (ACE-1), Table 12, respectively. The avoided costs were calculated using the DSMore
22 model by looking at the time of savings for each measure and the historic weather-weighted
23 value during that time. Natural gas energy savings were 20,947,356 net lifetime MCF for

R. KENNETH SKINNER
DIRECT TESTIMONY

business customers and 15,859,426 net lifetime MCF for residential customers with calculated avoided costs based on the time of savings and the historic daily weather-weighted value (see Exhibits A-10 (JJK-1), Table 1-3, and A-9 (ACE-1), Table 17). Also included in the avoided-value calculation were transmission and distribution avoided costs as well as line losses. Total Avoided Cost Benefits for the total Portfolio (excluding low-income) are \$525,068,855.

Program costs are provided through the Company's accounting system and as set forth in the direct testimony of Company witness Trenton T. Taylor. Costs are split into four categories for each program: Incentives, Indirect, Labor, and Marketing/Other. In addition, other costs such as utility administration, education and awareness, evaluation, measurement and verification, and tracking are added at the portfolio levels. The total 2022 EWR Program investment was \$281,637,720 (including the utility performance incentive and excluding low-income).

To complete the equation:

\$525,068,855 in benefits divided by \$281,637,720 in program costs = 1.86 UCT

Q. Please describe the cost-effectiveness results for Consumers Energy's EWR programs.

A. Consumers Energy programs are cost effective with the Gas Program Portfolio UCT score of 1.81 and the Electric Program Portfolio UCT score of 1.89. The Combined Fuel Portfolio UCT score is 1.86. This means that the energy savings benefits are 81% greater than the program costs for natural gas, 89% greater than the program cost for electric, and 86% greater than the program cost for the combination of gas and electric savings.

R. KENNETH SKINNER
DIRECT TESTIMONY

1 **Q. Based on the results of your work, do Consumers Energy EWR programs meet the**
2 **cost-effectiveness requirements of the state legislation and MPSC Order?**

3 A. Yes. Based on the analysis I performed using the DSMore model, the Company's
4 reconciled results of the 2022 EWR Program pass the cost-effectiveness test in accordance
5 with the guidelines outlined by the MPSC and the legislative requirements of 2008 PA 295,
6 as amended in 2016 PA 342. This analysis was done in accordance with MPSC guidelines
7 and did not include low-income programs. The results of my analysis are provided in the
8 Appendix of Exhibit A-1 (LM-1) at Tables 4-4, 4-6, and 4-7.

9 **Q. Does this complete your direct testimony?**

10 A. Yes, it does.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

DIRECT TESTIMONY

OF

TRENTON T. TAYLOR

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

TRENTON T. TAYLOR
DIRECT TESTIMONY

Q. Please state your name and business address.

A. My name is Trenton T. Taylor, and my business address is One Energy Plaza, Jackson, Michigan, 49201.

Q. Please describe your position and responsibilities.

A. I am employed by Consumers Energy Company (“Consumers Energy” or the “Company”) as the Energy Waste Reduction (“EWR”) Budget Analyst in the Finance Department. In this capacity, I am responsible for all accounting and financial reporting related activities associated with the investments in EWR.

Q. Please describe your education and professional experience.

A. I graduated from Grand Valley State University with a Bachelor of Science degree in Finance in 2012 and a Master of Business Administration in 2013. I have been employed at Consumers Energy since 2013, holding various positions in the finance department over this time. My primary duties have included financial reporting, forecasting, reconciliation, and variance analysis.

Q. What is the purpose of your direct testimony?

A. The purpose of my direct testimony is to provide the Company’s 2022 EWR investment results for its Electric and Gas programs, including a breakdown between Residential and Commercial & Industrial (“C&I”) customer groups.

Q. Are you sponsoring any exhibits with your direct testimony?

A. Yes, I am sponsoring four exhibits.

Exhibit A-18 (TTT-1)	EWR Electric Investment;
Exhibit A-19 (TTT-2)	EWR Gas Investment;
Exhibit A-20 (TTT-3)	EWR Carry Over Funding; and
Exhibit A-21 (TTT-4)	EWR Financial Incentive Calculation.

TRENTON T. TAYLOR
DIRECT TESTIMONY

1 **Q. Were these exhibits prepared by you or under your supervision?**

2 A. Yes.

3 **Q. What were the EWR Investments in 2022?**

4 A. In 2022, the Company invested \$188.98 million in its Electric EWR programs. These costs
5 are split between Residential and C&I in the amounts of \$66.56 million and
6 \$122.42 million respectively, as shown on Exhibit A-18 (TTT-1), line 6. In 2022, the
7 Company invested \$84.13 million in its Gas EWR programs. These costs are split between
8 Residential and C&I in the amounts of \$54.57 million and \$29.56 million respectively, as
9 shown on Exhibit A-19 (TTT-2), line 6.

10 **Q. Why do total investments differ from the amounts provided by Company witness**
11 **Svitlana Lykhytska in her direct testimony in this proceeding?**

12 A. Ms. Lykhytska's direct testimony and exhibits are based on 2022 general ledger activity,
13 which includes 2021 EWR Plan year costs that were recorded in the general ledger in 2022,
14 and excludes 2022 EWR Plan year costs that were recorded in the general ledger in 2023.
15 These timing differences are caused by normal year-end accruals for costs incurred, but
16 not yet invoiced, on an estimated basis. For reconciliation purposes, I have accounted for
17 these timing differences by recognizing the actual costs based on the year in which the
18 costs were incurred versus recorded.

19 **Q. What does Exhibit A-20 (TTT-3) depict?**

20 A. It is a history of the EWR carry over funding from 2017 through 2022 for residential and
21 C&I electric and gas investment. It provides a summary of investments for each year,
22 demonstrates the difference between investment approved by the Commission and actually

TRENTON T. TAYLOR
DIRECT TESTIMONY

made by the Company, and completes the analysis with a summary of the variance or carry over in investment dollars for each year.

Q. Was the Company's 2022 electric investment level within the Commission-approved investment level authorized in Case No. U-20875?

A. Yes. Although the Company's 2022 electric investment amount of \$188.98 million was above the Case No. U-20875 Commission-approved \$186.99 million for 2022, there was \$3.79 million in unutilized funding available from 2017, 2018, 2019, 2020, and 2021 as shown in Exhibit A-20 (TTT-3), column d, lines 1, 3, 6, 8, 11, 13, 16, 18, 21, and 23.

Q. Was the Company's 2022 gas investment level within the Commission-approved investment level authorized in Case No. U-20875?

A. Yes. The Commission approved \$84.23 million as the Company's 2022 gas investment amount. Additionally, there was \$487,314 in unutilized funding available from 2017, 2018, 2019, 2020, and 2021 as shown in Exhibit A-20 (TTT-3), column d, lines 2, 4, 7, 9, 12, 14, 17, 19, 22, and 24. The Company actually invested \$84.13 million as shown on Exhibit A-19 (TTT-2), line 6.

Q. Does the Company have the ability to increase annual investments above the approved levels referenced above?

A. Yes. The settlement agreement approved in the Company's 2022-2025 EWR Plan filing in Case No. U-20875 allows the Company ability to increase the annual investment amounts referenced above by 6% for electric and 10% for gas investments. In addition, the approved 2022-2025 EWR Plan settlement allows for spending flexibility between and within customer classes to ensure the ability to shift to more popular programs. For

TRENTON T. TAYLOR
DIRECT TESTIMONY

1 multifamily programs within the business program, this flexibility is limited to relocation
2 within the same service class.

3 **Q. Are the variances demonstrated in Exhibit A-20 (TTT-3) significant?**

4 A. No. These variances are within a reasonable range for the dollars approved by the
5 Commission and spent by the Company.

6 **Q. Is the Company requesting recovery of a Financial Incentive for the 2022 plan year?**

7 A. Yes. As shown in Exhibit A-21 (TTT-4) and as discussed by Company witness Lynne
8 McCollum, the Company is requesting recovery of the maximum Financial Incentive based
9 on its ability to exceed the 2022 performance metrics contained in the approved Settlement
10 Agreement in Case No. U-20875.

11 **Q. Does that conclude your direct testimony?**

12 A. Yes.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of)
CONSUMERS ENERGY COMPANY)
for authority to reconcile its)
2022 Energy Waste Reduction Plan Costs)
associated with the Plan approved in)
Case No. U-20875.)
_____)

Case No. U-21312

EXHIBITS

OF

TRENTON T. TAYLOR

ON BEHALF OF

CONSUMERS ENERGY COMPANY

May 2023

	(a)	(b)	(c)	(d)
<u>Line</u>	<u>Description</u>	<u>Residential</u>	<u>C&I</u>	<u>Total</u>
<u>Investment Summary</u>				
1	Program Investments	\$ 54,346,228	\$ 96,464,522	\$ 150,810,750
2	Administration (allocated)	\$ 6,276,387	\$ 15,133,839	\$ 21,410,226
3	Education & Awareness (allocated)	\$ 2,392,175	\$ 4,415,931	\$ 6,808,106
4	Evaluation, Measurment and Verification (allocated)	\$ 2,510,359	\$ 4,536,263	\$ 7,046,622
5	Database (allocated)	\$ 1,036,046	\$ 1,872,154	\$ 2,908,200
6	Total Electric Investments	<u>\$ 66,561,195</u>	<u>\$ 122,422,709</u>	<u>\$ 188,983,904</u>

	(a)	(b)	(c)	(d)
<u>Line</u>	<u>Description</u>	<u>Residential</u>	<u>C&I</u>	<u>Total</u>
<u>Investment Summary</u>				
1	Program Investments	\$ 48,520,084	\$ 25,732,415	\$ 74,252,499
2	Administration (allocated)	\$ 2,474,978	\$ 1,870,822	\$ 4,345,799
3	Education & Awareness (allocated)	\$ 2,100,180	\$ 1,031,159	\$ 3,131,339
4	Evaluation, Measurment and Verification (allocated)	\$ 1,116,544	\$ 693,103	\$ 1,809,647
5	Database (allocated)	\$ 358,282	\$ 228,951	\$ 587,233
6	Total Gas Investments	<u>\$ 54,570,067</u>	<u>\$ 29,556,450</u>	<u>\$ 84,126,517</u>

	(a)	(b)	(c)	(d)
<u>Line</u>	<u>Description</u>	<u>2017 Actual</u>	<u>2017 Plan U-18331</u>	<u>Variance (Carry Over)</u>
<u>2017 Investment Summary</u>				
1	Residential Electric Investment	\$ 36,877,147	\$ 37,280,570	\$ 403,423
2	Residential Gas Investment	\$ 33,761,109	\$ 34,729,612	\$ 968,503
3	C&I Electric Investment	\$ 76,605,158	\$ 76,721,709	\$ 116,551
4	C&I Gas Investment	\$ 19,104,637	\$ 19,105,822	\$ 1,185
5	Total Investment	<u>\$ 166,348,052</u>	<u>\$ 167,837,714</u>	<u>\$ 1,489,662</u>
<u>2018 Investment Summary</u>				
		<u>2018 Actual</u>	<u>2018 Plan U-18261</u>	<u>Variance (Carry Over)</u>
6	Residential Electric Investment	\$ 36,331,204	\$ 36,982,713	\$ 651,509
7	Residential Gas Investment	\$ 37,838,443	\$ 38,158,223	\$ 319,780
8	C&I Electric Investment	\$ 81,507,506	\$ 81,742,706	\$ 235,200
9	C&I Gas Investment	\$ 16,089,888	\$ 16,009,143	\$ (80,745)
10	Total Investment	<u>\$ 171,767,041</u>	<u>\$ 172,892,785</u>	<u>\$ 1,125,744</u>
<u>2019 Investment Summary</u>				
		<u>2019 Actual</u>	<u>2019 Plan U-20365</u>	<u>Variance (Carry Over)</u>
11	Residential Electric Investment	\$ 38,172,523	\$ 37,624,836	\$ (547,687)
12	Residential Gas Investment	\$ 37,415,993	\$ 38,262,462	\$ 846,469
13	C&I Electric Investment	\$ 77,814,597	\$ 77,669,332	\$ (145,265)
14	C&I Gas Investment	\$ 15,552,256	\$ 16,461,009	\$ 908,753
15	Total Investment	<u>\$ 168,955,369</u>	<u>\$ 170,017,639</u>	<u>\$ 1,062,270</u>
<u>2020 Investment Summary</u>				
		<u>2020 Actual</u>	<u>2020 Plan U-20372</u>	<u>Variance (Carry Over)</u>
16	Residential Electric Investment	\$ 48,410,373	\$ 45,696,490	\$ (2,713,883)
17	Residential Gas Investment	\$ 42,876,766	\$ 39,053,241	\$ (3,823,525)
18	C&I Electric Investment	\$ 91,255,154	\$ 96,015,689	\$ 4,760,535
19	C&I Gas Investment	\$ 26,255,197	\$ 28,756,606	\$ 2,501,409
20	Total Investment	<u>\$ 208,797,490</u>	<u>\$ 209,522,026</u>	<u>\$ 724,536</u>
<u>2021 Investment Summary</u>				
		<u>2021 Actual</u>	<u>2021 Plan U-20372</u>	<u>Variance (Carry Over)</u>
21	Residential Electric Investment	\$ 54,771,919	\$ 51,667,614	\$ (3,104,305)
22	Residential Gas Investment	\$ 40,431,189	\$ 41,779,929	\$ 1,348,740
23	C&I Electric Investment	\$ 106,965,184	\$ 111,094,560	\$ 4,129,376
24	C&I Gas Investment	\$ 28,735,665	\$ 25,257,782	\$ (3,477,883)
25	Total Investment	<u>\$ 230,903,957</u>	<u>\$ 229,799,885</u>	<u>\$ (1,104,072)</u>
<u>2022 Investment Summary</u>				
		<u>2022 Actual</u>	<u>2022 Plan U-20875</u>	<u>Variance (Carry Over)</u>
26	Residential Electric Investment	\$ 66,561,195	\$ 61,666,586	\$ (4,894,609)
27	Residential Gas Investment	\$ 54,570,067	\$ 54,454,241	\$ (115,826)
28	C&I Electric Investment	\$ 122,422,709	\$ 125,325,449	\$ 2,902,740
29	C&I Gas Investment	\$ 29,556,450	\$ 29,775,107	\$ 218,657
30	Total Investment	<u>\$ 273,110,421</u>	<u>\$ 271,221,383</u>	<u>\$ (1,889,038)</u>
<u>Total</u>				
		<u>6 Year Actual Total</u>	<u>6 Year Plan Total</u>	<u>Variance (Carry Over)</u>
31	Residential Electric Investment	\$ 281,124,361	\$ 270,918,809	\$ (10,205,552)
32	Residential Gas Investment	\$ 246,893,567	\$ 246,437,709	\$ (455,859)
33	C&I Electric Investment	\$ 556,570,309	\$ 568,569,446	\$ 11,999,137
34	C&I Gas Investment	\$ 135,294,093	\$ 135,365,469	\$ 71,376
35	Total Investment	<u>\$ 1,219,882,330</u>	<u>\$ 1,221,291,432</u>	<u>\$ 1,409,102</u>

MICHIGAN PUBLIC SERVICE COMMISSION

Consumers Energy Company

EWR Financial Incentive Calculation

Case No.: U-21312

Exhibit No.: A-21 (TTT-4)

Page: 1 of 1

Witness: TTTaylor

Date: May 2023

	(a)	(b)
<u>Line</u>	<u>Description</u>	<u>Total</u>
<u>Investment Summary (by month)</u>		
1	Electric Investment	\$ 188,983,904
2	Gas Investment	\$ 84,126,517
3	Total Investment	<u>\$ 273,110,421</u>
<u>Financial Incentive Summary</u>		
4	Electric Incentive @ 20%	\$ 37,796,781
5	Gas Incentive @ 20%	\$ 16,825,303
6	Total Incentive	<u>\$ 54,622,084</u>

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Case No. U-21312

PROOF OF SERVICE

STATE OF MICHIGAN)
) SS
COUNTY OF JACKSON)

Jennifer Joy Yocum, being first duly sworn, deposes and says that she is employed in the Legal Department of Consumers Energy Company; that on May 31, 2023, she served an electronic copy of **Application and Testimony and Exhibits of Consumers Energy Company Witnesses Lynne McCollum, Nathaniel S. Carver, Amy C. Ellsworth, Jeremiah J. Kraft, Svitlana Lykhytska, Hubert W. Miller, III, Allison M. Reis, R. Kenneth Skinner, and Trenton T. Taylor** upon the persons listed in Attachment 1 hereto, at the e-mail addresses listed therein.



Jennifer Joy Yocum

Subscribed and sworn to before me this 31st day of May, 2023.



Crystal L. Chacon, Notary Public
State of Michigan, County of Ingham
My Commission Expires: 05/25/24
Acting in the County of Eaton

ATTACHMENT 1 TO CASE NO. U-21312
(Parties to Case No. U-21205)

Party	Mailing Address	Email Address
Please serve all documents on mpsc.filings@cmsenergy.com as well as the attorneys appearing in this case.		
Counsel for Consumers Energy Company		
Theresa A.G. Staley, Esq. Anne M. Uitvlugt, Esq. Gary A. Gensch, Jr., Esq.	One Energy Plaza Jackson, MI 49201	theresa.staley@cmsenergy.com anne.uitvlugt@cmsenergy.com gary.genschjr@cmsenergy.com mpsc.filings@cmsenergy.com
Counsel for the Michigan Public Service Commission Staff		
Heather M.S. Durian, Esq. Amit T. Singh, Esq.	7109 West Saginaw Highway Post Office Box 30221 Lansing, MI 48909	durianh@michigan.gov singha9@michigan.gov
Counsel for the Association of Businesses Advocating Tariff Equity ("ABATE")		
Clark Hill PLC 500 Woodward, Suite 3500 Detroit, MI 48226	Clark Hill PLC 500 Woodward, Suite 3500 Detroit, MI 48226	mpattwell@clarkhill.com scampbell@clarkhill.com