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April 17, 2023

Ms. Melanie Sandoval
Records Bureau Chief
New Mexico Public Regulation Commission
Prc.records@state.nm.us
PO Box 1269
Santa Fe, NM 87504

**Subject: Application for Approval of 2024 Electric Energy Efficiency and Load Management Program Plan, Profit Incentive, and Revisions to Tariff Rider No. 16**

Dear Ms. Sandoval:

Enclosed herewith for filing please find Public Service Company of New Mexico's Application for Approval of 2024 Electric Energy Efficiency and Load Management Program Plan, Profit Incentive, and Revisions to Tariff Rider No. 16. The additional documents submitted in support of the Application include the following:

- Executive Summary
- Advice Notice No. 604 for Public Service Company of New Mexico (PNM) which includes the Table of Contents – Rates and 29th Revised Rider 16 – Energy Efficiency Rider
- Direct Testimony and Exhibits of Sharon James, Nicholas Phillips, and Abraham Casas

In compliance with NMAC 17.1.210.11.C, PNM states that:

a. Anticipated incremental increases in annual revenue resulting from the revisions to the Program Rider requested in this filing compared to 2023: $5,275,168 in 2024, which is net of 2022 program cost reconciliation; $6,185,559 in 2025; and $7,376,299 in 2026;

b. Number of customers in each rate class affected: see PNM Exhibit AC-4 page 1 for 2024, PNM Exhibit AC-4 page 2 for 2025, and PNM Exhibit AC-4 page 3 for 2026 in the Direct Testimony of Abraham Casas;

c. Impact on customers as a class average of consumption within each class as nearly as may be calculated: see PNM Exhibit AC-4 page 1 for 2024, PNM Exhibit AC-4 page 2 for 2025, and PNM Exhibit AC-4 page 3 for 2026 in the Direct Testimony of Abraham Casas.

PNM will serve a copy of this Application and all attachments on the Attorney General and all counsel of record and parties pro se in PNM's last rate case (ongoing Case No. 22-00270-UT) and PNM's last energy efficiency case (Case No. 21-00087-UT). All notices, pleadings, documents and other communications regarding this filing should be sent to the following individuals:


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This application is being electronically filed, and a copy of the check for the filing fee is attached. A check in the amount of $26.00 will be mailed to the NMPRC, which is the Application fee of $25.00 and $1.00 for the Advice Notice.

If you have any questions or require additional information regarding this Application and Advice Notice, please call me at (505) 241-2881.

Respectfully submitted,

*_/s/Steve Schwebke_______________*
Steve Schwebke
Senior Project Manager, Regulatory Policy and Case Management

cc: Certificate of Service

*GCG#530730*

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**NMPRC CASE NO. 23-00___-UT**
**EXECUTIVE SUMMARY**

Public Service Company of New Mexico's ("PNM") *Application for Approval of 2024 Electric Energy Efficiency and Load Management Program Plan, Profit Incentive, and Revisions to Tariff Rider No. 16* seeks approval of the following:

(a) PNM's electric energy efficiency and load management program plans for calendar years 2024, 2025, and 2026 ("2024 Plan"), which proposes continuation of ten existing energy efficiency and load management programs, with modifications;
(b) a sliding scale profit incentive mechanism for 2024, 2025, and 2026 similar to the profit incentive in PNM's last energy efficiency case;
(c) recovery of 2024 program costs and profit incentive totaling $36,967,919 (net of the 2022 program cost reconciliation) at a proposed rate of 3.952% of customer bills; recovery of 2025 program costs and profit incentive totaling $37,878,310 at a proposed rate of 4.058% of customer bills; and recovery of 2026 program costs and profit incentive totaling $39,069,050 at a proposed rate of 4.191% of customer bills through the 29th Revised Rider No. 16 pursuant to Advice Notice No. 604; and
(d) all other approvals and variances required to implement the 2024 Plan and Revised Rider No. 16.

The 2024 Plan portfolio of programs is cost-effective under the statutory Utility Cost Test ("UCT") with an estimated overall UCT ratio of 1.60 in 2024, an estimated overall UCT ratio of 1.59 in 2025, and an estimated overall UCT ratio of 1.64 in 2026. Several individual programs in some program years are not expected to pass the UCT, but PNM proposes to continue offering those programs because of their value in reaching all customer classes, including low-income customers.

The ten existing programs proposed to be continued with revised budgets and projected participation levels are:

A. Commercial Comprehensive;
B. Residential Comprehensive;
C. Behavioral Comprehensive;
D. Residential Products;
E. New Home Construction;
F. Energy Smart (MFA);
G. Easy Savings;

H. Power Saver Load Management;
I. Peak Saver Load Management; and
J. Home Works.

PNM requests approval of a profit incentive pursuant to the Efficient Use of Energy Act ("EUEA") and Energy Efficiency Rule. The EUEA requires the Commission "provide public utilities an opportunity to earn a profit on cost-effective energy efficiency and load management resource development that, with satisfactory program performance, is financially more attractive to the utility than supply-side utility resources." Section 62-17-5(F). PNM requests that the Commission grant a base level profit incentive in 2024, 2025, and 2026 equal to 7.1% of the energy efficiency program costs for that respective year. The base level incentive is dependent on PNM achieving annual energy savings in 2024 and 2025 sufficient for PNM to meet its statutory 2025 energy efficiency savings requirement of five percent of 2020 sales to New Mexico customers, which is 395 GWh. For 2026, PNM has assumed a target of 80 GWh of energy savings because the goal has not been established yet by the Commission. PNM's proposed method for calculating the incentive includes a sliding scale that provides additional levels of profit incentive for energy savings achieved beyond the base level in 2024, 2025, and 2026, up to a maximum level of 10.73% of program costs. PNM's proposed profit incentive is evidence based, cost-based, and utility specific, as required by the Commission's EE Rule and New Mexico Supreme Court precedent.

*GCG# 530737*

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | **Case No. 23-00___-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

**APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF 2024 ELECTRIC ENERGY EFFICIENCY AND LOAD MANAGEMENT PROGRAM PLAN, PROFIT INCENTIVE AND REVISIONS TO TARIFF RIDER NO. 16**

Public Service Company of New Mexico ("PNM") hereby submits its application for approval of its energy efficiency and load management program plans for 2024, 2025, and 2026 ("2024 Plan"), proposed profit incentive, and revised Tariff Rider No.16, through which PNM proposes to recover the costs of implementing the 2024 Plan and a reasonable profit incentive. The 2024 Plan, PNM's proposed profit incentive, and Tariff Rider No. 16 all comply with the New Mexico Public Utility Act, NMSA 1978, §§ 62-1-1 to 62-6-28, 62-8-1 to 62-13-16 (1887, as amended through 2021), the New Mexico Efficient Use of Energy Act, NMSA 1978 §§ 62-17-1 to -11 (2005, as amended through 2020) ("EUEA"), and the Commission's Energy Efficiency Rule, 17.7.2 NMAC ("EE Rule"), and should be approved. Specifically, PNM requests that the New Mexico Public Regulation Commission ("Commission" or "NMPRC") issue an order approving the following:

A. PNM's 2024 Plan, which proposes a continuation of all of the energy efficiency ("EE") and load management ("LM") programs approved in

PNM's last energy efficiency case, Case No. 20-00087-UT, in calendar years 2024, 2025, and 2026 with modifications;

B. a sliding scale profit incentive mechanism for calendar years 2024, 2025, and 2026 pursuant to NMSA 1978, Section 62-17-5(F);

C. recovery of PNM's program costs and profit incentives in 2024, 2025, and 2026 through PNM's 29th Revised Rider No. 16, filed pursuant to Advice Notice 604;

D. a variance from the data filing requirements of 17.9.530 NMAC; and

E. all other approvals, authorizations and actions that may be required under the Public Utility Act, the EUEA, and the Commission's rules and orders to implement the 2024 Plan, the proposed profit incentive and Revised Rider No. 16.

## II. BACKGROUND

1. PNM is a New Mexico corporation that owns, operates, and controls public utility plant, property and facilities, including generation, transmission, and distribution facilities that provide retail and wholesale electric service in New Mexico. PNM is a public utility subject to the jurisdiction of the Commission.

2. The EUEA requires the Commission to "direct public utilities to evaluate and implement cost-effective programs that reduce energy demand and consumption." NMSA 1978, § 62-17-5(B). Before approving an energy efficiency and load management program, the Commission must first determine that the utility's portfolio of programs "is cost-effective and designed to provide every affected customer class with the opportunity to participate and benefit economically." NMSA 1978, § 62-17-5(C). Cost-effectiveness is determined using the utility cost test ("UCT"), a standard that is met if the monetary costs borne by the utility that are incurred to develop, acquire, and operate energy efficiency or load management resources on a life-cycle basis are less than the avoided monetary costs associated with developing, acquiring, and operating the associated supply-side resources. NMSA 1978, §§ 62-17-5(C), 62-17-4(K).

3. Electric utilities must achieve not less than a five percent reduction of total 2020 retail kWh sales over the period of 2021 to 2025. NMSA 1978, § 62-17-5(G). Based on PNM's actual sales for 2020 of 7,898 GWhs, PNM's targeted cumulative energy savings in 2025 is calculated to be 395 GWh (7,898 x 0.05).

4. Under the EUEA, funding for EE and LM programs of electric utilities must be no less than three percent and no more than five percent of customer bills, excluding gross receipts taxes and franchise and right-of-way access fees, revenues in excess of $75,000 per customer per calendar year, and any customer's self-directed program credits or exemptions. NMSA 1978, § 62-17-6(A); 17.7.2.8(C)(1) NMAC.

5. The EUEA authorizes a public utility that undertakes cost-effective EE and LM programs to recover the costs of approved programs and incentives through a tariff rider. NMSA 1978, § 62-17-6(A). The EUEA directs the Commission to remove barriers to public utility expenditures in energy efficiency and load management by removing any regulatory disincentives and by providing utilities the opportunity to earn a profit from energy efficiency and load management resource development that is financially more attractive to the utility than the profit the utility earns from investing in supply side resources. NMSA 1978, § 62-17-5(F).

6. A public utility must obtain Commission approval of its EE and LM programs before implementing the programs, and before proposing to implement new EE and LM programs must solicit recommendations regarding the programs from interested parties. NMSA 1978, § 62-17-5(E). The Commission may direct public utilities to modify or terminate a program if the program is not sufficiently meeting its goals and after an adequate period for implementation has elapsed. NMSA 1978, § 62-17-8(C).

7. The Commission has not expressly endorsed a specific method for providing utilities "an opportunity to earn a profit on cost-effective energy efficiency and load management resource development that, with satisfactory program performance, is financially more attractive to the utility than supply-side utility resources." NMSA 1978, § 62-17-5(F). However, the Commission requires that a utility's profit incentive:

(1) be based on the utility's costs;
(2) be based on satisfactory performance of measures and programs;
(3) be supported by written testimony and exhibits; and
(4) not exceed the product (expressed in dollars) of:
  (a) its weighted cost of capital (expressed as a percent), and
  (b) its approved annual program costs.

17.7.2.8(L) NMAC. The Commission's requirement that an incentive be cost-based and supported by evidence reflects the New Mexico Supreme Court's holding in *Attorney General v. New Mexico Public Regulation Commission*, 2011-NMSC-034, ¶18, 150 N.M. 174, that any incentive under the EUEA must be evidence-based, cost-based, and utility specific.

8. The Commission's EE Rule establishes filing standards for energy efficiency plan applications, including the dates of filing and the program information the utility must present. 17.7.2.8(A), (H) NMAC. The EE Rule also requires the annual report to be filed in the same docket as the utility's application and that the annual report meet the requirements of the EE Rule as to content. 17.7.2.8(A) NMAC; 17.7.2.14 NMAC.

9. The Commission last considered and approved PNM's portfolio of EE and LM programs and an incentive in Case No. 20-00087-UT. In that case, the Commission approved a Recommended Decision regarding all the programs that PNM proposes to continue in the 2024 Plan and a sliding scale incentive mechanism that provided a base level incentive equal to 7.1% of program costs increasing to a maximum of 10.73% of program costs, depending on PNM's achievement of additional savings.

10. PNM was able to meet the 2020 savings requirement formerly specified in the EUEA, and PNM expects that it will meet the 2025 energy savings requirements established by the 2019 amendments to the EUEA.

## II. THE 2024 Plan

11. The 2024 Plan is attached as PNM Exhibit SKJ-2 to the Direct Testimony of PNM witness Sharon K. James and described in her testimony. The Plan covers the 2024, 2025, and 2026 calendar years. The 2024 Plan has a budget of $34,517,198 for calendar year 2024; a budget of $35,367,236 for 2025 and a budget of $36,479,038 for 2026. The Plan has annual projected energy savings of approximately 95 gigawatt hours ("GWh") in Plan year 2024; 97 GWh in Plan year 2025; and 100 GWh in Plan year 2026. The Plan has demand savings of approximately 83 megawatts ("MW") in each of 2024, 2025, and 2026.

12. PNM is requesting to continue the portfolio of ten programs that were previously approved by the Commission in Case No. 20-00087-UT, with modifications to budgets and participation levels described in the 2024 Plan and Ms. Jame's Direct Testimony. The programs are:

A. Commercial Comprehensive;

B. Residential Comprehensive;

C. Behavioral Comprehensive;

D. Residential Products;

E. New Home Construction;

F. Energy Smart (MFA);

G. Easy Savings;

H. Power Saver Load Management;

I. Peak Saver Load Management; and

J. Home Works.

13. PNM has improved these programs by incorporating input from the Energy Efficiency Public Advisory Group and information from Applied Energy Group ("AEG"). AEG performed both EE and DR potential studies in 2019, with the studies being finalized in early 2020. The EE study was again updated in 2022, which helped guide PNM in preparing the 2024 Plan. The Public Advisory Group met twice in 2023, providing comments which were carefully considered by PNM. A number of the suggestions were incorporated into the 2024 Plan and PNM believes the attendees of these meetings are in general agreement with the content of the 2024 Plan. PNM also used the New Mexico Technical Resource Manual[1] ("NM TRM") to validate energy savings for various technologies. Much of the research for the 2024 Plan was conducted through interaction with other utilities and through participation in national organizations concerned with energy efficiency, such as E-Source, Consortium for Energy Efficiency ("CEE"), American Council for an Energy Efficient Economy, Southwest Energy Efficiency Project, and Electric Power Research Institute.

14. The EUEA requires that a utility's portfolio of programs be cost-effective under the UCT. NMSA 1978, § 62-17-5(C). PNM's 2024 Plan satisfies the UCT at the portfolio level, with overall UCT ratios of 1.60 in 2024, 1.59 in 2025, and 1.64 in 2026. On an individual program basis, there are programs that are not expected to pass the UCT in each of the 2024 Plan years. PNM proposes to continue those programs because of their considerable value in reaching low-income customers and in providing programs available to all customer classes.

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[1] New Mexico Technical Resource Manual for the Calculation of Energy Efficiency Savings by Evergreen Economics and EcoMetric Consulting, April 17, 2019.

15. The 2024 Plan programs will be available to all customers throughout PNM's service area and are designed to give all customers in the targeted customer classes, including low-income customers, the opportunity to participate and to benefit economically. The 2024 Plan satisfies the EUEA's requirement that no less than five percent of program funding be directed to programs for low-income customers. NMSA 1978, § 62-17-6(B).

## III. INCENTIVE

16. PNM's incentive mechanism for 2024, 2025, and 2026 is described in the Direct Testimony of PNM witness James. PNM proposes a base level incentive for 2024, 2025, and 2026 of 7.1% of each year's program costs. This amount would be $2,450,721 in 2024, $2,511,074 in 2025, and $2,590,012 in 2026. PNM would earn this base level incentive if it achieves certain specified annual savings in each year. A three-stepped sliding scale mechanism would provide the opportunity for PNM to earn an increased incentive for energy savings achieved beyond the base level. The sliding scale would be capped at 10.73% of program costs, which is equal to the maximum incentive provided by the EE Rule, 17.7.2.8(L) NMAC.

17. PNM will earn the base level incentive in each of 2024 and 2025 if it achieves annual energy savings of 49 GWh, with no additional incentive up to 80 GWh of annual energy savings. In addition to this base incentive, PNM will earn additional incentive based on a sliding scale that will be triggered if PNM is able to achieve annual savings in excess of 80 GWh in 2024 or 2025. For 2026, PNM has assumed a target of 80 GWh of energy savings because the goal has not been established yet by the Commission. PNM's proposed incentive for 2026 includes a base level of 7.1% of program costs for minimum annual energy savings of 80 GWh and the same sliding scale mechanism for achieving annual energy savings in excess of 80 GWh as is proposed for 2024 and 2025.

18. Cost-effective programs designed to meet that level of savings constitute satisfactory performance under the EUEA and require the Commission to provide PNM an opportunity to earn a profit incentive. NMSA 1978, § 62-17-3.

19. The proposed incentive mechanism complies with the EE Rule because it is cost-based, PNM-specific, based on satisfactory program performance, and supported by the testimony of Ms. James. 17.7.2.8(L)(1), (2), (3) NMAC. The incentive amount will not exceed the EE Rule's cap of the Company's weighted average cost of capital multiplied by program costs. 17.7.2.8(L)(4) NMAC.

## IV. TARIFF RIDER NO. 16

20. The EUEA authorizes public utilities offering cost-effective EE and LM programs to recover all prudent program costs and incentives through an approved tariff rider. NMSA 1978, § 62-17-6(A). PNM's currently-authorized base rates and charges are not designed to recover energy efficiency and load management program costs or incentives. PNM proposes to recover these incremental costs from the customer classes that are eligible to participate in its energy efficiency and load management programs through its Energy Efficiency Rider, Rider No. 16. Specifically, PNM is requesting approval of its 29th Revised Rider No. 16, to recover its program costs and base incentive in each of the three years of the 2024 Plan: 2024, 2025, and 2026.

21. PNM's Energy Efficiency Rider has two rate elements: 1) an element to recover program costs and 2) an element to recover an incentive, which is adjusted yearly to reconcile the amount collected with the Commission-approved incentive amount. The Direct Testimony of PNM witness Abraham Casas describes the 29th Revised Rider No. 16. The 2024 rates are anticipated to take effect with the first billing cycle for January 2024.

22. Excluding any reconciliation adjustments to the incentive element of the Energy Efficiency Rider, the projected Energy Efficiency Rider for 2024 will increase customer billings by 3.952% over current billing levels without the rider in order to recover program costs and a base level profit incentive totaling $36,967,919. In 2025, the projected Energy Efficiency Rider will increase customer billings by 4.058% over current billing levels without the rider to recover program costs and a base level profit incentive totaling $37,878,310. In 2026, the projected Energy Efficiency Rider will increase customers billings by 4.191% over current billing levels without the rider to recover program costs and a base level profit incentive totaling $39,069,050. These amounts are illustrative only; actual amounts collected will depend on the earned incentive amounts. Also, certain customers' bills will be capped in accordance with NMSA 1978, Section 62-17-6(A) so that no customer's bill will increase by more than $75,000 per year over billing levels without the rider.

23. Concurrently with this Application, PNM is filing the following:

A. PNM Advice Notice No. 604 – 29th Revised Rider No. 16.

B. Pursuant to 17.1.2.10(B)(2)(a) and (b) NMAC, and attached as Appendix A to this Application, PNM's proposed Notice to Customers, which includes a statement of the current rates and the proposed rates for each customer class and the present and anticipated bills to residential customers under the proposed rates and at various usage levels for calendar years 2024, 2025, and 2026. Appendix A is provided for informational purposes only and the level of authorized revenue and final rate design approved by the Commission may change the rates ultimately charged to each class and for each consumption level from those proposed by PNM. In compliance with 17.1.210.11(C) NMAC, PNM states that:

i. Anticipated increases in annual revenue resulting from the changes to the Energy Efficiency Rider requested in the 2024 Plan as compared with 2023 revenues are approximately $5,275,168 for program costs and profit incentive in 2024 (net of the 2022 program cost reconciliation), which results in a total Energy Efficiency Rider rate of 3.952% of customer bills; approximately $6,185,559 for program costs and profit incentive in 2025, which results in a total Energy Efficiency Rider rate of 4.058% of customer bills; and approximately $7,376,299 for program costs and profit incentive in 2026, which results in a total Energy Efficiency Rider rate of 4.191% of customer bills.

ii. The number of customers in each rate class affected is shown in PNM Exhibit AC-4 page 1 for 2024, PNM Exhibit AC-4 page 2 for 2025, and PNM Exhibit AC-4 page 3 for 2026 in Mr. Casas' Direct Testimony; and

iii. The approximate impact on customers at the class average level of consumption for each class is shown in PNM Exhibit AC-4 page 1 for 2024, PNM Exhibit AC-4 page 2 for 2025, and PNM Exhibit AC-4 page 3 for 2026 in Mr. Casas' Direct Testimony.

## V. OTHER MATTERS

24. PNM incorporates into this Application, as if fully set forth herein, the direct testimony and exhibits of the following witnesses: Sharon K. James, Nicholas L. Phillips, and Abraham Casas. PNM's 2022 Annual Report and 2022 Measurement and Verification Report are attached to this Application as Appendix B and Appendix C, respectively, and are sponsored by Ms. James.

25. PNM will serve a copy of this Application, supporting testimony and exhibits, and the Advice Notice on the Attorney General and all counsel of record and parties *pro se* in PNM's

last rate case and PNM's last energy efficiency case, and will publish notice of this filing in accordance with the requirements of the Commission's Rules of Practice and Procedure.

26. Pursuant to 17.1.2.10(B)(2)(d) NMAC, PNM has fully complied with all Commission final orders in each of PNM's cases decided during the preceding five years, as evidenced by PNM's annual informational filing of April 29, 2022.

## VI. REQUEST FOR VARIANCES

27. Rule 530 (17.9.530 NMAC) imposes certain data filing requirements on investor-owned electric utilities applying for new or modified rates. To the extent the Commission deems Rule 530 applicable to PNM's proposed changes to the EE Rider rates, PNM requests a variance from that Rule so that PNM need not file the schedules and other data in this proceeding. Because PNM is not seeking a change in base rates and due to the specialized nature of the EE Rider, the detailed filing requirements of Rule 530 would serve no useful purpose.

28. The following designated corporate representatives and legal counsel for PNM should receive all notices, discovery requests, objections and responses, briefs, and all other documents related to this case:

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WHEREFORE, PNM respectfully requests that the Commission issue an order approving this Application and granting the following relief:

1. Approval of the 2024 Plan, including the ten programs that PNM is proposing to continue;

2. Approval of PNM's proposed profit incentive mechanism;

3. Approval of the revisions to the Energy Efficiency Tariff Rider;

4. Granting a variance to 17.9.530 NMAC; and

5. Granting such other approvals, authorizations and actions that may be required under the Public Utility Act, EUEA, and Commission rules and orders to implement the 2024 Plan and revisions to the tariff rider.

Respectfully submitted,

**PUBLIC SERVICE COMPANY OF NEW MEXICO**

*/s/ John Verheul*__________________

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*GCG#530739*

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE** | ) | **Case No. 23-_____-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

## NOTICE TO CUSTOMERS

**NOTICE** is hereby given by the New Mexico Public Regulation Commission ("Commission") that:

1. On April 17, 2023, Public Service Company of New Mexico ("PNM") filed its Application under the Public Utility Act ("PUA"), the Efficient Use of Energy Act ("EUEA"), the Energy Efficiency Rule ("EE Rule"), and Advice Notice No. 604 for approvals and authorizations necessary to implement its 2024 Electric Energy Efficiency and Load Management Program Plan ("2024 Plan") and to recover costs of the 2024 Plan through a revision to PNM's Energy Efficiency Rider For PNM Electric Services No. 16 ("Rider No. 16").

2. PNM's Application requests specific approval of the following:

(a) PNM's 2024 Plan, which covers the 2024, 2025, and 2026 calendar years and which includes continuation of ten existing energy efficiency and load management programs in 2024, 2025, and 2026, with modifications;

(b) a profit incentive for 2024, 2025, and 2026 in accordance with Section 62-17-5(F) of the EUEA;

(c) revisions to Rider No. 16 in compliance with the EUEA and as set forth in the Advice Notice, to recover program costs and base profit incentives in 2024, 2025, and 2026;

(d) a variance from the data filing requirements of Rule 530 applicable to changes in rates; and

(f) all other approvals, authorizations and actions that may be required under applicable law to implement the 2024 Plan and revised tariff rider.

3. Rider No. 16 allows PNM to recover costs incurred as a result of implementing, funding and administering residential and commercial electric energy efficiency and load management programs included in the portfolio as well as a profit incentive approved by the Commission in accordance with the EUEA. The 2024 Plan proposed program portfolio includes ten programs.

4. The revisions to Rider No. 16 provide for recovery of the cost for programs related to the 2024 Plan and the profit incentive rate element approved by the Commission as required by the EUEA. The currently approved Program Rider charged under Rider No. 16 is 3.396% (not including reconciliation amounts) of each affected customer's bill. The rider charge that will be applied to customers' bills upon approval of the Application and Advice Notice will be 3.952% for 2024, 4.058% for 2025, and 4.191% for 2026, exclusive of gross receipts tax and franchise fees, taking into account the maximum annual payment of $75,000 for program costs by any utility customer. The total program costs and incentive amounts reflected in Revised Rider No. 16 are $36,967,919 (net of 2022 program cost reconciliation) for 2024, $37,878,310 for 2025, and $39,069,050 for 2026, exclusive of gross receipts tax and franchise fees.

5. Currently, PNM Rider No. 16 applies to customers in the following rate classes: Residential Service 1A & 1B, Small Power Service 2A & 2B, General Power Service 3B & 3C, Large Power Service 4B, Large Power Service for Customers ≥8,000kW 5B, Water & Sewage Pumping 11B, Large Service for Public Universities 15B, Large Service for Manufacturing – Distribution Level 30B and Large Power Service >=3,000kW 35B.

6. The table below identifies the cost of each component to be collected through the Rider for **2024**:

| EE Program Costs | Amount | Percentage Impact | Months for Recovery |
|---|---|---|---|
| 2024 Program Costs | $34,517,198 | 3.707% | 12 months |
| 2024 Profit Incentives | $2,450,721 | 0.246% | 12 months |
| Total | $36,967,919 | 3.952% | 12 months |

7. For 2024, the following tariff rider charges will be paid in addition to the current non-energy efficiency charges that the customer is paying and will be collected through a line item charge on the customer's bill.

| Affected Electric Rate Classes | Tariff Applied | Program Cost Charge |
|---|---|---|
| PNM Electric Service Area: | | |
| Residential Service 1A & 1B | PNM Rider No. 16 | 3.952 % of each bill* |
| Small Power Service 2A & 2B | PNM Rider No. 16 | 3.952% of each bill* |
| General Power Service 3B & 3C | PNM Rider No. 16 | 3.952% of each bill* |
| Large Power Service 4B | PNM Rider No. 16 | 3.952% of each bill* |
| Large Power Service for Customers ≥8,000kW 5B | PNM Rider No. 16 | 3.952% of each bill* |
| Water & Sewage Pumping 11B | PNM Rider No. 16 | 3.952% of each bill* |

| | | |
|---|---|---|
| Large Service for Public Universities 15B | PNM Rider No. 16 | 3.952% of each bill* |
| | | |
| Large Service, Manufacturing – Distribution Level 30B | PNM Rider No. 16 | 3.952% of each bill* |
| Large Power Service >=3,000kW 35B | PNM Rider No. 16 | 3.952% of each bill* |

*3.952% of each affected customers' bill is exclusive of gross receipts tax and franchise fees and takes into account the maximum annual payment for program costs of $75,000 by any utility customer.

To calculate the dollar impact of all energy efficiency program cost charges on your monthly bill for 2024, you would take the amount of your current bill, deduct the amounts shown for gross receipts taxes and franchise fees, and then multiply the balance by 0.03952.

For PNM residential customers on Rate Schedule 1A without demand meters, the current average monthly bill and the anticipated 2024 bill for each of the following levels of consumption are as follows:

| Consumption (kwh) | Current Bill | Anticipated bill |
|---|---|---|
| 0 | $7.35 | $7.39 |
| 250 | $37.19 | $37.39 |
| 500 | $68.76 | $69.13 |
| 600 | $84.14 | $84.60 |
| 750 | $107.22 | $107.80 |
| 1000 | $147.47 | $148.27 |
| 2000 | $319.29 | $321.01 |

8. The table below identifies the cost of each component to be collected through the Rider for **2025**:

| **EE Program Costs** | **Amount** | **Percentage Impact** | **Months for Recovery** |
|---|---|---|---|
| 2025 Program Costs | $35,367,236 | 3.805% | 12 months |
| 2025 Profit Incentives | $2,511,074 | 0.252% | 12 months |
| Total | $37,878,310 | 4.058% | 12 months |

9. For 2025, the following tariff rider charges will be paid in addition to the current non-energy efficiency charges that the customer is paying and will be collected through a line item charge on the customer's bill:

| Affected Electric Rate Classes | Tariff Applied | Program Cost Charge |
|---|---|---|
| PNM Electric Service Area: | | |
| Residential Service 1A & 1B | PNM Rider No. 16 | 4.058 % of each bill* |
| Small Power Service 2A & 2B | PNM Rider No. 16 | 4.058% of each bill* |

| | | |
|---|---|---|
| General Power Service 3B & 3C | PNM Rider No. 16 | 4.058% of each bill* |
| Large Power Service 4B | PNM Rider No. 16 | 4.058% of each bill* |
| Large Power Service for Customers ≥8,000kW 5B | PNM Rider No. 16 | 4.058% of each bill* |
| Water & Sewage Pumping 11B | PNM Rider No. 16 | 4.058% of each bill* |
| Large Service for Public Universities 15B | PNM Rider No. 16 | 4.058% of each bill* |
| | | |
| Large Service, Manufacturing – Distribution Level 30B | PNM Rider No. 16 | 4.058% of each bill* |
| Large Power Service >=3,000kW 35B | PNM Rider No. 16 | 4.058% of each bill* |

*4.058% of each affected customers' bill is exclusive of gross receipts tax and franchise fees and takes into account the maximum annual payment for program costs of $75,000 by any utility customer.

To calculate the dollar impact of all energy efficiency program cost charges on your monthly bill for 2025 you would take the amount of your current bill, deduct the amounts shown for gross receipts taxes and franchise fees, and then multiply the balance by 0.04058.

For PNM residential customers on Rate Schedule 1A without demand meters, the current average monthly bill and the anticipated bill for each of the following levels of consumption are as follows:

| Consumption (kwh) | Current Bill | Anticipated bill |
|---|---|---|
| 0 | $7.35 | $7.40 |
| 250 | $37.19 | $37.43 |
| 500 | $68.76 | $69.20 |
| 600 | $84.14 | $84.68 |
| 750 | $107.22 | $107.91 |
| 1000 | $147.47 | $148.42 |
| 2000 | $319.29 | $321.33 |

10. The table below identifies the cost of each component to be collected through the Rider for **2026**:

| **EE Program Costs** | **Amount** | **Percentage Impact** | **Months for Recovery** |
|---|---|---|---|
| 2026 Program Costs | $36,479,038 | 3.931% | 12 months |
| 2026 Profit Incentives | $2,590,012 | 0.260% | 12 months |
| Total | $39,069,050 | 4.191% | 12 months |

11. For 2026, the following tariff rider charges will be paid in addition to the current non-energy efficiency charges that the customer is paying and will be collected through a line item charge on the customer's bill:

Affected Electric Rate Classes Tariff Applied Program Cost Charge

| | | |
|---|---|---|
| PNM Electric Service Area: | | |
| Residential Service 1A & 1B | PNM Rider No. 16 | 4.191% of each bill* |
| Small Power Service 2A & 2B | PNM Rider No. 16 | 4.191% of each bill* |
| General Power Service 3B & 3C | PNM Rider No. 16 | 4.191% of each bill* |
| Large Power Service 4B | PNM Rider No. 16 | 4.191% of each bill* |
| Large Power Service for Customers ≥8,000kW 5B | PNM Rider No. 16 | 4.191% of each bill* |
| Water & Sewage Pumping 11B | PNM Rider No. 16 | 4.191% of each bill* |
| Large Service for Public Universities 15B | PNM Rider No. 16 | 4.191% of each bill* |
| Large Service, Manufacturing – Distribution Level 30B | PNM Rider No. 16 | 4.191% of each bill* |
| Large Power Service >=3,000kW 35B | PNM Rider No. 16 | 4.191% of each bill* |

*4.191% of each affected customers' bill is exclusive of gross receipts tax and franchise fees and takes into account the maximum annual payment for program costs of $75,000 by any utility customer.

To calculate the dollar impact of all energy efficiency program cost charges on your monthly bill for 2026, you would take the amount of your current bill, deduct the amounts shown for gross receipts taxes and franchise fees, and then multiply the balance by 0.04191.

For PNM residential customers on Rate Schedule 1A without demand meters, the current average monthly bill and the anticipated bill for each of the following levels of consumption are as follows:

| Consumption (kwh) | Current Bill | Anticipated bill |
|---|---|---|
| 0 | $7.35 | $7.41 |
| 250 | $37.19 | $37.48 |
| 500 | $68.76 | $69.29 |
| 600 | $84.14 | $84.79 |
| 750 | $107.22 | $108.05 |
| 1000 | $147.47 | $148.61 |
| 2000 | $319.29 | $321.74 |

The proposed rate changes stated by customer rate class are for informational purposes. The final rates as approved may vary.

Energy efficiency programs play an important role in PNM's resource portfolio and are included in the most cost-effective resource portfolio in PNM's most recent Integrated Resource Plan. The benefits of the programs included in PNM's 2024 Plan exceed the expected costs for 2024, 2025, and 2026, primarily due to the costs for generation capacity and energy that can be avoided as a result of these programs.

12. Further information regarding this case may be obtained by contacting PNM or the Commission at the addresses and telephone numbers provided below. The Commission has

assigned Case No. 23-________-UT to this proceeding, and all inquiries or written comments concerning this matter should refer to that case number.

13. Any person desiring to become a party to this case must file a Motion for Leave to Intervene in conformity with 1.2.2.23(A) NMAC on or before __________, 2023.

14. The Commission Staff and Intervenors may file any direct testimony on or before ____________, 2023.

15. Any rebuttal testimony must be filed on or before _____________, 2023.

16. A public hearing will be held beginning at ____ a.m. on ______________, 2023, for the purpose of hearing and receiving evidence, arguments and any other appropriate matters in order to determine whether PNM's proposed programs and revised tariff rider, or other programs and tariff rider, should be approved by the Commission. The hearing may continue on ___________. The hearing will be held at ___________________.

17. The procedural dates and requirements currently set in this case are subject to further Order of the Commission or the Hearing Examiner.

18. The Commission's Procedural Rules found at 1.2.2 NMAC will apply to this proceeding except as modified by Order of the Commission or Hearing Examiner. A copy of such Rules may be obtained at the New Mexico Compliation Commission website, https://nmonesource.com/nmos/en/nav.do .

19. Anyone filing pleadings, documents or testimony in this case must comply with the Commission's electronic filing policy, as amended from time to time. This includes filings in .pdf format, with electronic signatures, sent to the Records Bureau's e-mail address, as set out on the Commission's website at prc.records@state.nm.us, within regular business hours of the due date to be considered timely filed. Regular business hours are from 8:00 am to 5:00 pm MT. Documents received after regular business hours will be considered as filed the next business day. Parties must serve copies of all filings on all parties of record and the Commission's Utility Division Staff ("Staff"). All filings shall be e-mailed to Staff and the parties on the dates they are filed with the Commission. All filings shall be e-mailed to the Hearing Examiner at ___________. Additional details regarding this proceeding and its procedural requirements are set forth in the Hearing Examiner's Procedural Order, issued __________.

20. Any interested person may examine PNM's filing in this case together with any exhibits and related papers which may be filed in this case at PNM Headquarters, Main Offices, Albuquerque, New Mexico 87158, telephone: (505) 241-2700, website www.pnm.com, or on the Commission's website at www.nmprc.state.nm.us under "Case Lookup – eDocket."

21. Any interested person may appear at the time and place of hearing and make a written or oral comment pursuant to 1.2.2.23(F) NMAC without becoming an intervenor. Interested persons may also send written comments, which shall reference NMPRC Case No. 23-______-UT, to the Commission at New Mexico Public Regulation Commission, Docketing Office

– Records Mgmt. Bureau, 142 West Palace Ave. #300, Santa Fe, NM 87501. The Commission may be reached by telephone at 1-888-427-5772. However, comments governed by this paragraph will not be considered as evidence in this case.

22. Any person whose testimony has been pre-filed will attend the hearing and submit to examination under oath.

23. Interested persons should contact the Commission for confirmation of the hearing date, time and place, since hearings are occasionally rescheduled.

24. Any person with a disability requiring special assistance in order to participate in this proceeding should contact the Commission at its docketing office at least 24 hours prior to the commencement of the hearing. The Commission's docketing office may be reached at (505) 827-4526. Public documents associated with the hearing can be provided in various accessible forms for disabled individuals. Request for summaries or other types of accessible forms should be addressed to the Commission's Utility Division at (505) 827-6941.

**ISSUED** at Santa Fe, New Mexico this ___ day of ________, 2023.

**NEW MEXICO PUBLIC REGULATION COMMISSION**

______________________________________________

**Hearing Examiner**

*GCG#530736*

# PNM
# Energy Efficiency Program

## 2022 Annual Report

April 17, 2023

# Table of Contents

# Introduction

- The 2022 Program was cost effective, as measured by the Utility Cost Test ("UCT"), with a UCT of 1.77 for the portfolio of programs.
- The total annual net savings after free rider and other adjustments were accounted for was 96.1 GWh at the customer meter.
- The two load management programs represent an average hourly capacity of approximately 51MW.
- Total program expenses were about $30.9 million.
- The average cost per kWh of lifetime energy savings from the energy efficiency programs, not including load management, was 2.44¢/kWh.

The PNM Energy Efficiency Program empowers individuals and businesses across PNM's service area to save energy and money by installing measures and/or adopting practices that result in the reduction of electric consumption or demand curtailment within their homes and businesses. In 2020, and 2021, the COVID-19 pandemic forced adaptability and flexibility in how we interacted with our customers while still providing a positive customer experience. This innovation and malleability not only helped us in maintaining program offerings during these unprecedented circumstances, but also in meeting our targets towards achieving the 2025 Efficient Use of Energy Act ("EUEA") savings goals. Any necessary modifications that occurred due to the pandemic and continued in 2022 will be described in the specific program sections throughout the report below.

# Program Results Summary

PNM submits this annual report on the performance of the PNM Energy Efficiency and Load Management Program for calendar year 2022, ("2022 Program"). This annual report is based on the measurement and verification of PNM's 2022 programs performed by Evergreen Economics ("Evergreen"). The Evaluation of the 2022 Public Service Company of New Mexico Energy Efficiency and Demand Response Programs ("M&V Report") prepared by Evergreen is submitted as a separate document.

The programs evaluated in this annual report were approved by the New Mexico Public Regulation Commission ("NMPRC" or "Commission") in Case No. 20-00087-UT. This report covers all costs incurred in the implementation of the programs and all customer participation in the programs from January 1, 2022, through December 31, 2022.

This is the fourteenth annual report on PNM's Energy Efficiency Programs. Results are based upon independent measurement and verification.

Table 1 provides the definition of "Participants or Units" by program.

## Table 1

| Programs | Participants | Units | Description |
|---|---|---|---|
| Residential Comp. | X | X | Cooling Equip/Appliances/Homes |
| Residential Products | | X | Light bulbs/Non-lighting Measures |
| Commercial Comp. | X | X | Apartments/Projects/Distributors |
| Easy Savings | | X | Self-install Kits Mailed to Homes |
| Energy Smart | X | | Single Family and Multifamily Homes |
| New Home Const. | X | | New Homes |
| PNM Home Works | X | | Res Education/Self-install Kits |
| Behavioral Comp. | X | | Res Reports and C&I Process Improvements |
| Power Saver (LM) | | X | Res/Sm Bus AC Units/Smart T-Stats |
| Peak Saver (LM) | X | | C&I Premises |

Table 2 shows the total number of customer participants (or units), the annual energy and demand savings, the lifetime energy savings, and the total costs for each of the programs for calendar year 2022.

## Table 2

| Program | Participants or Units | Annual Savings (kWh) | Annual Savings (kW) | Lifetime Savings (kWh) | Total Program Costs |
|---|---|---|---|---|---|
| Residential Comp. | 9,977 | 7,920,539 | 1,479 | 56,600,135 | $ 4,728,302 |
| Residential Products | 1,593,925 | 38,895,954 | 7,381 | 705,961,561 | $ 5,678,631 |
| Commercial Comp. | 459 | 35,566,893 | 4,885 | 377,009,078 | $ 9,236,758 |
| Easy Savings | 4,672 | 2,685,739 | 244 | 35,451,756 | $ 416,736 |
| Energy Smart | 300 | 1,248,219 | 64 | 20,158,729 | $ 651,142 |
| New Home Const. | 1,402 | 1,186,457 | 317 | 17,796,860 | $ 773,518 |
| PNM Home Works | 13,926 | 3,817,037 | 161 | 42,636,303 | $ 687,152 |
| Behavioral Comp. | 219,522 | 4,267,563 | - | 6,972,253 | $ 885,561 |
| Power Saver (LM) | 60,716 | 366,045 | 36,249 | 366,045 | $ 5,512,439 |
| Peak Saver (LM) | 157 | 155,921 | 15,449 | 155,921 | $ 2,333,855 |
| **Total** | **1,905,056** | **96,110,366** | **66,231** | **1,263,108,642** | **$ 30,904,095** |

# Program Information

This section highlights the successful strategies and accomplishments of the following programs in 2022.

(1) Commercial Comprehensive

(2) Residential Comprehensive

(3) Residential Products

(4) Energy Smart

(5) PNM Home Works

(6) New Home Construction

(7) Easy Savings Kit

(8) Power Saver load management

(9) Peak Saver load management

(10) Behavioral Comprehensive

(11) Market Transformation

(12) Self-Direct

## Commercial Comprehensive

PNM contracted with DNV, Inc. to implement the Commercial Comprehensive energy efficiency program which is comprised of seven sub-programs. DNV implemented the New Construction, Retrofit Rebates, Building Tune-Up, Quick Saver small business, Distributor Discount programs and the Multifamily sub-programs in 2022. Personnel continued standard use of personal protective equipment ("PPE") during 2022 as recommended by the CDC.

**New Construction** and **Retrofit Rebates** offer pre-set and custom incentives for installing qualifying equipment in new and existing buildings, and for implementing efficient designs in new buildings. Eligible equipment includes energy efficient lighting, HVAC, refrigeration, food service equipment, motors and variable speed drives, window film and plug load controls. **Building Tune-Up** offers incentives for building owners and operators to improve whole-system building efficiency through retro-commissioning, performing advanced tune-ups of air conditioning systems, and to support building operator certification training. In the PNM **Distributor Discount** program, a participating distributor sells high-efficiency equipment from an approved product list to an eligible PNM customer; the customer receives an instant discount at the point of purchase, and PNM pays the rebate directly to the distributor.

In 2022, there were 261 customer projects in the New Construction, Retrofit Rebate, Building Tune-Up, and Distributor Discount programs. The projects completed at these customers' facilities paid customers approximately $3.1 million in rebates and will save over 25.7 million kWh per year.

*"Bulldog Energy Solutions has been working with PNM/DNV Energy Services team for over a decade. Our relationship is strong, and it has been both fulfilling and rewarding… We look forward to the future with PNM/DNV and new opportunities to deliver more energy savings to our customers."*

-Veronica Shaw of Bulldog Energy Solutions, 2022 PNM Trade Ally Award Recipient

PNM **Quick Saver** is a direct-install program for small business customers who have an annual peak electric demand of 200 kW or less. It offers business customers pre-set incentives for installing qualifying lighting products and refrigeration in existing buildings. An important aspect of the program is ongoing training of participating contractors for continued and successful program implementation. For 2022, the Quick Saver program processed over $1.3 million in incentives on 198 customer projects which will save approximately 7.5 million kWh per year across the PNM service area.

The **Multifamily** program is designed to meet the needs of the hard-to-reach multifamily customer segment by offering an attractive mix of low-cost direct install measures, such as lighting replacement, along with deeper savings measures, such as upgrades to cooling equipment, all in one package. The program completed 55 projects, paid about $998,000 in rebates, and achieved 2.4 million kWh of energy savings.

## Residential Comprehensive

### Refrigerator Recycling

ARCA, Inc., the third-party contractor utilized for the Refrigerator Recycling program, operates a center in Albuquerque that disassembles and recycles all refrigerators and freezers collected through the program. The program recycled 6,880 units in 2022.

The Retailer Recycling component was added in 2021 to the Refrigerator Recycling program. Through this offering, customers who purchase new refrigerators at participating appliance retailers can easily schedule a pickup of their old appliance at their home while visiting the retailer's location. This convenient one-stop-shop feature allows customers to also arrange for the removal of outdated, inefficient units at the point of sale of their new unit which offsets overall program costs by allowing the program implementer to collect multiple units at a single central location versus traveling across the PNM service area.

In addition, retailers also qualify for incentive payments for their partnership, thereby encouraging other local businesses to participate in the program. Although this retailer component has experienced difficulty gaining traction, PNM plans to continue recruitment efforts into 2023. The Refrigerator Recycling program as a whole achieved approximately 4 million kWh savings in 2022.

*"PNM's multifamily energy efficiency rebate program provided meaningful financial incentives that helped offset the cost of achieving a net-zero operation for Siler Yard. Coupled with other state and federal incentives, it really makes achieving high levels of energy efficiency in new multifamily construction a win-win."*

-Daniel Werwath, Executive Director of NM Interfaith Housing, discussing Siler Yard, a multifamily complex in Santa Fe

### Home Energy Checkup, Low-Income Checkup

In the Home Energy Checkup program, a Home Energy Specialist visits a customer's home and completes a walk-through energy assessment and provides a comprehensive report which includes personalized recommendations based on the conducted assessment. The Energy Specialist installs a selection of direct installation ("DI") measures, including LEDs, weather stripping, door sweeps, outlet gaskets, big gap filler, and advanced power strips. Wi-Fi smart thermostats are installed at the time of the energy assessment for a nominal co-pay in homes with refrigerated air conditioning. The Energy Specialist also visually inspects and makes recommendations regarding existing windows and level of insulation in the home as well as the age and condition of the existing appliances and provides information about available rebates for early appliance replacement with new ENERGY STAR® qualified appliances. Rebates for installing high efficiency cooling equipment are also available for eligible participants with old inefficient cooling equipment.

All in-home Energy Specialists are bilingual and bilingual call center Customer Representatives or virtual Energy Specialists are available upon request to ensure that customers are easily able to make appointments and have their energy efficiency questions and concerns answered. Customers have the flexibility to self-schedule appointments via the internet as well.

Income-qualified participants receive the same walk-through assessment, installed DI measures, and a comprehensive assessment report as referenced in the above paragraph. Eligible participants may also qualify for a free ENERGY STAR® refrigerator replacement and free installation of a Wi-Fi smart thermostat for homes with refrigerated air conditioning.

PNM actively seeks out ways to collaborate in the community. PNM is collaborating with New Mexico Gas Company ("NMGC") to offer Home Energy Checkups to income qualified residential customers living in Native American communities. For several years in a row, PNM has partnered with Prosperity Works and Energy Works to offer income qualified Home Energy Checkups and will continue to look for more opportunities to collaborate with community organizations.

In 2022 PNM continued to offer customers a way to participate in this program virtually. The virtual offering includes rebate applications for appliances and/or cooling equipment, and customized DI measures mailed. Following the initial interaction, the customers receive a follow-up video phone call to review energy savings tips, address customer questions, and to verify that DI measures were installed. A total of 1,333 customers throughout PNM's service area received a Home Energy Checkup achieving over 1.7 million kWh savings.

### Residential Midstream Cooling

In 2021, the Residential Cooling program was modified from a downstream mail-in rebate program to a midstream program offering discounted HVAC systems, heat pumps, heat pump water heaters, and smart thermostats at the distributor level. The program works with distributors across the PNM service area to offer discounts to contractors on high efficiency cooling equipment when the unit is purchased and installed in an active residential PNM customer's home. With the discount being offered by distributors, customers are no longer required to submit paperwork to receive the benefit. Rebates for evaporative cooling equipment are still available, however, they are offered through the Residential Retail Products Program. A/C tune-ups were added to the cooling program in 2021 as well.

> *"This last year the Midstream Program has benefitted our company in numerous ways. Utilizing program rebates we have developed and maintained relationships with new customers which has increased our sales revenue for the year and expanded our customer base. The program has not only benefitted us and our customers, it has also benefitted the end users of our products. It has created incentive for end users to purchase higher efficiency equipment which is not only a net positive for the environment, it also saves the customer money in the long run."*
>
> **- Lisa Cordova,**
> Vice President
> **Albuquerque Winair Co.**

Virtual training with distributors and contractors is still available if requested, however, participating partners chose to participate in over a dozen in-person training sessions.

The newly modified midstream program did not perform as well as expected in 2021 due to a number of factors exacerbated by the ongoing effects of the COVID-19 pandemic including: minimal response to training and recruitment efforts due to time and resource constraints within the HVAC contractor and wholesaler community, equipment cost increases, and low inventory of eligible equipment components due to ongoing supply chain issues. However, while some COVID-19 related issues such as supply chain and resource constraints continued into 2022, the program is seeing continued improvement in recruiting additional wholesale partners to participate in the program. The program achieved savings of approximately 369,000 kWh in 2022. There are 13 wholesale distributors currently participating in the program.

## Residential Products

In 2021, the Residential Lighting program was expanded to become the Residential Products program to continue incentivizing LED bulbs, in addition to, in-store discounts on additional non-lighting measures such as advanced power strips, ceiling fans, and air purifiers to name a few. In addition to these newly added discounted items, the program also offers mail-in, online, and instant rebates on high efficiency home appliances and evaporative cooling equipment. A total of 250 retailers including large home improvement stores, warehouse clubs, discount retailers, drug stores, independent hardware, charity retailers, and dollar stores participated in the program throughout the PNM service area achieving a total of approximately 39 million kWh savings and providing approximately $4 million in total incentives.

Each participating retailer displayed point-of-purchase (“POP”) materials describing the benefits of LEDs, in addition to the newly expanded non-lighting product list and implemented other mass marketing strategies to engage customers. Retailer training was completed in person by field representatives in 2022. Field representatives visited participating retailers on either a bi-weekly or monthly basis depending on the retailer’s sales volume. Field representatives visited stores 2,849 times in 2022.

## Home Works

The PNM Home Works program provides energy efficiency education and energy saving kits to fifth graders and to high school students through the Energy Innovation program. Due to the continued COVID-19 pandemic restrictions in spring of 2021, the Home Works and Energy Innovation programs were delivered through an Energy Champion e-learning course, 100% virtual presentations, and a Kahoot game with a primary focus on energy efficiency, renewable and non-renewable natural resources, and how electricity is created and delivered into homes and businesses with a special emphasis on sustainability and the unique energy usage footprint of a high school-aged student in the home. Virtual presentations are still offered if requested, however most participating schools have returned to requesting in-person presentations.

*"Y'all go above and beyond the call of duty. Thank you for your invaluable contributions to enrich education."*

- Rick Cole, Century High School

Once presentations are completed, each fifth grade and high school student receives a sealed customized PNM kit of energy efficiency devices to install at home, which includes easy-to-install lighting and weatherization measures including outlet gaskets, weather stripping, and door sweeps and a written guide to assist students and parents with installation of the efficient technologies while also learning about additional ways to reduce energy waste in the home. The high school kit also contains a tier-two advanced power strip. Participating teachers have the opportunity to receive a mini grant to use in their classrooms to help maximize the number of surveys returned from students and to confirm students installed the kits at home. The value of the mini grant is based on student participation levels.

The program provided just under 14,000 kits to 153 schools throughout the PNM service area during the 2022 spring and fall semesters. The program achieved approximately 3.8 million kWh savings in 2022.

### New Home Construction

This program incentivizes home builders to exceed the level of energy efficiency required by the applicable building code. The program offers participants incentives for building new, highly efficient, single-family residential homes through either a prescriptive or a performance path. Under the prescriptive path, home builders receive rebates for specific energy efficient technologies, whereas under the performance path home builders can choose to receive rebates for overall home performance upon verification by credentialed home energy raters. The program provided incentives for 1,402 homes in 2022, 528 of which were prescriptive homes, and 874 of which were performance homes. A total of 52 builders participated in the program in 2022; 32 in the central region, 15 in the northern region, and 5 in the southern region of our service area. Supply chain delays, as well as increased building costs and delayed home completion time continued to impact this program in 2022.

### Low-Income Focused Programs

In 2022, the portfolio as a whole expended approximately 9% of the budget in low-income focused program offerings throughout our service area.

### Easy Savings Kit

In 2022, a custom pick-a-kit portal offered low-income PNM customers the choice to customize an energy kit from a list of pre-selected DI measures that include various specialty LEDs, advanced power strip and other energy saving items. If the customer does not want to customize their own energy saving kit offerings, they may choose the option of a traditional pre-made energy kit that has a standardized mix of DI measures from those listed above. The primary channels for recruiting customers are direct mail or email campaigns. In 2022, the measure mix was enhanced to include outlet gaskets, weather stripping as well as a door sweep. As the market changes, the measure mix will continue to be evaluated for cost effectiveness.

> *"Not a day goes by that I am not thankful for this wonderful blessing! Winter and summer I no longer worry about being comfortable in this old house or worry about utility bills I can't pay. Thank you seems barely enough to show my gratitude and joy from the blessings you all have brought to me. Please know if is sincere and truly heartfelt!!"*
>
> -Joani Amos, Energy Smart weatherization recipient

PNM continues to work with agencies to retain continued awareness of the PNM Easy Savings Kit program and to encourage agencies to provide information and links on their websites as applicable. In 2022, over 4,600 kits were mailed to customers generating approximately 2.6 million kWh energy savings.

### EnergySmart

PNM is contracted with the New Mexico Mortgage Finance Authority ("MFA") to install LEDs and replace inefficient refrigerators. Additional weatherization efficiency measures such as attic insulation, air and duct sealing, window and door replacement, and programmable thermostats are also offered through the program to help income-qualified single family and multifamily customers save money and energy in their homes. In 2022, MFA and its subcontractors leveraged PNM and federal funding, and provided services to 300 income-qualified homes including 75 multifamily and achieved 1.2 million kWh energy savings.

## Behavioral Comprehensive

### Commercial Strategic Energy Management (SEM) Program

This program targets commercial and industrial customer classes by focusing on business practice change from senior management through employee staff to positively affect organizational culture in reducing energy waste and improving energy intensity. The SEM approach emphasizes the importance of equipping and enabling plant management and staff to impact energy consumption through behavioral and operational change and structured planning of facility upgrades and process improvements.

Beginning in 2021, the SEM program implementer, Strategic Energy Group (SEG), began working in conjunction with the PNM Strategic Account Management team to contact a list of customers whose annual electric usage exceeds 4 GWh as the minimum threshold to participate. In addition to working with the Account Management team, other recruitment strategies were put into place including multiple SEM overview webinars both real-time and recorded, email campaigns, and virtual lunch and learn meetings. In total, there are currently five participants in the SEM program from the healthcare, education, and governmental customer segments with other prospective pending participants being engaged.

While only a small number of customers were able to participate in 2022, other customers could not participate due to issues stemming from COVID-19, lack of available resources, and prior recent participation in similar energy management programs. By nature, a behavioral-based program sees customers realizing savings slowly over the course of a multi-year implementation process. The program achieved 1.3 million kWh energy savings in the 2022 program year.

### Residential Home Energy Report Program

This behavior-based program offering utilizes more digital versus the historical paper only delivery method which reduces paper waste and offers a broader sample of participants personalized tips and efficiency rebate recommendations through a phone app, website and/or emailed report. Participants have the capability to fill in any gaps about their homes on a pre-populated online survey, view energy efficiency tips and other program offerings and discover which high level end-use categories specific to their homes, such as cooling, heating and “always on” equipment are consuming the most energy.

This program made its debut in summer 2021 to over 200,000 residential customers within PNM’s service area. However, lower residential annual consumption averages and higher than expected attrition rates due to customer move in/move outs contributed to a decrease in energy savings achieved. A digital expansion wave was launched to over

21,312 customers to counteract the rising attrition rates. Over 3.8 million e-mails were sent in 2022 with a high delivery rate of 97%, and healthy open and click rates of 45% and 4% respectively. Almost 217,000 paper reports were sent to selected customers who did not have e-mail addresses on record.

This program has been very well received by participants with an average e-mail like rate of 80% and is in the top three of the most preferred means to learn about customer-specific energy consumption. This program achieved over 2.9 million kWh energy savings for the 2022 program year with new engagement strategies in place to encourage even more behavior-based energy savings in 2023.

## Market Transformation

The goal of the Market Transformation ("MT") strategy increases awareness of energy efficiency to induce behavioral changes that result in the adoption of energy efficient measures. In 2022, MT strategy continued to focus on outreach across the PNM service area to help customers better understand how they use energy and how to make better-informed decisions on ways they can use energy more efficiently. This outreach took a variety of forms, including social media outreach and promotional campaigns highlighting the benefits of energy efficiency.

## Power Saver and Peak Saver Load Management

Peak Saver and Power Saver are the PNM load management programs. PNM customers with annual peak demand of 50 kW or greater can participate in Peak Saver and customers with annual peak demand of less than 50 kW, including residential customers, can participate in Power Saver. These load management programs were successfully utilized to offset the need for peaking resources during the summer of 2022. PNM dispatched the load management resource three times for a total of about 10 hours. The peak 15-minute load curtailment amount was 76.3 MW. Table 3 shows the times and durations of the load curtailment events in 2022. Generac Grid Services implements the Peak Saver program on behalf of PNM.

### Table 3

| Date | Start Time (MDT) | End Time (MDT) | Duration (Hr) |
|---|---|---|---|
| 6/10/2022 | 3:00 PM | 7:00 PM | 4 |
| 7/11/2022 | 3:00 PM | 7:00 PM | 4 |
| 9/2/2022 | 5:00 PM | 7:00 PM | 2 |

On October 28, 2020, the NMPRC issued a final order in Case No. 20-00087-UT, PNM's energy efficiency program application for 2021, 2022 and 2023, which directed Evergreen Economics, as independent program evaluator for PNM's energy efficiency and load management ("EE/LM") programs, to do the following:

- In PNM's future M&V reports, the independent evaluator shall verify that load reductions from deployment of PNM's LM Programs avoided or offset the need for or use of additional peaking units or power purchases or shifted demand from peak to off peak period.

Evergreen addressed these points in the Load Management as a Resource section of the M&V Report. Evergreen made the statement below. Note that the Figures referenced are figures in the M&V report which will be posted to PNM.com/regulatory.

> The evaluation team concludes that PNM's demand response (DR) programs, Power Saver and Peak Saver, were highly effective reducing peak demand during the summer of 2022 when PNM faced tight supply conditions. The LM programs achieved their intended objective of helping to fulfill PNM's reserve margin and responding quickly to operational needs. Both functions offset the need for construction or purchase of traditional peak capacity resources.
>
> The LM programs made a significant contribution during on-peak hours, as demonstrated by Figure 43. This figure shows the actual system load with DR in place and the counterfactual load without DR on June 10th. Both Peak Saver and Power Saver were activated on this day due to a resource constraint brought on by the unexpected loss of a generation resource. During the four-hour event, which was dispatched between 3:00 PM and 7:00 PM, an average of 45.2 MW of load was reduced on PNM's system. Figure 45 shows that PNM system load would have peaked at the hour ending 7:00 PM at approximately 1842 MW absent dispatch of the LM programs. Dispatching DR lowered the net peak for the day by almost 2.5 percent.

# Program Benefits and Goals

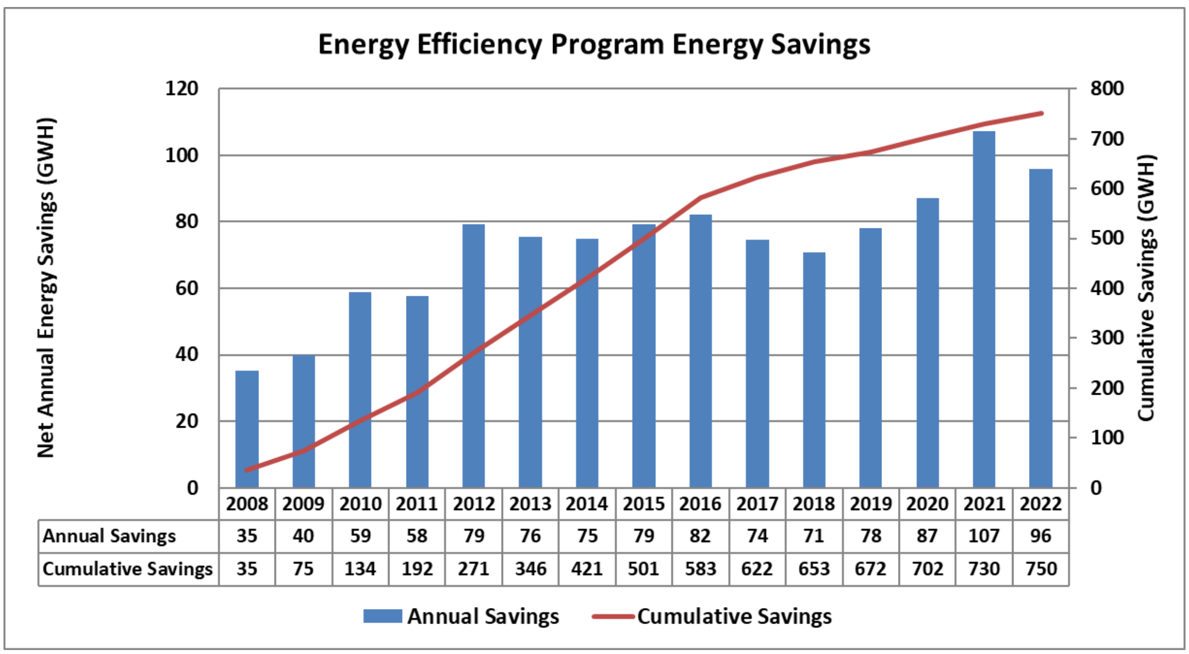
The 2022 Program benefitted the PNM system, customers in all customer classes, the environment, and the New Mexico economy.

The Efficient Use of Energy Act ("EUEA") required that PNM achieve cumulative energy savings of 411 GWh by 2014, equal to five percent (5%) of PNM's retail sales in 2005, and 658 GWh by 2020, equal to eight percent (8%) of 2005 retail sales. PNM's cumulative energy savings of 421 GWh through 2014 exceeded the 2014 savings requirement specified in the EUEA. PNM's cumulative energy savings of 702 GWh through 2020 exceeded the 2020 savings target and represents approximately 8.6% of 2005 retail sales. The 2019 amendment to the EUEA requires that PNM achieve energy savings of not less than 5 percent (5%) of 2020 retail sales from its EE and LM programs implemented in years 2021 through 2025. When PNM filed its application for approval of its 2021 through 2023 EE&LM Program Plan, this target was estimated to be approximately 403 GWh. Based on actual 2020 retail sales, PNM programs will have to achieve 395 GWh or, on average, 79 GWh of annual savings in the years 2021 through 2025.

Figure 1 shows the annual incremental savings on the left axis and annual cumulative savings achieved through 2022 on the right axis.

The energy efficiency measures installed by PNM customers participating in PNM programs in any specific year will continue to save energy in years to come. However, for cost-effectiveness analysis and for purposes of determining the cumulative savings applicable to the EUEA goals in 2014, 2020 and 2025, the average effective useful life ("EUL") of the portfolio is applied. The average EUL for the portfolio is determined by dividing the total lifetime savings by the annual savings. The average portfolio EUL for the 2022 Program is 13 years. The average portfolio EUL has historically averaged 10 years. The increase in EUL can mainly be attributed to the extension of the existing EISA I standards. The EISA II standard was anticipated in future years and anticipated to take effect in 2023. The annual savings from 2009 through 2013 no longer contribute to the cumulative savings since the average ten-year life for those savings has ended. The cumulative savings for 2022 in Figure 1 are the sum of all annual savings beginning in 2014.

**Figure 1**




| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Savings | 35 | 40 | 59 | 58 | 79 | 76 | 75 | 79 | 82 | 74 | 71 | 78 | 87 | 107 | 96 |
| Cumulative Savings | 35 | 75 | 134 | 192 | 271 | 346 | 421 | 501 | 583 | 622 | 653 | 672 | 702 | 730 | 750 |

The 2022 program provided almost $13 million in rebates and helped a wide range of customers with direct incentives that offset the cost of energy efficiency improvements and lowered their electric bills. Highlights include:

- 6,880 inefficient refrigerators and freezers were removed from the market.
- Over 1.5 million products including lighting and non-lighting measures were discounted through the Residential Products program.

- More than 12,000 low-income customers benefited from the five programs that serve low-income customers.
- Over 450 commercial customer projects, including over 198 small commercial projects, were completed in the business energy efficiency programs.
- 55 common area projects with a combined 69 units were renovated with high-efficiency equipment.

Approximately 61,000 residential and business customers participated in the demand response programs. The 2022 Energy Efficiency Program also had a significant impact on the New Mexico economy. Customer incentives are designed to pay between 25 and 75 percent of the incremental cost of an efficiency improvement. Using a multiplier factor of two, the economic impact of the customer incentives would be about $26 million dollars. The 2022 Program also had a significant impact on local employment. Most of the PNM programs are implemented by third-party contractors who employ local staff. The 2022 third-party program implementers directly supported approximately 41 local employees. In addition, much of the $12.8 million in incentives paid to customers supported additional employment by local companies and trade allies that provided energy efficiency improvements.

In addition, the energy savings from the 2022 Program will result in a reduction in water consumption and $CO_2$ emissions. Estimated water savings and reductions of $CO_2$ are shown in Table 10 below.

The PNM Energy Efficiency Program, now in its fifteenth year, was a key resource in PNM's 2020 Integrated Resource Plan ("2020 IRP"). The 2020 IRP evaluated many different portfolio options that could be implemented to meet expected growth in the demand for electricity for a planning period of 20 years. Energy efficiency and load management programs are found to be cost-competitive alternatives when compared to meeting system needs with traditional supply-side resources. PNM identified its most cost-effective portfolio to meet the objective of the NMPRC IRP Rule which is to "identify the most cost effective portfolio of resources to supply the energy needs of customers."[1] The IRP Rule further provides that "For resources whose costs and service quality are equivalent, the utility should prefer resources that minimize environmental impacts."[2] PNM's IRP included the impacts of the 2020 Program Plan and projected growth of programs that allow PNM to achieve the spending requirements and energy saving goals specified in the EUEA.

## Tariff Collections

The costs of implementing the 2022 Program are recovered through the Energy Efficiency Rate Rider No. 16 ("Rider") on customer bills. The Rider for 2022 included a program cost rate element that was assessed monthly as a percentage (3.350% of the monthly bill charge. A profit incentive rate element was also assessed monthly as a percentage including a 2022 base element (0.231% and a 2021 reconciliation element 0.056%).

[1] 17.7.3.6 NMAC.
[2] *Id*.

In 2022, PNM collected $30,604,381 in program funding through the 3.350% Rider No. 16 rate element. In 2020, PNM's plan year Rider No. 16 collections exceeded expenditures by $870,666 resulting in an underage added to the amount available for program expenditures in 2022 pursuant to 17.7.2.8(E) NMAC. Accordingly, the amount of rider collections available for program funding in 2022 was $31,475,047 ($30,604,381+870,666). PNM's actual expenditures in 2022 were $30,904,095, resulting in an under-expended amount of $570,952. Accounting for carrying charges on monthly balances in 2022 of $78,421 resulted in a net underage of $649,373. The Final Order in Case No. 20-00087-UT authorized PNM to earn a Profit Incentive in 2022. PNM submitted the documentation for a tariff rider adjustment, including the program cost under-expenditure and profit incentive reconciliation, with supporting testimony, along with this annual report.

## 2022 Cost Reconciliation and Impact on 2024 Program Budget

In compliance with the Final Order, PNM will add the 2022 under-expended amount of $649,373 to the approved 2024 program plan budget as approved in Case No. 20-00087-UT.

## Regulatory Proceedings

On November 4, 2020, the Commission voted to renew the contract with Evergreen Economics to perform independent measurement and verification of New Mexico energy efficiency and load management programs for the 2021 and 2022 program years.

On April 15, 2022, PNM filed Advice Notice No. 585 to reconcile the collection of the 2021 program costs and profit incentive. Rider No. 16 was modified to reflect the profit incentive reconciliation, and the new rates went into effect on May 31, 2022.

## Energy Efficiency Rule Reporting Requirements

The following section of the annual report provides detailed information on the performance of the 2021 Program including information required by the NMPRC Energy Efficiency Rule, Section 17.7.2.14 – Annual Report.

## Documentation of Program Expenditures

All 2022 Program expenses including labor, materials, third-party expenses, and all other costs, are tracked through a unique set of accounts. Likewise, all revenue collected through the tariff rider is booked to a special regulatory asset account which is balanced against the expenses. These costs and revenues are kept separate from PNM rate-base accounting; therefore, there is no cross-subsidization and no impact on PNM's allowed rate of return. Costs specific to an individual program, such as customer incentives and third-party administration, are allocated directly to that program. Shared costs, such as internal administration, are allocated to each program in proportion to their direct costs.

Total calendar year expenditures for the 2022 Program were $30,904,095. These expenditures include all expenses incurred by PNM to develop and implement the individual programs. The same total expenditure data was provided to Evergreen to be included in the M&V Report. Table 4 shows the allocation of costs to the various programs for calendar year 2022.

## Table 4

| Programs | Admin | M&V | Promotion | Incentives (Rebates) | Third-Party Costs | Market Transformation | Total Costs |
|---|---|---|---|---|---|---|---|
| Residential Comp. | $ 173,822 | $ 148,295 | $ 98,202 | $ 1,605,791 | $ 2,599,992 | $ 102,201 | $ 4,728,302 |
| Residential Products | $ 213,418 | $ 55,327 | $ 120,571 | $ 3,907,384 | $ 1,256,449 | $ 125,482 | $ 5,678,631 |
| Commercial Comp. | $ 343,427 | $ 187,870 | $ 194,020 | $ 5,207,398 | $ 3,102,120 | $ 201,922 | $ 9,236,758 |
| Easy Savings | $ 15,816 | $ - | $ 8,935 | $ 233,473 | $ 149,212 | $ 9,299 | $ 416,736 |
| Energy Smart | $ 24,712 | $ - | $ 13,961 | $ 498,260 | $ 99,678 | $ 14,530 | $ 651,142 |
| New Home Const. | $ 17,069 | $ - | $ 9,643 | $ 392,087 | $ 344,683 | $ 10,036 | $ 773,518 |
| PNM Home Works | $ 26,079 | $ - | $ 14,733 | $ 631,006 | $ - | $ 15,334 | $ 687,152 |
| Behavioral Comp. | $ 31,299 | $ 60,860 | $ 17,683 | $ - | $ 757,317 | $ 18,403 | $ 885,561 |
| Power Saver (LM) | $ 208,187 | $ 26,963 | $ 117,616 | $ 350,856 | $ 4,686,411 | $ 122,406 | $ 5,512,439 |
| Peak Saver (LM) | $ 87,552 | $ 26,963 | $ 49,463 | $ - | $ 2,118,399 | $ 51,477 | $ 2,333,855 |
| **Total** | **$ 1,141,383** | **$ 506,278** | **$ 644,828** | **$ 12,826,254** | **$ 15,114,262** | **$ 671,090** | **$ 30,904,095** |

The total approved budget for 2022 was $31,018,623 and the total actual expenses for the year were $30,904,095; therefore, total spending was less than 1 percent below the approved budget. Table 5 shows the budgeted amounts, the actual expenditures, and the variances for each program.

## Table 5

| Programs | Approved Budget | 2022 Actual Costs | Variance ($) |
|---|---|---|---|
| Residential Comp. | $ 6,480,692 | $ 4,728,302 | $ (1,752,390) |
| Residential Products | $ 3,641,180 | $ 5,678,631 | $ 2,037,451 |
| Commercial Comp. | $ 9,525,633 | $ 9,236,758 | $ (288,875) |
| Easy Savings | $ 587,822 | $ 416,736 | $ (171,087) |
| Energy Smart | $ 246,427 | $ 651,142 | $ 404,715 |
| New Home Const. | $ 682,841 | $ 773,518 | $ 90,677 |
| PNM Home Works | $ 582,089 | $ 687,152 | $ 105,063 |
| Behavioral Comp. | $ 1,083,133 | $ 885,561 | $ (197,572) |
| Power Saver (LM) | $ 5,655,445 | $ 5,512,439 | $ (143,005) |
| Peak Saver (LM) | $ 2,533,360 | $ 2,333,855 | $ (199,506) |
| **Total** | **$ 31,018,623** | **$ 30,904,095** | **$ (114,528)** |

## Estimated and Actual Participation and Savings

Table 6 presents estimated and actual customer participation (or units), annual energy savings and annual peak demand savings for each program. Estimated values represent the targets for calendar year 2022. Please note that all energy savings are reported as savings at the customer meter.

## Table 6

| Program | Estimated Participants or Units | Actual Participants or Units | Estimated Savings (kWh) | Actual Savings (kWh) | Estimated Savings (kW) | Actual Savings (kW) |
|---|---|---|---|---|---|---|
| Residential Comp. | 10,602 | 9,977 | 7,308,118 | 7,920,539 | 1,601 | 1,479 |
| Residential Products | 1,008,890 | 1,593,925 | 29,744,405 | 38,895,954 | 4,959 | 7,381 |
| Commercial Comp. | 676 | 459 | 52,277,959 | 35,566,894 | 8,365 | 4,885 |
| Easy Savings | 7,200 | 4,672 | 1,642,095 | 2,685,739 | 126 | 244 |
| Energy Smart | 238 | 300 | 991,092 | 1,248,219 | 244 | 64 |
| New Home Const. | 1,100 | 1,402 | 1,510,569 | 1,186,457 | 370 | 317 |
| PNM Home Works | 12,850 | 13,926 | 3,435,723 | 3,817,037 | 473 | 161 |
| Behavioral Comp. | 329,179 | 219,522 | 17,073,997 | 4,267,563 | 977 | - |
| Power Saver (LM) | - | 60,716 | 1,548,878 | 366,045 | 55,000 | 36,249 |
| Peak Saver (LM) | - | 157 | 782,000 | 155,921 | 25,000 | 15,449 |
| **Total** | **1,370,735** | **1,905,056** | **116,314,834** | **96,110,366** | **97,114** | **66,231** |

## Estimated and Actual Costs and Avoided Costs (Benefits)

Table 7 presents the net present value of estimated and actual monetary costs and benefits for each program. Estimated costs and benefits are those contained in the 2022 Program Plan, approved in Case No.20-00087-UT. The actual net present value of monetary benefits was determined by taking the discounted value of the annual avoided costs times the annual savings over the effective useful life of each program. Please see Appendix A for PNM avoided costs.

## Table 7

| Program | Estimated NPV of Monetary Costs | Actual NPV of Monetary Costs | Estimated NPV of Monetary Benefits | Actual NPV of Monetary Benefits |
|---|---|---|---|---|
| Residential Comp. | $ 4,728,302 | $ 3,602,736 | $ 2,387,803 | $ 1,408,487 |
| Residential Products | $ 5,678,631 | $ 5,247,662 | $ 27,616,028 | $ 24,840,745 |
| Commercial Comp. | $ 9,236,758 | $ 10,666,682 | $ 12,534,928 | $ 13,124,040 |
| Easy Savings | $ 416,736 | $ 379,526 | $ 1,106,692 | $ 633,814 |
| Energy Smart | $ 651,142 | $ 252,209 | $ 483,146 | $ 182,617 |
| New Home Const. | $ 773,518 | $ 931,208 | $ 1,033,367 | $ 1,306,480 |
| PNM Home Works | $ 687,152 | $ 776,517 | $ 879,465 | $ 557,006 |
| Behavioral Comp. | $ 885,561 | $ 432,714 | $ 86,841 | $ 64,073 |
| Power Saver (LM) | $ 5,512,439 | $ 4,641,494 | $ 5,956,446 | $ 1,039,335 |
| Peak Saver (LM) | $ 2,333,855 | $ 2,537,792 | $ 2,538,628 | $ 538,836 |
| **Total** | **$ 30,904,095** | **$ 29,468,541** | **$ 54,623,346** | **$ 43,695,434** |

## Cost Effectiveness Evaluation

Table 8 presents the Utility Cost Test ("UCT") ratio for each program and for the total portfolio of programs as determined by the independent evaluator. The UCT ratio is the ratio of actual monetary benefits to monetary costs. The UCT of the total portfolio of programs as determined by the independent evaluator was 1.77.

### Table 8

| Program Name | Net UCT |
|---|---|
| Residential Comp. | 0.51 |
| Refrig. Recycl. | 0.62 |
| HEC - Mkt | 0.41 |
| HEC - LI | 0.46 |
| Cooling & Midstream | 0.47 |
| Residential Products | 3.58 |
| Commercial Comp. | 1.36 |
| Easy Savings | 2.66 |
| Energy Smart (MFA) | 0.74 |
| New Home Const. | 1.34 |
| Behavioral | 0.10 |
| Home Works | 1.28 |
| Power Saver (LM) | 1.08 |
| Peak Saver (LM) | 1.09 |
| **Total** | **1.77** |

Table 9 reflects a separate UCT based on avoided costs that were filed and approved with the Commission and this UCT also relies on contract terms that defined payment terms and savings assumptions.

### Table 9

| | kWh | kW | Lifetime kWh | EUL | LI% | Total Cost | 2021 UCT |
|---|---|---|---|---|---|---|---|
| Residential Comp. | 7,920,539 | 1,479 | 56,600,135 | 7 | 31.1% | 4,728,302 | 0.41 |
| Refrig. Recycl. | 4,089,349 | 949 | 20,107,329 | 4.92 | 0.0% | $ 1,588,016 | 0.62 |
| HEC - Mkt | 1,788,600 | 172 | 16,007,966 | 8.95 | 0.0% | $ 1,060,675 | 0.41 |
| HEC - LI | 1,674,087 | 194 | 14,983,078 | 8.95 | 100.0% | $ 1,181,752 | 0.46 |
| Midstream Cooling | 368,504 | 165 | 5,501,763 | 14.93 | 0.0% | $ 897,860 | 0.47 |
| Residential Products | 38,895,954 | 7,381 | 705,961,561 | 18.15 | 0.0% | $ 5,678,631 | 4.86 |
| Commercial Comp. | 35,566,894 | 4,885 | 377,009,078 | 10.60 | 26.3% | $ 9,236,758 | 1.45 |
| Easy Savings | 2,685,739 | 244 | 35,451,756 | 13.20 | 100.0% | $ 416,736 | 2.66 |
| Energy Smart (MFA) | 1,248,219 | 64 | 20,158,729 | 16.15 | 100.0% | $ 651,142 | 0.74 |
| New Home Const. | 1,186,457 | 317 | 17,796,860 | 15.00 | 0.0% | $ 773,518 | 1.34 |
| Behavioral Comp. | 4,267,563 | - | 6,972,253 | 2.00 | 0.0% | $ 885,561 | 0.10 |
| Home Works | 3,817,037 | 161 | 42,636,303 | 11.17 | 40.0% | $ 687,152 | 1.28 |
| Power Saver (LM) | 366,045 | 36,249 | 366,045 | 1.00 | 0.0% | $ 5,512,439 | 1.08 |
| Peak Saver (LM) | 155,921 | 15,449 | 155,921 | 1.00 | 0.0% | $ 2,333,855 | 1.09 |
| **Total** | **96,110,368** | **66,231** | **1,263,108,642** | | | **$ 30,904,095** | **1.77** |

### Self-Direct Program Participation and Evaluation

PNM received no Self-Direct applications in 2022.

### Estimated Water and CO2 Savings

Table 10 shows the estimated carbon dioxide (“$CO_2$“) emission reductions and water savings associated with the PNM portfolio of programs. The annual avoided $CO_2$ emissions and water savings for the 2022 Program were determined by multiplying the PNM weighted-average emissions rate and water consumption by the annual and lifetime energy savings.

**Table 10**

| Emission Impact | Avoided Electric Emissions Rate (Metric Tons/GWh) | Annual Avoided Emissions (Metric tons) | Lifetime Avoided Emissions (Metric tons) |
|---|---|---|---|
| $CO_2$ Reduced | 419 | 40,282 | 529,393 |
| **Water Impact** | **Water Consumption (gal/MWH)** | **Annual Water Saved (gal)** | **Lifetime Water Saved (gal)** |
| Water Saved | 240.0 | 23,066,488 | 303,146,074 |

# Independent Measurement and Verification Report

PNM contracted with Evergreen Economics to conduct the independent evaluation of the 2022 Program. The M&V Report is submitted as a separate document along with this annual report. A summary of some of the more important findings and recommendations, along with comments from PNM, is provided below.

### Background and Purpose

On November 2, 2020, the Commission renewed the selection of Evergreen Economics as the state-wide independent evaluator and approved the M&V budget and scope of work for a two-year term to conduct annual measurement and verification analysis for the 2022 program year. Evergreen conducted an independent evaluation of the 2022 Program and their M&V Report is based on data from January 1, 2022, through December 31, 2022. PNM worked closely with Evergreen to provide the data necessary to complete the 2022 M&V Report. This included rebate processing and participant files, budget data by program and avoided-cost information.

### Summary of Findings and PNM Comments

The total portfolio of programs was found to be cost effective. The results of the M&V analysis will be used to adjust technical assumptions made by PNM regarding program performance, unit savings and net-to-gross values. The M&V Report contains specific findings and recommendations which are summarized in the following section.

### Key Points

The evaluator performed a project sampling of engineering desk reviews for Commercial Comprehensive, deemed savings reviews, and statistical models for Peak and Power Saver programs. The reviews resulted in high realized gross savings, particularly for kWh.

Participant surveys were conducted with participants in the Retrofit Rebate, QuickSaver, Home Energy Checkup, Residential Midstream Cooling, and Refrigerator Recycling programs. Customer satisfaction with the PNM Energy Efficiency programs remains high.

Overall, participant surveys in the Commercial Comprehensive program resulted in high levels of satisfaction in 2022 from the already high levels observed in previous years.

A low-income household survey identified that opportunities continue to exist to achieve energy efficiency in the low-income segment and to increase trust and protect customer privacy among low-income households. However, cost effectiveness continues to be a concern among our low-income portfolio of programs.

## Commercial Comprehensive

The Commercial Comprehensive program consists of the following sub-programs; Quick Saver, Retrofit Rebates, New Construction, Midstream and Multifamily. The evaluation activities, which included surveys with Retrofit Rebate and Quick Saver participants as well as interviews with Multifamily and New Construction participants, noted that nearly all interviewees expressed high levels of satisfaction with the majority of participants reporting ratings of “very satisfied” for all eleven program components. The survey asked about PNM as an energy provider, the rebate program, time it took to receive the rebate, equipment and quality of installation, contractor interaction and quality of installation, and the overall value of program regarding the time and effort it required to participate. The evaluator specifically mentioned that Quick Saver participants were the most satisfied overall of all eleven program components.

To determine the mix of projects to evaluate, a statistically significant sample of projects, stratified by savings and measure type, was defined for detailed desk reviews. The evaluator requested the implementer to continue to improve upon the documentation whenever changes in the calculation steps are made to ensure that the documentation can be followed to reproduce the reported savings estimates. For each sub-program, the evaluator determined an Engineering Adjustment Factor (“EAF”) by dividing the verified savings by the reported savings value. PNM and the program implementer have improved upon savings assumptions and calculations based on prior years evaluations, and as a result the evaluator EAF is very close to 1.0. On average, an EAF of 0.987 was determined for kWh savings and an EAF of 0.985 was determined for kW savings.

Despite the EAF adjustment being close to 1.0, the evaluator had several recommendations regarding documentation of energy savings calculations, and additional documentation of prescriptive elements that may not be Energy Star or not on the DLC (Design Lights Consortium) qualified products list. Further information is available in the 2022 M&V report.

## Residential Comprehensive

The Prescriptive path under the Residential Comprehensive program is made up of three sub-programs: Refrigerator Recycling, Home Energy Checkup (including a low-income component), and Residential Midstream Cooling. Home Energy Checkup includes a walk-through energy assessment and installation of a selection of DI measures and rebates for energy efficient appliances as well as a newly offered virtual home visit. The evaluator was able to reasonably confirm the Residential Comprehensive program savings assumptions; however, they recommend further documentation of baseline assumptions and calculation methods. Participant surveys were also used as a process evaluation tool that assessed how well the programs operate.

## Residential Products (Formerly Residential Lighting Program)

The Residential Products program incorporates in-store, mail-in and online incentives for non-lighting residential products such as ENERGY STAR appliances, advanced power strips, room ACs, as well as incentives on LED products in retailers across PNM’s service area.

The evaluator determined savings impacts using a pricing elasticity model which estimates sales of incentivized lamps when compared to pricing of regular lamps. Approximately 75 percent of lamps sold were priced at $2.00 or less, demonstrating the effectiveness of incentives.

The evaluator did not make any specific comments regarding the Residential Products separate from the lighting program; however, they did report the savings separately. The total net savings of the lighting and residential products program was 38.9 GWh, lighting accounted for 28.2 GWh and non-lighting products achieved 10.7 GWh representing 27.4 percent of the Program savings.

## Residential Behavioral Home Energy Reports

The PNM Home Energy Reports ("HER") program provides customers with information on their energy consumption that includes a comparison with a matched set of similar households. As part of this design, the program implementer Bidgely randomly assigns customers to a treatment group that receives the HER that provides tips on how to reduce energy consumption. Those customers not in the treatment group are randomly assigned to the control group and do not receive the report.

Early energy reports were "digital" in that email communication was the primary point of contact. A subsequent effort used paper mail. Paper mail realized the most savings, however, earlier digital communications were unable to target higher use customers. This program will be re-evaluated in 2023.

## Peak Saver

The Peak Saver program is a demand response program offered to non-residential customers with peak load contributions of at least 50 kW. The program compensates participants for reducing electric load upon dispatch during periods of high system load. Peak Saver was implemented by Generac Grid Services in 2022, who managed the enrollment, dispatch, and settlement with participating customers. During the summer 2022 demand response season, there were 157 participating facilities and three demand response events.

One-minute interval load data is used to calculate load impacts using a customer baseline ("CBL") method per the contract between PNM and Generac Grid Services. A CBL is an estimate of what participant loads would have been absent the DR event dispatch. Load impacts are the difference between the CBL and the metered load during the event. The evaluator was able to replicate the calculations used for contract settlement. The peak impact as reported by the implementer results in an average event capacity of 26,831 kW. Evaluator-calculated performance resulted in an average performance of 15,449 kW. The difference is largely a result of prior hour adjustments to the measured baseline prior to the event.

## Power Saver

Power Saver is a direct load control program offered to residential, small commercial (< 50 kW), and medium commercial (50 kW – 150 kW) PNM customers. To facilitate load control, participants must have a device attached to the exterior of their air conditioning unit. This "paging" device receives a paging signal that will activate a control sequence that cycles the unit's compressor for an interval of time (usually half the time as normal) to reduce peak demand in the summer. Residential and small commercial participants receive an annual $25 incentive for their participation. Medium commercial participants receive an annual incentive of $9 per ton of refrigerated air conditioning. A residential smart thermostat component was added to the program in 2018 and a residential bring your own thermostat ("BYOT") specifically promoting Google-Nest was promoted in 2022.

For thermostat components, load curtailment is achieved via communication with the Wi-Fi-enabled thermostat.

There were two Power Saver events during the summer 2022 demand response season. Power Saver was not called for the third event that Peak Saver was called for. All events used a 50% cycling strategy where curtailment is based on the runtime in the previous hour. The peak contract capacity as determined by the maximum 15-minute capacity during an event was 49,480 kW. The realized gross energy savings was 366,031 kWh and the realized gross demand savings (calculated as an hourly average reduction) was 36,250 kW.

## Appendix A – PNM Avoided Costs

The following table provides the avoided energy, demand and carbon costs for calendar year 2022. These costs were used in the PNM cost-effectiveness model and by Evergreen in its program evaluation. These are the avoided costs included in PNM's most recently approved energy efficiency plan, Case No. 20-00087-UT.

| Avoided Energy and Capacity Costs EE and DR | EE Energy Capacity ($/kWyr) | EE Avoided T & D ($/kWyr) | EE Total Capacity MW ($/kW-yr) | EE Energy (incl $CO_2$) ($/kWh) | DR MW ($/kW-yr) | Avoided Energy Cost DR ($/kWh) |
|---|---|---|---|---|---|---|
| 2021 | $0.00 | $5.00 | $5.00 | $0.009 | $30.42 | $0.00 |
| 2022 | $159.13 | $5.08 | $164.20 | $0.012 | $139.59 | $0.00 |
| 2023 | $148.55 | $5.15 | $153.70 | $0.014 | $119.80 | $0.00 |
| 2024 | $141.06 | $5.23 | $146.29 | $0.013 | $135.53 | $0.00 |
| 2025 | $149.81 | $5.31 | $155.11 | $0.015 | $150.01 | $0.00 |
| 2026 | $155.65 | $5.39 | $161.04 | $0.017 | $129.07 | $0.00 |
| 2027 | $138.36 | $5.47 | $143.83 | $0.016 | $125.84 | $0.00 |
| 2028 | $134.22 | $5.55 | $139.77 | $0.019 | $125.84 | $0.00 |
| 2029 | $139.38 | $5.63 | $145.02 | $0.020 | $125.84 | $0.00 |
| 2030 | $129.56 | $5.72 | $135.28 | $0.019 | $113.44 | $0.00 |
| 2031 | $121.17 | $5.80 | $126.97 | $0.021 | $101.00 | $0.00 |
| 2032 | $110.58 | $5.89 | $116.47 | $0.029 | $80.64 | $0.00 |
| 2033 | $133.42 | $5.98 | $139.39 | $0.026 | $141.75 | $0.00 |
| 2034 | $130.84 | $6.07 | $136.91 | $0.028 | $141.75 | $0.00 |
| 2035 | $128.52 | $6.16 | $134.68 | $0.029 | $141.75 | $0.00 |
| 2036 | $126.14 | $6.25 | $132.40 | $0.030 | $140.99 | $0.00 |
| 2037 | $118.09 | $6.34 | $124.43 | $0.028 | $91.05 | $0.00 |
| 2038 | $136.97 | $6.44 | $143.41 | $0.030 | $160.06 | $0.00 |
| 2039 | $129.03 | $6.54 | $135.57 | $0.030 | $65.70 | $0.00 |

# Evaluation of the 2022 Public Service Company of New Mexico Energy Efficiency and Demand Response Programs

## Final Report

**Submitted by Evergreen Economics**

**April 4, 2023**

# Table of Contents

# Executive Summary

This report presents the independent evaluation results for Public Service Company of New Mexico (PNM) energy efficiency and demand response programs for program year 2022 (PY2022).

The PNM programs and evaluation requirements were first established in 2005 by the New Mexico legislature's passage of the 2005 Efficient Use of Energy Act (EUEA).[1] The EUEA requires public utilities in New Mexico, in collaboration with other parties, to develop cost-effective programs that reduce energy demand and consumption. Utilities are required to submit their proposed portfolio of programs to the New Mexico Public Regulation Commission (NMPRC) for approval. As a part of its approval process, the NMPRC must find that the program portfolio is cost effective based on the Utility Cost Test (UCT).

An additional requirement of the EUEA is that each program must be evaluated at least once every three years. As part of the evaluation requirement, PNM must submit to the NMPRC a comprehensive evaluation report prepared by an independent program evaluator. As part of the reporting process, the evaluator must measure and verify energy and demand savings, determine program cost effectiveness, assess how well the programs are being implemented, and provide recommendations for program improvements as needed.

For PY2022, the following PNM programs were evaluated:

1. Commercial Comprehensive
2. Residential Lighting
3. Residential Comprehensive
4. Home Energy Reports
5. Commercial Strategic Energy Management (SEM)
6. Peak Saver (Residential & Small Commercial)
7. Power Saver (Large Commercial & Industrial)

For each of the evaluated programs, the evaluation team estimated realized gross and net impacts (kWh and kW) and calculated program cost effectiveness using the UCT.[2] Brief process evaluations

[1] NMSA §§ 62-17-1 *et seq* (SB 644). Per the New Mexico Public Regulation Commission Rule Pursuant to the requirements of the EUEA, the NMPRC issued its most recent *Energy Efficiency Rule* (*17.7.2 NMAC*) effective September 26, 2017, that sets forth the NMPRC's policy and requirements for energy efficiency and load management programs. This Rule can be found online at http://164.64.110.134/parts/title17/17.007.0002.html

[2] The evaluation team consists of Evergreen Economics, EcoMetric, Demand Side Analytics, and Research & Polling.

were also conducted for the Commercial Comprehensive and Residential Comprehensive programs.

The remaining programs that were not evaluated in 2022 are still summarized in this report. The accomplishments for the non-evaluated programs are reported using the following parameters:

- Gross impacts (kWh, kW) were calculated using PNM's *ex ante* values for annual savings;
- Net impacts were calculated from the gross impacts using the existing *ex ante* net-to-gross (NTG) ratio; and
- Cost effectiveness calculations were calculated using the *ex ante* net impact values and cost data as reported by PNM.

The analysis methods used for the evaluated PY2022 programs are summarized as follows:

**Commercial Comprehensive**. The majority of projects in the Commercial Comprehensive program are prescriptive in nature, and as such the evaluation of this program centered on a deemed savings review, phone survey verification, and project desk reviews. Custom projects were evaluated by a desk review and participant phone survey. The deemed savings review for prescriptive measures focused on verifying that the appropriate savings values were applied based on the equipment installed and per the referenced source of savings, whether that is the New Mexico TRM or another source. The phone survey was used to verify that program-rebated measures are still installed and functional as well as gather information to calculate a free ridership rate, as described in more detail in the *Net Impacts* section below. Additionally, desk reviews conducted by engineers examined the savings assumptions and calculations specific to each project that is selected for review. Finally, on-site visits were conducted to verify measures in a sample of the larger projects.

**Residential Lighting Program.** As a prescriptive measure program, the evaluation of the Residential Lighting program focused on a deemed savings review and elasticity model to estimate net impacts. Since LED incentives are provided upstream, participant data are not available and a participating customer phone survey to verify the purchase and installation of bulbs is not possible. Instead, we reviewed the savings values in the tracking database and those documented in the TRM to verify that the correct savings values are being applied and that rebated bulbs are program qualifying. The elasticity model was used to determine net impacts is described in more detail below.

**Residential Comprehensive.** This is a prescriptive program serving PNM's residential customers and is made up of three sub-programs: Home Energy Checkup (including low-income households), Residential Cooling, and Refrigerator Recycling. The Home Energy Checkup sub-program includes a home energy assessment and the installation of low-cost measures in addition to available equipment rebates. The impact evaluation for the Residential Comprehensive program centered on a deemed savings review and participant survey. For the process evaluation, the participant survey and contractor interviews were used to assess how well the program is operating.

**Home Energy Reports**. This program provides participating customers with information on their energy consumption by providing a comparison with a matched set of similar households. The feedback on energy use, combined with tips for reducing energy use, is designed to create sustained reductions in consumption. Net impacts were estimated using a billing regression and consumption data from both the participants and control group customers.

**Commercial Strategic Energy Management (SEM)**. The Commercial SEM program helps business customers reduce their energy use by providing organizational training, technical support for operations and maintenance (O&M) improvements, and energy monitoring and report tools that help track and manage facilities energy costs. Savings were calculated based on desk review of the individual projects that included a review of the billing regression results from the program implementer.

**Power Saver and Peak Saver.** PNM had two demand response programs in PY2022. The Power Saver program focuses on single-family, multifamily, and small and medium commercial customers. For all Power Saver customers, the five-minute interval load data were analyzed during event periods and compared to load shapes from a control group. The Peak Saver program is for larger customers that typically have unique load shapes, which makes finding a matched control group difficult. For these customers, savings were estimated based on the differences in load shapes between event and non-event weekdays for the same customer.

Table 1 summarizes the PY2022 evaluation methods.

**Table 1: Summary of PY2022 Evaluation Methods by Program**

| Program | Deemed Savings Review | Participant Survey / Interviews | Engineering Desk Reviews | Site Visits | Elasticity Model | Billing Regression |
|---|---|---|---|---|---|---|
| Commercial Comprehensive | ◆ | ◆ | ◆ | ◆ | | |
| Residential Lighting | ◆ | | | | ◆ | |
| Residential Comprehensive | ◆ | ◆ | | | | |
| Home Energy Reports | ◆ | | | | | ◆ |
| Commercial SEM | ◆ | | ◆ | | | |
| Power Saver (Res & Small/Med Commercial) | | | | | | ◆ |
| Peak Saver (Large Commercial & Industrial) | | | | | | ◆ |

The results of the PY2022 impact evaluation are shown in Table 2 (kWh) and Table 3 (kW), with the programs evaluated in 2022 highlighted in blue. For the non-evaluated programs, the totals are based on the *ex ante* savings and NTG values from the PNM tracking data.

**Table 2: PY2022 Savings Summary – kWh**

| Program | # of Projects | Expected Gross kWh Savings | Engineering Adjustment Factor | Realized Gross kWh Savings | NTG Ratio | Realized Net kWh Savings |
|---|---|---|---|---|---|---|
| **Commercial Comprehensive** | | | | | | |
| Retrofit Rebate | 145 | 18,717,132 | 0.9982 | 18,682,518 | 0.842 | 15,730,680 |
| New Construction | 50 | 11,905,492 | 0.9126 | 10,865,318 | 0.842 | 9,148,598 |
| Quick Saver | 198 | 6,609,173 | 1.1367 | 7,512,915 | 1.000 | 7,512,915 |
| Multifamily | 55 | 3,412,404 | 0.8318 | 2,838,292 | 0.842 | 2,389,842 |
| Building Tune-Up | 7 | 428,970 | 1.0000 | 428,970 | 0.842 | 361,193 |
| Midstream | 4 | 310,494 | 1.6213 | 503,406 | 0.842 | 423,868 |
| **Residential Lighting** | 1,426,905 | 41,513,817 | 1.0000 | 41,513,817 | 0.680 | 28,229,395 |
| **Residential Products** | 167,020 | 15,686,115 | 1.0000 | 15,686,115 | 0.680 | 10,666,558 |
| **Home Works** | 13,926 | 3,817,037 | 1.0000 | 3,817,037 | 1.000 | 3,817,037 |
| **Energy Smart** | 300 | 1,248,219 | 1.0000 | 1,248,219 | 1.000 | 1,248,219 |
| **Residential Comprehensive** | | | | | | |
| Home Energy Checkup - LI | 1,099 | 1,708,426 | 1.0000 | 1,708,426 | 0.980 | 1,674,257 |
| Home Energy Checkup | 1,333 | 1,835,567 | 0.9944 | 1,825,288 | 0.980 | 1,788,782 |
| Refrigerator Recycling | 6,880 | 7,444,920 | 1.0000 | 7,444,920 | 0.549 | 4,087,261 |
| Cooling | 665 | 555,122 | 1.0020 | 556,232 | 0.663 | 368,782 |
| **Easy Savings** | 4,672 | 2,685,739 | 1.0000 | 2,685,739 | 1.000 | 2,685,739 |
| **New Home Construction** | 1,402 | 1,625,284 | 1.0000 | 1,625,284 | 0.730 | 1,186,457 |
| **Residential Behavioral HER** | 219,518 | 5,303,515 | 0.5497 | 2,915,218 | 1.000 | 2,915,218 |
| **Commercial Behavioral SEM** | 5 | 1,890,070 | 0.7155 | 1,352,397 | 1.000 | 1,352,397 |
| **Peak Saver** | 157 | 233,765 | 0.6670 | 155,922 | 1.000 | 155,922 |
| **Power Saver** | 60,716 | 518,110 | 0.7065 | 366,031 | 1.000 | 366,031 |
| **Total** | **1,905,057** | **127,449,371** | | **123,732,063** | | **96,109,150** |

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## Table 3: PY2022 Savings Summary - kW

| Program | # of Projects | Expected Gross kW Savings | Engineering Adjustment Factor | Realized Gross kW Savings | NTG Ratio | Realized Net kW Savings |
|---|---|---|---|---|---|---|
| **Commercial Comprehensive** | | | | | | |
| Retrofit Rebate | 145 | 2,596 | 0.9813 | 2,547 | 0.842 | 2,145 |
| New Construction | 50 | 1,417 | 1.1847 | 1,679 | 0.842 | 1,413 |
| Quick Saver | 198 | 1,315 | 0.8293 | 1,090 | 1.000 | 1,090 |
| Multifamily | 55 | 387 | 0.7260 | 281 | 0.842 | 237 |
| Building Tune-Up | 7 | | 1.0000 | | 0.842 | |
| Midstream | 4 | 32 | 2.0335 | 65 | 0.842 | 55 |
| **Residential Lighting** | 1,426,905 | 7,963 | 1.0000 | 7,963 | 0.680 | 5,415 |
| **Residential Products** | 167,020 | 2,891 | 1.0000 | 2,891 | 0.680 | 1,966 |
| **Home Works** | 13,926 | 161 | 1.0000 | 161 | 1.000 | 161 |
| **Energy Smart** | 300 | 64 | 1.0000 | 64 | 1.000 | 64 |
| **Residential Comprehensive** | | | | | | |
| Home Energy Checkup – LI | 1,099 | 198 | 1.0000 | 198 | 0.980 | 194 |
| Home Energy Checkup | 1,333 | 180 | 0.9707 | 175 | 0.980 | 171 |
| Refrigerator Recycling | 6,880 | 1,728 | 1.0000 | 1,728 | 0.549 | 949 |
| Cooling | 665 | 245 | 1.0148 | 249 | 0.663 | 165 |
| **Easy Savings** | 4,672 | 244 | 1.0000 | 244 | 1.000 | 244 |
| **New Home Construction** | 1,402 | 435 | 1.0000 | 435 | 0.730 | 318 |
| **Residential Behavioral HER** | 219,518 | | | | 1.000 | |
| **Commercial Behavioral SEM** | 5 | | | | 1.000 | |
| **Peak Saver** | 157 | 26,831 | 0.5758 | 15,449 | 1.000 | 15,449 |
| **Power Saver** | 60,716 | 49,480 | 0.7326 | 36,250 | 1.000 | 36,250 |
| **Total** | **1,905,057** | **96,167** | | **71,470** | | **66,286** |

Beginning in 2021, the impact evaluation moved to applying new NTG ratios prospectively in future years, rather than retrospectively as had been done in prior years. For the PY2021 evaluation, the only updates to the NTG ratios occurred with the Commercial Comprehensive program, and these new ratios are being applied to the PY2022 results. For that program, the ratios changed from 0.861 to 0.842 for all sub-programs except the direct install Quick Saver, which will continue to use an NTG ratio of 1.000. Additionally, for PY2022, the Residential Lighting NTG is being applied to the Residential Products portion of the program. The Residential Products portion of the program will be evaluated in PY2023 and a new NTG ratio will be calculated.

Table 4 summarizes the updates to the NTG ratios for PY2023, with the updated values shaded in green.

**Table 4: Net-to-Gross Ratio Updates for PY2023**

| Program | PY2022 NTG Ratio | PY2023 NTG Ratio |
|---|---|---|
| **Commercial Comprehensive** | | |
| Retrofit Rebate | 0.842 | 0.626 |
| New Construction | 0.842 | 0.763 |
| Quick Saver | 1.000 | 1.000 |
| Multifamily | 0.842 | 0.763 |
| Building Tune-Up | 0.842 | 0.763 |
| Midstream | 0.842 | 0.763 |
| **Residential Lighting** | 0.680 | 0.510 |
| **Residential Products** | 0.680 | TBD |
| **Home Works** | 1.000 | 1.000 |
| **Energy Smart** | 1.000 | 1.000 |
| **Residential Comprehensive** | | |
| Home Energy Checkup | 0.980 | 0.978 |
| Refrigerator Recycling | 0.549 | 0.630 |
| Cooling | 0.663 | 0.626 |
| **Easy Savings** | 1.000 | 1.000 |
| **New Home Construction** | 0.730 | 0.730 |

| | | |
|---|---|---|
| **Residential Behavioral HER** | 1.000 | 1.000 |
| **Commercial Behavioral SEM** | 1.000 | 1.000 |
| **Peak Saver** | 1.000 | 1.000 |
| **Power Saver** | 1.000 | 1.000 |

Lifetime kWh savings are shown in Table 5 by program and for the portfolio overall. This includes expected gross, realized gross, and realized net kWh lifetime savings. Based on the data collection and analysis conducted for this evaluation, the evaluation team found that, overall, PNM is operating high-quality programs that are achieving significant energy and demand savings and producing satisfied participants.

**Table 5: PY2022 Savings Summary – Lifetime kWh**

| Program | Expected Gross kWh Lifetime Savings | Realized Gross kWh Lifetime Savings | Realized Net kWh Lifetime Savings |
|---|---|---|---|
| **Commercial Comprehensive** | | | |
| Retrofit Rebate | 198,401,599 | 198,034,687 | 166,745,207 |
| New Construction | 126,198,215 | 115,172,374 | 96,975,139 |
| Quick Saver | 70,057,234 | 79,636,894 | 79,636,894 |
| Multifamily | 36,171,482 | 30,085,897 | 25,332,325 |
| Building Tune-Up | 4,547,082 | 4,547,082 | 3,828,643 |
| Midstream | 3,291,236 | 5,336,101 | 4,492,997 |
| **Residential Lighting** | 830,276,332 | 830,276,332 | 564,587,906 |
| **Residential Products** | 207,948,693 | 207,948,693 | 141,405,111 |
| **Home Works** | 42,640,998 | 42,640,998 | 42,640,998 |
| **Energy Smart** | 20,159,473 | 20,159,473 | 20,159,473 |
| **Residential Comprehensive** | | | |
| Home Energy Checkup – LI | 15,290,413 | 15,290,413 | 14,984,604 |
| Home Energy Checkup | 16,428,325 | 16,336,326 | 16,009,600 |
| Refrigerator Recycling | 36,606,964 | 36,606,964 | 20,097,223 |
| Cooling | 8,287,707 | 8,304,283 | 5,505,739 |

| | | | |
|---|---|---|---|
| **Easy Savings** | 35,451,755 | 35,451,755 | 35,451,755 |
| **New Home Construction** | 28,120,252 | 28,120,252 | 20,527,784 |
| **Residential Behavioral HER** | 5,303,515 | 2,915,218 | 2,915,218 |
| **Commercial Behavioral SEM** | 5,670,210 | 4,057,191 | 4,057,191 |
| **Peak Saver** | 233,765 | 155,921 | 155,921 |
| **Power Saver** | 518,110 | 366,031 | 366,031 |
| **Total** | **1,691,603,361** | **1,681,442,885** | **1,265,875,759** |

Using net realized savings from this evaluation and cost information provided by PNM, the evaluation team calculated the ratio of benefits to costs for each of PNM's programs and for the portfolio overall. The evaluation team calculated cost effectiveness using the UCT, which compares the benefits and costs to the utility or program administrator implementing the program.[3] The evaluation team conducted this test in a manner consistent with the California Energy Efficiency Policy Manual.[4]

The results of the UCT are shown below in Table 6. Overall, the portfolio had a UCT of 1.77 for PY2022 and therefore was cost effective.

**Table 6: PY2022 Cost Effectiveness**

| Program | Utility Cost Test (UCT) |
|---|---|
| Res Comp – Refrigerator Recycling | 0.62 |
| Res Comp – Home Energy Checkup | 0.41 |
| Res Comp – Home Energy Checkup LI | 0.46 |
| Res Comp – Residential Cooling | 0.47 |
| Residential Behavioral HER | 0.06 |
| Residential Lighting | 5.35 |
| Residential Products | 3.58 |
| Commercial Comprehensive | 1.45 |

[3] The Utility Cost Test is sometimes referred to as the Program Administrator Cost Test, or PACT.
[4] California Public Utilities Commission. 2013. *Energy Efficiency Policy Manual, Version 5*. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf

| | |
|---|---|
| Commercial Comprehensive - Multifamily | 0.67 |
| Easy Savings | 2.66 |
| Energy Smart (MFA) | 0.74 |
| New Home Construction | 1.34 |
| PNM Home Works | 1.28 |
| Commercial Behavioral SEM | 0.17 |
| PNM Power Saver | 1.08 |
| PNM Peak Saver | 1.09 |
| **Overall Portfolio** | **1.77** |

The impact evaluation—which included engineering desk reviews and site visits for a sample of Commercial Comprehensive projects, a review of deemed savings values for the other programs — resulted in engineering adjustment factor rates greater than 1.000 for realized gross savings, particularly for kWh. Adjustments to savings based on the Commercial Comprehensive desk reviews were primarily due to several factors: incomplete project documentation where savings calculations did not match up with the NM TRM, adjustments to operating hour and interactive effects factor assumptions for lighting projects and differences in HVAC baseline parameters.

The process evaluation activities included customer surveys and a small number of interviews with contractors for both the Residential Comprehensive and Commercial Comprehensive programs. Across all these surveys and interviews, we found very high levels of satisfaction with PNM's PY2022 programs.

# 1 Commercial Comprehensive Program

## 1.1 Commercial Comprehensive Gross Impacts

To verify gross savings estimates, the evaluation team conducted engineering desk reviews for a sample of the projects in the Commercial Comprehensive program completed in 2022. The goal of the desk reviews was to verify equipment installation, operational parameters, and estimated savings.

Both prescriptive and custom projects received desk reviews that included the following:

1. Review of project description, documentation, specifications, and tracking system data;
2. Confirmation of installation using invoices and/or post-installation reports; and
3. Review of post-installation reports detailing differences between installed equipment and documentation, and subsequent adjustments made by the program implementer.

For projects in the Commercial Comprehensive program that used deemed savings values for prescriptive measures, the engineering desk reviews included the following:

- Review of measures available in the New Mexico TRM and the PNM work papers to determine the most appropriate algorithms which apply to the installed measure;
- Recreation of savings calculations using TRM/work paper algorithms and inputs as documented by submitted specifications, invoices, and post-installation inspection reports; and
- Review of TRM/work paper algorithms to identify candidates for future updates and improvements.

For the custom projects included in the Commercial Comprehensive program, the engineering desk reviews included the following:

1. Review of engineering analyses for technical soundness, proper baselines, and appropriate approaches for the specific applications;
2. Review of methods of determining demand (capacity) savings to ensure they are consistent with program and/or utility methods for determining peak load/savings;
3. Review of input data for appropriate baseline specifications and variables such as weather data, bin hours, and total annual hours to determine if they are consistent with facility operation; and
4. Consideration and review for interactive effects between affected systems.

In support of the engineering desk reviews, primary data were collected for select projects through on-site verification. The evaluation team visited sites to confirm the installation of efficiency measures and operational parameters. Reviewing engineers contacted selected participants by phone and email to schedule appointments to come on-site and confirm installation of incentivized equipment and verify operational parameters integral to the calculation of estimated savings. The evaluation team also performed verification by requesting additional project-specific information from PNM and its implementers when clarification was needed and performing internet searches to confirm calculation parameters (e.g., operating hours). A total of eight site visits were completed for high impact and high uncertainty projects, and no major issues were identified during these visits. Moreover, positive feedback was provided by the participants in regard to the performance of the incentivized equipment and the program as a whole.

The *ex ante* 2022 impacts are summarized in Table 7 for each Commercial Comprehensive sub-program, with the Retrofit Rebate and New Construction sub-programs accounting for most of the savings. In total, the Retrofit Rebate sub-program accounted for 15 percent of the energy impacts in PNM's overall portfolio.

**Table 7: Commercial Comprehensive Savings Summary**

| Sub-Program | # of Projects | Expected Gross kWh Savings | Expected Gross kW Savings |
|---|---|---|---|
| Retrofit Rebate | 145 | 18,717,132 | 2,596 |
| New Construction | 50 | 11,905,492 | 1,417 |
| Quick Saver | 198 | 6,609,173 | 1,315 |
| Multifamily | 55 | 3,412,404 | 387 |
| Building Tune-Up | 7 | 428,970 | - |
| Midstream | 4 | 310,494 | 32 |
| **Total** | **459** | **41,383,665** | **5,746** |

The majority of the gross impact evaluation activities were devoted to engineering desk reviews for a sample of projects. For the desk reviews, the sample frame included projects in the Commercial Comprehensive program. The evaluation team reviewed projects in the Retrofit Rebate, Multifamily, New Construction, Direct Install (Quick Saver), Building Tune-Up, and Midstream sub-programs. The sample for the Retrofit Rebate sub-program was stratified to cover a range of different measure types so that no single measure (often lighting) would dominate the desk reviews. The sample was also stratified based on total energy savings within each sub-program. In some cases, very large projects were assigned to a certainty stratum and were automatically added to the sample (rather than randomly assigned). This allowed for the largest projects to be included in the desk reviews and maximized the amount of savings covered in the sample. Overall, the sampling strategy ensured that a mix of projects in terms of both project size and measure type would be included in the desk reviews.

The final sample design is shown in Table 8. The resulting sample achieved a relative precision of 90/3.3 for the Commercial Comprehensive program overall, with precision ranging from 80/<1 to 80/22 for the individual sub-programs.

**Table 8: Commercial Comprehensive Desk Review Sample**

| Sub-Program | Measure Group | Stratum | Count | Average kWh | Total kWh Savings | % of Savings | Current Sample |
|---|---|---|---|---|---|---|---|
| Retrofit Rebate | Custom | Certainty | 2 | 928,982 | 1,857,963 | 4% | 2 |
| | | 1 | 3 | 328,426 | 985,279 | 2% | 2 |
| | | 2 | 7 | 104,811 | 733,674 | 2% | 4 |
| | HVAC | Certainty | 1 | 367,045 | 367,045 | 1% | 1 |
| | | 1 | 4 | 74,782 | 299,127 | 1% | 3 |
| | | 2 | 13 | 14,501 | 188,511 | <1% | 2 |
| | Lighting | Certainty | 3 | 1,400,559 | 4,201,678 | 10% | 3 |
| | | 1 | 8 | 410,979 | 3,287,829 | 8% | 2 |
| | | 2 | 31 | 126,289 | 3,914,961 | 9% | 2 |
| | | 3 | 65 | 29,273 | 1,902,725 | 5% | 2 |
| | Other | Certainty | 1 | 27,390 | 27,390 | <1% | 1 |
| Quick Saver | | 1 | 4 | 319,205 | 1,276,821 | 3% | 3 |
| | | 2 | 22 | 107,275 | 2,360,055 | 6% | 6 |
| | | 3 | 48 | 36,977 | 1,774,915 | 4% | 4 |
| | | 4 | 124 | 9,656 | 1,197,390 | 3% | 3 |
| Building Tune-Up | | Certainty | 1 | 950,950 | 950,950 | 2% | 1 |
| | | 1 | 7 | 61,281 | 428,970 | 1% | 3 |
| Midstream | | Certainty | 4 | 77,624 | 310,495 | 1% | 4 |
| Multifamily | | 1 | 3 | 375,000 | 1,125,000 | 3% | 2 |

| Sub-Program | Measure Group | Stratum | Count | Average kWh | Total kWh Savings | % of Savings | Current Sample |
|---|---|---|---|---|---|---|---|
| | | 2 | 5 | 188,513 | 942,564 | 2% | 2 |
| | | 3 | 13 | 70,919 | 921,951 | 2% | 5 |
| | | 4 | 29 | 14,582 | 422,891 | 1% | 3 |
| New Construction | | Certainty | 5 | 1,762,767 | 8,813,835 | 21% | 5 |
| | | 1 | 45 | 68,703 | 3,091,656 | 7% | 7 |
| **Total** | | | **448** | **327,354** | **41,383,675** | **100%** | **72** |

The gross realized impacts for the Commercial Comprehensive program were determined by performing engineering desk reviews and site visits on the sample of projects. For prescriptive projects, the evaluation team found multiple measures that existed in both the New Mexico TRM and the PNM Workpapers, and the savings calculation approaches sometimes differed across sources. In these cases, we examined both sources but defaulted to the methodology and algorithm inputs in the NM TRM and ASHRAE 90.1-2016. Some of the other incentivized measures existed only in the PNM Workpapers, and in these cases, the algorithms were reviewed for accuracy and adjusted as necessary to calculate realized energy and demand savings. We also deferred to non-prescriptive values (e.g., custom lighting hours of use) assumed in the project files when possible, checking the values for reasonableness by corroborating with sources such as the TRM and posted business hours.

For custom projects, the *ex ante* savings calculations were recreated when possible (i.e., simple spreadsheet calculations). For more complex analyses (whole building energy simulations), the evaluation team audited the approaches taken and inputs used. When applicable, approaches and assumptions used in custom analyses were compared to those contained in the TRM.

Table 9 and Table 10 show the results of the desk reviews and how the resulting engineering adjustments were used to calculated realized savings. For the Commercial Comprehensive program overall, these adjustments resulted in an engineering adjustment factor of 0.9867 for kWh and 0.9855 for kW.

**Table 9: PY2022 Commercial Comprehensive Gross kWh Impact Summary**

| Sub-Program | # of Projects | Expected Gross kWh Savings | Engineering Adjustment Factor | Realized Gross kWh Savings |
|---|---|---|---|---|
| Retrofit Rebate | 145 | 18,717,132 | 0.9982 | 18,682,518 |
| New Construction | 50 | 11,905,492 | 0.9126 | 10,865,318 |
| Quick Saver | 198 | 6,609,173 | 1.1367 | 7,512,915 |
| Multifamily | 55 | 3,412,404 | 0.8318 | 2,838,292 |
| Building Tune-Up | 7 | 428,970 | 1.0000 | 428,970 |
| Midstream | 4 | 310,494 | 1.6213 | 503,406 |
| **Total** | **459** | **41,383,665** | **0.9867** | **40,831,418** |

**Table 10: PY2022 Commercial Comprehensive Gross kW Impact Summary**

| Sub-Program | # of Projects | Expected Gross kW Savings | Engineering Adjustment Factor | Realized Gross kW Savings |
|---|---|---|---|---|
| Retrofit Rebate | 145 | 2,596 | 0.9813 | 2,547 |
| New Construction | 50 | 1,417 | 1.1847 | 1,679 |
| Quick Saver | 198 | 1,315 | 0.8293 | 1,090 |
| Multifamily | 55 | 387 | 0.7260 | 281 |
| Building Tune-Up | 7 | - | 1.0000 | |
| Midstream | 4 | 32 | 2.0335 | 65 |
| **Total** | **459** | **5,746** | **0.9855** | **5,663** |

A summary of the individual desk review findings for each of the 72 projects is included in Appendix H.

## 1.2 Commercial Comprehensive Net Impacts

The evaluation team estimated net impacts for some programs using the self-report approach. This method uses responses to a series of carefully constructed survey questions to learn what participants would have done in the absence of the utility's program. The goal is to ask enough questions to paint an adequate picture of the influence of the program activities (rebates and other program assistance) within the confines of what can reasonably be asked during a phone survey.

With the self-report approach, specific questions that are explored include the following:

1. What were the circumstances under which the customer decided to implement the project (i.e., new construction, retrofit/early replacement, replace-on-burnout)?
2. To what extent did the program accelerate installation of high efficiency measures?
3. What were the primary influences on the customer's decision to purchase and install the high efficiency equipment?
4. How important was the program rebate on the decision to choose high efficiency equipment?
5. How would the project have changed if the rebate had not been available (e.g., would less efficient equipment have been installed, would the project have been delayed)?
6. Were there other program or utility interactions that affected the decision to choose high efficiency equipment (e.g., was there an energy audit done, has the customer participated before, is there an established relationship with a utility account representative, was the installation contractor trained by the program)?

The method used for estimating free ridership (and ultimately the net-to-gross [NTG] ratio) using the self-report approach is based on the 2017 Illinois Statewide Technical Reference Manual (TRM).[5] For the PNM programs, questions regarding free ridership were divided into several primary components:

- A ***Program Component*** series of questions that asked about the influence of specific program activities (rebate, customer account rep, contractor recommendations, other assistance offered) on the decision to install energy efficient equipment;
- A ***Program Influence*** question, where the respondent was asked directly to provide a rating of how influential the overall program was on their decision to install high efficiency equipment, and
- A ***No-Program Component*** series of questions, based on the participant's intention to carry out the energy-efficient project without program funds or due to influences outside of the program.

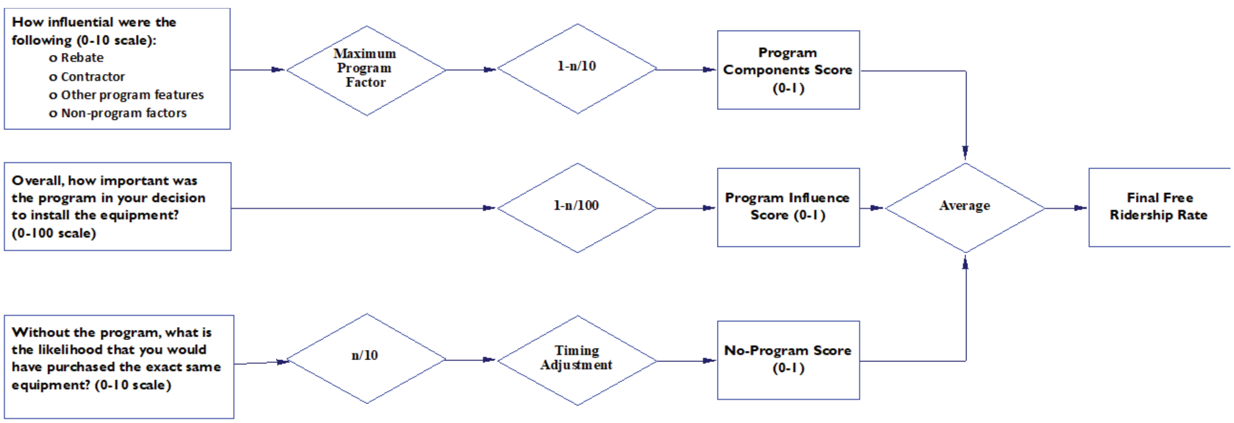
Each component was assessed using survey responses that rated the influence of various factors on the respondent's equipment choice. Since opposing biases potentially affect the main components, the No-Program Component typically indicates higher free ridership than the Program Component/Influence questions. Therefore, combining these opposing influences helps mitigate the potential biases. This framework also relies on multiple questions that are

[5] The full Illinois TRM can be found at http://www.ilsag.info/il_trm_version_6.html

crosschecked with other questions for consistency. This prevents any single survey question from having an excessive influence on the overall free ridership score.

Figure 1 provides a simplified version of the scoring algorithm. In some cases, multiple questions were asked to assess the levels of efficiency and purchase timing in absence of the program. For each of the scoring components, the question responses were scored so that they were consistent and resulted in values between 0 and 1. Once this was accomplished, the three question components were averaged to obtain the final free ridership score.

**Figure 1: Self-Report Free Ridership Scoring Algorithm**




**Source:** Adapted by Evergreen Economics from the 2017 Illinois TRM.

More detail on each of the three question tracks is provided below.

## *Program Component Questions*

The ***Program Component*** battery of questions was designed to capture the influence of the program on the equipment choice. These questions were also designed to be as comprehensive as possible so that all possible channels through which the program is attempting to reach the customer were included.

The type of questions included in the Program Component question battery included the following:

- How influential were the following on your decision to purchase your energy efficient equipment?
  - Rebate amount
  - Contractor recommendation
  - Utility advertising/promotions
  - Technical assistance from the utility (e.g., energy audit)

- Recommendation from utility customer representative (or program implementer)
- Previous participation in a utility efficiency program

As shown at the top of Figure 1, the question with the highest value response (i.e., the program factor that had the greatest influence on the decision to install a high efficiency measure) was the one that was used in the scoring algorithm as the Program Component score.

## *Program Influence Question*

A separate ***Program Influence*** question asked the respondent directly to rate the combined influence of the various program activities on their decision to install energy efficient equipment. This question allowed the respondent to consider the program as a whole and incorporated other forms of assistance (if applicable) in addition to the rebate. Respondents were also asked about potential non-program factors (condition of existing equipment, corporate policies, maintenance schedule, etc.) to put the program in context with other potential influences.

The Program Influence question also provided a consistency check so that the stated importance of various program factors could be compared across questions. If there appeared to be inconsistent answers across questions (rebate was listed as very important in response to one question but not important in response to a different question, for example), then the interviewer asked follow-up questions to confirm responses. The verbatim responses were recorded and were reviewed by the evaluation team as an additional check on the free ridership results.

## *No-Program Component Questions*

A separate battery of ***No-Program Component*** questions was designed to understand what the customer might have done if the PNM rebate program had not been available. With these questions, we attempted to measure how much of the decision to purchase the energy efficient equipment was due to factors that were unrelated to the rebate program or other forms of assistance offered by PNM.

The types of questions asked for the No-Program Component included the following:

- If the program had not existed, would you have
- Purchased the exact same equipment?
- Chosen the same energy efficiency level?
- Delayed your equipment purchase?
- Did you become aware of the utility rebate program before or after you chose your energy efficient equipment?

The question regarding the timing of awareness of the rebate was used in conjunction with the importance rating the respondent provided in response to the earlier questions. If the respondent had already selected the high efficiency equipment prior to learning about the rebate and said that the rebate was the most important factor, then a downward adjustment was made on the influence of the rebate in calculating the Program Component score.

The responses from the No-Program Component questions were analyzed and combined with a timing adjustment to calculate the No-Program score, as shown in Figure 1. The timing adjustment was made based on whether or not the respondent would have delayed their equipment purchase if the rebate had not been available. If the purchase would have been delayed by one year or more, then the No-Program Component score was set to zero, thereby minimizing the level of free ridership for this algorithm component only.

### *Free Ridership and NTG Calculation*

The values from the Program Component score, the Program Influence score, and the No-Program Component score were averaged in the final free ridership calculation; the averaging helped reduce potential biases from any particular set of responses. The fact that each component relied on multiple questions (instead of a single question) also reduced the risk of response bias. As discussed above, additional survey questions were asked about the relative importance of the program and non-program factors. These responses were used as a consistency check, which further minimized potential bias.

Once the self-report algorithm was used to calculate free ridership, the total NTG ratio was calculated using the following formula:

$$\textit{Net-to-Gross Ratio} = (1 - \textit{Free Ridership Rate})$$

Beginning in 2021, any updates to program NTG ratios will be applied prospectively. As a result, the new NTG ratios for Commercial Comprehensive developed in the PY2022 evaluation will be used beginning in PY2023. The realized net impacts discussed below are calculated using the existing NTG ratios from PY2021.

## 1.3 Realized Gross and Net Impacts

The final step in the impact evaluation process is to calculate the realized gross and net savings, based on the program-level analysis described above. The **Gross Realized Savings** are calculated by taking the original *ex ante* savings values from the participant tracking databases and adjusting them using an **Installation Adjustment** factor (based on the count of installed measures verified through the phone surveys) and an **Engineering Adjustment** factor (based on the engineering analysis, desk reviews, etc.):

$$\begin{aligned}&\textbf{Gross Realized Savings} = \\&\textbf{(}\textbf{\textit{Ex Ante}}\textbf{ Savings)*(Installation Adjustment)*(Engineering Adjustment Factor)}\end{aligned}$$

Net Realized Savings are then determined by multiplying the Gross Realized Savings by the NTG ratio:

$$\textbf{Net Realized Savings} = \textbf{(Net-to-Gross Ratio)*(Gross Realized Savings)}$$

Net impacts for the Commercial Comprehensive program were calculated using NTG ratios from the participant phone survey or *ex ante* values, depending on the sub-program. For the Retrofit Rebate sub-program, the NTG ratio was developed using the self-report method and participant phone survey data from the PY2021 evaluation.

The resulting NTG ratio is 0.842. While the survey sample was mostly Retrofit Rebate customers, there were also a few customers from the New Construction and Multifamily sub-programs, and so the same NTG ratio was applied to these programs, as well as to the Building Tune-Up sub-program. This resulted in an increase in the NTG ratio for these latter three sub-programs relative to their original *ex ante* values. For the Quick Saver sub-program, an NTG ratio of 1.00 was applied, due to the direct install design of this sub-program.

Table 11 and Table 12 summarize the PY2022 net impacts for the Commercial Comprehensive program using the existing NTG ratios from PY2021. Net realized savings for the program overall are 35,567,095 kWh, and net realized demand savings are 4,940 kW.

**Table 11: PY2022 Commercial Comprehensive Net kWh Impact Summary**

| Sub-Program | # of Projects | Realized Gross kWh Savings | NTG Ratio | Realized Net kWh Savings |
|---|---|---|---|---|
| Retrofit Rebate | 145 | 18,682,518 | 0.842 | 15,730,680 |
| New Construction | 50 | 10,865,318 | 0.842 | 9,148,598 |
| Quick Saver | 198 | 7,512,915 | 1.000 | 7,512,915 |
| Multifamily | 55 | 2,838,292 | 0.842 | 2,389,842 |
| Building Tune-Up | 7 | 428,970 | 0.842 | 361,193 |
| Midstream | 4 | 503,406 | 0.842 | 423,868 |
| **Total** | **459** | **40,831,418** | | **35,567,095** |

**Table 12: PY2022 Commercial Comprehensive Net kW Impact Summary**

| Sub-Program | # of Projects | Realized Gross kW Savings | NTG Ratio | Realized Net kW Savings |
|---|---|---|---|---|
| Retrofit Rebate | 145 | 2,547 | 0.842 | 2,145 |
| New Construction | 50 | 1,679 | 0.842 | 1,413 |
| Quick Saver | 198 | 1,090 | 1.000 | 1,090 |
| Multifamily | 55 | 281 | 0.842 | 237 |
| Building Tune-Up | 7 | | 0.842 | |
| Midstream | 4 | 65 | 0.842 | 55 |
| **Total** | **459** | **5,663** | | **4,940** |

Table 13 shows how the Commercial Comprehensive NTG ratios will be updated for PY2023 based on the PY2022 evaluation results. The decrease in the PY2023 NTG ratios is due to a few large customers who would have installed the measures without the program (i.e., free riders). To reduce the impact of these large free riders, the evaluation team took an average of the PY2022 and PY2023 NTG ratios, resulting in a NTG ratio of 0.626 for Retrofit Rebates and 0.763 for the remaining sub-programs. The Quick Saver sub-program is direct install and gets an NTG ratio of 1.000.

**Table 13: NTG Ratio Updates for PY2023**

| Sub-Program | PY2022 NTG Ratio | PY2023 NTG Ratio |
|---|---|---|
| Retrofit Rebate | 0.842 | 0.626 |
| New Construction | 0.842 | 0.763 |
| Quick Saver | 1.000 | 1.000 |
| Multifamily | 0.842 | 0.763 |
| Building Tune-Up | 0.842 | 0.763 |
| Midstream | 0.842 | 0.763 |

## 1.4 Commercial Comprehensive Cost Effectiveness

The evaluation team calculated cost effectiveness using the Utility Cost Test (UCT) for the Commercial Comprehensive program, with the test calculations based on those prescribed in the California Energy Efficiency Policy Manual.[6]

In the UCT, the benefits of a program are considered to be the present value of the net energy saved, and the costs are the present value of the program's administrative costs plus incentives paid to customers. To perform the cost effectiveness analysis, the evaluation team obtained the following from PNM:

- Avoided cost of energy for Energy Efficiency and Demand Response (costs per kWh over a 20+ year time horizon);
- Avoided cost of capacity for Energy Efficiency and Demand Response (estimated cost of adding a kW/year of generation, transmission, and distribution to the system);
- Avoided cost of CO2 (estimated monetary cost of CO2 per kWh generated);
- Avoided transmission and distribution costs;
- Discount rate;
- Line loss factor; and
- Program costs (all expenditures associated with program delivery).

For the Commercial Comprehensive program, the program-weighted average effective useful life values were provided by PNM, calculated by dividing lifetime savings by annual savings. The evaluation team performed a spot check of measure-specific effective useful life values to confirm reasonableness and alignment with the TRM when applicable. The final net energy savings values estimated from the PY2022 impact evaluation for Commercial Comprehensive were used in the final cost effectiveness calculations.

For the 2022 Commercial Comprehensive program, the UCT value was 1.36.

## 1.5 Quick Saver and Retrofit Rebate Participant Surveys

A respondent phone survey was fielded in early 2023 for participants in the Retrofit Rebate and Quick Saver sub-programs of the Commercial Comprehensive program.

Table 14 shows the distribution of completed surveys for the two sub-programs.

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[6] California Public Utilities Commission. 2013. *Energy Efficiency Policy Manual, Version 5*. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf

**Table 14: Commercial Comprehensive Phone Survey Sample**

| Sub-Program | Count of Customers with Valid Contact Info | Target # of Completes | Completed Surveys |
|---|---|---|---|
| Quick Saver | 125 | 50 | 50 |
| Retrofit Rebate | 146 | 50 | 51 |
| **Total** | **271** | **100** | **101** |

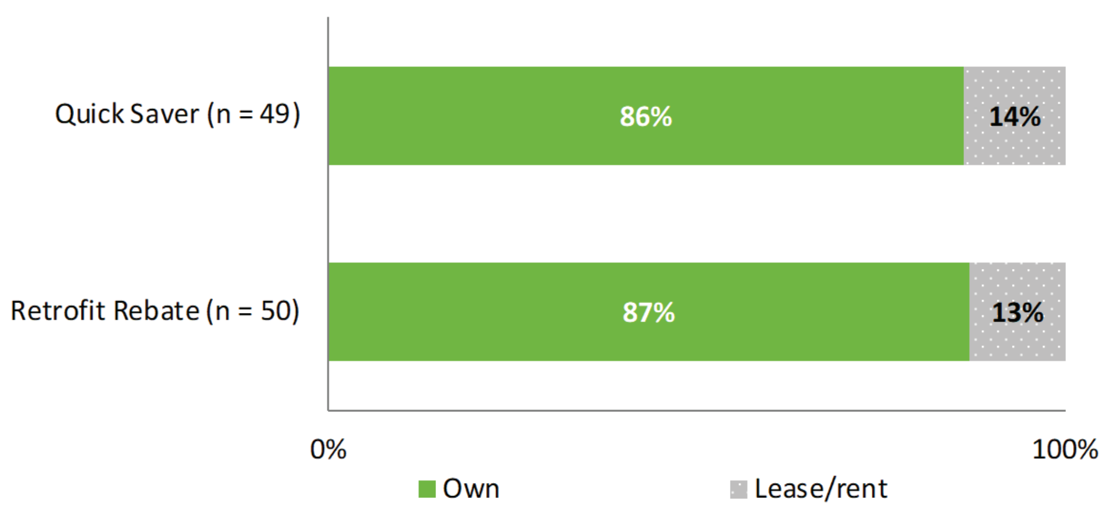
The following sections report results on company demographics, sources of program awareness, motivations for participation, and program satisfaction.

Throughout the analysis described here, we present the survey results as weighted percentages based on the proportion of savings represented by survey respondents relative to the total savings of all program respondents.

## 1.5.1 Company Demographics

We asked survey respondents whether their company owns or leases the building where the project was completed. Figure 2 shows that 86 percent of Quick Saver sub-program respondents and 87 percent of Retrofit Rebate sub-program respondents owned their building.

**Figure 2: Quick Saver and Retrofit Rebate Respondent Own or Rent**




The following two figures summarize the survey respondents' building and employee size by whether they participated in the Quick Saver or Retrofit Rebate sub-programs.

Figure 3 and Figure 4 show that respondents participating in the Quick Saver sub-program tend to report small to midsized building sizes and small number of employees. Most respondents (86%) participating in the Quick Saver sub-program had buildings that were smaller than 50,000 square feet, while 88 percent of them had less than 100 full-time employees. Comparatively, the respondents participating in the Retrofit Rebate sub-program reported similarly sized buildings, with well over half of the respondent firms (61%) occupying buildings that were smaller than 50,000 square feet. In addition, 51 percent of Retrofit Rebate respondents reported having more than 100 full-time employees.

**Figure 3: Quick Saver and Retrofit Rebate Respondent Building Size**

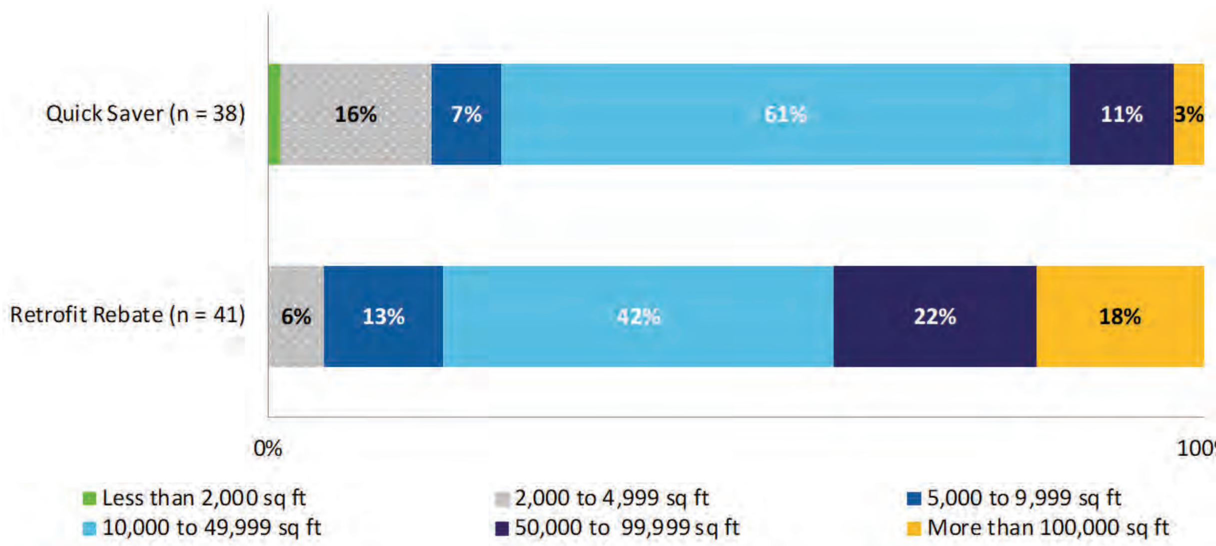



**Figure 4: Quick Saver and Retrofit Rebate Respondent Number of Employees**

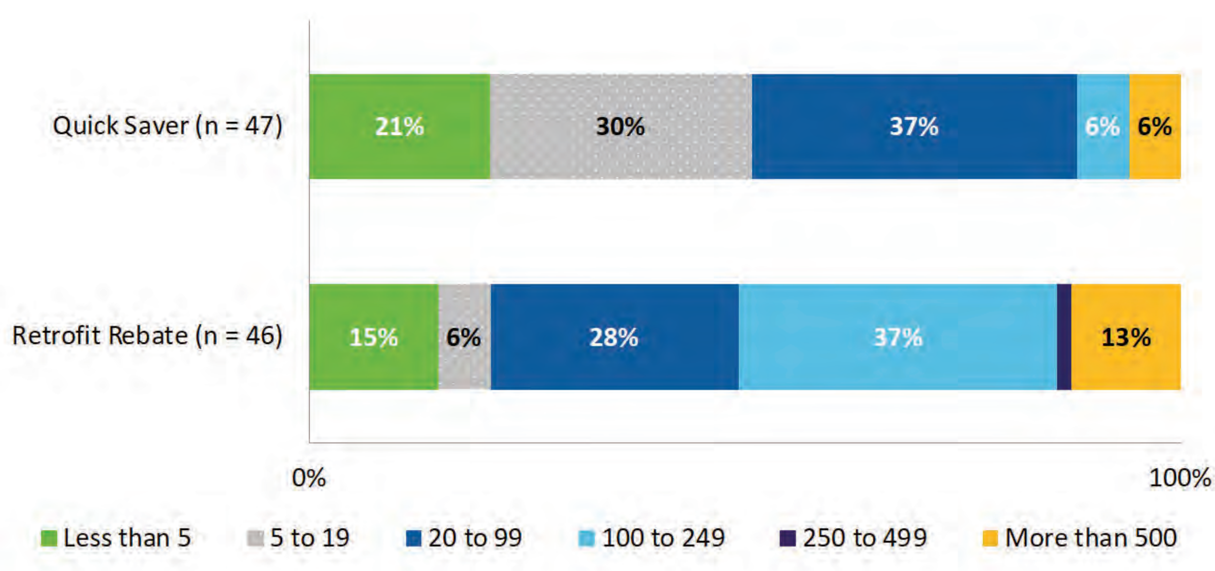
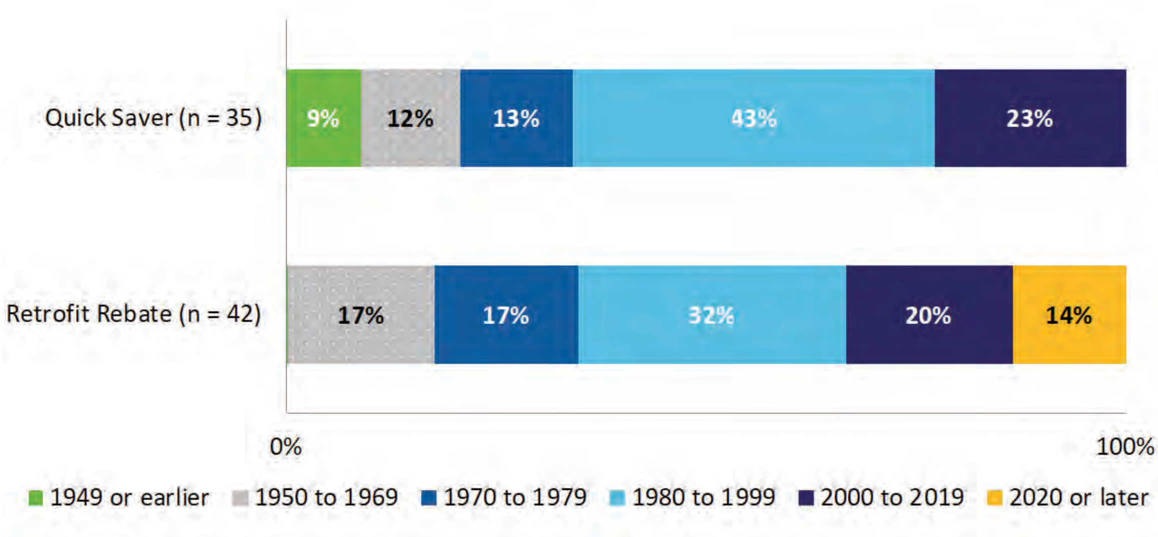


Figure 5 shows that respondent buildings of the Quick Saver sub-program tend to be older than those of the Retrofit Rebate sub-program. Quick Saver respondents reported about a quarter (23%) with buildings built in 2000 or later, while Retrofit Rebate respondents reported that a third (34%) were built in 2000 or later.

**Figure 5: Quick Saver and Retrofit Respondent Building Age**

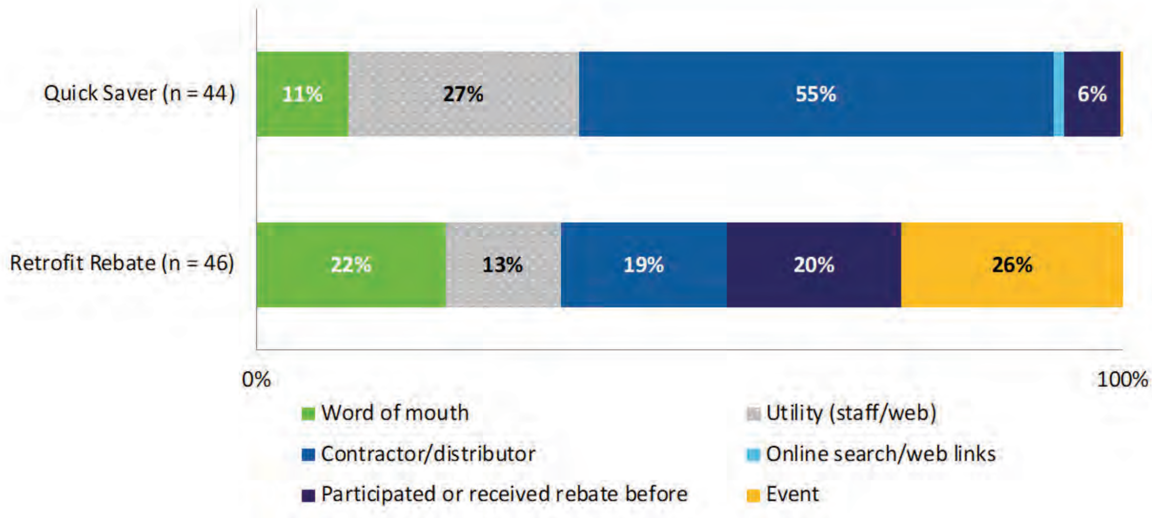



### 1.5.2 Sources of Awareness

Both Quick Saver and Retrofit Rebate sub-program respondents became aware of the program rebates/assistance through a variety of ways, such as from contractors/distributors, online web searches, and previous participation in a PNM rebate program.

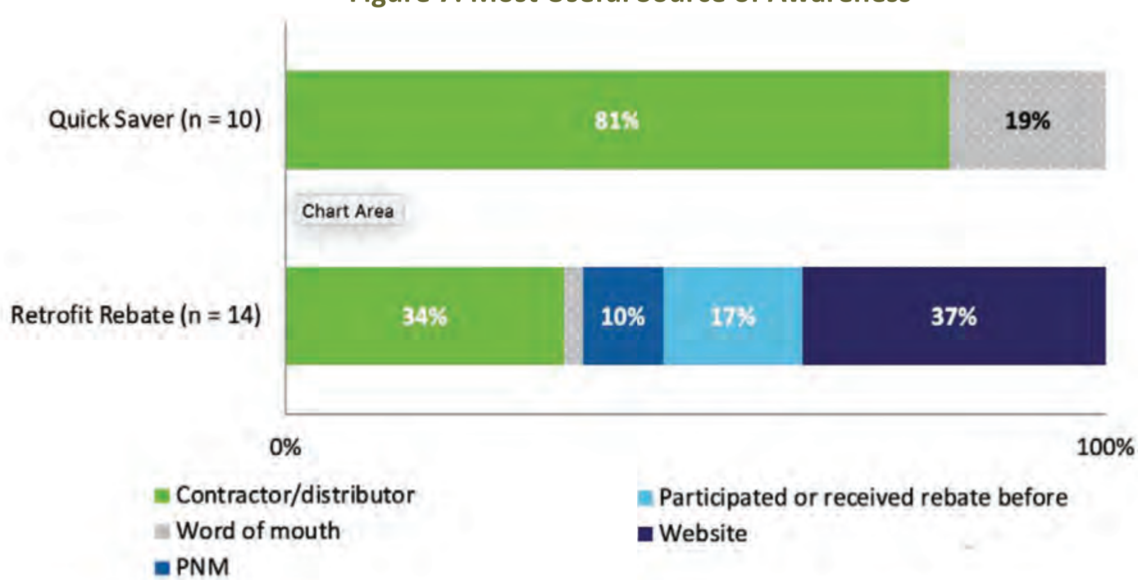
As shown in Figure 6, the majority of Quick Saver sub-program respondents initially learned of the program through contractors or distributors (55%), while the most frequently reported Retrofit Rebate source was learning about the program at an event (26%). Event sources included conferences, seminars, or workshops.

**Figure 6: Initial Source of Awareness**




Respondents were then asked to identify the most helpful source in helping them to decide whether to participate in the program (Figure 7). The majority of the Quick Saver sub-program respondents found their contractor/distributor to be the most helpful source (81%). Retrofit Rebate sub-program respondents found the website to be the most helpful source (37%), with their contractor/distributor also influencing about a third (34%) of respondents.

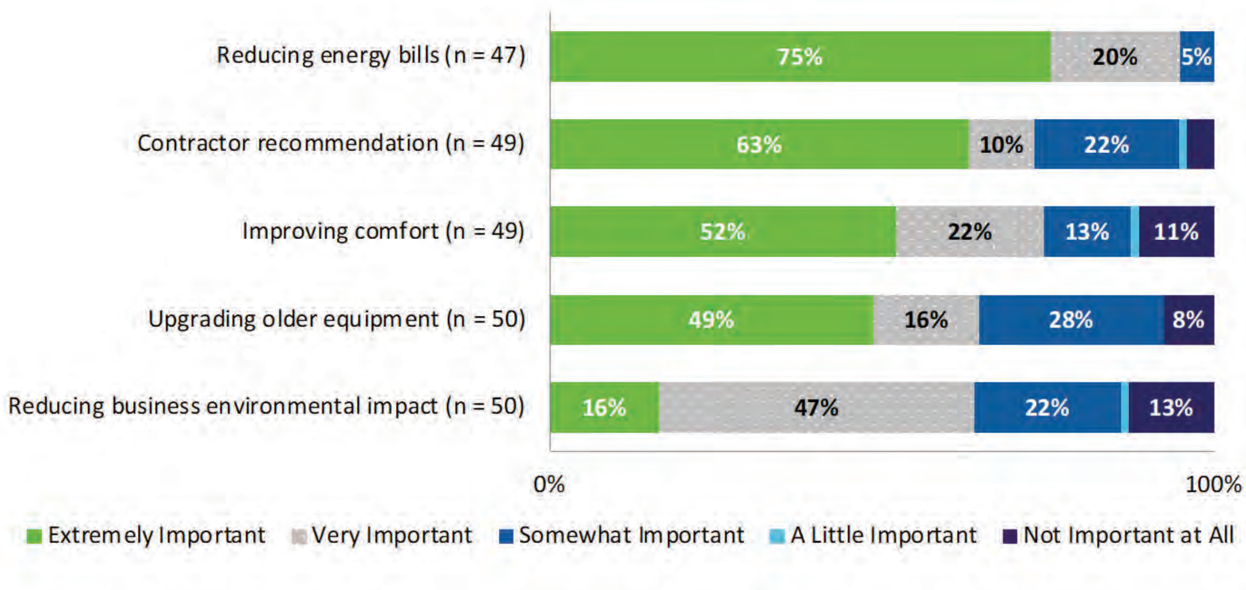
**Figure 7: Most Useful Source of Awareness**



### 1.5.3 Motivations for Participation

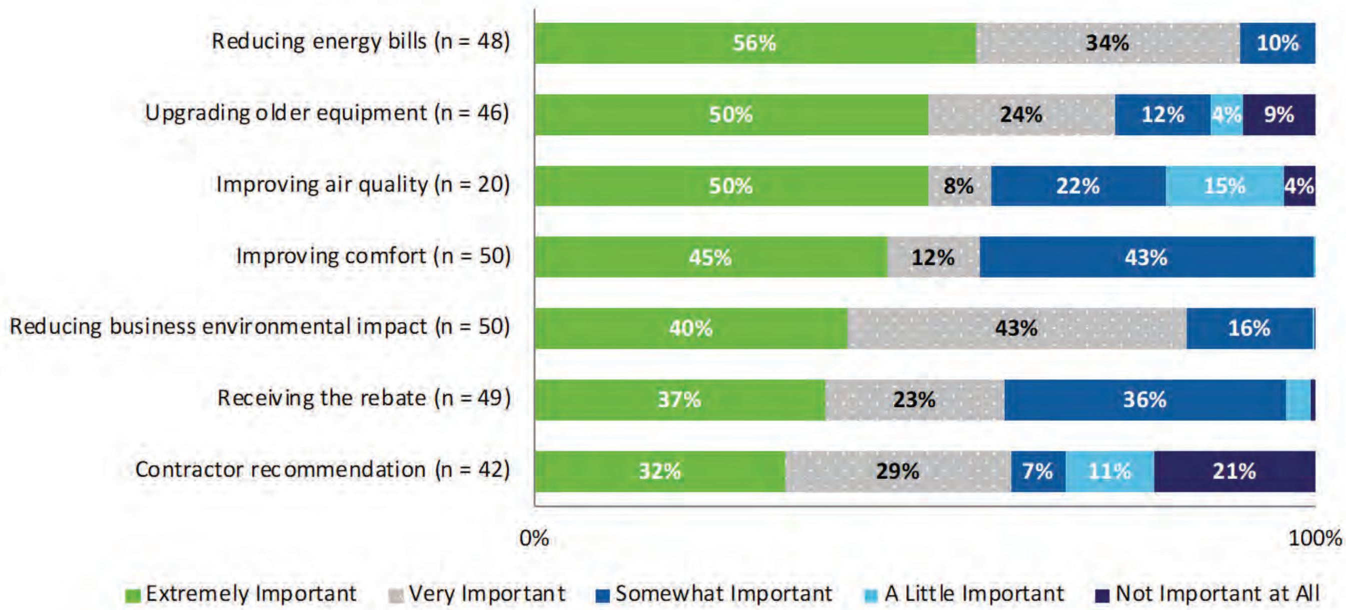
Figure 8 and Figure 9 show the level of importance placed on a variety of factors that might be influencing participation. For Quick Saver respondents, reducing energy bills was the most influential factor, with three-quarters (75%) of individuals indicating it was extremely important in their decision to participate. Other motivating factors were contractor recommendation (63%) and improving comfort of the business (52%).

**Figure 8: Quick Saver Motivations for Participation**




Retrofit Rebate sub-program respondents reported that reducing energy bills, upgrading older equipment, and improving air quality were most important for determining participation in the program, with 56 percent, 50 percent, and 50 percent of respondents selecting the factors as extremely important, respectively.

**Figure 9: Retrofit Rebate Motivations for Participation**




In addition to motivations for purchasing, Retrofit Rebate sub-program respondents were given a list of potential program and non-program factors that may have influenced their decision about how energy efficient their equipment would be. They were then asked to rate each factor's importance on a 1 to 10-point scale.[7] As shown in Figure 10, recommendation from a contractor and the contractor who performed the work were rated as most important, with 72 percent and 53 percent reported as extremely important, respectively.

[7] On the 0- to 10-point scale, 0 indicated "not at all important" and 10 indicated "extremely important".

**Figure 10: Retrofit Rebate Importance of Program Factors**

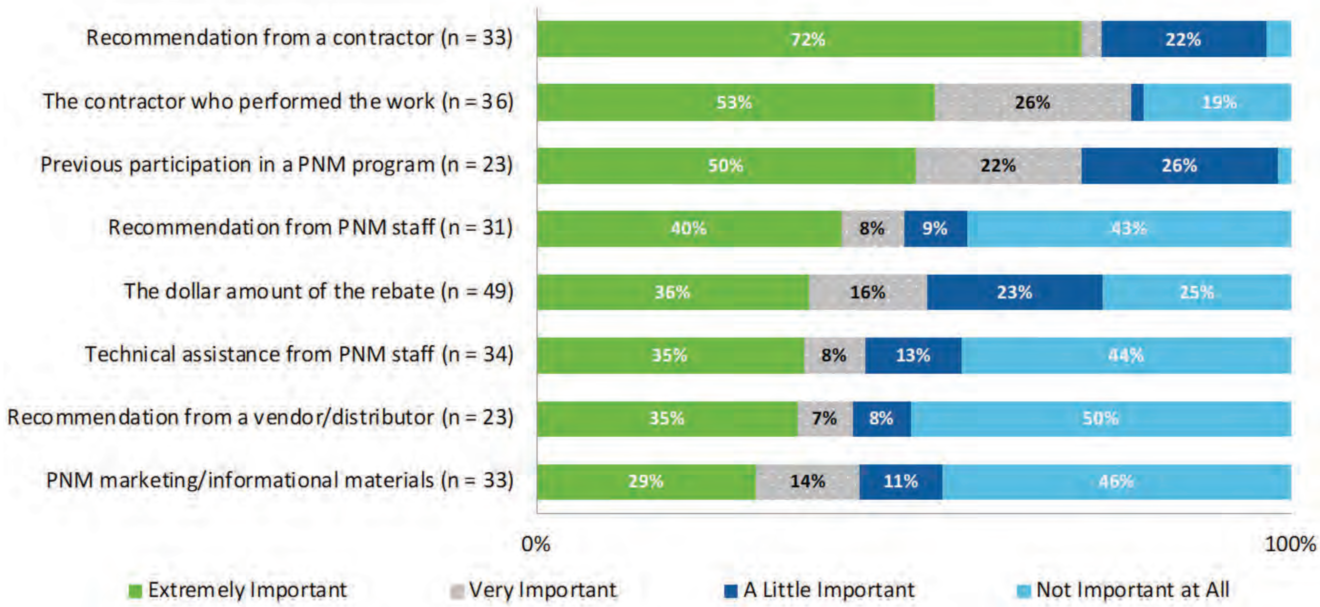
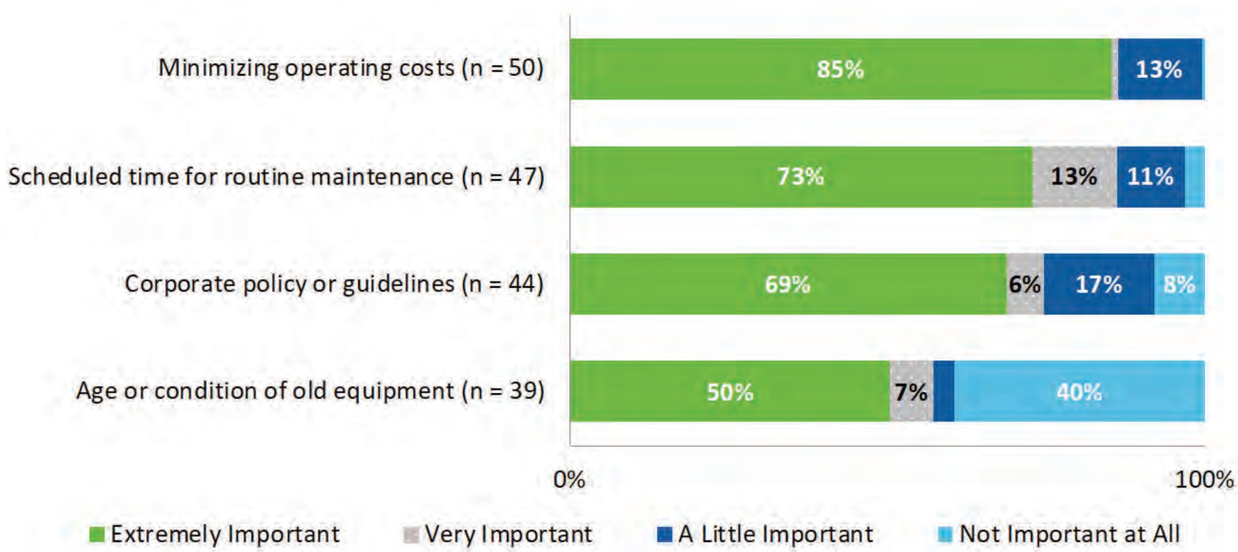



Figure 11 shows that most Retrofit Rebate sub-program respondents rated minimizing operating costs and scheduled time for routine maintenance as the most influential non-program factors in the decision regarding efficiency level of the equipment, with 85 percent and 73 percent of respondents reporting extremely important, respectively. The age or condition of old equipment was reported as the least influential non-program factor, with 40 percent of respondents reporting that it was not important at all.

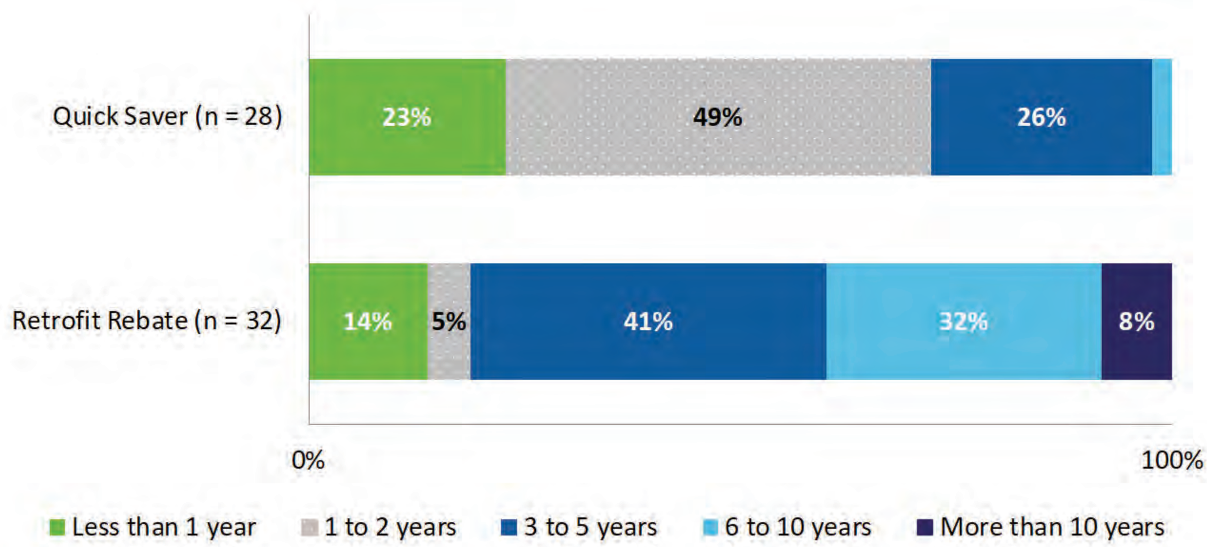
**Figure 11: Retrofit Rebate Importance of Non-Program Factors**



Respondents were asked approximately how much longer their equipment would have lasted if it had not been replaced.

Figure 12 shows that most Quick Saver sub-program respondents reported that their equipment would last two years or less without needing replacement (72%). The program may be targeting customers with dysfunctional equipment, who may be planning to replace their equipment soon (i.e., free riders). Conversely, most Retrofit Rebate respondents estimated that their equipment would last at least three or more years without needing replacement (81%). This suggests that the Retrofit Rebate sub-program is doing a good job at targeting customers with functioning equipment, rather than those whose equipment is not working (potential free riders).

**Figure 12: Remaining Life of Equipment**




### 1.5.4 Respondent Satisfaction

The respondents evaluated their satisfaction with various components of the Quick Saver and Retrofit Rebate sub-programs on the following scale: very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, and very dissatisfied. The individual components that respondents were asked to rank their satisfaction with included:

- PNM as an energy provider
- The rebate program overall
- The equipment installed through the program
- The contractor who installed the equipment
- Overall quality of the equipment installation
- The time it took to receive the rebate
- The dollar amount of the rebate

- Interactions with PNM
- The overall value of the equipment for the price they paid
- The time and effort required to participate
- The project application process

As seen in Figure 13 and Figure 14, respondents from both the Quick Saver sub-program and Retrofit Rebate sub-program generally expressed high levels of satisfaction, with well over two-thirds of respondents reporting that they were very satisfied with each factor.

Quick Saver respondents reported being most satisfied with the overall value of the equipment for the price paid and the equipment installed through the program (94% and 87% reported being very satisfied, respectively). Retrofit Rebate respondents were most satisfied with the rebate program overall and the overall value of the equipment for the price paid, (97% and 96% reported being very satisfied, respectively).

**Figure 13: Quick Saver Sub-Program Satisfaction**

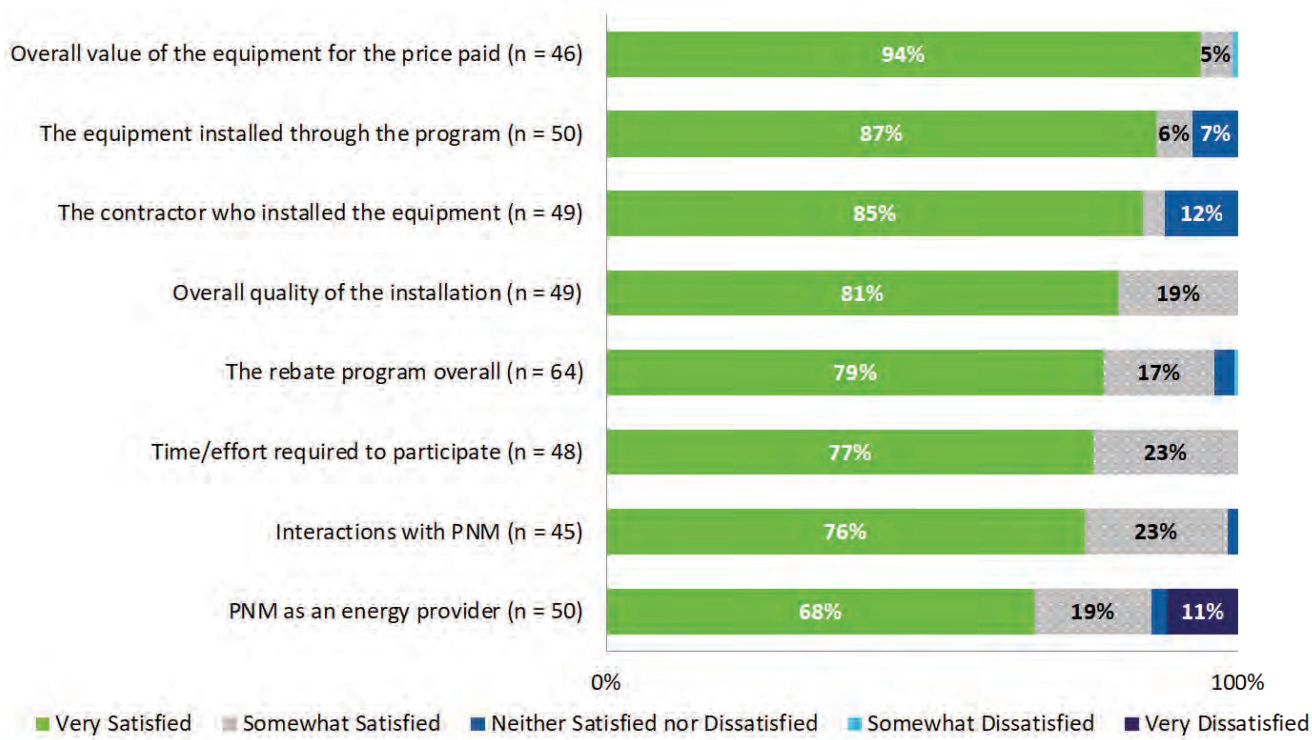
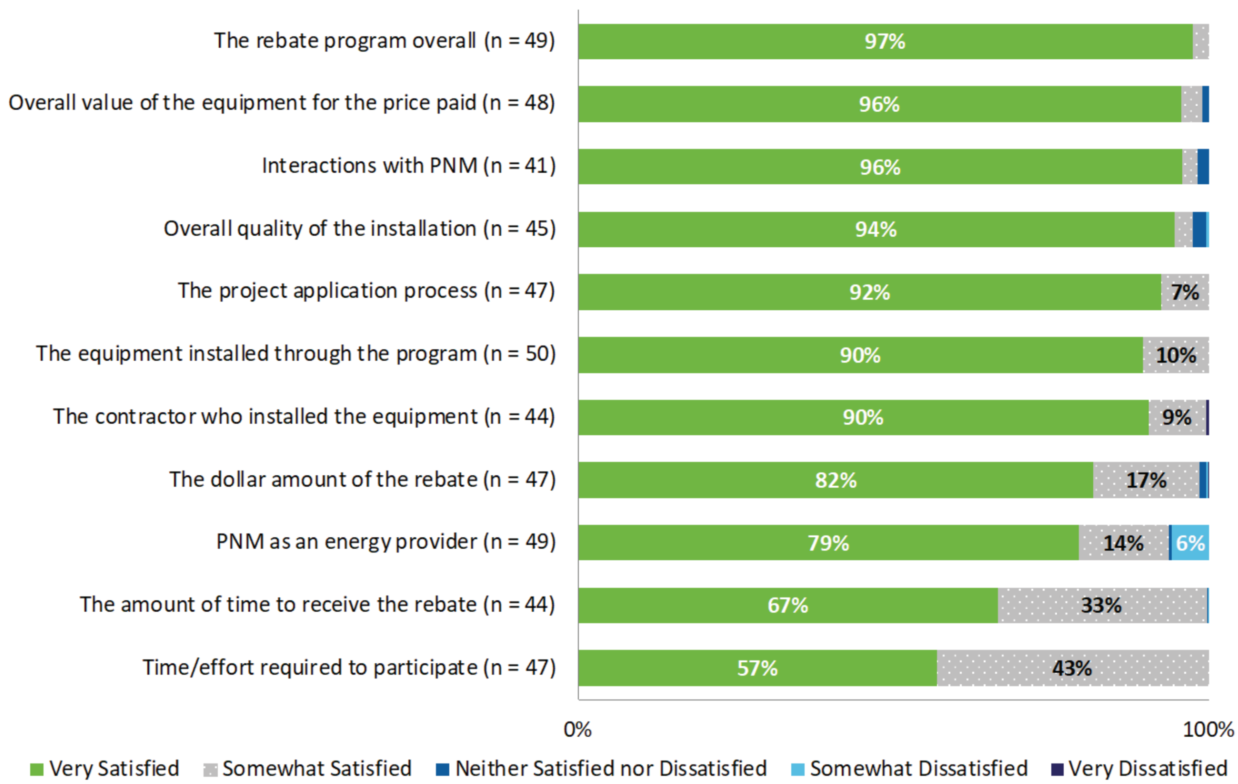


**Figure 14: Retrofit Rebate Sub-Program Satisfaction**




Overall respondent satisfaction for the Quick Saver sub-program is lower in PY2022 than it was in PY2021. While 95 percent of Quick Saver sub-program respondents reported being very satisfied in PY2021 across all factors, in PY2022, the average percent of those who reported being very satisfied across all factors was 81 percent. Notably, in PY2021, 98 percent of Quick Saver sub-program respondents reported that they were very satisfied with interactions with PNM, while in PY2022, 76 percent reported being very satisfied with this factor.

This pattern of decreased satisfaction is seen among the Retrofit Rebate sub-program respondents as well. While 95 percent of Retrofit Rebate sub-program respondents reported being very satisfied in PY2021 across all factors, in PY2022, the average percent of those who reported being very satisfied across all factors was 85 percent. In particular, in PY2021, 98 percent of Retrofit Rebate respondents reported that they were very satisfied with the amount of time and effort required to participate, while in PY2022, only 57 percent reported being very satisfied with this factor.

## 1.6 Commercial Comprehensive Contractor Interviews

The evaluation team conducted seven interviews with contractors who participated in the Commercial Comprehensive program in PY2022. The interviews lasted for about 25 minutes. The following topics were discussed:

- Contractor background and program involvement,
- Role and influence of the PNM program in the market, and
- Program satisfaction.

Due to the low number of interviews and depth of discussion, this section presents results qualitatively to show the range of perceptions and responses.

### 1.6.1 Contractor Background and Program Involvement

The interviewed participants varied regarding the scope of their work and geographic reach of their businesses. Most respondents were contractors from small, self-started companies, while some shared that their companies and clientele were more established. Though they noted different specialties and niches, overall, the contractors shared that their primary services were electrical with a focus on commercial service work.

Most contractors were familiar with utility energy efficiency programs prior to the 2022 program year. Respondents were asked to share when they first learned about and got involved with the commercial rebate program. A few of the participants were involved in the program from its inception. Others learned about the program from friends, family, or past employers. One participant realized that the program was applicable to their work and clientele on their own.

The contractors' overall knowledge of the rebate process across respondents suggests that the PNM region has an established community of contractors who share opportunities with one another.

### 1.6.2 PNM Program Reach

Many of the interviewed contractors reported that the majority of their customers who apply within PNM territory end up qualifying for a rebate. Some contractors attribute this high rate to selection bias—the contractors are familiar enough with the rebate process to only recommend potentially qualifying jobs to apply. This is indicative of contractors understanding the market and how and when the PNM Commercial Comprehensive program can meet client needs. Of the customers who reported lower rates of projects qualifying for rebates, the reason is that the PNM program is not yet central to their work; the rebate program and applicable jobs make up a smaller proportion of their work. This is due to the contractors being new to the program or servicing more residential than commercial projects.

Some contractors felt that PNM could market the program to commercial businesses to expand opportunities for contractors. Other contractors advocated for the opposite, sharing concerns that marketing could draw too many contractors to the program and inadvertently result in lower quality rebate services in the area.

Contractors identified certain customer segments that are not reached as well as others. One contractor stated that property managers (such as those that oversee strip malls) could be reached more effectively which, in turn, would benefit their residents and bring them cost savings. For example, the contractor explained that property managers of commercial strip malls were not as incentivized to make energy efficient upgrades since electricity is often sub-metered at such locations. Relatedly, other contractors expressed slower adoption among chain restaurants. Another contractor recognized that smaller businesses have lower staffing and slower responses to outreach and would need more personalized or word of mouth marketing to learn about the program. Lastly, one contractor expressed an interest in finding a way to install energy efficient measures at school districts, especially after seeing the cost savings and satisfaction levels of charter schools that recently made upgrades.

### 1.6.3 PNM Program Influence

To better understand the program influence on the market, the evaluation team explored how and when contractors communicate about the PNM rebates with customers and what role they place in contractors' and customers' ultimate choices. The responses suggested that the contractors were proactive with their promotion of the program—most contractors have established a practice of introducing the program as soon as possible during potentially qualifying jobs. All contractors identified themselves as the ones who inform customers of the efficiency opportunities.

Contractors noted that the rebate program greatly influenced customer decision making, especially for customers who perceive cost as a large barrier to upgrading their equipment. Contractors shared that they perceived the overall market demand for energy efficient equipment increasing because of this program; they see energy efficiency upgrades as a market necessity that this program supports. The contractors noted that customers outside of PNM territory are less likely to install efficiency measures as those within PNM territory. They said that this may be attributable to the fact that incentives outside of PNM's service territory are not as attractive as the PNM rebate program. Contractors also said that PNM's paperwork process was more accessible to contractors in comparison to other programs, which may be another reason for less energy efficiency measures outside of the PNM territory.

Most of the contractors shared that the program has influenced what equipment they suggest to a customer, implying that the rebate program encourages more efficient and higher quality products into the market.

### 1.6.4 PNM Program Satisfaction

Contractors themselves tended to rate the Commercial Comprehensive program relatively highly. Interviewed contractors rated the program a 4 or 5 (five responses) on a 5-point scale.[8]

Contractors identified areas of potential improvement or ideas that they hoped PNM would consider. These included:

- ***Establishing direct customer service contacts*** – Contractors expressed a desire for more customer service support. One contractor felt that their lack of a direct customer service contact was the main barrier to more involvement with the program. A different interviewee wished that PNM customer service provided contractors with more leads or information about the market.
- ***Updating or reassessing the contractor Quick Saver Portal*** – We received conflicting feedback on the contractor portal/software aspect of the rebate process. For example, one contractor shared that the portal process has been easy to navigate. Another contractor shared that the inventory software should be more streamlined.
- ***Increasing contractor accountability*** – One contractor felt strongly that PNM ought to hold other contractor work to higher standards. They recommended that PNM consider merit-based models to reward high-performing trade allies. Another contractor echoed this, noting a specific incident where they reviewed a client's Quick Saver upgrades and realized that the contractor who had administered the rebate for the customer in the first place had not installed the most energy efficient products available.
- ***Considering new methods for contractor compensation*** – A couple of the contractors communicated a desire for quicker payments. They both suggested direct deposit payments as opposed to the current processes.

To summarize, most of the contractors were familiar with the program prior to the 2022 program year. Contractors appreciated the reach and influence of the program on the market, noting the impact of incentives on customer behavior and decision making. The contractors had mixed feelings on where to best market the program. Overall, contractors expressed satisfaction with the Commercial Comprehensive program. The contractors shared ideas to improve the program, including a desire for increased customer support.

[8] The evaluation team asked contractors to rate the Commercial Comprehensive program overall on a 5-point scale that ranged from 1 ('very dissatisfied') to 5 ('very satisfied'). A 3 was defined as 'neither satisfied nor dissatisfied', while a 4 indicated the contractor was 'somewhat satisfied'.

## 1.7 Conclusions and Recommendations

Impact evaluation activities for the Commercial Comprehensive program included engineering desk reviews and site visits for a sample of the Retrofit Rebate, Multifamily, New Construction, Direct Install (Quick Saver), Building Tune-Up, Midstream, and AC Tune-Up sub-programs. Based on these desk reviews, an engineering adjustment factor of 1.0025 was found for kWh savings, and 0.9896 was found for kW savings. Conclusions and recommendations resulting from these reviews are discussed below:

Project-specific *ex ante* calculation steps for prescriptive projects and custom Multifamily projects were not always documented in the files available for the evaluation team's review.

- Using inputs from the provided project documents and algorithms from the 2021 PNM Workpapers and the New Mexico TRM resulted in savings different (both higher and lower) than those reported by PNM for multiple projects.
- Without additional documentation of the project-specific calculations performed by PNM, the reasons for differences between *ex ante* and *ex post* savings were not always clear to the evaluation team.
- **Recommendation 1:** Provide documentation of calculation steps made for each project, ensuring that submitted project documentation can be followed to reproduce the reported savings estimates.

The supplied information for the Midstream sub-program did not include any application files, *ex ante* savings calculations, or other documentation. All the program data were supplied in an Excel workbook.

- All Midstream projects were included in a single Excel workbook summary table, where each row represents a different measure. The summary table shows only values (no formulas) for a limited number of parameters related to the facility location, installed equipment, and energy savings.
- **Recommendation 2**: Provide copies of invoices, savings calculations (or an explanation of how the savings values in the Excel summary table are generated), and any other documentation related to equipment involved in the measures for the evaluation teams' review.

The evaluation team was not able to replicate the *ex ante* HVAC savings for several projects throughout the evaluated sub-programs using the supplied project documentation and PNM workpapers.

- Using assumptions, algorithms, baseline values provided in the New Mexico TRM, ASHRAE 90.1 2016, and AHRI documentation on installed HVAC units, the evaluation team calculated *ex post* HVAC savings, which were different (both higher and lower) than those reported by PNM.

- The evaluation team observed the use of Commercial, General as the building type for coincidence factor (CF) selection.
- **Recommendation 3:** Provide algorithm inputs that were used to calculate the *ex ante* savings for the HVAC projects throughout the sub-programs.
- **Recommendation 4:** Utilize the appropriate building type (when it is available) from the New Mexico TRM or PNM workpapers to select CF.

The evaluation team used HVAC interactive factors and coincidence factors for multiple Direct Install (Quick Saver) projects to align with the listed building type for interior light fixtures. The implementation team confirmed that they use a standardized assumption of 1.0 for both the energy and demand interactive efforts factors for Quick Saver projects which deviates from the methodology listed in the NM TRM. This assumption does not account for the interactive effects associated with efficient light fixtures installed in conditioned spaces.

- **Recommendation 5:** Utilize HVAC interactive factors and coincidence factors for interior fixtures to ensure the energy and peak demand savings are accurately calculated, provided the factors are appropriate for the building type when cross-checked with the PNM Workpaper and the NM TRM.

The evaluation team found Direct Install (Quick Saver) projects and Multifamily projects that claimed peak demand savings for exterior light fixtures. These fixtures were installed in unconditioned spaces (exterior) so, the evaluation team set the demand savings for these fixtures to zero.

- **Recommendation 6:** Zero out peak demand savings for exterior light fixtures.

The evaluation team adjusted the baseline fixture wattage for multiple fixtures in various Direct Install (Quick Saver) projects to align with the PNM Workpaper Fixture List.

- **Recommendation 7**: If possible, utilize the baseline fixture nomenclature per the PNM Workpaper Fixture List.

The evaluation team was not able to replicate the *ex ante* savings for the custom LED signage for the Direct Install (Quick Saver) project 19704.

- **Recommendation 8**: Provide *ex ante* calculations for custom projects when the input parameters may deviate from the PNM Workpapers and NM TRM.

The evaluation team modified savings for several projects in the evaluation sample for the New Construction sub-program.

- Several fixtures were either (1) not DLC or Energy Star Certified and/or (2) “not approved” in project submittals. These fixtures were removed from the analysis, which decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. The removal of ineligible and/or unapproved fixtures coupled with the reduction in square footage decreased savings. The NM TRM allows for fixtures not listed on a qualified products list (QPL) to receive approval if results of independent lab testing show the projects comply with the requirements in the most current version of the DLC Technical Requirements.

- **Recommendation 9:** In addition to Interior/Exterior Lighting COMcheck Certificates for all New Construction lighting projects, provide DLC or Energy Star certificates for each fixture. Ensure the DLC or Energy Star reported wattages are used for proposed LPD calculations. Additionally, ensure fixtures that are "not approved" in project submittals are updated accordingly when calculating proposed LPD.
- **Recommendation 10:** For fixtures that are not listed on a QPL but generate savings in projects completed through program, the implementation team should provide independent lab testing results to show that the fixtures comply with the requirements in the most current version of the DLC Technical Requirements.

The evaluation team modified savings for projects containing dehumidifier measures.

- In PNM-22-04638, savings for dehumidifiers were affected by two modifications. The first concerned the Energy Factor$_{EE}$ (EF) for the Quest 225 unit. The algorithm was sourced from *FES- A22 Dehumidification for Indoor Horticultural Facilities*, which requires the EF to be in L/kWh. The *ex ante* calculation used 6.1, which corresponds to the units pints/kWh. Specifications were not provided for this model in the project documentation and as such, manufacturer specifications were sourced online from the Quest website. The Quest specifications stated the EF for a water removal of 225 pints/day is 2.9 L/kWh, which was used in the *ex post* calculation. Second, a CF was applied twice in the *ex ante* calculation. It was first factored into the algorithm from the source *FES- A22 Dehumidification for Indoor Horticultural Facilities*. A second coincidence factor (with the building type "warehouse") was applied in the UCT calculation document. The CF was only applied one time in the *ex post* calculation.
- No *ex ante* calculations were provided for PNM-22-04817 and the evaluation team was not able to replicate savings. As such, the discrepancy in savings cannot be determined.
- **Recommendation 11:** Ensure the correct units are used when calculating savings. Additionally, provide manufacturer specifications for each dehumidifier model.
- **Recommendation 12:** Ensure CFs are not applied more than once.

The evaluation team used HVAC interactive factors for projects containing both LED grow lights and HVAC measures.

- HVAC interactive factors were not considered in any of the LED grow light measures. This assumption is valid when there is no heating or cooling present. The evaluation team was able to ascertain the presence of cooling in projects that also contained HVAC measures.

- **Recommendation 13:** Ensure HVAC interactive factors are used when there is a presence of heating or cooling.

# 2 Residential Comprehensive

PNM's Residential Comprehensive program is made up of three sub-programs: Home Energy Checkup, Residential Cooling, and Refrigerator Recycling. The Home Energy Checkup sub-program includes a home energy assessment and the installation of low-cost measures in addition to available equipment rebates.

The impact evaluation for the Residential Comprehensive program included a deemed savings review and participant survey. The participant survey was also used for the process evaluation that assessed how well the program is operating.

## 2.1 Residential Comprehensive Gross Impacts

The *ex ante* 2022 impacts are summarized in Table 15 for each Residential Comprehensive sub-program. In total, the Residential Comprehensive program accounted for nine percent of energy impacts in PNM's overall portfolio.

**Table 15: Residential Comprehensive Savings Summary**

| Sub-Program | # of Projects | Expected Gross kWh Savings | Expected Gross kW Savings |
|---|---|---|---|
| Home Energy Checkup - LI | 1,099 | 1,708,426 | 198 |
| Home Energy Checkup | 1,333 | 1,835,567 | 180 |
| Refrigerator Recycling | 6,880 | 7,444,920 | 1,728 |
| Cooling | 665 | 555,122 | 245 |
| **Total** | **9,977** | **11,544,035** | **2,351** |

The gross impact evaluation of the Residential Comprehensive program consisted of a deemed savings review of per-unit savings values for each of the three-subprograms. We compared PNM documentation on the source, calculations, and input assumptions of savings values to determine whether they were correct and appropriate.

For the Refrigerator Recycling sub-program, we were able to confirm the source of savings, calculation, and input assumptions for all measures. The engineering adjustment for the Refrigerator Recycling sub-program is 1.00.

For the Home Energy Checkup sub-program, we were able to confirm the source of savings, calculations, and input assumptions for the majority of measures. For measures where we did not have enough information on the input assumptions to replicate the calculations, we confirmed that the per-unit values were within a reasonable range for the type of measure. A slight engineering adjustment was made to account for an adjustment to the air filter with whistle measure kWh and kW savings. The resulting engineering adjustment for the Home Energy Checkup sub-program is 0.9944 for kWh and 0.9707 for kW.

The evaluation team was able to replicate calculations and input assumptions for the majority of the Residential Cooling sub-program measures but in a handful of cases the savings did not line up with the baseline assumptions used. This resulted in an engineering adjustment of 1.0020 for kWh and 1.0148 for kW.

Table 16 and Table 17 show the results of the deemed savings reviews and how the resulting engineering adjustments were used to calculate realized savings. For the Residential Comprehensive program overall, these adjustments resulted in an engineering adjustment factor of 0.9992 for kWh and 0.9996 for kW.

**Table 16: PY2022 Residential Comprehensive Gross kWh Impact Summary**

| Sub-Program | # of Projects | Expected Gross kWh Savings | Engineering Adjustment Factor | Realized Gross kWh Savings |
|---|---|---|---|---|
| Home Energy Checkup - LI | 1,099 | 1,708,426 | 1.0000 | 1,708,426 |
| Home Energy Checkup | 1,333 | 1,835,567 | 0.9944 | 1,825,288 |
| Refrigerator Recycling | 6,880 | 7,444,920 | 1.0000 | 7,444,920 |
| Cooling | 665 | 555,122 | 1.0020 | 556,232 |
| **Total** | **9,977** | **11,544,035** | **0.9992** | **11,534,866** |

**Table 17: PY2022 Residential Comprehensive Gross kW Impact Summary**

| Sub-Program | # of Projects | Expected Gross kW Savings | Engineering Adjustment Factor | Realized Gross kW Savings |
|---|---|---|---|---|
| Home Energy Checkup - LI | 1,099 | 198 | 1.0000 | 198 |
| Home Energy Checkup | 1,333 | 180 | 0.9707 | 175 |
| Refrigerator Recycling | 6,880 | 1,728 | 1.0000 | 1,728 |
| Cooling | 665 | 245 | 1.0148 | 249 |
| **Total** | **9,977** | **2,351** | **0.9996** | **2,350** |

## 2.2 Residential Comprehensive Realized Gross and Net Impacts

Net impacts for the Residential Comprehensive program were calculated using NTG ratios from the participant phone survey, using a similar self-report approach algorithm described above for the Commercial Comprehensive program. Table 18 and Table 19 summarize the PY2022 net impacts for the Residential Comprehensive program using the existing NTG ratios from PY2021. Net realized savings for the program overall are 7,919,082 kWh, and net realized demand savings are 1,479 kW.

**Table 18: PY2022 Residential Comprehensive Net kWh Impact Summary**

| Sub-Program | # of Projects | Realized Gross kWh Savings | NTG Ratio | Realized Net kWh Savings |
|---|---|---|---|---|
| Home Energy Checkup - LI | 1,099 | 1,708,426 | 0.9800 | 1,674,257 |
| Home Energy Checkup | 1,333 | 1,825,288 | 0.9800 | 1,788,782 |
| Refrigerator Recycling | 6,880 | 7,444,920 | 0.5490 | 4,087,261 |
| Cooling | 665 | 556,232 | 0.6630 | 368,782 |
| **Total** | **9,977** | **11,534,866** | | **7,919,082** |

### Table 19: PY2022 Residential Comprehensive Net kW Impact Summary

| Sub-Program | # of Projects | Realized Gross kW Savings | NTG Ratio | Realized Net kW Savings |
|---|---|---|---|---|
| Home Energy Checkup - LI | 1,099 | 198 | 0.9800 | 194 |
| Home Energy Checkup | 1,333 | 175 | 0.9800 | 171 |
| Refrigerator Recycling | 6,880 | 1,728 | 0.5490 | 949 |
| Cooling | 665 | 249 | 0.6630 | 165 |
| **Total** | **9,977** | **2,350** | | **1,479** |

Additionally, using the PY2022 program data provided by PNM, energy savings values were calculated for refrigerators and freezers recycled through the PNM Refrigerator Recycling program from 1955 to 2021. Figure 15 shows the average savings associated with recycled refrigerators and freezers, by year manufactured. The greatest savings are for refrigerators and freezers manufactured in 1990 or earlier. The largest decrease in savings for both refrigerators and freezers occurs between the '1990 or earlier' and '1991-2000' bins, and there is a subsequent leveling out of savings across the remaining year manufactured bins. Overall, savings tend to decrease as the manufactured year increases.

### Figure 15: Average kWh Savings for Refrigerators and Freezers by Year Manufactured

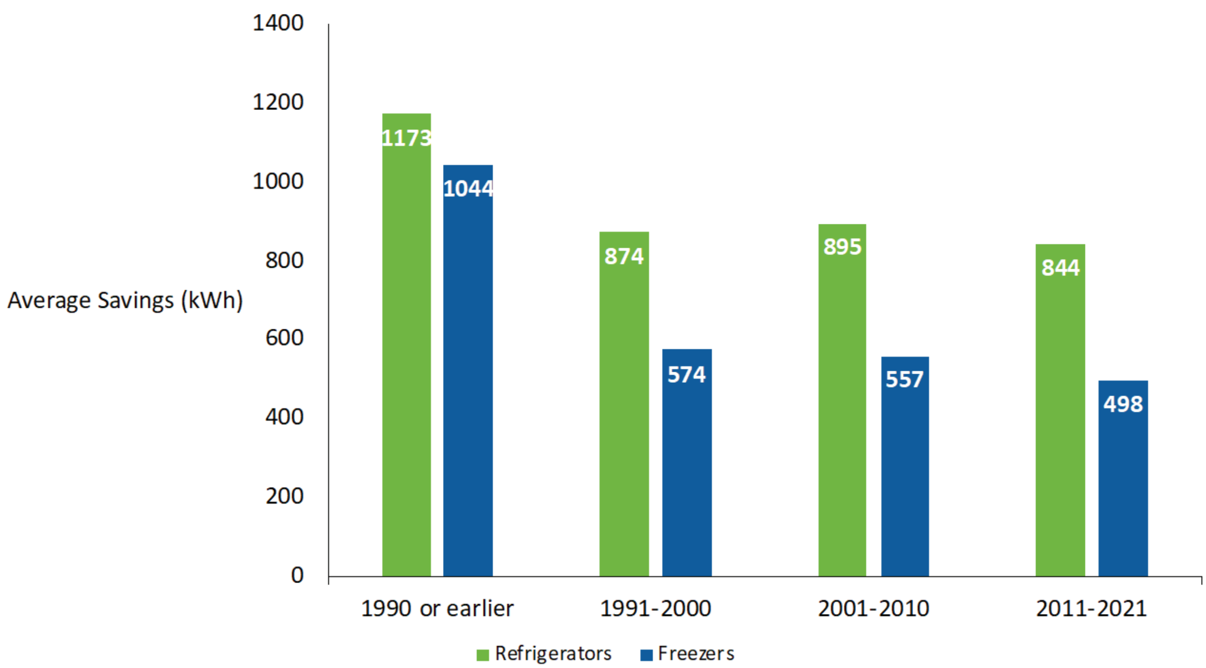


Figure 16 shows the percent of refrigerators and freezers in manufactured year bins. Most of the recycled refrigerators were relatively new, with 61 percent in the 2000 to 2014 time frame. The age distribution for freezers is more widely dispersed.

**Figure 16: Refrigerator and Freezer Frequency by Year Manufactured**

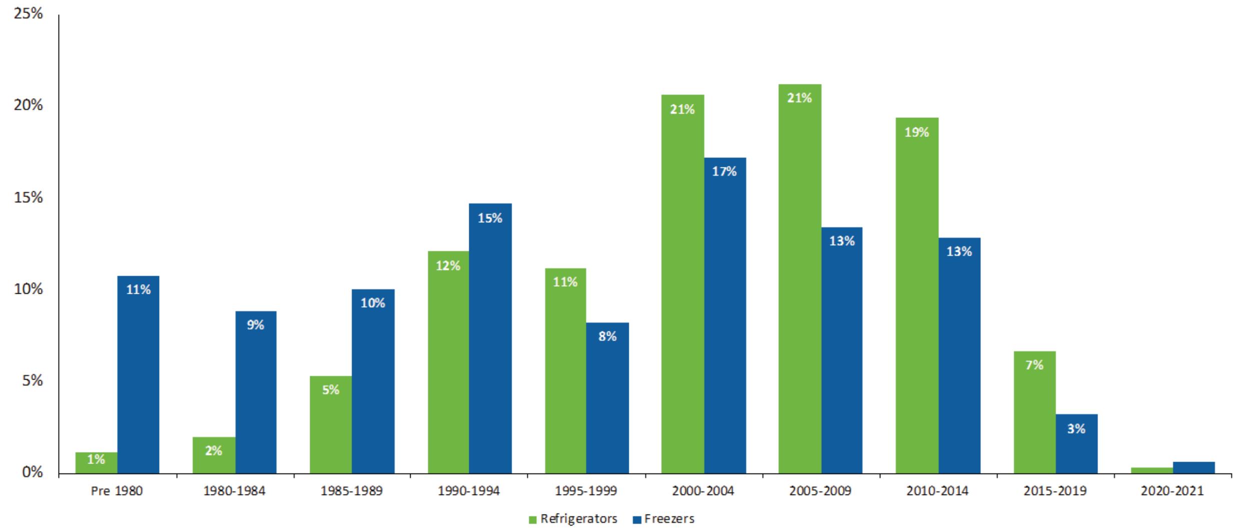



Table 20 shows how the Residential Comprehensive NTG ratios will be updated for PY2023 based on the PY2022 evaluation results.

**Table 20: NTG Ratio Update for PY2023**

| Sub-Program | PY2022 NTG Ratio | PY2023 NTG Ratio |
|---|---|---|
| Home Energy Checkup | 0.980 | 0.978 |
| Cooling | 0.663 | 0.626 |
| Refrigerator Recycling | 0.549 | 0.630 |

## 2.3 Residential Comprehensive Cost Effectiveness

The evaluation team calculated cost effectiveness using the Utility Cost Test (UCT) for the Residential Comprehensive program, with the test calculations based on those prescribed in the California Energy Efficiency Policy Manual.[9]

[9] California Public Utilities Commission. 2013. *Energy Efficiency Policy Manual, Version 5*. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf

In the UCT, the benefits of a program are considered to be the present value of the net energy saved, and the costs are the present value of the program's administrative costs plus incentives paid to customers. To perform the cost effectiveness analysis, the evaluation team obtained the following from PNM:

- Avoided cost of energy for Energy Efficiency and Demand Response (costs per kWh over a 20+ year time horizon);
- Avoided cost of capacity for Energy Efficiency and Demand Response (estimated cost of adding a kW/year of generation, transmission, and distribution to the system);
- Avoided cost of CO2 (estimated monetary cost of CO2 per kWh generated);
- Avoided transmission and distribution costs;
- Discount rate;
- Line loss factor; and
- Program costs (all expenditures associated with program delivery).

For the Residential Comprehensive program, the program-weighted average effective useful life values were provided by PNM, calculated by dividing lifetime savings by annual savings. The evaluation team performed a spot check of measure-specific effective useful life values to confirm reasonableness and alignment with the TRM when applicable. The final net energy savings values estimated from the PY2022 impact evaluation for Residential Comprehensive were used in the final cost effectiveness calculations.

## 2.4 Residential Comprehensive Participant Phone Surveys

As part of the process evaluation, the evaluation team conducted telephone surveys with residential customers who received rebates through the three PNM Residential Comprehensive sub-programs. The surveys were completed in January 2023 and ranged from 15 to 20 minutes in length.

The participant survey was designed to cover the following topics:

- Verifying the installation of measures included in the program tracking database;
- Collecting information on participants' satisfaction with their program experience;
- Survey responses for use in the free ridership calculations;
- Baseline data on energy use and/or equipment holdings;
- Participant drivers/barriers; and
- Additional process evaluation topics.

PNM provided program participation data on the Residential Comprehensive participant projects, which allowed us to select a sample for surveys. The evaluation team randomly selected and recruited program participants based on whether they had valid contact information and received a rebate through the Residential Comprehensive sub-programs.

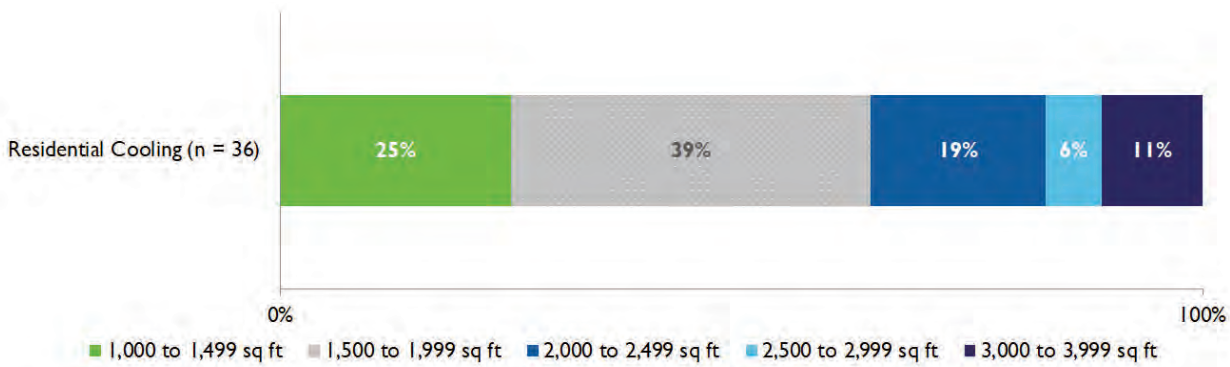
**Table 21: Residential Comprehensive Phone Survey Sample**

| Sub-Program | Count of Customers with Valid Contact Info | Target # of Completes | Completed Surveys |
|---|---|---|---|
| Cooling | 440 | 40 | 40 |
| Refrigerator Recycling | 4,791 | 110 | 110 |
| Home Energy Checkup | 1,727 | 75 | 75 |
| **Total** | **6,958** | **225** | **225** |

## 2.4.1 Residential Cooling Survey Results

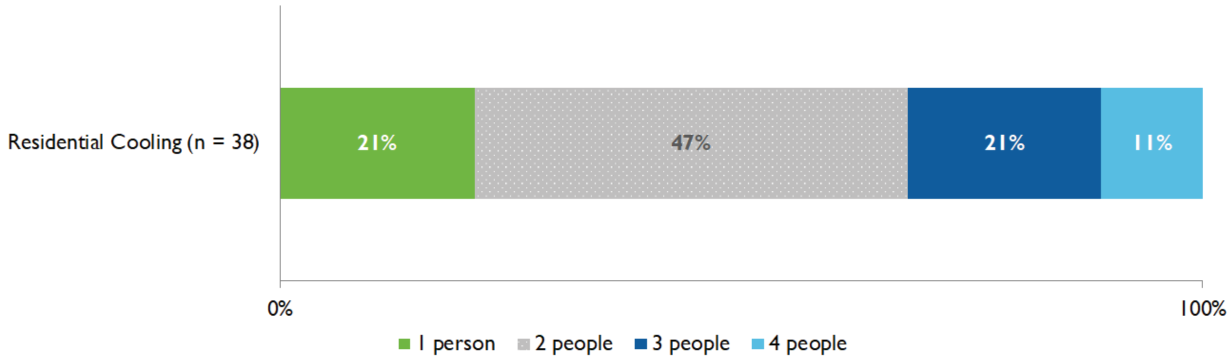
Thirty-nine of the 40 respondents reported owning the homes in which their cooling equipment were installed. The home sizes of respondents tended to be on the smaller side out of the size options provided; as shown in Figure 17, 64 percent of respondents reported home sizes between 1,000 to 1,999 square feet, while 36 percent of respondents reported home sizes between 2,000 to 3,999 square feet.

**Figure 17: Residential Cooling Respondent Home Size (n=36)**



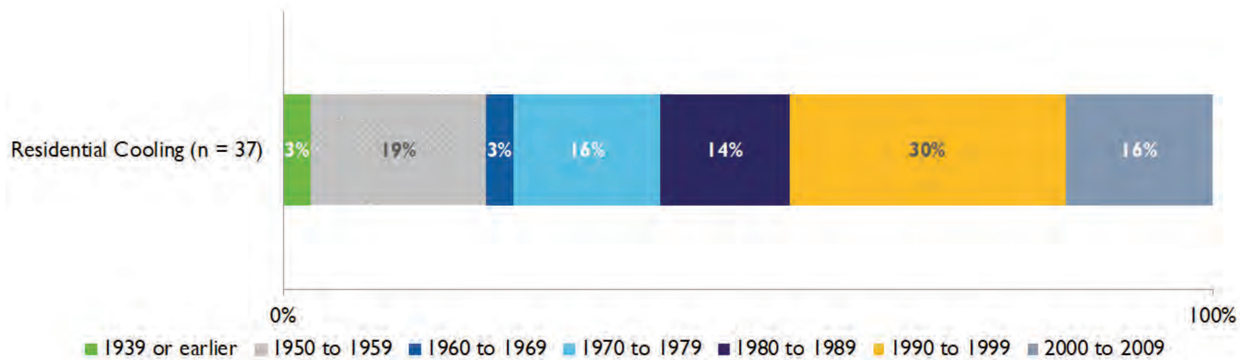

Similarly, a majority of respondents (68%) reported smaller household sizes of one or two people, as shown in Figure 18, while 32 percent of respondents reported household sizes of three or four people. There were no households with more than four members.

**Figure 18: Residential Cooling Respondent Household Size (n=38)**




As shown in Figure 19, a majority of participants (55%) reported that their home was built sometime before 1989. This suggests that the program is doing a good job at targeting older homes, where the potential for significant energy savings is the greatest. However, there is still strong representation from more recently built homes, with the largest percentage of homes built between 1990 to 1999 (30%).

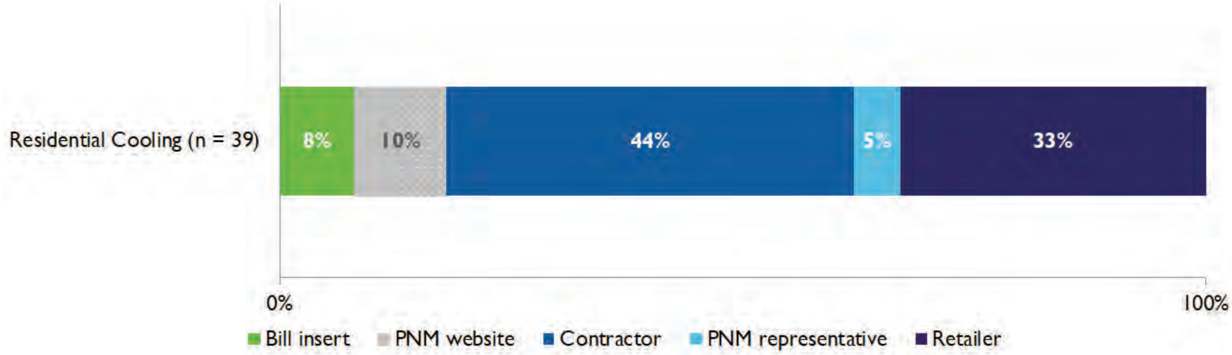
**Figure 19: Residential Cooling Participant Home Age (n=37)**




## *Source of Awareness*

Respondents became aware of the program rebates/assistance through a variety of channels, including retailers, contractors, the PNM website, PNM representatives, and bill inserts. As shown in Figure 20, 44 percent of respondents initially became aware of the program through a contractor. The next most common methods of discovering the rebate program were through a retailer (33%) or through the PNM website (10%).

**Figure 20: Residential Cooling Initial Sources of Awareness (n=39)**

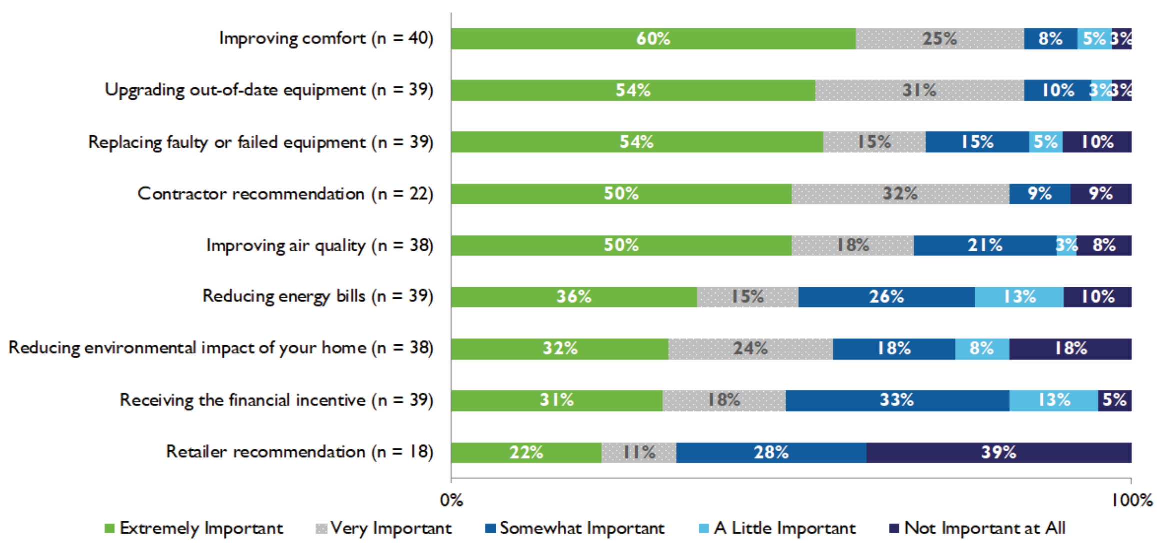



## *Motivations for Participation*

Respondents were then asked to rate a variety of factors that might have influenced their decision to participate in the incentive program (Figure 21). Out of the factors presented to Cooling participants, respondents selected the need or desire to upgrade out-of-date equipment or replace faulty or failed equipment as the most important factors in their decision to participate in the rebate program (54% of respondents ranked each of these factors as extremely important).

Additionally, Cooling participants indicated that comfort in their home was an extremely important factor in their decision to participate in the program (60%). Finally, out of the participants who used a contractor to install the measure (n = 22), 82 percent indicated that the contractor recommendation was a very important or extremely important factor in their decision to participate in the program.

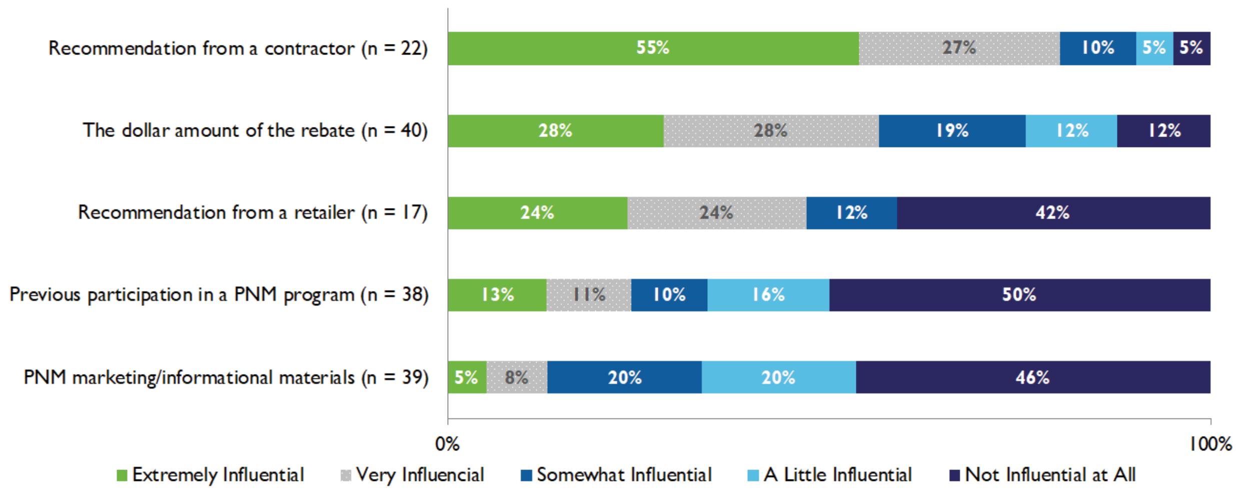
**Figure 21: Residential Cooling Motivations for Participation**



In addition to motivations for participating, survey respondents were given a list of potential program factors that may have influenced their decision to make an upgrade and were then asked to rate their influence on a 0 to 10 scale.[10]

As shown in Figure 22, a majority of participants (55%) rated the contractor recommendation as extremely influential (ratings of 9 to 10) in their decision to make the efficiency upgrade, followed by the dollar amount of the rebate (28%) and recommendations from a retailer (24%).

**Figure 22: Residential Cooling Influence of Program Factors**




## *Participant Satisfaction*

Survey respondents evaluated their satisfaction with various components of the Cooling sub-program, and more broadly PNM as an energy provider, on the following scale: very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied, and very satisfied. The individual components that participants were asked to rank their satisfaction with included:

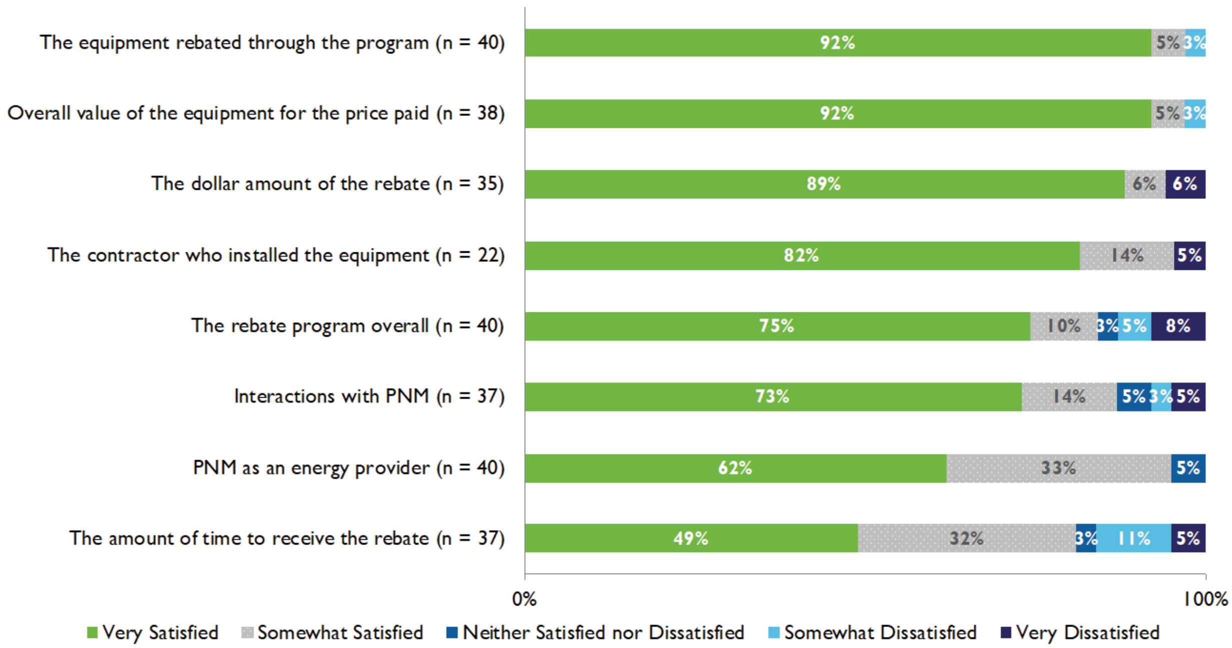
- The installation contractor
- The rebated equipment
- The dollar amount of the rebate
- The overall value of the equipment for the price they paid
- The rebate program overall
- PNM as an energy provider
- Interactions with PNM

[10] On the 0 to 10-point scale, 0 indicated 'Not influential at all' and 10 indicated 'Extremely influential.'

- The time it took to receive the rebate

Figure 23 summarizes the satisfaction levels for Cooling respondents. Overall, surveyed program participants expressed high levels of satisfaction with all Cooling sub-program components, with the majority being very satisfied. Respondents were most satisfied with the equipment rebated through the program (92%), the overall value of the equipment for the price paid (92%), and the dollar amount of the rebate (89%). Finally, respondents who gave a low rating to the amount of time taken to receive their rebate stated that they had either not received their rebate yet or it took longer than expected.

**Figure 23: Cooling Participant Program Satisfaction**




It is worth noting that while a majority of respondents reported being very satisfied with the rebate program overall (75%), 15 percent reported being either very dissatisfied, somewhat dissatisfied, or neither satisfied nor dissatisfied. When these respondents were asked why they gave such a rating, several noted that they had not received the rebate, one commented that one unit was not rebated even though they were told it would be, and another said they were generally confused. When asked about recommendations for improving the PNM program, several respondents mentioned difficulties with the "website," although they didn't elaborate on which website they were referring to, and many mentioned a need for more communication of program information and timeline.

## 2.4.2 Refrigerator Recycling Survey Results

The same phone survey was administered to a sample of 110 customers who participated in PNM's Refrigerator Recycling program, and the following charts present highlights of their responses.

Throughout the analysis, we present the survey results as weighted percentages based on the proportion of survey respondents' savings relative to the savings of all program participants.

### *Household Demographics*

There was a fairly even distribution of home sizes, with the most common range being 1,500 to 1,999 square feet (32%, shown in Figure 24). The majority of respondents (64%) reported household sizes of one or two people, as shown in Figure 25, and no households had more than seven members.

**Figure 24: Refrigerator Recycling Respondent Home Size (n = 86)**

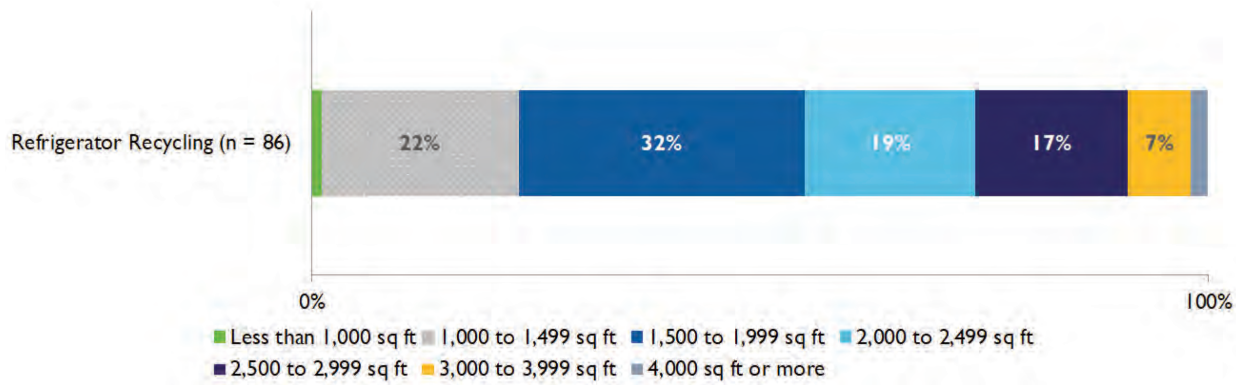
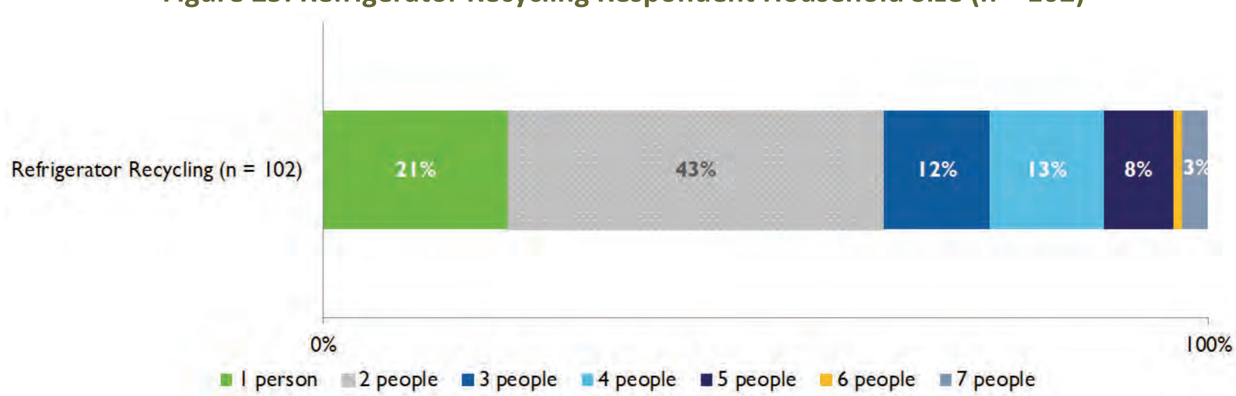
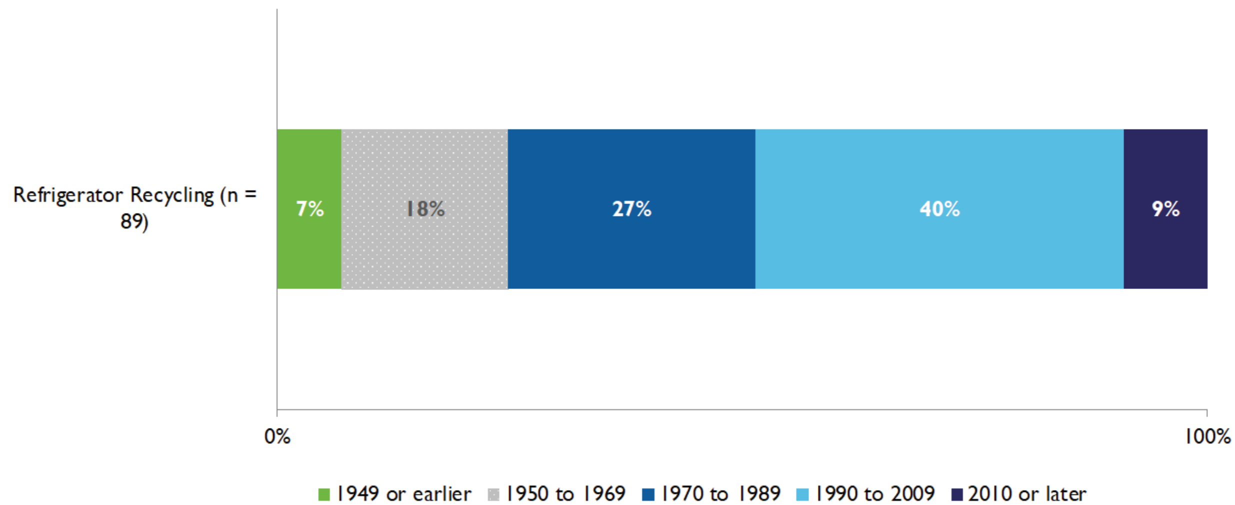



**Figure 25: Refrigerator Recycling Respondent Household Size (n = 102)**



As seen in Figure 26, the most common home vintage ranges were 1990 to 2009 (40%) followed by 1970 to 1989 (27%), with 52 percent of homes built prior to 1990. Similar to the Cooling participants, the vast majority of the Refrigerator Recycling participants (94%) own their home.

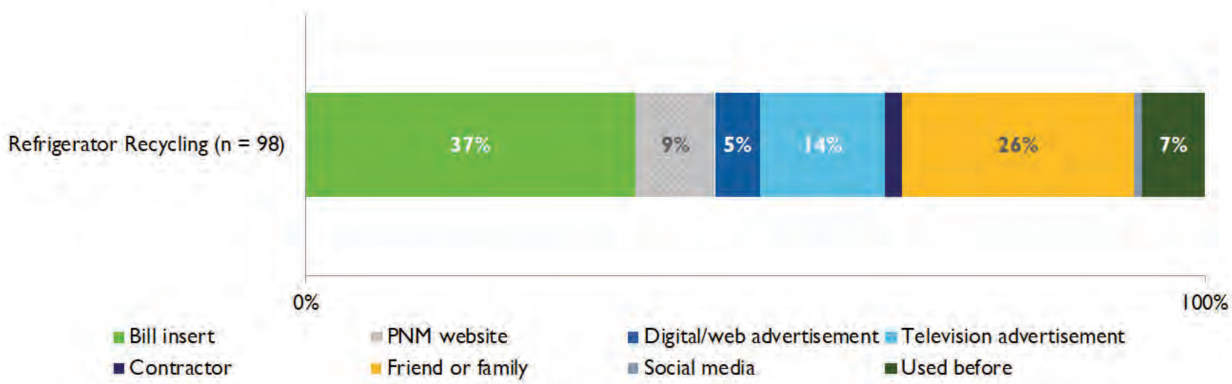
**Figure 26: Refrigerator Recycling Respondent Home Age (n = 89)**




## *Source of Awareness*

For customers looking to recycle their refrigerator, the PNM bill insert was the most common source of awareness (37%, shown in Figure 27) followed by friends or family (26%). This differs from the Cooling program, for which 44 percent of participants cited their contractor as the primary source of awareness.

**Figure 27: Refrigerator Recycling Initial Sources of Awareness (n = 98)**




## *Motivations for Participation*

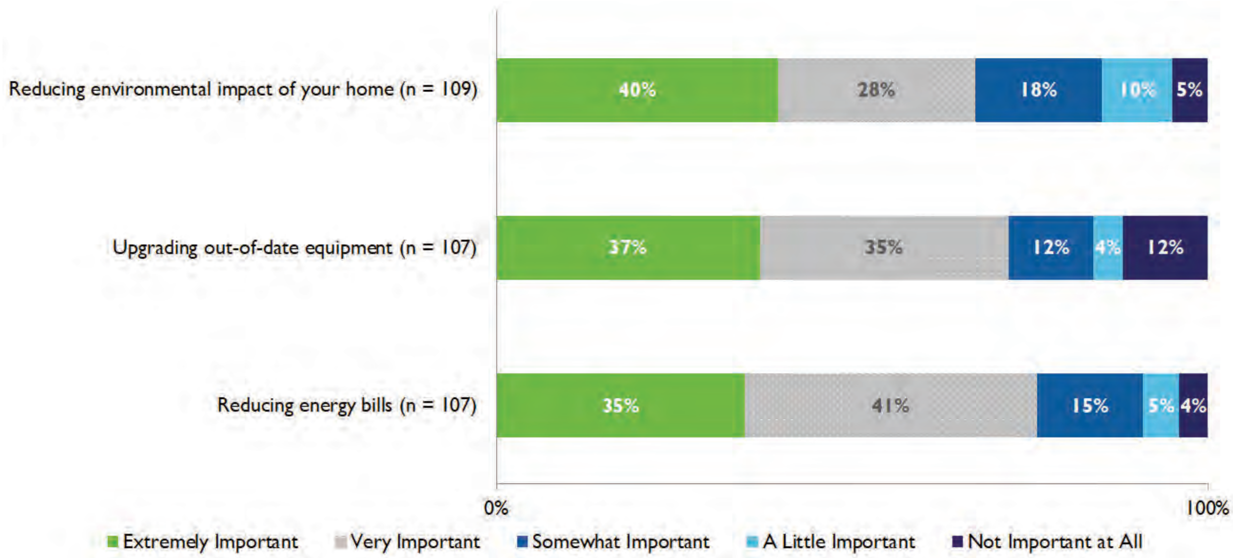
Participants were asked to rank the importance of three potential reasons for recycling their refrigerator:

- reducing environmental impact of their home,
- upgrading out-of-date equipment, and
- reducing energy bill amounts.

As seen in Figure 28, when considering 'extremely important' and 'very important' ratings combined, reducing energy bills and upgrading out-of-date equipment have higher values (76% and 72%, respectively) compared to reducing environmental impact (68%), suggesting slightly greater importance. Still, reducing environmental impact is clearly an important motivating factor, as it has the highest percentage of extremely important ratings (40%).

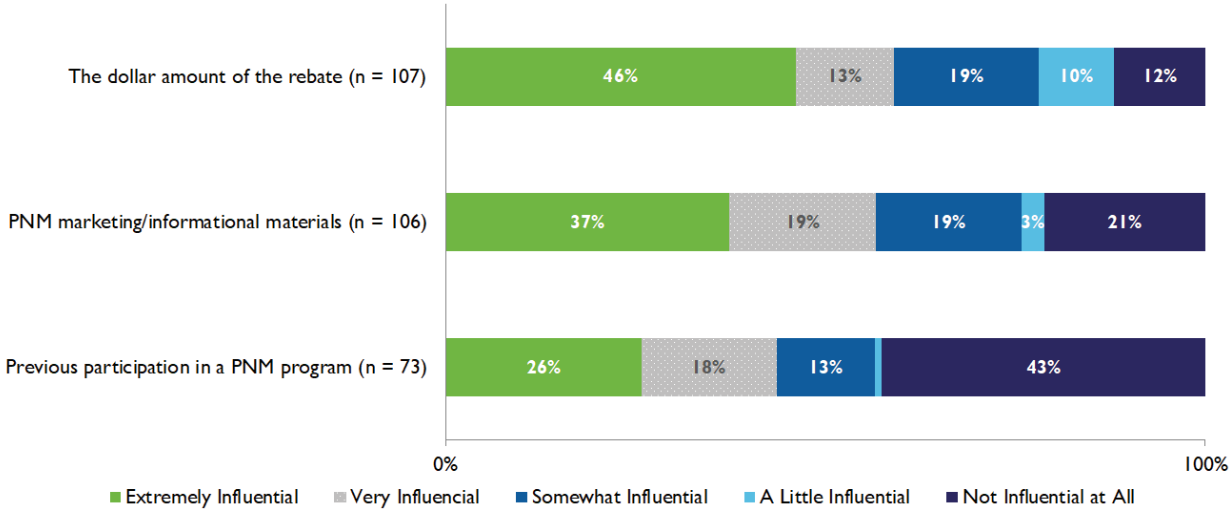
Participants were also asked if there were any other reasons for recycling that were more important than the three options provided. While the vast majority of participants indicated that there were no other reasons, six respondents (5%) noted that they didn't want the refrigerator to end up in a landfill.

**Figure 28: Refrigerator Recycling Motivations for Participation**




Participants were asked about other influences on their decision to recycle. As shown in Figure 29, the dollar amount of the rebate was the most influential factor (46% of participants ranked it as extremely influential), followed by PNM marketing/informational materials (37% 'extremely influential') and previous participation in a PNM program (26% 'extremely influential'). Notably, 43 percent of respondents ranked previous participation in a PNM program as not influential at all.

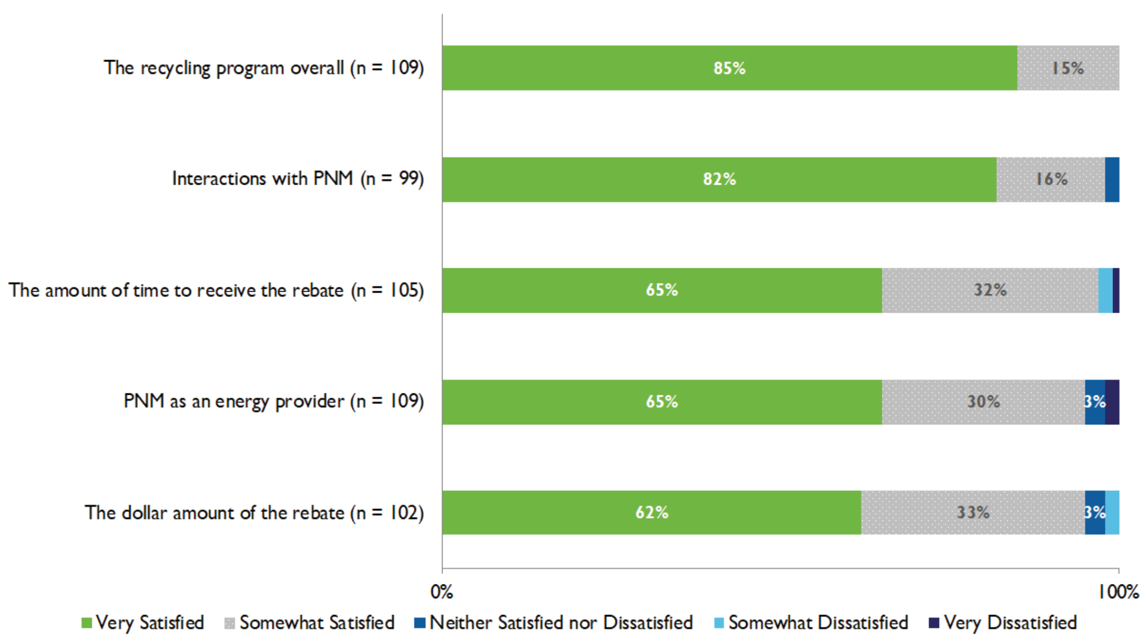
**Figure 29: Refrigerator Recycling Influence of Program Factors**




## *Participant Satisfaction*

Participants in the Refrigerator Recycling program were generally very satisfied with their participation experience, with 85 percent reporting that they were very satisfied with the program overall (Figure 30). Unlike the Cooling program, all respondents reported being somewhat satisfied or very satisfied with the program overall, and across all satisfaction-related questions there were minimal ratings of dissatisfaction.

**Figure 30: Refrigerator Recycling Participant Program Satisfaction**



## *Likelihood of Recycling without Program*

The final three questions relate to what customers would have done if the Refrigerator Recycling program had not been available.

While a sizeable percentage of respondents reported that they would have been not at all likely to recycle their refrigerator in the absence of the program (26%, seen in Figure 31), most of the participants (61%) reported that they would have been very likely or extremely likely to recycle without the program. Similar percentages of participants reported that they would have recycled their refrigerator within 12 months of when they recycled through the program (Figure 32), indicating that the program is not significantly accelerating the timing of recycling.

**Figure 31: Likelihood of Recycling Same Equipment if PNM Rebate Program Not Available (n = 106)**

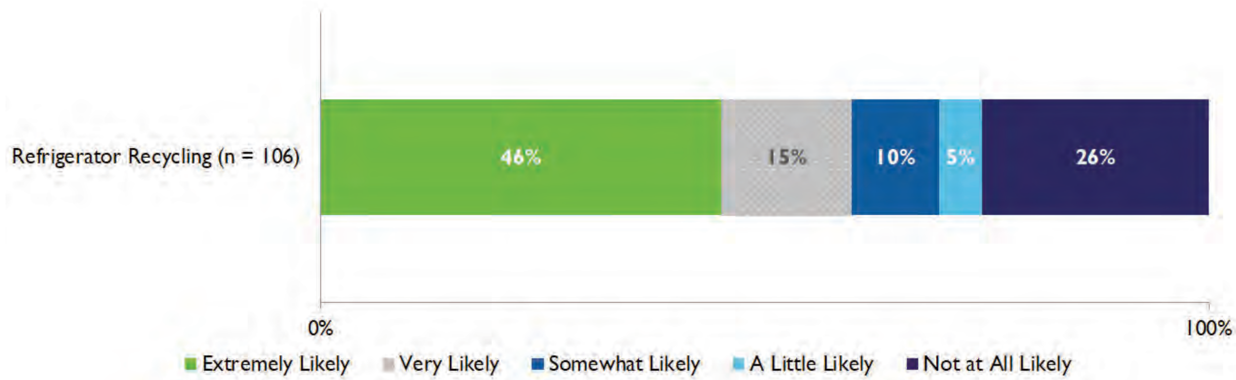



**Figure 32: Likelihood of Recycling within 12 Months if the PNM Rebate Program Not Available (n = 106)**

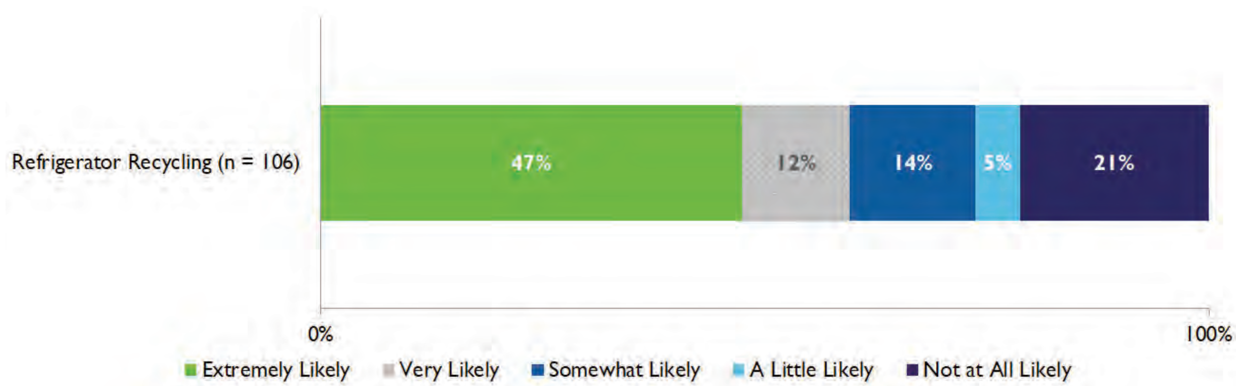
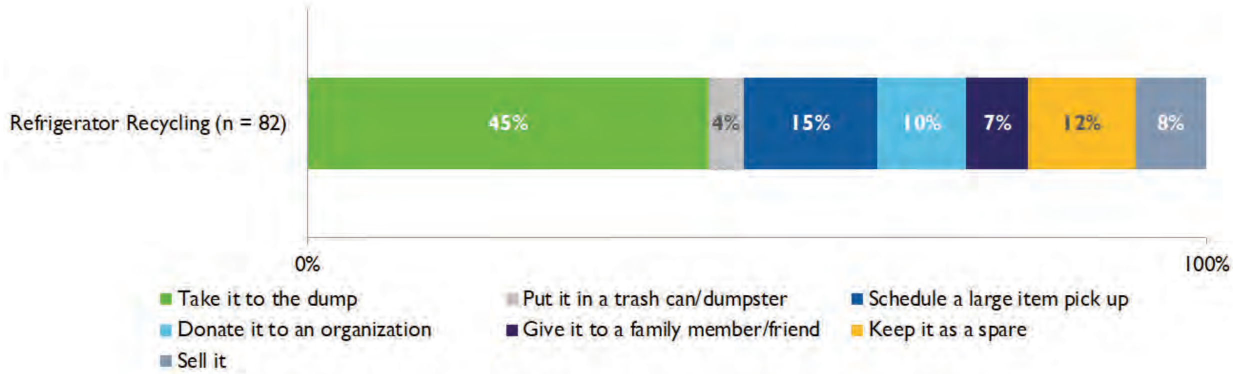



Figure 33 shows what respondents say they would have done with their refrigerator had they not been able to recycle it through the program. The largest share of respondents reported that they would have taken the refrigerator to the dump (45%), followed by scheduling a large item pick up (15%) or keeping it as a spare (12%). The large share of respondents who reported that they would take the refrigerator to the dump seems to contradict the similarly large share of respondents who reported that they were extremely likely to recycle their refrigerator in the absence of the program.

**Figure 33: Plan for Refrigerator if not Recycled through Program**




### 2.4.3 Home Energy Checkup Survey Results

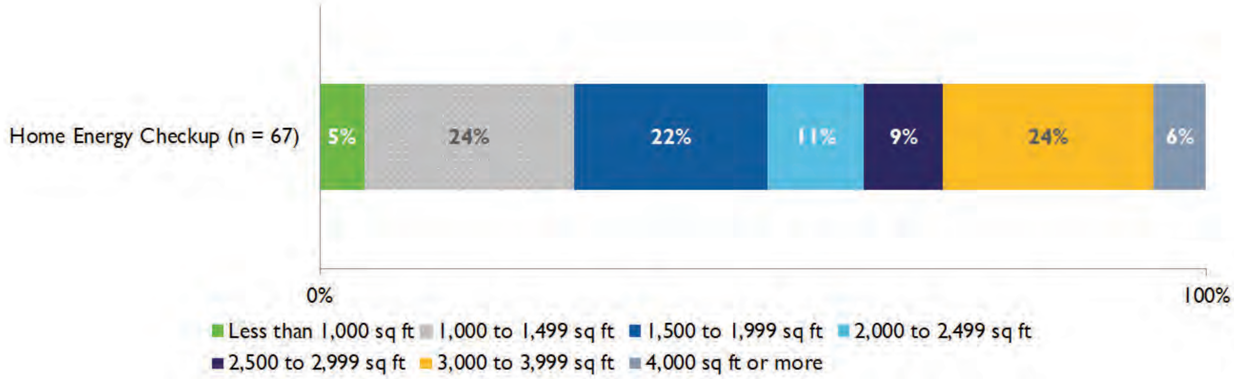
Finally, the same phone survey was used for a sample of 75 participants from the Home Energy Checkup program.

Throughout the analysis, we present the survey results as weighted percentages based on the proportion of survey respondents' savings relative to the savings of all program participants.

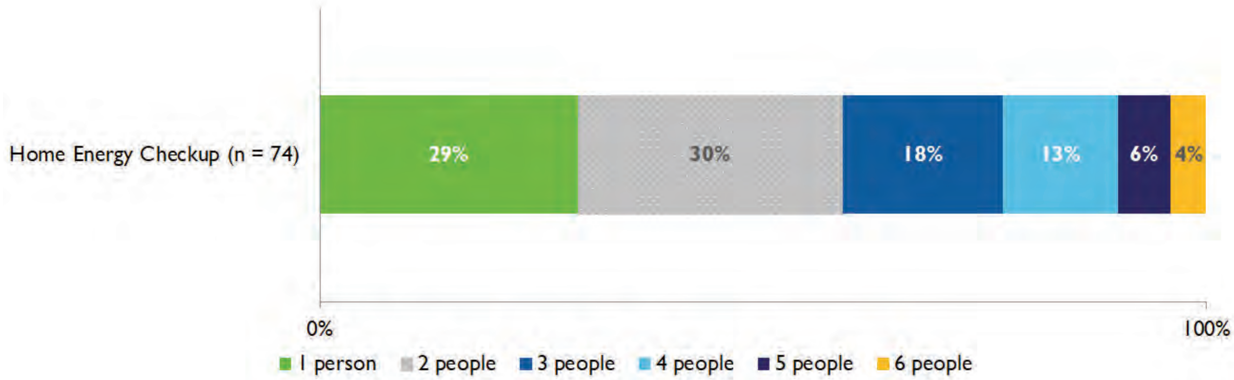
#### *Household Demographics*

Participants' home sizes varied, with the greatest percentage of homes within the 1,000 to 1,499 square foot and 3,000 to 3,999 square foot ranges (24% each, Figure 34). Similar to the other sub-programs, the majority of participants (59%) reported household sizes of one or two people (Figure 35), and no household had more than six members.

### Figure 34: Home Energy Checkup Respondent Home Size (n = 67)

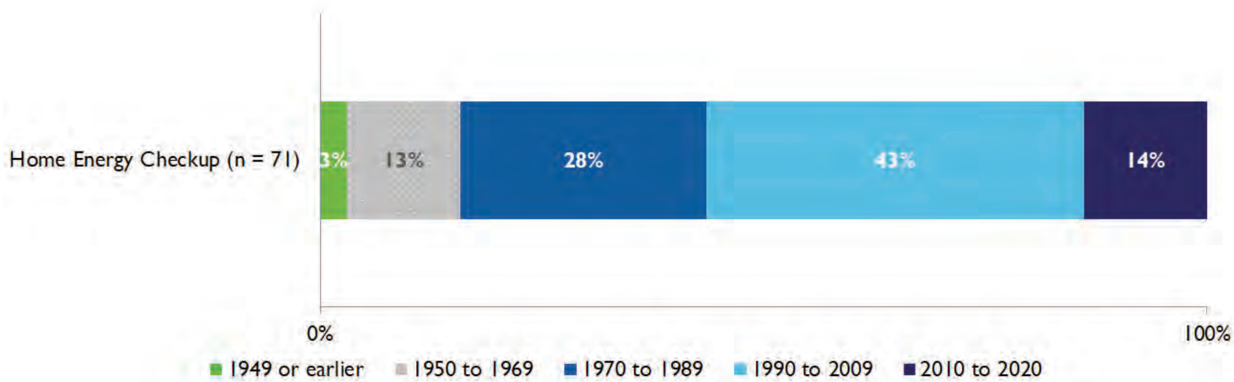



### Figure 35: Home Energy Checkup Respondent Household Size (n = 74)




As seen in Figure 36, participants' homes tend to be newer, with 43 percent built between 1990 to 2009, and 57 percent built in 1990 or later.

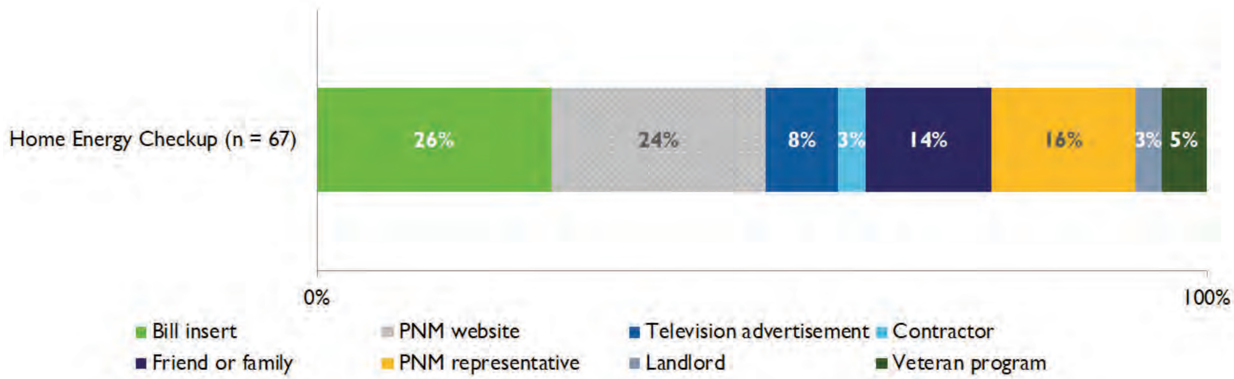
### Figure 36: Home Energy Checkup Respondent Home Age (n = 71)



## Source of Awareness

Sources of awareness for the Home Energy Checkup program were varied, with bill inserts (26%) and the PNM website (24%) listed as the most common sources (Figure 37). Notable other sources include PNM representative (16%), friend or family (14%), and television advertisement (8%).

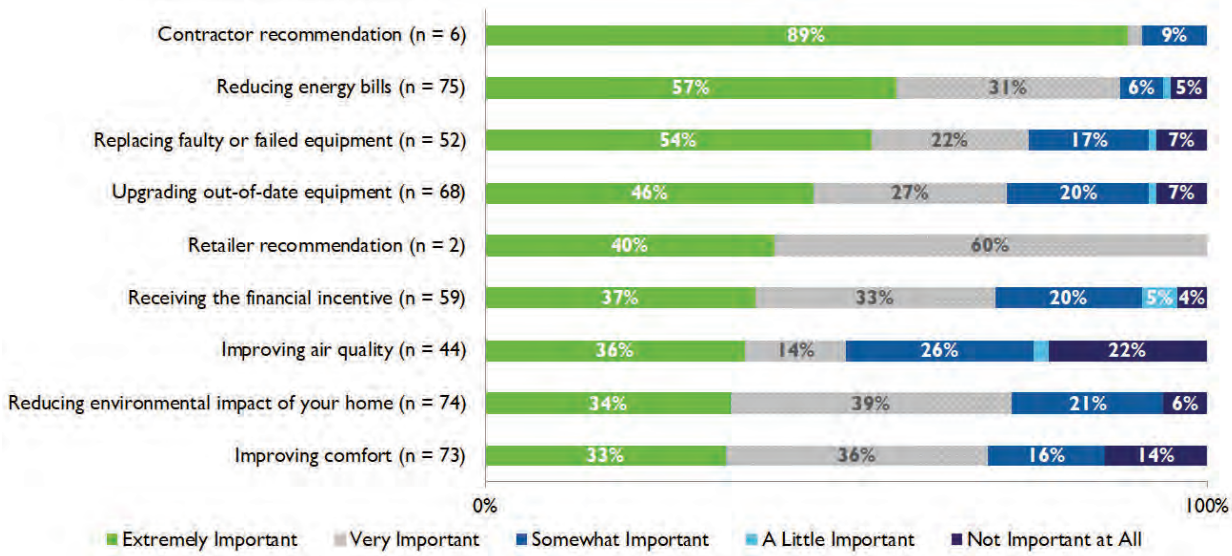
**Figure 37: Participant Source of Awareness (n = 67)**




## Motivations for Participation

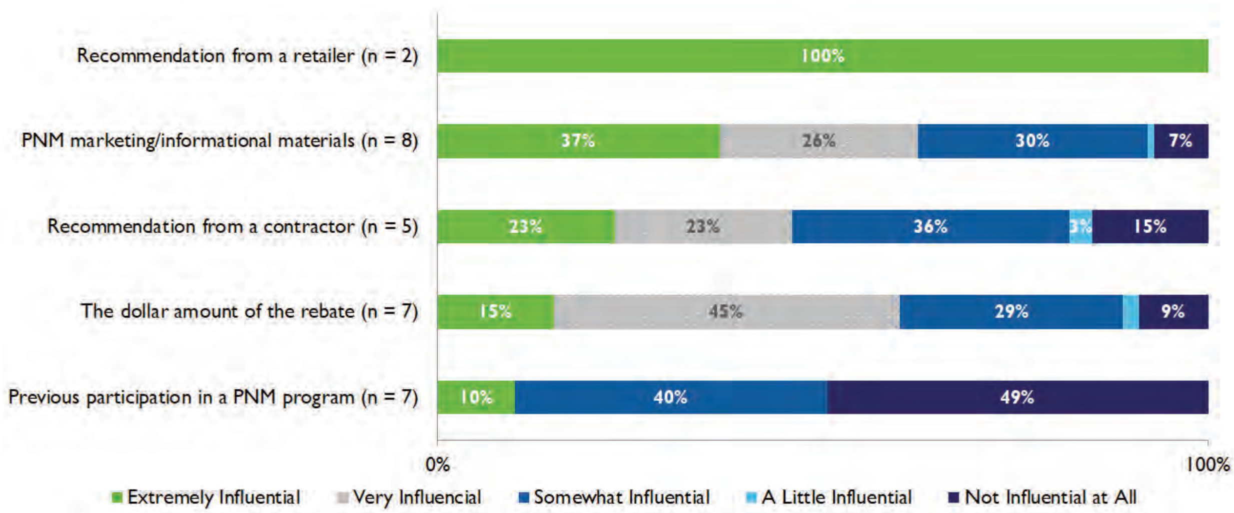
As shown in Figure 38, the biggest driver of participation was a contractor recommendation, with 89 percent of participants rating it as extremely important, although the sample was small (n = 6). The next largest drivers of participation were reducing energy bills (57% 'extremely important') and replacing faulty or failed equipment (54% 'extremely important'). Most factors were rated as very important or extremely important, and improving air quality was the least favorably rated (only 50 percent 'extremely important' and 'very important' combined).

**Figure 38: Home Energy Checkup Motivations for Participation**




A small fraction of participants responded to survey questions about other influences on their decision to participate in the program. As seen in Figure 39, a recommendation from a retailer was the most influential factor, with 100 percent of respondents indicating that it was extremely influential, although the sample was small (n = 2). Responses were mixed for the other factors, with 37 percent of respondents rating the next most influential factor of PNM marketing/informational materials as extremely influential. A recommendation from a contractor and previous participation in a PNM program do not seem to have considerably influenced decisions to participate.

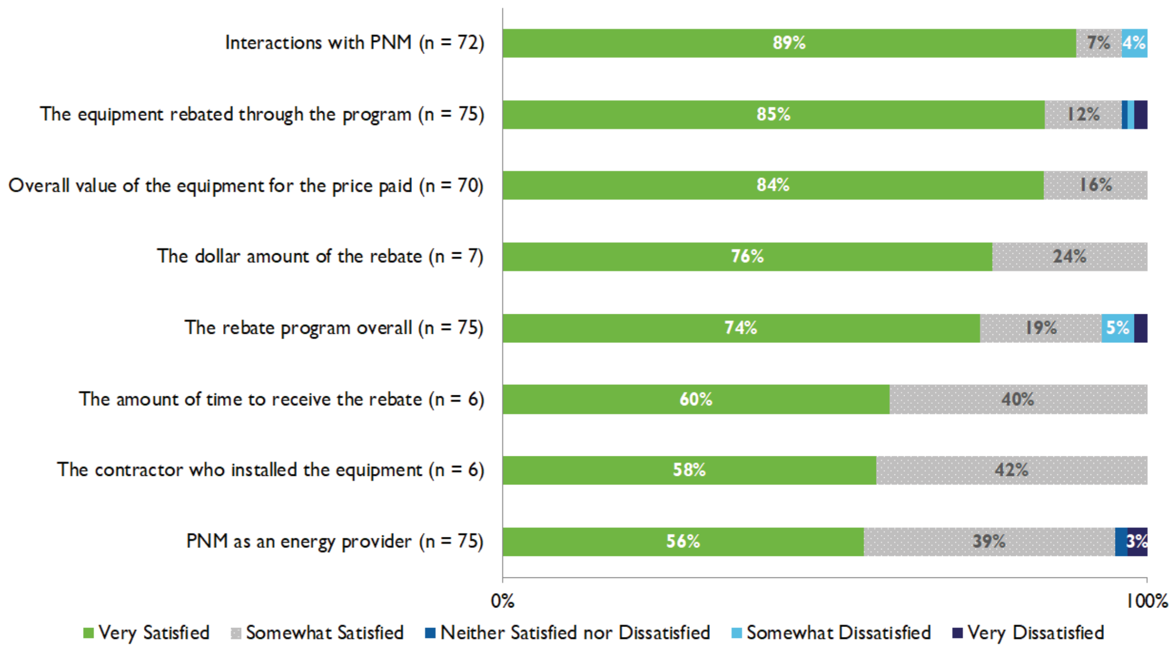
**Figure 39: Home Energy Checkup Influence of Program Factors**



### *Participant Satisfaction*

Similar to the other sub-programs, participants in the Home Energy Checkup program reported very high levels of satisfaction, with 93 percent reporting that they were very satisfied or somewhat satisfied with the rebate program overall. Across all satisfaction-related questions there were very few ratings of dissatisfaction.

**Figure 40: Home Energy Checkup Participant Program Satisfaction**




## 2.5 Cooling Contractor Interviews

The evaluation team completed two interviews with contractors who installed equipment in the PY2022 Residential Comprehensive program. For this evaluation round, the team focused on the Residential Cooling sub-program. The interviews covered the following topics:

- Contractor background and program involvement;
- Role and influence of the PNM program in the market; and
- Program satisfaction.

Due to the low number of interviews and the depth of discussion, this section presents results qualitatively to show the range of perceptions and responses.

### 2.5.1 Contractor Background and Involvement

The interviewed contractors were from small to mid-sized businesses with a local focus. The interviewees shared that their firms offered full-service plumbing, heating, and cooling. The contractors shared different initial experiences with PNM involvement. One contractor stated that they had been involved with energy efficiency programs for many years and learned of the PNM program through an email from PNM. They stated that joining the program was an easy process, but they recognize that the investment in specialized tools to join may be a barrier to participation for some contractors. The other contractor shared that they learned of the PNM program through word-of-mouth. The contractor spent about a year learning about the program before they made the decision to join. This contractor explained that they wanted to fully understand the program's components before making a commitment to involvement.

Both contractors mentioned that they understood the entirety of their firm's involvement with the program. One contractor mentioned that the training for the sub-program was helpful. Both contractors shared that they do not currently have direct correspondence with PNM, but PNM did promote the program well through marketing.

### 2.5.2 PNM Program Influence

To better understand the program influence on the market, the evaluation team explored how and when contractors communicate about the PNM rebates with customers and what role they play in the contractors' and customers' ultimate choices.

The contractors shared that customers were usually very interested in the opportunity and sought contractor services on their own after seeing PNM marketing material. The contractors felt that the program would grow organically through word-of-mouth, especially given the already high demand for the program, as well as rising inflation rates. Notably, one contractor hypothesized that when the program launched, their firm could have had their employees on these projects all summer long. To further emphasize program reach and popularity, the other contractor estimated that 95 percent of residential projects that applied for the program within PNM territory would end up receiving the service. The other five percent of their estimate would compose of customers who did not quite understand the program. Interviewees felt that the program did help with promoting energy efficiency.

One contractor did note that the program could be expanded to rural communities in the region but caveated that this would not be logistically viable for most firms to service.

Participating contractors emphasized the program's reach in the market and popularity.

### 2.5.3 Program Satisfaction

The interviewed contractors expressed neutral satisfaction with the Cooling sub-program, rating it a 3 on average on a 1 to 5-point scale.[11]

[11] 1 being not at all satisfied, 2 somewhat dissatisfied, 3 neither satisfied nor dissatisfied, 4 somewhat satisfied and 5 very satisfied.

Contractors felt that the program information and processes were relatively clear to contractors. Contractors did identify areas of potential improvement or ideas they wish PNM would consider. These included:

- ***Administering more intentional marketing –*** the contractors both raised points about PNM marketing. One contractor mentioned that PNM marketing did not align with the number of contractors participating in the program. They experienced an overload of customer inquiries. The contractor said that customers were frustrated when their firm did not have bandwidth to service additional ACs. The other contractor felt that some customers misinterpreted the marketed information. This meant that some customers thought that their cooling equipment would be replaced or repaired, as opposed to receiving an AC tune up. Other customers also thought that spring/summer cooling equipment could be assessed in fall/winter, which is not the case. One contractor recommended that PNM form a direct customer service email or phone line so that contractors can send customers to a PNM contact for this type of confusion.
- ***Estimating contractor service time more accurately –*** one contractor stated that PNM estimated AC tune ups would require 1-1.5 hours of contractor time. In actuality, the contractor said that when including for the data collection processes of the program, the tune up required up to 4 hours of work. This meant that the sub-program was not as economically beneficial to their firm as expected; the contractor said that they had to turn many customers away because of this.

These results are based on a small number of interviews, however, and should be seen as informing the utility's understanding of how the program influences the market and not how much. It would take more research to determine how widespread these dynamics are or to measure market effect quantitatively.

## 2.6 Conclusions and Recommendations

The gross impact evaluation of the Residential Comprehensive program consisted of a deemed savings review of per-unit savings values for each of the three sub-programs. We compared PNM documentation on the source, calculations, and input assumptions of savings values to determine whether they were correct and appropriate. Based on our review, the deemed savings values used by PNM are generally in line with those recommended in the New Mexico TRM.

For the Refrigerator Recycling sub-program, we confirmed the source of deemed savings values and found the per-unit values to be within a reasonable range for the refrigerator and freezer recycling measures.

For the Home Energy Checkup sub-program, we were able to confirm the source of savings, calculations, and input assumptions for all measures. For measures where we did not have enough information on the input assumptions to replicate the calculations, we confirmed that the per-unit values were within a reasonable range for the type of measure. However, specific details on the calculations or exact source of savings would be preferred. A slight engineering adjustment was made to account for an adjustment to the air filter with whistle measure kWh and kW savings.

- **Recommendation:** Clearly and consistently document the source of deemed savings, formulas used to calculate deemed savings, and all input assumptions for those calculations in order to facilitate evaluator review of savings values.

The realization rate for the Residential Comprehensive Cooling sub-program is not equal to 1.00 due to the lack of baseline efficiency information in the program tracking data. The evaluation team instead used a baseline assumption based on the heating and cooling capacity of the units. This resulted in slight adjustment to the original gross impact values. If the baseline efficiency rating was included in the program tracking data, the sub-program realization rate would likely be equal to 100 percent.

- **Recommendation:** Include information on baseline efficiency assumptions in the savings calculations for measures in the Residential Comprehensive Cooling sub-program.

# 3 Residential Lighting Program

The residential lighting market in the U.S. has experienced significant change since the Energy Independence and Security Act of 2007 (EISA) was signed into law in December 2007. Since passage of EISA, which led to the phase-out of incandescent bulbs, consumers have become more aware of LEDs, and the purchase price of LEDs has become increasingly affordable. PNM's Residential Lighting program promotes adoption of LED lighting by providing incentives to customers to replace less efficient light bulbs with LED bulbs through in-store rebates and coupons at participating retailers in PNM's service territory. Table 22 shows total bulb sales for program year 2022 by warehouse and non-warehouse stores, and giveaway events.

**Table 22: Sales of Bulbs Through the PNM Residential Lighting Program, 2022 Program Year (October 1, 2021 – January 1, 2023)**

| Retailer Type | Standard LED | Specialty LED | Total | Percent of Total |
|---|---|---|---|---|
| Warehouse | 296,201 | 154,636 | 450,837 | 31.6% |
| Non-Warehouse | 627,310 | 273,782 | 901,092 | 63.2% |
| Giveaway Events* | 74,976 | 0 | 74,976 | 5.3% |
| **Total** | **998,487** | **428,418** | **1,426,905** | **100.0%** |

Source: Analysis by Evergreen Economics of data provided by PNM.
* Regarded as "non-retail" for purposes of our analysis and for this report.

While 15 retailers participated in the Residential Lighting program over the period analyzed, five participating mass market and warehouse retailers dominated bulb sales. Combined, these three retailers accounted for 89 percent of incentivized sales through the program.

## 3.1 Residential Lighting Gross Impacts

For the Residential Lighting program measures, the gross impact analysis consisted of reviewing the calculations of per-unit savings values used for all the individual lighting measures covered by the program and then comparing those calculations to the algorithms and assumptions in the New Mexico TRM. In general, the evaluation team found that the formula used to calculate bulb savings was being applied correctly. Table 23 shows the gross impact results for PY2022.

**Table 23: Residential Lighting Gross Impacts**

| Residential Lighting | Expected Gross Savings | Engineering Adjustment Factor | Realized Gross Savings |
|---|---|---|---|
| kWh Savings | 41,513,817 | 1.00 | 41,513,817 |
| kW Savings | 7,963 | 1.00 | 7,963 |

Source: Analysis by Evergreen Economics of data provided by PNM.

## 3.2 Residential Lighting Net Impacts

The evaluation team used a Poisson regression model to estimate free ridership and the net-to-gross (NTG) ratio for PNM's upstream Residential Lighting program.[12] The Poisson regression modeling approach utilizes (incentivized) price and quantity sales data on bulbs purchased through the upstream Residential Lighting program to estimate the impact that rebates provided by PNM have on the demand for LED bulbs.[13] The impact is measured as a marginal effect, which is an estimate of the percent change in bulbs demanded associated with a one dollar decrease in the rebated price paid by customers.

The purpose of the Poisson regression model is to estimate the price sensitivity of retail demand for LED bulbs incentivized through PNM's upstream Residential Lighting program. Using the output of the regression model, we calculated the marginal price effect for LED bulbs, which is an estimate of how much demand for bulbs change with a one-unit (e.g., $1.00) increase or decrease in price. Once this relationship is established, we can estimate how much the program is influencing overall LED lighting sales through the point-of-sale rebate.

The model specifications we used for the analysis is as follows:[14]

$$\begin{aligned} ln\left(bulbs_{i,t,s}\right) &= \alpha + \beta_1 price_{i,t,s} + \beta_2 watts_i + \beta_3 lumens_i \\ bulbs_{i,t,s} &= Number\ of\ bulb\ type\ i\ sold\ \ in\ period\ t\ by\ store\ s \\ price_{i,t,s} &= Rebated\ price\ of\ bulb\ type\ i\ sold\ \ in\ period\ t\ by\ store\ s \\ watts_i &= Wattage\ of\ bulb\ type\ i \\ lumens_i &= Lumens\ of\ bulb\ type\ i \end{aligned}$$

[12] For programs with an upstream incentive, the rebate is provided to the retailer and then passed along to the customer as a rebate at the point of sale.

[13] This is in contrast to alternative net impact methods that rely on surveys or interviews (e.g., in-store intercept surveys) of a sample of customers that ask them how important the incentive was in their decision to purchase the light bulbs.

[14] Prior to model estimation, bulb sales data were normalized to a consistent 30-day sales period.

We estimated separate models for warehouse and non-warehouse retailers for standard and specialty LED bulbs (four models in total). Warehouse and non-warehouse retailers differed significantly with respect to the average number of bulbs sold per store per day: 81 standard and 42 specialty LED bulbs per day for warehouse stores; 8 standard and 4 specialty LED bulbs per day for non-warehouse stores. Warehouse stores typically sell bulbs in larger packs than non-warehouse retailers but carry a narrower selection.

Once the Poisson regression model was estimated, the model coefficients were used to estimate net program bulb sales using the following steps:

1. The total number of bulbs sold through the program was totaled from the program sales data (**Gross Program Sales**).
2. The average price per bulb ***with*** the rebate and ***without*** the rebate was calculated from the sales data.
3. The coefficients from the models were used to compute ***estimated bulb sales with the rebate*** and ***estimated bulb sales without the rebate***. The difference between these two estimates represents the **Net Program Sales**—i.e., bulb sales that are attributable to PNM's upstream Residential Lighting program.
4. The free ridership rate and NTG ratio were calculated using the following equation:

$$Free\ Ridership\ Rate = \frac{Estimated\ Bulb\ Sales\ without\ Rebate}{Estimated\ Bulb\ Sales\ with\ Rebate}$$

$$\textit{Net-to-Gross Ratio}\ = 1 - Free\ Ridership\ Rate$$

The evaluation team utilized the Poisson regression model and the analytical approach described above to estimate the net impacts of PNM's upstream Residential Lighting program. The quantity of bulbs sold is inversely related to price, as illustrated by the sales and price data shown in Table 24. About 75 percent of bulbs sold through PNM's Residential Lighting program were $2.00 or less, and another 17 percent were between $2.01 and $4.00. Relatively few bulbs sold through the program had a incentivized cost greater than $4.00.

**Table 24: Bulb Sales by Incentivized Price of Bulb***

| | Standard LED | | Specialty LED | | |
|---|---|---|---|---|---|
| Rebated Price Per Bulb | Average Pre-Rebate Price Per Bulb | Average Rebated Price Per Bulb | Average Pre-Rebate Price Per Bulb | Average Rebated Price Per Bulb | Proportion of Bulbs Sold |
| $2.00 or less | $2.51 | $1.39 | $3.25 | $1.87 | 75.2% |
| $2.01 - $4.00 | $4.04 | $1.34 | $4.87 | $1.99 | 17.3% |
| $4.01 - $6.00 | $7.13 | $2.20 | $7.50 | $2.49 | 5.1% |
| $6.01 - $8.00 | $8.81 | $1.79 | $9.41 | $2.45 | 1.2% |
| $8.01 - $10.00 | $10.62 | $1.68 | $12.71 | $3.39 | 0.5% |
| More than $10.00 | $19.05 | $2.35 | $23.20 | $3.86 | 0.7% |

Source: Analysis by Evergreen Economics of data provided by PNM.
* Data includes only those bulbs sold and rebated through a retail outlet.

Table 25 shows estimates of price elasticity of demand for each LED bulb type and type of retailer and for the program overall. The price elasticity of demand is a measure of the change in the demand for a good or service when the price of that good or service increases by 1.0 percent. Price elasticities are assumed to be negative—that is, as price goes up, demand for the good or service goes down; it is the magnitude of the elasticity (i.e., responsiveness) that is of primary interest.[15]

As Table 25 shows, the evaluation team found that the demand for standard and specialty LED bulbs is price elastic for both standard and specialty LED bulbs sold by warehouse and non-warehouse retailers. For standard LED bulbs, we estimate that a 10 percent increase in price would reduce demand by 11.1 percent at non-warehouse retailers and 19.8 percent at warehouse stores.[16] For specialty LED bulbs, we estimate that a 10 percent increase in price would reduce demand by 10.7 percent at non-warehouse stores and by 12.8 percent at warehouse stores. Overall, when weighting by all LED bulb sales from all retailers, the evaluation team estimates that a 10 percent increase in the price of LED bulbs would lead to a 13.1 percent reduction in demand, holding all else constant.

[15] If the price elasticity for a good is greater than 1.0 in absolute value, demand for that good is referred to as elastic (more responsive). Similarly, when the price elasticity is less than 1.0 in absolute value, demand for that good is referred to as inelastic.

[16] A price elasticity is generally expressed based on either a 1 percent or a 10 percent change in price; for LED bulbs, we believe it is more illuminating to consider a 10 percent change in price, which is derived by simply multiplying the estimated elasticity by 10.

**Table 25: Estimates of Price Elasticity of Demand for LED Bulbs and NTG Ratio**

| LED Bulb Type and Retailer | Elasticity at Mean Rebated Price* | NTG Ratio at Mean Rebated Price |
|---|---|---|
| Standard Warehouse | -1.98 | 0.65 |
| Standard Non-Warehouse | -1.11 | 0.41 |
| Specialty Warehouse | -1.28 | 0.73 |
| Specialty Non-Warehouse | -1.07 | 0.43 |
| **Residential Lighting Program** | **-1.31** | **0.51** |

Source: Analysis by Evergreen Economics of data provided by PNM.
* Elasticity estimates based on a one percent increase in price.

Table 25 also shows estimates of the NTG ratio for PNM's Residential Lighting program using the Poisson regression model. The estimates of the NTG ratio also vary by bulb type and retailer. The estimated NTG ratios for standard LED bulbs were 0.65 and 0.41, respectively, for warehouse and non-warehouse retailers. The highest NTG ratio estimate was for specialty bulbs sold by warehouse retailers (0.73) and the lowest estimated NTG ratio was for standard bulbs sold at non-warehouse stores (0.41). The estimated NTG ratios for specialty bulbs were 0.73 for warehouse stores and 0.43 for non-warehouse retailers.

Figure 41 shows how expected rates of free ridership and NTG ratios vary by bulb type and retailer. As the rebated price of LEDs drop, the proportion of purchasers that free ride decreases and the NTG ratio increases. The trajectories differ for each combination of bulb type and retailer because the types and prices of bulbs differ. It is also likely that the characteristics of customers who shop at warehouse and non-warehouse retailers differ.

The upper panel of Figure 41 shows free ridership rate by bulb price. The free ridership rate represents the proportion of bulbs sold by rebated price that would have sold even without the rebate. As the rebated price decreases (moving from right to left along the horizontal axis), more and more consumers—who otherwise would not purchase LED bulbs—are motivated to purchase bulbs, resulting in a decreasing proportion of purchasers that are free riders.

The purpose of the incentives is to encourage those consumers who would not otherwise purchase an LED to make the purchase. However, since the rebate is available to all purchasers of the LED bulbs, even those who would have purchased the bulbs without the rebate receive the rebate. The larger the incentive, the greater the number of consumers who will purchase LED bulbs, leading to a lower rate of free ridership and a higher NTG ratio (lower panel of Figure 41).

### Figure 41: Estimated Free Ridership and NTG Ratio by Bulb Type and Retailer Type

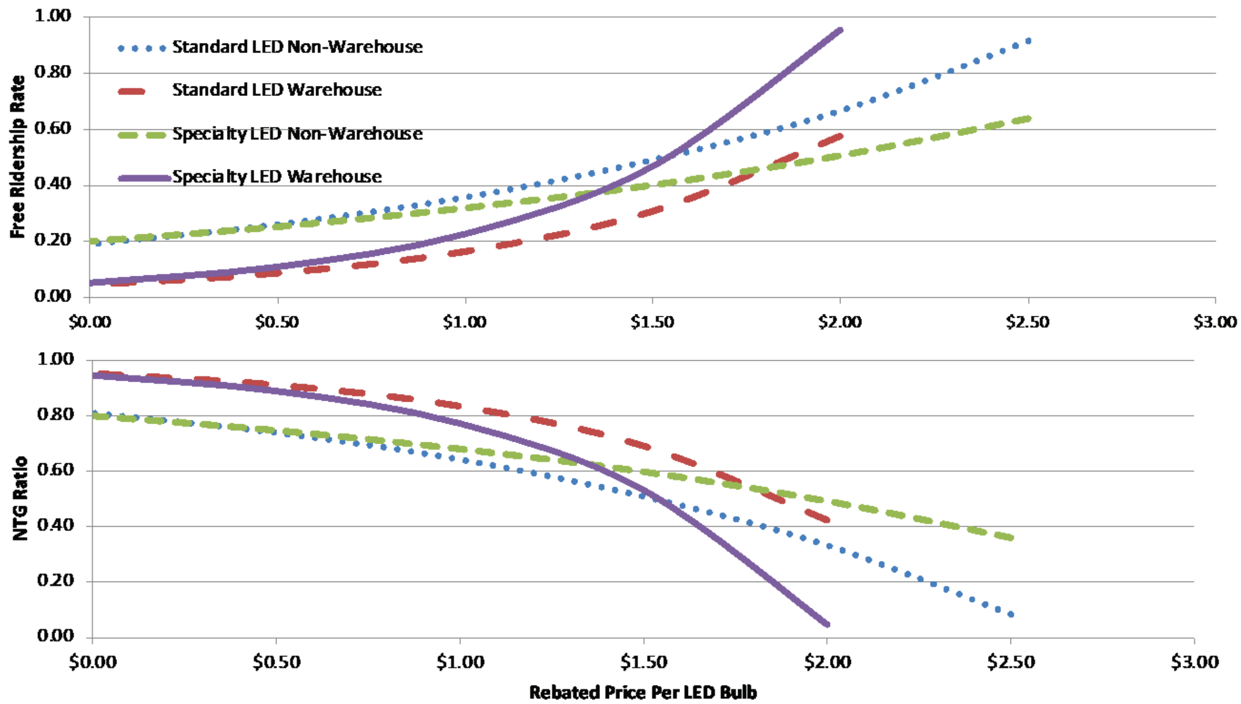



Table 26 summarizes the final gross and net impacts for the Residential Lighting program using the NTG ratio derived from the Poisson regression model. Using the overall NTG ratio of 0.6800 from the PY2021 evaluation, the PY2022 net realized impacts for the Residential Lighting program are 28,229,395 kWh and 5,415 kW. The NTG ratio of 0.51 calculated in PY2022 will be applied to the Residential Lighting program beginning in PY2023.

### Table 26: Residential Lighting PY2022 Impact Summary

| Residential Lighting | Expected Gross Savings | Engineering Adjustment Factor | Realized Gross Savings | NTG Ratio | Realized Net Savings |
|---|---|---|---|---|---|
| kWh Savings | 41,513,817 | 1.00 | 41,513,817 | 0.680 | 28,229,395 |
| kW Savings | 7,963 | 1.00 | 7,963 | 0.680 | 5,415 |

# 4 Home Energy Reports

The PNM Home Energy Reports (HER) program provides customers with information on their energy consumption that includes a comparison with a matched set of similar households. As part of this design, the program implementer Bidgely randomly assigns customers to a treatment group that receives the HER that provides tips on how to reduce energy consumption. Those customers not in the treatment group are randomly assigned to the control group and do not receive the report.

The PNM 2022 HERs program was launched with new and previously untreated customers in July of 2021. The program design is focused on maximizing treatment and savings cost-effectively in a shorter 2021 treatment period.

Wave 1 of the program launched later than expected (July instead of January of 2021) with a limited number of customers meeting the program selection criteria. The program was unable to target high consumption users in either Wave 1 or the subsequent Wave 2, which is likely limiting the ability to detect savings for both of these groups. Wave 3 involved a paper HER, instead of the email report used for Wave 1 and Wave 2 and was also able to target higher consumption users.

## 4.1 Home Energy Reports Methods

### *Bidgley Replication Model*

To calculate program savings, we first estimate a billing regression model that utilizes monthly billing data for customers in both the treatment and control groups. As a first step, we use these data to replicate the billing regression model Bidgely uses to estimate energy savings, shown below:

$$ADC_{it} = \sum_j \beta_{1j} Month_{jt} + \sum_j \beta_{2j} Month_{jt} * ADClag_{it} + \beta_3 Treatment_i + \varepsilon_{it}$$

Where,

$ADC_{kt}$ = The average daily consumption in kWh for customer i during billing month t in the post-period;

$Month_{jt}$ = A binary variable taking a value of 1 when j = t and 0 otherwise;

$ADClag_{it}$= Customer i’s energy use in the same calendar month of the pre-program year as the calendar month of month t;

$Treatment_i$= A binary variable indicating whether customer i is in the treatment group (taking a value of 1) or in the control group (taking a value of 0);

$\varepsilon_{it}$= The error term for customer i during month t

In the Bidgely model specification, the coefficient on the treatment variable, $\beta_3$, provides an estimate of average daily energy savings due to the program. The product of the average daily savings and the total number of participant days provides an estimate of the annual program savings.

## Evergreen Recommended Model

The Bidgely post-only model provides an estimate of the linear relationship between pre and post kWh usage. The non-interacted coefficient on treatment used in the Bidgely model shifts the overall level of daily kWh by treatment but does not allow for savings to vary by consumption levels. Furthermore, the shift estimated by the coefficient on the non-interacted treatment is uniform across all customers and months regardless of previous energy usage patterns.

To address this issue, we explored an alternative model specification that interacts the treatment and usage variables, which allows savings to vary with consumption levels. Interacting treatment with pre-usage allows us to estimate the change in treatment usage dependent on pre-usage for each month. This should improve the model accuracy and increase the likelihood of being able to detect savings that are expected to be quite small (i.e., less than 1 percent of annual consumption). The exact model specification for our recommended model is shown below:

$$ADC_{it} = \alpha + \sum_j \beta_{1j} Month_{jt} * ADClag_{it} + \sum_j \beta_{2j} Month_{jt} * Treatment_i * ADClag_{it} + \sum_j \beta_{3j} Month_{jt} + \varepsilon_{it}$$

Where,

$ADC_{it}$ = The average daily consumption in kWh for customer i during billing month t in the post-period;

$Month_{jt}$ = A binary variable taking a value of 1 when j = t and 0 otherwise;

$Treatment_i$= A binary variable indicating whether customer i is in the treatment group (taking a value of 1) or in the control group (taking a value of 0);

$ADClag_{it}$= Customer i's energy use in the same calendar month of the pre-program year as the calendar month of month t;

$\varepsilon_{it}$= The error term for customer i during month t

In this model, $\beta_{2j}$ represents the impact of participation that is dependent on pre-period kWh usage for month $j$. Monthly savings for month $j$ is equal to the product of $\beta_{2j}$, mean pre-period usage in month $j$, and the number of days in month $j$. The average yearly savings per customer is the sum of monthly savings. Program savings is the product of average yearly savings and the total number of customers. We estimate standard errors and confidence intervals using the delta method.[17]

We use this specification to estimate savings for each wave of the HER reports.

## *Data Screening*

We use the following data screens in our analysis:

- Positive usage and billing coverage filter
    - Filter out months of data with 0 or missing values[18];
- Median filter
    - Filter usage data points with usage less than 0.1 times median and greater than 10 times the median[19];
- Monthly filters
    - Match each month of pre-data to a month of post-data
    - Filter out customers in all waves with fewer than 12 months of post data;

Customers that opted-out after receiving their first HER are left in the analysis and used to calculate program savings.

Table 27 shows the number of accounts by wave and treatment status removed by each filter. Bidgely provided the account numbers of treatment customers by month for who was included in their analysis. The counts of each treatment customers that were included in every month of Bidgely data are also displayed in Table 27.

[17] Program savings is a transformation of the model estimated in Equation 2, meaning that standard errors calculated from the model also need to be transformed. The delta method approximates the standard errors of transformed equations using a first-order Taylor approximation.
[18] For months with missing days of data, we require that at least 60 percent of the days each month are present and filter out months with less than 60 percent bill coverage.
[19] This median is the overall median energy usage (kWh) across all bills included in the analysis period. Bidgley also uses this data screen.

**Table 27: Data Screens for Accounts by Wave**

| Filter | | | Wave 1: 2021 Email Treatment | Wave 1: 2021 Email Control | Wave 2: 2021 Email Expansion Treatment | Wave 2: 2021 Email Expansion Control | Wave 3: 2021 Paper Treatment | Wave 3: 2021 Paper Control |
|---|---|---|---|---|---|---|---|---|
| **Total Number of Customers Received** | | | **164,698** | **20,321** | **22,148** | **9,862** | **32,672** | **14,253** |
| Monthly Filters | Match each month of pre-data to a month of post data | Accounts Removed | 9,329 | 1,272 | 1,195 | 528 | 702 | 297 |
| | Wave Month Requirement | Accounts Removed | 40,335 | 5,060 | 8,970 | 4,068 | 7,404 | 3,132 |
| **Final Number of Accounts in Analysis - Evergreen** | | | **115,034** | **13,989** | **11,983** | **5,266** | **24,566** | **10,824** |
| **Final Number of Accounts in Analysis - Bidgely** | | | **138,101** | **-** | **16,907** | **-** | **28,139** | **-** |

Table 28 shows the number of months by wave and treatment status removed by each filter.

**Table 28: Data Screens for Months by Wave**

| Filter | | Wave 1: 2021 Email Treatment | Wave 1: 2021 Email Control | Wave 2: 2021 Email Expansion Treatment | Wave 2: 2021 Email Expansion Control | Wave 3: 2021 Paper Treatment | Wave 3: 2021 Paper Control |
|---|---|---|---|---|---|---|---|
| **Total Number of Months Received** | | **5,412,106** | **664,352** | **662,682** | **294,863** | **1,101,807** | **482,610** |
| Positive Usage and Billing Coverage Filter | Months Removed | 291,678 | 35,997 | 37,984 | 17,127 | 58,614 | 25,467 |
| Median Filter | Months Removed | 1,039 | 111 | 226 | 144 | 69 | 29 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Monthly Filters | Match each month of pre-data to a month of post data | Months Removed | 1,688,463 | 208,790 | 189,338 | 84,430 | 325,424 | 141,768 |
| | Wave Month Requirement | Months Removed | 670,110 | 83,718 | 147,542 | 66,778 | 128,116 | 55,570 |
| **Final Number of Months in Analysis - Evergreen** | | | **2,760,816** | **335,736** | **287,592** | **126,384** | **589,584** | **259,776** |

Table 29 displays the treatment start dates and evaluation periods for each of the three waves.

**Table 29: Treatment Start Dates and Evaluation Period**

| Wave | Treatment Start | Evaluation Period |
|---|---|---|
| Wave 1: Email | July 2021 | January - December 2022 |
| Wave 2: Email Expansion | December 2021 | January - December 2022 |
| Wave 3: Paper | June 2021 | January - December 2022 |

## 4.2 Home Energy Reports Findings

Table 30 presents the 2022 savings with 90 percent confidence intervals for the three waves for the Bidgely replication model and the Evergreen recommended model. Both models are run with the same data filters, with the number of accounts specified in Table 27. For both models, we do not exclude program opt-outs from savings calculations until 12 months of opt-out.

**Table 30: Savings for Bidgley and Evergreen Recommended Model by Wave**

| Model | Wave | N Participants | Savings Per Customer | Percent |
|---|---|---|---|---|
| Bidgely Replication Model | Wave 1: Email[20] | 164,698 | -6.8 ± 12.5 | -0.08% ± 0.15% |
| | Wave 2: Email Expansion | 22,148 | -21.4* ± 20.5 | -0.29%* ± 0.28% |
| | Wave 3: Paper | 32,672 | 96.1* ± 16.8 | 0.95%* ± 0.17% |

[20] Not statistically significant.

| | | | | |
|---|---|---|---|---|
| Evergreen Recommended | Wave 1: Email | 164,698 | -18.9* ± 10.7 | -0.22%* ± 0.13% |
| | Wave 2: Email Expansion | 22,148 | -38.6* ± 17.4 | -0.52%* ± 0.24% |
| | Wave 3: Paper | 32,672 | 89.2* ± 15.4 | 0.88%* ± 0.15% |

*Significant at 10 percent

Table 31 shows the annual net savings for the first year of treatment for each wave for the Bidgely replication model, the Evergreen recommended model, and the savings reported by Bidgely. For the Evergreen recommended and Bidgely replication models, Wave 1 and Wave 2 did not have statistically significant model results (or else showed an increase in consumption rather than savings) and therefore the savings for those waves have been set to zero. For Wave 3, 2022 net savings calculated from the Bidgely replication model and the Evergreen recommended model equate to about 3.1 million kWh and 2.9 million kWh, respectively. Comparatively, Bidgely reports 2022 net savings to be about 3.1 million kWh, with significant savings in both Wave 2 and Wave 3.

**Table 31: 2022 Net Savings by Wave**

| Wave | Reported Bidgley Net kWh Savings | Bidgley Replication Model Net kWh Savings | Evergreen Net kWh Savings |
|---|---|---|---|
| Wave 1: Email | 0 | 0 | 0 |
| Wave 2: Email Expansion | 388,355 | 0 | 0 |
| Wave 3: Paper | 2,702,562 | 3,140,931 | 2,915,218 |
| **Total** | **3,090,917** | **3,140,931** | **2,915,218** |

# 5 Commercial Strategic Energy Management

## 5.1 Commercial Strategic Energy Management Gross Impacts

The evaluation team reviewed a census of SEM projects, spanning the 2021 and 2022 calendar years. During the PY2021 evaluation, the evaluation team did not verify the claimed savings as they were received just before the final evaluation report was delivered. As such, no verification activities could be conducted for the PY2021 claimed savings. However, the evaluation team stated that the SEM program would be evaluated in PY2022. Therefore, the evaluation team included any savings adjustments from PY2021 in the verified savings for PY2022 to true-up the total savings for this program.

The PNM Commercial Strategic Energy Management (SEM) program enrolled five participants in 2021. Four of the five program participants were still onboarding between April and October 2021 with one participant dropping out of the program during PY2022. The reported PY2021 savings were partial year savings, with the analysis files showing data from two months for some projects to 12 months for other projects. The evaluation team verified the PY2021 savings as part of our efforts during PY2022 evaluation. To calculate the PY2022 savings, the evaluation team calculated the net savings over the course of the projects (2021-2022). For any projects that warranted an adjustment, the PY2022 savings were adjusted from the previous reported PY2021 savings values for each project. Table 32 shows the reported *ex ante* PY2021 and PY2022 savings for each of the five participants.

**Table 32: PY2021 and PY2022 SEM Energy Savings**

| Project Number | PY2021 Expected Gross kWh Savings | PY2022 Expected Gross kWh Savings |
|---|---|---|
| SEM 2022 - 1 | 1,329,580 | 899,820 |
| SEM 2022 - 2 | 49,343 | 77,305 |
| SEM 2022 - 3 | -75,898 | 442,616 |
| SEM 2022 - 4 | -12,905 | 228,652 |
| SEM 2022 - 5 | 30,142 | 241,677 |
| **Total** | **1,320,262** | **1,890,070** |

The reported *ex ante* program savings were estimated using the measured difference between forecasted energy use and actual metered energy data during the program performance period. Measure installation and building operational changes occur throughout the program performance period after a participant was fully onboarded. The program implementation contractor created site-specific baseline forecast models for each facility. The model methods ranged between simple average energy production models to multivariate linear regression methods.

The detailed review of the SEM projects focused on the key modeling assumptions to determine their reasonableness and if they were consistent with the program & industry guidelines. The evaluation approach included the following:

- Review participant model and measure implementation plan documentation;
- Assess baseline model input data adequacy including weather and other site-specific variables such as occupancy measures;
- Determine if the participant's baseline model approach is reasonable based on the available data & the site-specific energy profile;
- Rerun submitted models and confirm correct energy savings calculations;
- Run alternate models with different weather or other temporal variables (e.g. degree day combinations, month, weekday, or holiday indicators). Assess potential savings impacts resulting from one or more modeling changes. For simple mean energy models verify that regression models were not a viable option; and
- If needed, recalculate final verified energy savings due to corrections or model reruns.

Table 33 shows the realized gross kWh impacts for the PY2021 Commercial SEM program. The evaluation team set the savings to zero for any project where the implementation team's savings workbooks showed negative savings. It was not clear based on the supplied project documentation that measures implemented through the program caused the negative savings. Additionally, facilities with negative savings experienced non-routine events or production changes which contributed to the increased energy usage (negative savings). This adjustment had the largest impact on the realized gross kWh savings for PY2021 projects.

**Table 33: PY2021 Commercial SEM Gross kWh Impact Summary**

| Project Number | Expected Gross kWh Savings | Realized Gross kWh Savings |
|---|---|---|
| SEM 2022 - 1 | 1,329,580 | 1,373,630 |
| SEM 2022 - 2 | 49,343 | 336,825 |
| SEM 2022 - 3 | -75,898 | 11,842 |
| SEM 2022 - 4 | -12,905 | 80,646 |
| SEM 2022 - 5 | 30,142 | 175,747 |
| **Total** | **1,320,262** | **1,978,690** |

Table 34 shows the realized gross kWh impacts for the PY2022 Commercial SEM program. The realized gross savings are incremental to the realized savings calculated for PY2021 and occurred during PY2022. To calculate the incremental savings, the evaluation team included any adjustments (positive or negative) from the PY2021 savings and applied them to the savings for each project as part of the PY2022 realized savings.

**Table 34: PY2022 Commercial SEM Gross kWh Impact Summary**

| Project Number | Expected Gross kWh Savings | Realized Gross kWh Savings |
|---|---|---|
| SEM 2022 - 1 | 899,820 | 44,050 |
| SEM 2022 - 2 | 77,305 | 287,482 |
| SEM 2022 - 3 | 442,616 | 87,740 |
| SEM 2022 - 4 | 228,652 | 344,899 |
| SEM 2022 - 5 | 241,677 | 588,226 |
| **Total** | **1,890,070** | **1,352,397** |

## 5.2 Conclusions and Recommendations

Impact evaluation activities for the Commercial SEM program included engineering desk reviews of the supplied regression models. Conclusions and recommendations resulting from these reviews are discussed below.

The evaluation team reviewed the PNM SEM 2022 participant savings tracking sheet and the project specific calculation workbooks. This review showed that the savings listed in the PNM SEM participant savings report did not match the savings the determined in each of the project calculation workbooks. Table 35 shows a comparison of the saving values listed in the supplied documentation. Based on prior discussions with the implementation team, the savings summary report is a forecast of savings, instead of a record of achieved savings.

**Table 35: Comparison of 2022 Reported Savings vs 2022 Workbook Savings**

| Project Number | 2022 Expected Gross kWh Savings | 2022 Workbook kWh Savings |
|---|---|---|
| SEM 2022 - 1 | 899,820 | -975,460 |

| | | |
|---|---|---|
| SEM 2022 - 2 | 77,305 | 0 |
| SEM 2022 - 3 | 442,616 | -64,357 |
| SEM 2022 - 4 | 228,652 | 331,994 |
| SEM 2022 - 5 | 241,677 | 106,492 |
| **Total** | **1,890,070** | **-601,331** |

- **Recommendation 1**: Ensure the SEM program savings report is updated with actual monthly results based on the completed models. The implementation team should keep this savings summary up to date throughout the year, making revisions if model updates are made.

The program reported negative savings for multiple projects in PY2021 and PY2022. While the program may claim negative savings values for measures completed through the program, this should be done only when the increase in usage is a direct cause of the program interaction. Changes to production or non-routine events can and do increase facility energy use but should not penalize the SEM program.

- **Recommendation 2**: Ensure that changes to production and non-routine events are properly accounted for in savings models. If the billing regression savings analysis for a project results in negative savings as a result of production changes or non-routine events, consider setting the savings to zero instead of claiming negative savings.

The evaluation team found that significant facility usage deviations from the baseline period can result from non-routine energy events at the facility. Non-routine events may change energy usage unrelated to efficiency projects for a short or sustained period.

- **Recommendation 3**: Conduct regular check-ins to help capture data early. This may explain detected or undetected energy use changes that may impact program savings. Program check-ins with participants including data transfers should be frequent enough to catch unexpected changes in energy usage.

During PY2021 and PY2022, there were no peak demand savings claimed by the SEM program. Targeting and quantifying measures that generate peak demand savings may be an added benefit for the participant and the program.

- **Recommendation 4**: The PNM SEM team should consider increased program emphasis around peak demand reductions. Making hourly meter data available whenever possible can facilitate data driven peak demand estimates.

The evaluation observed that monthly indicators are often better to capture seasonal savings measures (e.g. HVAC) by reducing model error in peak usage months. For example, the evaluation team added additional monthly indicator variables to a regression model (SEM 2022 – 5) which reduced the model error by 19%.

- **Recommendation 5**: For SEM participants with daily or hourly baseline energy models, the PNM SEM team should consider adding temporal or seasonal indicator variables to models.

The evaluation team believes it may be helpful to estimate the preliminary energy savings potential for the planned measure lists (Opportunity Register) during onsite visits. A range-based estimate may aid in managing both participant and program team expectations. If energy conservation measure savings estimates are falling short of a 5-10% baseline energy usage, the savings may not be detectable during the program year using a usage regression, and secondary engineering calculations may be a better fit.

- **Recommendation 6**: The program team should consider estimating savings amounts for planned measures or activities. If this is currently being done by the program team, those values should be included in the Opportunity Register.

# 6 Power Saver Program

Power Saver is a direct load control program offered to residential, small commercial (< 50 kW), and medium commercial (50 kW – 150 kW) Public Service New Mexico (PNM) customers. To facilitate load control in the DCU program components, participants must have a device attached to the exterior of their air conditioning unit. This device is capable of receiving a radio signal that will turn off the unit's compressor for an interval of time. For the smart thermostat components, load curtailment is achieved via communication with the WiFi-enabled thermostat. Residential and small commercial participants receive an annual $25 incentive for their participation. Medium commercial participants receive an annual incentive of $9 per ton of refrigerated air conditioning.

There were four Power Saver events during the summer 2022 demand response (DR) season, which began May 15th and ended September 30th. Table 36 provides some information on the 2022 events. During the first two events, all five program components were dispatched. For the latter two events, only the Residential DCU and Small Commercial DCU components were dispatched. For all segments other than Residential BYOT, each event used an adaptive 50% cycling strategy where curtailment is based on the runtime in the previous hour. For the BYOT component, thermostat devices are curtailed using a 50% cycling strategy performed by the thermostat manufacturer.

The realized gross energy savings is 366,031 kWh and the realized gross demand savings is 36,250 kW.

**Table 36: 2022 Power Saver Event Summary**

| Date | Day of Week | Start Time (MDT) | End Time (MDT) | Daily High at KABQ (F) |
|---|---|---|---|---|
| 6/10/2022 | Friday | 3:00 PM | 7:00 PM | 100 |
| 7/11/2022 | Monday | 3:00 PM | 7:00 PM | 96 |
| 7/18/2022 | Monday | 3:00 PM | 7:00 PM | 98 |
| 7/19/2022 | Tuesday | 3:00 PM | 7:00 PM | 101 |

After the conclusion of the summer 2022 season, Itron provided the Evergreen team with a series of datasets for the evaluation. These files included:

- For Residential DCU and Small Commercial sites, 5-minute load data from 6/1/2022 to 9/30/2022

- For Medium Commercial DCU sites, 5-minute load data from 6/1/2022 to 9/30/2022
- For Residential DCU and Small Commercial sites, an M&V list that provided the location type (residential or commercial), the group (control or curtailment), and/or the dates each load control device was active
- For Medium Commercial sites, an M&V list that provided the dates each load control device was active
- For the Two-Way Smart Thermostat and BYOT groups, 5-minute runtime data from 6/1/2022 to 9/30/2022

The Evergreen team also received Itron's Power Saver impact evaluation report, which detailed the methods Itron employed in calculating customer baselines (CBLs) for the five different DR program components. A CBL is an estimate of what participant loads would have been absent the DR event dispatch. For each DR program component, the report also showed the load impact, which is the difference between the CBL and the metered load, for each 5-minute interval of each curtailment day. The key steps in the Evergreen verified savings analysis were:

1) For each DR program component, reproduce the performance estimates calculated by Itron using the contractually-agreed upon CBL method.
2) Modify the CBL methodology and produce ex post estimates of what the per-device impact was during the 2022 DR season.
3) Where possible, leverage additional historical data from 2015 through 2022 to produce ex ante estimates of what the per-device impact at peaking conditions (5-6 PM at 100°F) will be in future summers.
4) Scale the per-device estimates by the number of active program devices to calculate the aggregate load reduction capability (MW) of the Power Saver program.

Table 37 and Table 38 summarize our findings for residential and commercial segments, respectively. The main driver in the difference between Itron and Evergreen load reduction estimates is that Itron commonly summarized impacts with the maximum (e.g., the largest 5-minute impact in a one-hour interval is the impact for that hour), whereas the Evergreen team summarized impacts with an average. Multiplying our per-device reduction estimates by the number of devices in each class leads to a 2022 average total estimated load reduction of approximately 33.69 MW, 1.11 MW, 0.54 MW, 2.48 MW, and 1.28 MW for the Residential DCU, Two-Way Smart Thermostat, BYOT, Small Commercial, and Medium Commercial segments respectively. In aggregate, the average 2022 performance prior to making offline and operability adjustments is 39.10 MW. This is approximately 69% of Itron's pre-adjustment estimate for the 2022 season (56.80 MW). After making an online adjustment for the thermostat groups of (82% for Two-Way Smart Thermostats and 85% for BYOT) and an operability adjustment for the three DCU segments (87%), the aggregate Evergreen-calculated impact for 2022 is 33.95 MW (compared to 49.48 MW from Itron after adjustment).

The Evergreen team used Power Saver results from 2015 to 2022 to estimate the load relief capability under extreme conditions. At 100% operability, we estimate the program is capable of delivering 41.77 MW of load reduction under planning conditions of 100°F between 5:00 PM and 6:00 PM MDT. Of the estimated 41.77 MW of load reduction capability, 35.81 MW comes from the Residential DCU segment, 1.32 MW comes from the Two-Way Smart Thermostat segment, 0.59 MW comes from the BYOT segment, and 2.66 MW and 1.39 MW come from the Small and Medium Commercial segments, respectively. Factoring in the operability/online adjustments, the aggregate program can provide 36.25 MW of load relief.

**Table 37: Residential Results**

| | | Unit | Residential DCU | | Two-Way Smart Thermostats | | BYOT Smart Thermostats | |
|---|---|---|---|---|---|---|---|---|
| | | | Measured | Adjusted | Measured | Adjusted | Measured | Adjusted |
| Number of Devices | | # | 49,589 | 49,589 | 759 | 759 | 775 | 775 |
| Itron | 2022 Load Reduction Estimate | kW / device[21] | 0.90 | 0.78 | 1.58 | 1.30 | 1.95 | 1.66 |
| Itron | 2022 Load Reduction Estimate | Total MW | 44.46 | 38.68 | 1.20 | 0.99 | 1.51 | 1.29 |
| Evergreen | 2022 Load Reduction Estimate | kW / device | 0.68 | 0.59 | 1.46 | 1.20 | 0.70 | 0.60 |
| Evergreen | 2022 Load Reduction Estimate | Total MW | 33.69 | 29.31 | 1.11 | 0.91 | 0.54 | 0.46 |
| Evergreen | Ex Ante Load Reduction Estimate[22] | kW / device | 0.72 | 0.63 | 1.74 | 1.42 | 0.76 | 0.64 |
| Evergreen | Ex Ante Load Reduction Estimate[22] | Total MW | 35.81 | 31.15 | 1.32 | 1.08 | 0.59 | 0.50 |
| Evergreen | 2022 Energy Savings | kWh / device | 1.84 | 1.60 | 4.52 | 3.70 | 2.63 | 2.24 |
| Evergreen | 2022 Energy Savings | Total MWh | 365.21 | 317.73 | 6.86 | 5.62 | 4.08 | 3.47 |

[21] An operability adjustment of 87% is applied to the 2022 kW factors for Residential DCU, Small Commercial DCU, and Medium Commercial DCU. An online adjustment of 82% is applied to Residential Two-Way Smart Thermostats, and an online adjustment of 85% is applied to Residential BYOT.

[22] Ex ante program capability is reported in the 5 PM – 6 PM MDT hour at 100°F.

### Table 38: Commercial Results

| | | Unit | Small Commercial | | Medium Commercial | |
|---|---|---|---|---|---|---|
| | | | Measured | Adjusted | Measured | Adjusted |
| Number of Devices (Number of Locations) | | # | 5,464 | 5,464 | 3,209 (439) | 3,209 (439) |
| Itron | 2022 Load Reduction Estimate | kW / device | 1.09 | 0.95 | 1.19 | 1.04 |
| Itron | 2022 Load Reduction Estimate | Total MW | 5.97 | 5.19 | 3.83 | 3.34 |
| Evergreen | 2022 Load Reduction Estimate | kW / device | 0.45 | 0.39 | 2.91 | 2.53 |
| Evergreen | 2022 Load Reduction Estimate | Total MW | 2.48 | 2.15 | 1.28 | 1.11 |
| Evergreen | Ex Ante Load Reduction Estimate | kW / device | 0.49 | 0.42 | 3.16 | 2.75 |
| Evergreen | Ex Ante Load Reduction Estimate | Total MW | 2.66 | 2.31 | 1.39 | 1.21 |
| Evergreen | 2022 Energy Savings | kWh / device | 1.72 | 1.50 | 1.16 | 1.01 |
| Evergreen | 2022 Energy Savings | Total MWh | 37.60 | 32.71 | 7.47 | 6.50 |

# 7 Peak Saver Program

PNM offers the Peak Saver program to non-residential customers with peak load contributions of at least 50 kW. The program compensates participants for reducing electric load upon dispatch during periods of high system load. Enbala implemented the Peak Saver program in 2022, handling the enrollment, dispatch, and settlement with participating customers. During the 2022 demand response season, there were 159 participating facilities and three demand response events. These events are summarized in Table 39.

**Table 39: 2022 Peak Saver Event Summary**

| Date | Weekday | Participants | Start Time (MDT) | End Time (MDT) | Daily High at KABQ (F) |
|---|---|---|---|---|---|
| 06/10/2022 | Friday | 159 | 3:00 PM | 7:00 PM | 100 |
| 07/11/2022 | Monday | 159 | 2:00 PM | 6:00 PM | 95 |
| 09/02/2022 | Friday | 159 | 5:00 PM | 7:00 PM | 93 |

After the 2022 demand response (DR) season concluded, Enbala provided the Evergreen team with one-minute interval load data and end-of-season summary information on performance metrics for each site/event combination. The interval data spanned from May 19$^{th}$ to September 4$^{th}$ and included load impacts calculated using a customer baseline (CBL) method outlined in the PNM-Enbala contract. A CBL is an estimate of participant loads absent the DR event dispatch, and load impacts are the difference between CBL and the metered load during the event. The relevant CBLs were also included in the one-minute load data.

Using these data sources, the Evergreen team completed our verified savings analysis. The three key steps in the analysis were:

1. Reproducing the performance estimates calculated by Enbala using the contractually-agreed upon CBL method;
2. Assessing the accuracy of the contract CBL method by examining its ability to predict loads on non-event weekdays; and
3. Modifying the CBL methodology to reduce bias and calculate verified impacts for each event.

## 7.1 Validation of Settlement Calculations

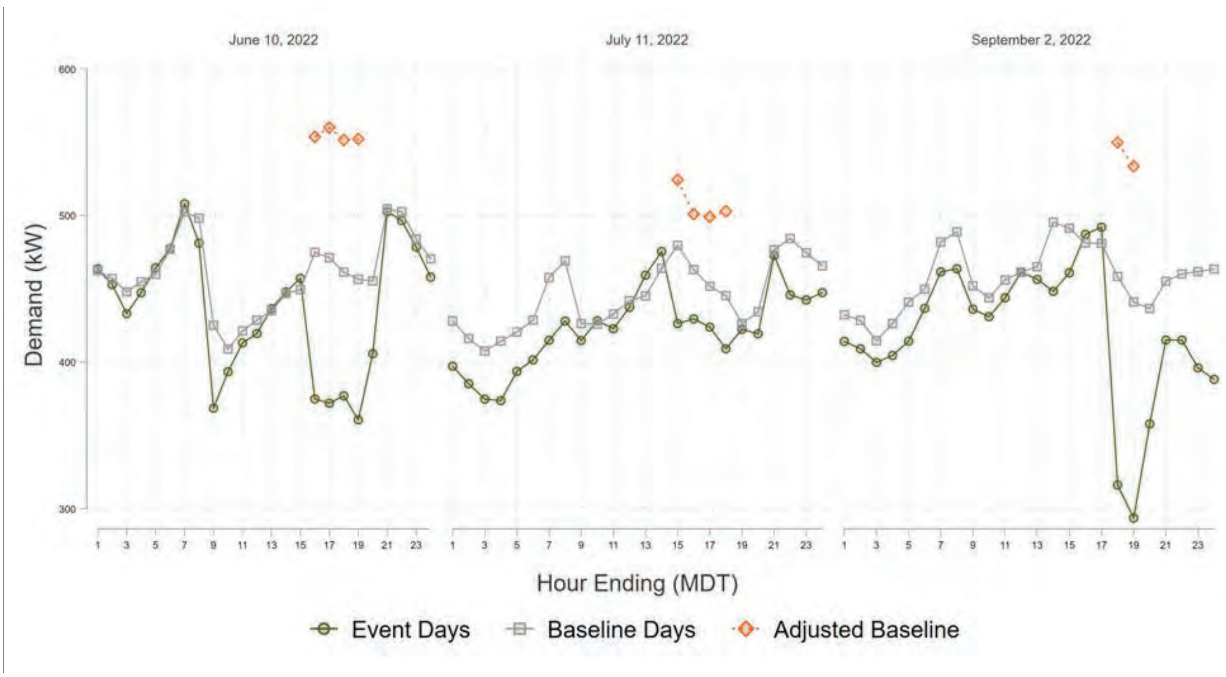
The settlement calculations called for a "high 3-of-5" baseline with an uncapped, asymmetric day-of adjustment. To determine the high 3-of-5 days, the following process was used:

- Select the five non-holiday, non-event weekdays that immediately precede the event; and
- Out of those five days, pick the three days with the highest average demand during the hours in which the event occurred. In the case of a tie, the baseline day chosen was the one closest to the event day.

Our team was successful in replicating almost all of the settlement baselines. Enbala's average settlement baseline for all sites and event hours was 532.85 kW, while our team's average settlement baseline was 532.86 kW. Any variances between the settlement baseline and our team's baseline were minimal, with differences typically less than 0.01 percent. The baseline calculations adhered to a highly consistent rule set, with the exception of one participant with solar and negative loads during daytime hours.

Figure 42 shows the average hourly event day loads for the full population, the average hourly loads on the high 3-of-5 baseline days, and the average hourly baselines for the event intervals. Note dispatch hours varied across events days (3:00 PM to 7:00 PM on June 10th, 2:00 PM to 6:00 PM on July 11th, and 5:00 PM to 7:00 PM on September 2nd).

**Figure 42: Peak Saver Loads and Baselines**




Once we validated that the baselines were calculated according to the contract methods, our team proceeded to the performance metric calculations. The performance metrics are defined as follows:

- **10-Minute Participant Capacity Performance** – The difference between the CBL and the lowest actual electrical demand measured by a one-minute interval reading between eight and ten minutes after the start of an event.
- **Average Participant Capacity Performance** – The average difference between the CBL and the participant's actual electric demand beginning ten minutes after the initiation of the event.
- **Participant Event Capacity Performance** – Weighted average of 10-Minute Participant Capacity Performance (40% weight) and Average Participant Capacity Performance (60% weight).
- **Energy Delivered** – The difference (in kWh) between the adjusted CBL and the metered load summed across all DR event hours.

Using the settlement baselines, all performance calculations were replicated without problem. Table 40 shows portfolio performance metrics by date.

**Table 40: Peak Saver Performance Metrics by Date – Contract Settlement Method**

| Date | 10-Minute Participant Capacity (kW) | Average Participant Capacity (kW) | Participant Event Capacity Performance (kW) | Energy Delivered (kWh) |
|---|---|---|---|---|
| 06/10/2022 | 29,543 | 27,456 | 28,882 | 111,137 |
| 07/11/2022 | 17,476 | 11,761 | 14,578 | 50,955 |
| 09/02/2022 | 37,736 | 36,316 | 37,032 | 71,673 |
| **Average** | **28,252** | **25,178** | **26,831** | **77,922** |

## 7.2 Peak Saver Conclusions and Recommendations

After our review of the 2022 Peak Saver program, the Evergreen team offers the following recommendations:

- Make the multiplicative adjustment symmetric rather than asymmetric. As discussed in the assessment of CBL accuracy presented in Section 2.1, using an asymmetric adjustment results in an upwards bias in the baseline. Biasing the baseline inherently biases the performance metrics. The bias is greatly reduced when using a symmetric adjustment.
- Set a cap for the multiplicative adjustment factor to prevent unrealistic baselines.
- Examine load data for solar patterns or pre-pumping/pre-cooling on event days. Pre-pumping/pre-cooling on event days is fine, but sites that do so should not receive the adjustment factor (or the adjustment factor should be based on weather rather than load). For sites with solar, consider using a smaller adjustment factor cap, using an additive adjustment, or removing the adjustment factor altogether.

- Compare DR nominations with the average demand on typical summer afternoons. If any nominations seem too high, update them. (We'll note that nominations for some sites do change throughout the summer.)
- PNM should also consider collecting all meter channels for sites with solar PV. This would allow the CBL to fully capture the load shape of sites that are net exporters during key times of day. It's possible that these sites reduced load and thus became larger exporters than they would have been on a non-event day, but the available data doesn't allow for a measurement. Also, an additive adjustment may work better than a multiplicative one for sites whose load can cross zero during the event period or adjustment window.
- Set DR performance equal to the battery discharge to measure the performance of solar + storage sites provided that the battery system records telemetry, the site does not discharge their battery on non-event days and does not engage in other curtailment activities within the facility.

# 8 Load Management as a Resource

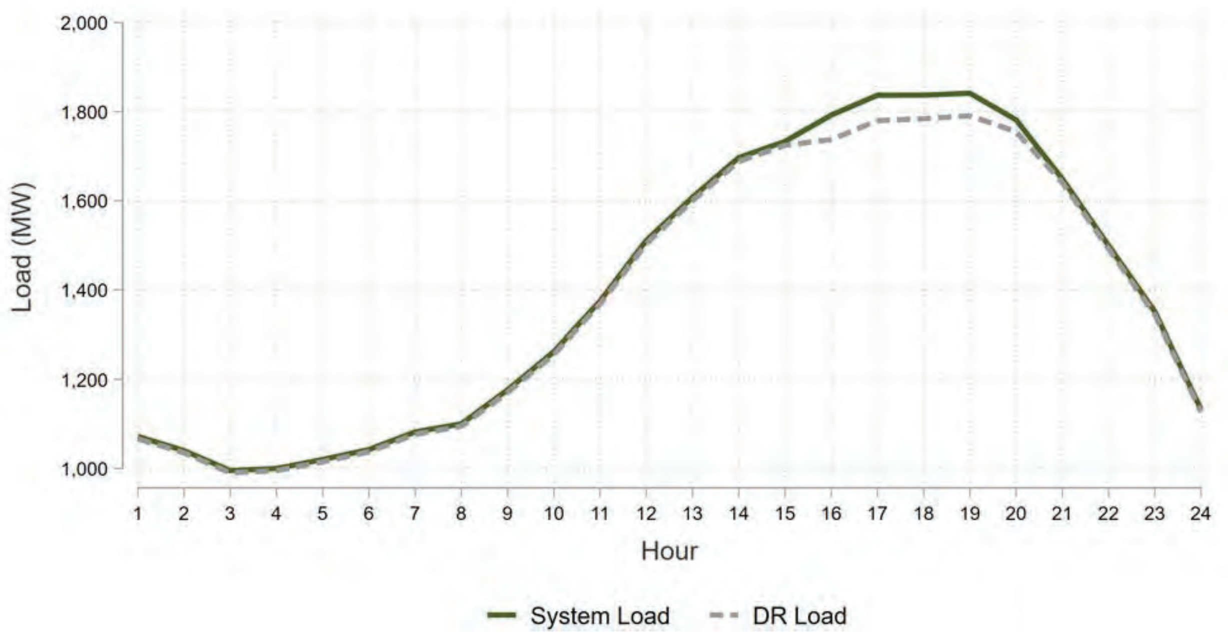
On January 31, 2018, the New Mexico Public Regulation Commission (NMPRC) issued a final order in PNM's 2017 energy efficiency case that directs Evergreen Economics, as independent program evaluator for PNM's energy efficiency and load management (LM) programs, to do the following:

*In PNM's future M&V reports, the independent evaluator shall verify that load reductions from deployment of PNM's LM programs avoided or offset the need for or use of additional peaking units or power purchases or shifted demand from peak to off peak period.*

The evaluation team concludes that PNM's demand response (DR) programs, Power Saver and Peak Saver, were highly effective reducing peak demand during the summer of 2022 when PNM faced tight supply conditions. The LM programs achieved their intended objective of helping to fulfill PNM’s reserve margin and responding quickly to operational needs. Both functions offset the need for construction or purchase of traditional peak capacity resources.

The LM programs made a significant contribution during on-peak hours, as demonstrated by Figure 43. This figure shows the actual system load with DR in place and the counterfactual load without DR on June 10th. Both Peak Saver and Power Saver were activated on this day due to a resource constraint brought on by the unexpected loss of a generation resource. During the four-hour event, which was dispatched between 3:00 PM and 7:00 PM, an average of 45.2 MW of load was reduced on PNM’s system. Figure 45 shows that PNM system load would have peaked at the hour ending 7:00 PM at approximately 1842 MW absent dispatch of the LM programs. Dispatching DR lowered the net peak for the day by almost 2.5 percent.

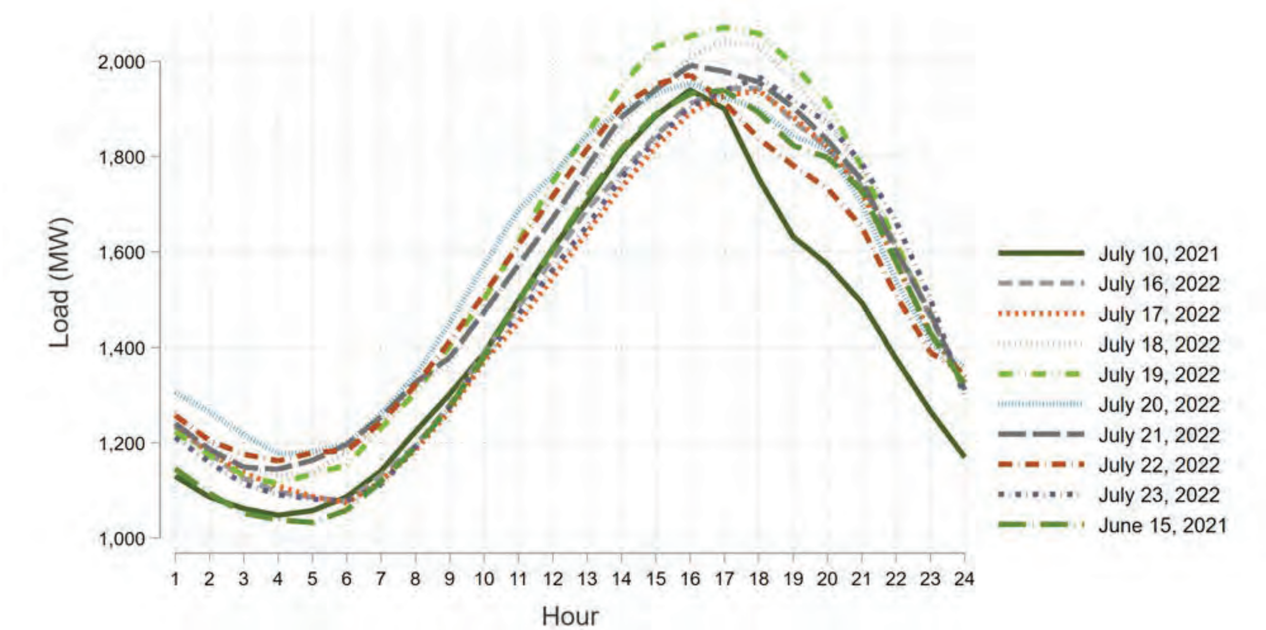
**Figure 43: PNM System Load June 10, 2022**




PNM's Load Management programs have been a key capacity resource for the last decade, delivering fast and reliable reductions in load when operational constraints necessitate dispatch. The value of DR as a capacity resource on the PNM system is expected to continue in the future due to two significant drivers. First, increased prevalence of extreme weather across the western US is leading to higher system loads during peak periods and sustained heat events. Second, the expansion of solar photovoltaic (PV) capacity both behind and in front of the meter. Climate concerns and decreasing costs have led to rapid growth of residential and commercial installations, which in turn has moved net system peaks later in the day. Because solar power is more intermittent than thermal generation, LM programs will remain an important tool for balancing supply and demand on the PNM system.

Figure 44 illustrates this trend by plotting the top 10 load days from 2012 to 2022. Notably, all 10 of the highest peak days recorded in this period occurred in the years 2021 and 2022. A one-degree increase in temperature (ºF) leads to a 20-25 MW increase in peak load on the PNM system. As peak loads grow, the mandated reserve capacity margin, currently set at 18%, will require higher MW capacity buffers to ensure adequate supply at peaking conditions. Moreover, greater variance among high-load hours, which results in increased costs of maintaining variable use resources, makes a strong case for the use of DR resources that are maintained at near-zero operating costs. Interestingly, the load management programs were not called on several of the highest load days of summer 2022. This illustrates the shift in focus from traditional gross peaks (when loads are highest) to net peaks (when load net of solar production is highest).

**Figure 44: Top 10 System Load Days 2012-2022**




The expansion of PV installations is a prominent theme in stakeholder materials released to date for PNM's 2023 Integrated Resource Plan (IRP). Afternoon load curves are being smoothed out, and peak demand is shifting to later hours in the day. This trend is expected to continue given the sustained PV network expansion. Itron's 2022-2040 adoption forecasts outline a "high PV" scenario, where PV capacity installed is over 1,100 MW by 2040, at a rate of 45 MW/year addition. It is noteworthy that even the "low" case of over 700 MW by 2040 is far above the prior IRP's forecast of 400 MW. This highlights the need for higher buffer capacity in the future, as the PV infrastructure is expected to play an increasingly significant role in shaping peak load structures.[23]

The prevalence of PV installations reduces energy demand during the traditional 12:00-17:00 PM on-peak window and creates a peak load in the late afternoon when consumption remains high but solar production has started to fade. PNM has acknowledged this trend and suggests that the system may soon be able to meet the 0.1 LOLE metric while not meeting the EUE/LOLH metric as significant energy limited resources are included in the system.[24]

Furthermore, the increased reliance on intermittent energy sources must also be taken into consideration. Figure 45 shows the load duration curve for 2022, which illustrates the high load

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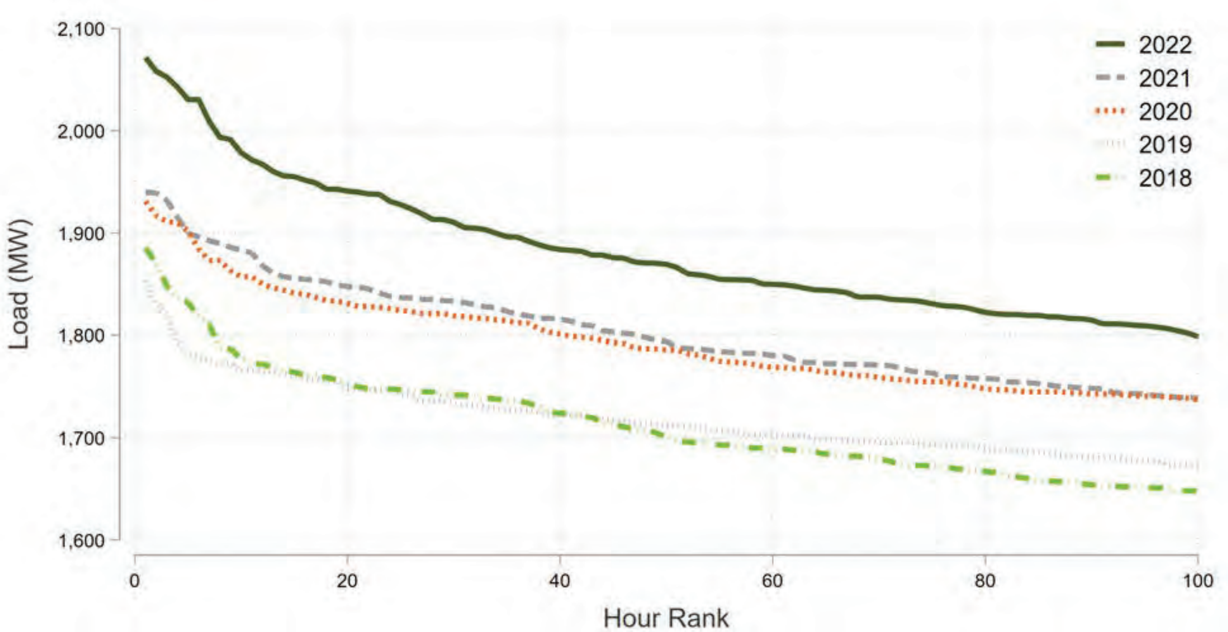
[23] PNM 2023-2042 IRP: Siemens Market Price Outlook, Itron Load Forecast, and Pricing topics. https://www.pnmforwardtogether.com/assets/uploads/Slides-IRP-PAG-Steering-Meeting-13-Pricing-TOD-Market-Prices-Forecast-Load.pdf

[24] PNM 2023-2042 IRP: Modeling for Reliability, Resource Adequacy and Resiliency. https://www.pnmforwardtogether.com/assets/uploads/2023-IRP-Technical-Session-1-Post2.pdf

variance among the highest loading hours. The standard deviation among the top 20 hours in 2022 was 65.6 MW, twice the amount recorded in 2019. The load durations illustrate just how few hours per year the last 5-10% of PNM's capacity requirement are needed. However, when LM programs are needed, they are needed quickly – almost like an ancillary services resource. PNM's LM programs have proven effective at lowering loads quickly. For example, the Peak Saver program registered a verified ten-minute capacity of 17.7 MW during the June 10th event, which exceeded the program's average event capacity of 15.3 MW.

Load Management programs fill an important role in the supply mix as PNM navigates the energy transition by helping to offset the need for traditional thermal peaking capacity. Given PNM's aggressive goal of having renewables and storage account for two-thirds of its installed capacity by 2033[25], flexible and fast-responding DR programs are a key resource to balance supply and demand on a changing system.

**Figure 45: Top 100 Hour Load Duration Curves 2018-2022**




The value of Load Management programs lies almost entirely in the capacity benefits they produce. Table 41 compares the energy and capacity benefit streams of PNM's Load Management programs with its EE programs. While demand response programs can provide energy benefits by shifting load, the energy value of DR is limited and over 99% of the benefits come from avoided

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[25] PNM 2023-2042 IRP: Southwest Resource Adequacy in the Desert Southwest and Supply Resilience in Planning for PNM. https://www.pnmforwardtogether.com/assets/uploads/2023-IRP-Meeting-2-SWRA-and-Resiliency-Studies-20220525.pdf

capacity costs. While EE programs do reduce peak demand and produce capacity benefits, the majority of their benefits come in the form of avoided energy.

**Table 41: 2022 Demand Response Program Benefits**

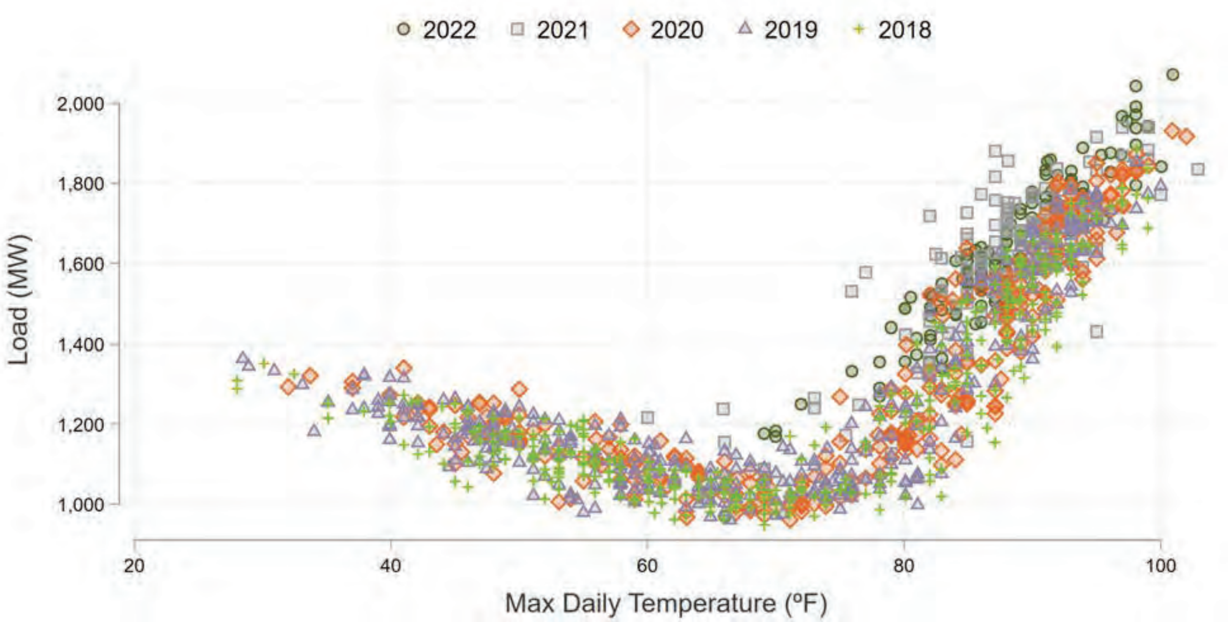
| Program | Energy Benefit ($1,000) | Capacity Benefit ($1,000) | Percent Capacity |
|---|---|---|---|
| Power Saver | $42.02 | $48,482.19 | 99.91% |
| Peak Saver | $17.90 | $20,663.03 | 99.91% |
| Energy Efficiency Programs | $21,871.36 | $38,465.81 | 63.86% |

PNM's Load Management programs are a good fit for its peak capacity requirements for several reasons:

- Load Management resources are dispatchable and available quickly.
- PNM is a summer-peaking utility.
- PNM’s peak loads are concentrated in relatively few hours per year. As shown in Figure 45, there is often a 100 MW difference in system load between the highest load hour and the 20$^{th}$ load hour of the year.

Dispatchable resources like PNM’s Load Management programs work well when only called a limited number of times per year. This is different from traditional generation resources which have substantial fixed costs and become more economically viable with increased utilization. PNM's status as a summer-peaking utility is a constant trend, with peak summer load typically 20 to 30 percent higher than peak winter load, as shown in Figure 46. Power Saver relies on control of central air conditioners to deliver peak load reduction, so the program’s DR capability is inherently limited to the summer months. However, this is when the PNM system experiences constraints. While Power Saver has limited availability seasonally, it is a load-following resource – meaning it delivers the largest impacts when system loads are elevated due to extreme temperatures. The Load Management programs are also flexible with respect to timing. As net peaks shift later in the evening, PNM can call events later in the day.

**Figure 46: Daily Maximum PNM System Load and Temperature by Year**



# 9 Cost Effectiveness Summary

Earlier chapters presented the UCT cost effectiveness results for those programs evaluated in 2022. This chapter presents a summary of the cost effectiveness calculations for all of the PY2022 PNM programs.

As discussed previously, in order to do the UCT calculation, the evaluation team obtained the following from PNM:

- Avoided cost of energy for Energy Efficiency and Demand Response (costs per kWh over a 20+ year time horizon);
- Avoided cost of capacity for Energy Efficiency and Demand Response (estimated cost of adding a kW/year of generation, transmission, and distribution to the system);
- Avoided cost of CO2 (estimated monetary cost of CO2 per kWh generated);
- Avoided transmission and distribution costs;
- Discount rate;
- Line loss factor; and
- Program costs (all expenditures associated with program delivery).

Additional considerations for the UCT as applied to the PNM programs:

- PNM does not quantify the avoided cost of transmission and distribution.
- PNM provided a levelized avoided cost of capacity, to which the discount rate was not applied further.
- The NMPRC allows for the benefits of low-income programs to be boosted by 20 percent to account for utility system economic benefits. PNM estimates the following proportions of low-income customers participate in their programs:
    - 100 percent of Low-Income Home Energy Checkup
    - 39 percent of Commercial Comprehensive - Multifamily
    - 100 percent of Easy Savings
    - 100 percent of Energy Smart
    - 40 percent of Home Works
- Program costs were broken into the following categories:
    - Administration
    - Promotion
    - Measurement & Verification
    - Rebates

- o Third-Party Costs
- o Market Transformation

The results of the UCT for all programs based on net realized savings are shown below in Table 42. Overall, the PY2022 portfolio was found to have a UCT ratio of 1.77.

**Table 42: PY2022 Cost Effectiveness**

| Program | Utility Cost Test (UCT) |
|---|---|
| Res Comp – Refrigerator Recycling | 0.62 |
| Res Comp – Home Energy Checkup | 0.41 |
| Res Comp – Home Energy Checkup LI | 0.46 |
| Res Comp – Residential Cooling | 0.47 |
| Residential Behavioral HER | 0.06 |
| Residential Lighting | 5.35 |
| Residential Products | 3.58 |
| Commercial Comprehensive | 1.45 |
| Commercial Comprehensive - Multifamily | 0.67 |
| Easy Savings | 2.66 |
| Energy Smart (MFA) | 0.74 |
| New Home Construction | 1.34 |
| PNM Home Works | 1.28 |
| Commercial Behavioral SEM | 0.17 |
| PNM Power Saver | 1.08 |
| PNM Peak Saver | 1.09 |
| **Overall Portfolio** | **1.77** |

# Evaluation of the 2022 Public Service Company of New Mexico Energy Efficiency and Demand Response Programs

## Final Report - Appendices

April 4, 2023

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# Appendix A: Commercial Comprehensive Participant Survey Instrument

Hello, my name is (your name) from Research & Polling, Inc. I am calling on behalf of PNM. I'm calling because our records show that you recently completed an energy efficiency project where you installed (measure 1) at your business located at (site address) and received a rebate through the PNM (rebate program). I'd like to ask a short set of questions about your experience with the (rebate program) program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about the/these energy efficiency upgrade(s) and energy use at your firm?

Yes ........................ 1
No.......................... 2
Never installed ..... 3

Q1-M1. (A 1) Our records show in 2022 your business got a rebate through PNM for installing (measure 1). Are you familiar with this project?

Yes ........................ 1
No ......................... 2
Never installed ..... 3
Don't know ........... 4

Q1a-M1. Our records show it was installed at (site address) in (site city). Is that correct?

Yes ........................ 1
No ......................... 2
Never installed ..... 3

Q1b-M1. Where was (measure 1) installed? (Among those who installed measure 1 at a different location than PNM's records.)

[Data Processing Use Only] Q2-M1. (A 1a) Is there someone else at your company who would know about buying the (measure 1)?

Yes, transfer and go to intro ....... 1
Yes, no transfer .......................... 2

Q3-M1. (A 2) Thinking about the (measure 1) for which you received a rebate, is the (measure 1) still installed in your facility?

Yes .................................. 1
No ................................... 2
Prefer not to answer ...... 3
Don't know ..................... 4

Q4a-M1. (A 3) Was the (measure 1) removed? (Among those who do not currently have measure 1 installed at their facility.)

Yes, it was removed ........ 01
No .................................. 02
Prefer not to answer ....... 03
Don't know .................... 99

Q4b-M1. (A 3) Was the (measure 1) never installed? (Among those who do not currently have measure 1 installed at their facility.)

Yes, never installed ......... 01
Prefer not to answer ....... 02
Don't know .................... 99

Q5-M1. (A 3a) Why was the (measure 1) removed/never installed? (Among those who do not currently have measure 1 installed at their facility or never installed measure 1.)

Q6-M1. (A 4) Is the (measure 1) still functioning as intended? (Among those who currently have measure 1 installed.)

Yes ................................. 1
No .................................. 2
Prefer not to answer ...... 3
Don't know .................... 4

Q7-M1. (A 5) Did your firm use a contractor to install the (measure 1) or did internal staff do the work?

Contractor ....................... 01
Internal Staff .................. 02
Prefer not to answer ....... 03
Landlord.......................... 04
Don't know .................... 99

Q8-M1. (A 6) Why did your firm choose to use internal staff instead of a contractor? (Among those who had internal staff install measure 1.)

Prefer not to answer ................................................................. 98
Don't know ................................................................................ 99

Q1-M2. (A 1) Our records show in 2022 your business got a rebate through PNM for installing a (measure 2). Do you remember this? (Among those who received rebates for more than one measure.)

Yes ....................... 1
No ......................... 2
Never installed ..... 3
Don’t know ........... 4

Q1a-M2. Our records show (measure 2) was installed at (site address) in (site city). Is that correct? (Among those who received rebates for more than one measure.)

Yes ........................ 1
No ......................... 2
Never installed ..... 3
Don't know ........... 4

Q1b-M2. Where was (measure 2) installed? (Among those who received rebates for more than one measure and installed measure 2 at a different location than PNM's records.)

Q3-M2. (A 2) Thinking about the (measure 2) for which you received a rebate, is the (measure 2) still installed in your facility? (Among those who received rebates for more than one measure.)

Yes ................................. 1
No .................................. 2
Prefer not to answer ...... 3
Don't know ..................... 4

Q4a-M2. (A 3) Was the (measure 2) removed? (Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility.)

Yes, it was removed ........ 01
No .................................. 02
Prefer not to answer ....... 03
Don't know ..................... 99

Q4b-M2. (A 3) Was the (measure 2) never installed? (Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility.)

Yes, never installed ......... 01
Prefer not to answer ....... 02
Don't know ..................... 99

Q5-M2. (A3a) Why was the (measure 2) removed/never installed? (Among those who received rebates for more than one measure and currently do not have measure 2 installed at their facility or never installed measure 2.)

Q6-M2. (A 4) Is the (measure 2) still functioning as intended? (Among those who received rebates for more than one measure and have measure 2 installed.)

Yes ................................. 1
No .................................. 2
Prefer not to answer ...... 3
Don't know ..................... 4

Q7-M2. (A 5) Did your firm use a contractor to install the (measure 2) or did internal staff do the work? (Among those who received rebates for more than one measure and have measure 2 installed.)

Contractor ...................... 01
Internal Staff .................. 02
Prefer not to answer ....... 03
Don't know .................... 99

Q8-M2. (A 6) Why did your firm choose to use internal staff instead of a contractor? (Among those who received rebates for more than one measure and had internal staff install measure 2.)

Prefer not to answer ................................................................ 98
Don't know ................................................................................ 99

Q9-M2. (A 7) Were your (measure 1) and (measure 2) installed/purchased together as a single project or were these done separately? (Among those who received rebates for two measures.)

Together as one project ....... 1
Separately ........................... 2
Prefer not to answer ........... 3
Don't know .......................... 4

Q1-M3. (A 1) Our records show in 2022 your business got a rebate through PNM for installing a (measure 3). Do you remember this? (Among those who received rebates for more than one measure.)

Yes ....................... 1
No ........................ 2
Never installed ..... 3
Don't know .......... 4

Q1a-M3. Our records show (measure 3) was installed at (site address) in (site city). Is that correct? (Among those who received rebates for more than one measure.)

Yes ....................... 1
No ........................ 2
Never installed ..... 3
Don't know .......... 4

Q1b-M3. Where was (measure 3) installed? (Among those who received rebates for more than one measure and installed measure 3 at a different location than PNM's records.)

Q3-M3. (A 2) Thinking about the (measure 3) for which you received a rebate, is the (measure 3) still installed in your facility? (Among those who received rebates for more than one measure.)

Yes ................................ 1
No ................................. 2
Prefer not to answer ...... 3
Don't know .................... 4

Q4a-M3. (A 3) Was the (measure 3) removed? (Among those who received rebates for more than one measure and currently do not have measure 3 installed at their facility.)

Yes, it was removed ........ 01
No .................................. 02
Prefer not to answer ....... 03
Don't know .................... 99

Q4b-M3. (A 3) Was the (measure 3) never installed? (Among those who received rebates for more than one measure and currently do not have measure 3 installed at their facility.)

Yes, never installed ......... 01
Prefer not to answer ....... 02
Don't know .................... 99

Q5-M3. (A3a) Why was the (measure 3) removed/never installed? (Among those who received rebates for more than one measure and currently do not have measure 3 installed at their facility or never installed measure 3.)

Q6-M3. (A 4) Is the (measure 3) still functioning as intended? (Among those who received rebates for more than one measure.)

Yes ................................ 1
No ................................. 2
Prefer not to answer ...... 3
Don't know .................... 4

Q7-M3. (A 5) Did your firm use a contractor to install the (measure 3) or did internal staff do the work? (Among those who received rebates for more than one measure.)

Contractor ....................... 01
Internal Staff .................. 02
Prefer not to answer ....... 03
Don't know .................... 99

Q8-M3. (A 6) Why did your firm choose to use internal staff instead of a contractor? (Among those who received rebates for more than one measure and had internal staff install measure 3.)

Prefer not to answer ................................................................ 98
Don't know ................................................................................ 99

Q9-M3. (A 7) Were your (measure 1), (measure 2) and (measure 3) installed/purchased together as a single project or were these done separately? (Among those who received rebates for three measures.)

Together as one project ....... 1
Separately ........................... 2
Prefer not to answer ............ 3
Don't know .......................... 4

Q10. (B 1) How did your company FIRST learn about the program?

Word of mouth (business associate, co-worker) ...................... 01
Utility program staff ................................................................ 02
Utility website ......................................................................... 03
Utility bill insert ....................................................................... 04
Utility representative .............................................................. 05
Utility advertising .................................................................... 06
Email from utility ..................................................................... 07
Contractor/distributor ............................................................ 08
Building audit or assessment .................................................. 09
Television Advertisement - Mass Media .................................. 10
Other mass media (sign, billboard, newspaper/magazine ad) ... 11
Event (conference, seminar, workshop) .................................. 12
Online search, web links ......................................................... 13
Participated or received rebate before .................................... 14
No way in particular ................................................................ 98
Don't know .............................................................................. 99

Q11. (B 2) What other sources did your company use to gather information about the program? ... Were there any others?

Word of mouth (business associate, co-worker) ...................... 01
Utility program staff ................................................................ 02
Utility website ......................................................................... 03
Utility bill insert ....................................................................... 04
Utility representative .............................................................. 05
Utility advertising .................................................................... 06
Email from utility ..................................................................... 07
Contractor/distributor ............................................................ 08
Building audit or assessment .................................................. 09
Television Advertisement - Mass Media .................................. 10
Other mass media (sign, billboard, newspaper/magazine ad) ... 11
Event (conference, seminar, workshop) .................................. 12
Online search, web links ......................................................... 13
Participated or received rebate before .................................... 14
None ........................................................................................ 98
Don't know .............................................................................. 99

Q12. (B 3) Of all the sources you mentioned, which did you find most useful in helping you decide to participate in the program? (Among those who mentioned additional sources used to gather information.)

None in particular ................................................................... 97
Prefer not to answer ................................................................ 98
Don't know .............................................................................. 99

[Data Processing Use Only] POLLER NOTE: Was Measure Installed?

Yes .... 1
No ..... 2

Q13a. (C 1) Did the equipment that your firm installed replace existing equipment?

Yes (i.e. all equipment was replacing old equipment) .................... 1
Some equipment was a replacement, and some was a new addition .......... 2
No (i.e. all equipment was an addition to existing equipment) ....... 3
Prefer not to answer ........ 4
Don't know ........ 5

Q13b. (C 1) Is the equipment that your firm purchased intended to replace existing equipment? (Among those who did not install the measure.)

Yes (i.e. all equipment is replacing old equipment) ...................... 1
Some equipment is a replacement, and some was a new addition 2
No (i.e. all equipment is an addition to existing equipment) ......... 3
Prefer not to answer ........ 4
Don't know ........ 5

Q14a. (C 2) Was the replaced equipment ... (Among those who installed the measure and some or all new equipment was replacing old equipment.)

Fully functional and not in need of repair? ......... 1
Functional, but needed minor repairs? ............. 2
Functional, but needed major repairs? ............. 3
Not functional? ........ 4
Prefer not to answer ........ 5
Don’t know ........ 6

Q14b. (C 2) Is the equipment you intend to replace ... (Among those who did not install the measure.)

Fully functional and not in need of repair? ......... 1
Functional, but needs minor repairs? ................ 2
Functional, but needs major repairs? ................ 3
Not functional? ........ 4
Prefer not to answer ........ 5
Don't know ........ 6

Q15a. (C 3a) About how old, in years, was the equipment prior to replacement? (Among those who installed the measure, and some or all new equipment was replacing old equipment, and the replaced equipment was functional.)

Number of years ______
Prefer not to answer ........ 499
Don't know ........ 500

Q15b. (C 3b) About how old, in years, is the equipment you are replacing? (Among those who did not install the measure, some or all new equipment was replacing old equipment, and the replaced equipment was functional.)

Number of years ______
Prefer not to answer .............................................................. 499
Don't know .............................................................................. 500

Q16. (C 4) How much longer (in years) do you think your old equipment would have lasted if you had not replaced it? (Among those who installed the measure, and some or all new equipment was replacing old equipment, and the replaced equipment was functional.)

Less than a year ............. 1
1 - 2 years ...................... 2
3 - 5 years ...................... 3
6 - 10 years .................... 4
More than 10 years ........ 5
Prefer not to answer ...... 6
Don't know .................... 7

Q17. (C 5a) Next I will read a list of reasons your firm may have considered when you decided to conduct your project. For each one, please tell me if it was not at all important, a little important, somewhat important, very important or extremely important. How important was <u>reducing environmental impact of the business</u> on your decision to conduct your project?

1 - Not Important At All ........ 1
2 - A Little Important ........... 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

Q18. (C 5b) How important was <u>upgrading out-of-date equipment</u> on your decision to conduct your project?

1 - Not Important At All ........ 1
2 - A Little Important ........... 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

Q19. (C 5c) How important was <u>improving comfort at the business</u> on your decision to conduct your project?

1 - Not Important At All ........ 1
2 - A Little Important ........... 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

[Data Processing Use Only] POLLER NOTE: Was HVAC Measure Installed?

Yes .... 1
No ..... 2

Q20. (C 5d) How important was improving air quality on your decision to conduct your project? (Among those who installed HVAC measure.)

1 - Not Important At All ........ 1
2 - A Little Important ............ 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

Q21. (C 5e) How important was receiving the rebate on your decision to conduct your project? (Among those who did not use direct install.)

1 - Not Important At All ........ 1
2 - A Little Important ............ 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

Q22. (C 5f) How important was reducing energy bill amounts on your decision to conduct your project?

1 - Not Important At All ........ 1
2 - A Little Important ............ 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

[Data Processing Use Only] POLLER NOTE: Did respondent answer "Contractor" in Q.7?

Yes .... 1
No ..... 2

Q23. (C 5g) How important was the contractor recommendation on your decision to conduct your project? (Among those who used a contractor to install the measure.)

1 - Not Important At All ........ 1
2 - A Little Important ............ 2
3 - Somewhat Important ...... 3
4 - Very Important ................ 4
5 - Extremely Important ....... 5
Don't Know/Won't Say ......... 6

[Data Processing Use Only] POLLER NOTE: Did respondent answer "Contractor" in Q.7?

Yes .... 1
No ..... 2

Q24. (D 1a) Next, I'm going to ask you to rate the importance of each of the following factors on your decision to determine how energy efficient your project would be. Please rate the importance of each of these factors in determining your project's energy efficiency level using a scale from 0 to 10, where 0 means not at all important and 10 means extremely important. Please let me know if the factor is not applicable. How important was <u>the contractor who performed the work</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................. 01
2 ............................................. 02
3 ............................................. 03
4 ............................................. 04
5 ............................................. 05
6 ............................................. 06
7 ............................................. 07
8 ............................................. 08
9 ............................................. 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q25. (D 1b) How important was <u>the dollar amount of the rebate</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................. 01
2 ............................................. 02
3 ............................................. 03
4 ............................................. 04
5 ............................................. 05
6 ............................................. 06
7 ............................................. 07
8 ............................................. 08
9 ............................................. 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q26. (D 1c) How important was <u>technical assistance received from PNM staff</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................. 01

2 .......................................... 02
3 .......................................... 03
4 .......................................... 04
5 .......................................... 05
6 .......................................... 06
7 .......................................... 07
8 .......................................... 08
9 .......................................... 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q27. (D 1d) How important was endorsement or recommendation by your PNM account manager or other PNM staff in determining how energy efficient your project would be? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 .......................................... 01
2 .......................................... 02
3 .......................................... 03
4 .......................................... 04
5 .......................................... 05
6 .......................................... 06
7 .......................................... 07
8 .......................................... 08
9 .......................................... 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q28. (D 1e) How important was information from PNM marketing or informational materials in determining how energy efficient your project would be? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 .......................................... 01
2 .......................................... 02
3 .......................................... 03
4 .......................................... 04
5 .......................................... 05
6 .......................................... 06
7 .......................................... 07
8 .......................................... 08
9 .......................................... 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q29. (D 1f) How important was <u>previous participation in a PNM program</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

| | |
|---|---|
| 0 – Not important at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 – Extremely important | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

Q30. (D 1g) How important was <u>endorsement or recommendation by a contractor</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

| | |
|---|---|
| 0 – Not important at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 – Extremely important | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

Q31. (D 1h) How important was <u>endorsement or recommendation by a vendor or distributor</u> in determining how energy efficient your project would be? (Among those who did not use direct install.)

| | |
|---|---|
| 0 – Not important at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 – Extremely important | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

Q33. (D 1j) Now, I would like to read you some factors that are not related to the rebate program. Using the same scale from 0 to 10, where 0 means not at all important and 10 means extremely important., please rate the following non program factors' importance in determining your project's energy efficiency. How important was the age or condition of the old equipment in determining your project's energy efficiency? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................ 01
2 ............................................ 02
3 ............................................ 03
4 ............................................ 04
5 ............................................ 05
6 ............................................ 06
7 ............................................ 07
8 ............................................ 08
9 ............................................ 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ........................................ 99

Q34. (D 1k) How important was corporate policy or guidelines in determining your project's energy efficiency? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................ 01
2 ............................................ 02
3 ............................................ 03
4 ............................................ 04
5 ............................................ 05
6 ............................................ 06
7 ............................................ 07
8 ............................................ 08
9 ............................................ 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ........................................ 99

Q35. (D 1l) How important was minimizing operating cost in determining your project's energy efficiency? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................ 01
2 ............................................ 02
3 ............................................ 03
4 ............................................ 04
5 ............................................ 05
6 ............................................ 06
7 ............................................ 07
8 ............................................ 08

9 ............................................ 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q36. (D 1m) How important was scheduled time for routine maintenance in determining your project's energy efficiency? (Among those who did not use direct install.)

0 – Not important at all .......... 00
1 ............................................ 01
2 ............................................ 02
3 ............................................ 03
4 ............................................ 04
5 ............................................ 05
6 ............................................ 06
7 ............................................ 07
8 ............................................ 08
9 ............................................ 09
10 – Extremely important ....... 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ....................................... 99

Q37. (D 2) Of the items I just asked you about, think of the program factors as relating to assistance provided by the utility, such as the rebate, marketing from PNM, recommendation by a contractor and technical assistance from PNM. I also asked you about some non-program factors, which included the age and condition of the old equipment, company policy, operating costs and routine maintenance.

If you had to divide 100% of the influence on your decision to determine how energy efficient your new equipment would be between the PNM program and non-program factors, what percent would you give to the importance of the program factors? (Among those who did not use direct install.)

Percentage Program Factors ............. ______%
Prefer not to answer ............................................................. 499
Don't know ............................................................................ 500

Q38. (D 3) And what percent would you give to the importance of the non-program factors? (Among those who did not use direct install and provided a percentage for the importance of program factors on their decision.)

Percentage Non-Program Factors .............. ______%
Prefer not to answer ............................................................. 499
Don't know ............................................................................ 500

Q39. (D 5) Did you first learn about the (rebate program) BEFORE or AFTER you decided how energy efficient your equipment would be? (Among those who did not use direct install.)

Before ............................ 1

After ............................... 2
Prefer not to answer ...... 3
Don't know ..................... 4

Q40. (D 6) Using a scale from 0 to 10, where 0 means not at all likely and 10 means extremely likely, please rate the likelihood that you would have installed the same equipment with the exact same level of energy efficiency if the (rebate program) was not available. (Among those who did not use direct install.)

0 - Not at all likely .................. 00
1 ............................................. 01
2 ............................................. 02
3 ............................................. 03
4 ............................................. 04
5 ............................................. 05
6 ............................................. 06
7 ............................................. 07
8 ............................................. 08
9 ............................................. 09
10 - Extremely likely .............. 10
Don't know ............................ 97
Prefer not to answer .............. 98
N/A ........................................ 99

Q41. (D 7) You just rated your likelihood to install the same equipment without any assistance from the program as a(n) (response from Q40) out of 10. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a (highest rating/s from Q24-Q32) out of 10 for the importance of (re-read question wording for highest responses Q24-Q32). Can you briefly explain why you were likely to install the equipment without the program, but also rated the program as highly influential in your decision? (Among those who did not use direct install, stated that they were 08, 09, or 10 as extremely likely to install the same equipment if the rebate program was not available, and rated one or more program factors as 08, 09, or 10 on the previous list.)

Q42. (D 8) You just rated your likelihood to install the same equipment without any assistance from the program as a(n) (response from Q40) out of 10. Earlier, when I asked you to rate the importance of each program factor on your decision, the highest rating you gave was a(n) (lowest rating/s from Q24-Q32) out of 10. Can you briefly explain why you said you were not likely to install the equipment without help from the program, yet did not rate the program as highly influential in your decision? (Among those who did not use direct install, stated that they were 00, 01, or 02 as not at all likely to install the same equipment if the rebate program was not available, and rated one or more program factors as 00, 01, or 02 on the previous list.)

Q43. (D 9) If the (rebate program) was not available, would you have delayed starting the project to a later date? (Among those who did not use direct install.)

Yes ................................................................ 1
No ................................................................ 2
Would not have done the project at all ........ 3

Prefer not to answer .................................... 4
Don't know .................................................. 5

Q44. (D 10) Approximately how much later would you have done the project if the (rebate program) was not available? Would it have been … (Among those who did not use direct install and stated they would have delayed starting the project if the rebate program was not available.)

Within one year ........................................................ 1
Between 12 months and less than 2 years ................ 2
Between 2 years and 3 years .................................... 3
Greater than 3 years ................................................. 4
Would not have installed the equipment at all ......... 5
Prefer not to answer ................................................. 6
Don't know ................................................................ 7

Q45. (D 11) Using a scale from 0 to 10, where 0 means not at all likely and 10 means extremely likely, please rate the likelihood that you would have conducted this project within 12 months of when you actually completed this project if the (rebate program) was not available. (Among those who did not use direct install and stated they would have delayed starting the project within one year if the rebate program was not available.)

0 - Not at all likely .................. 00
1 ............................................. 01
2 ............................................. 02
3 ............................................. 03
4 ............................................. 04
5 ............................................. 05
6 ............................................. 06
7 ............................................. 07
8 ............................................. 08
9 ............................................. 09
10 - Extremely likely ............... 10
Don't know ............................ 97
Prefer not to answer ............... 98
N/A ........................................ 99

Q46. (E 1a) For each of the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. PNM as an energy provider.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied .............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7
Don't know .......................................... 8

Q47. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with PNM as an energy provider.)

Q48. (E 1b) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The rebate program overall.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7
Don't know .......................................... 8

Q49. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with the rebate program overall.)

Q50. (E 1c) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The equipment installed through the program.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7
Don't know .......................................... 8

Q51. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with the equipment installed through the program.)

[Data Processing Use Only] POLLER NOTE: Was installation done by "Contractor" in Q.7?

Yes .... 1
No ..... 2

Q52. (E 1d) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The contractor who installed the equipment. (Among those who used a contractor to do the installation.)

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7

Don't know .......................................... 8

Q53. Can you tell me why you gave that rating? (Among those who used a contractor to do the installation and were Very Dissatisfied or Somewhat Dissatisfied with the contractor who installed the equipment.)

Q54. (E 1e) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The overall quality of the equipment installation. (Among those who used a contractor to do the installation.)

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ........................... 7
Don't know .......................................... 8

Q55. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with the overall quality of the equipment installation.)

Q56. (E 1f) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The amount of time it took to receive your rebate for your equipment. (Among those who did not use direct install.)

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ........................... 7
Don't know .......................................... 8

Q57. Can you tell me why you gave that rating? (Among those who did not use direct install and were Very Dissatisfied or Somewhat Dissatisfied with the amount of time it took to receive the rebate for the equipment.)

Q58. (E 1g) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The dollar amount of the rebate for the equipment. (Among those who did not use direct install.)

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4

Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ........................... 7
Don't know .......................................... 8

Q59. Can you tell me why you gave that rating? (Among those who did not use direct install and were Very Dissatisfied or Somewhat Dissatisfied with the dollar amount of the rebate for the equipment.)

Q60. (E 1h) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. Interactions with PNM.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ........................... 7
Don't know .......................................... 8

Q61. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with interactions with PNM.)

Q62. (E 1I) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The overall value of the equipment your company received for the price you paid.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied ............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ........................... 7
Don't know .......................................... 8

Q63. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with the overall value of the equipment their company received for the price they paid.)

Q64. (E 1j) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The amount of time and effort required to participate in the program.

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3

Somewhat Satisfied .............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7
Don't know .......................................... 8

Q65. Can you tell me why you gave that rating? (Among those who were Very Dissatisfied or Somewhat Dissatisfied with the amount of time and effort required to participate in the program.)

Q66. (E 1k) For the following, please tell me if you were very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied or very satisfied. The project application process. (Among those who did not use direct install.)

Very Dissatisfied .................................. 1
Somewhat Dissatisfied ......................... 2
Neither Satisfied nor Dissatisfied ......... 3
Somewhat Satisfied .............................. 4
Very Satisfied ...................................... 5
Not applicable ..................................... 6
Prefer not to answer ............................ 7
Don't know .......................................... 8

Q67. Can you tell me why you gave that rating? (Among those who did not use direct install and were Very Dissatisfied or Somewhat Dissatisfied with the project application process.)

Q68. (E 2) Do you have any recommendations for improving the (rebate program) program?

No .......................................... 97
Prefer not to answer................ 98
Don't know ............................. 99

Q69. (Gen 1) Finally, we have a few questions about your firm for classification purposes only. Do you own or lease your building where the project was completed?

Own ........................................ 01
Lease/Rent .............................. 02
Prefer not to answer ............... 03
Don't know ............................. 99

Q70. (Gen 1a) Does your firm pay your PNM bill, or does someone else (e.g., a landlord)? (Among those who answered that they own, lease, or rent the building where the project was completed.)

Pay own .......................... 1
Someone else pays ......... 2
Prefer not to answer ...... 3
Don't know ..................... 4

Q71. (Gen 2) Approximately what is the total square footage of the building where the project was completed?

| | |
|---|---|
| Less than 1,000 square feet | 1 |
| Between 1,000 and 1,999 square feet | 2 |
| Between 2,000 and 4,999 square feet | 3 |
| Between 5,000 and 9,999 square feet | 4 |
| Between 10,000 and 49,999 square feet | 5 |
| Between 50,000 and 99,999 square feet | 6 |
| 100,000 square feet or more | 7 |
| Prefer not to answer | 8 |
| Don't know | 9 |

Q72. (Gen 3) Approximately what year was your firm's building built?

| | |
|---|---|
| 1939 or earlier | 01 |
| 1940 to 1949 | 02 |
| 1950 to 1959 | 03 |
| 1960 to 1969 | 04 |
| 1970 to 1979 | 05 |
| 1980 to 1989 | 06 |
| 1990 to 1999 | 07 |
| 2000 to 2009 | 08 |
| 2010 and later | 09 |
| 2020 | 10 |
| Prefer not to answer | 11 |
| Don't know | 12 |

Q73. (Gen 4) Approximately, How many full-time equivalent (FTE) employees does your company currently have in the state of New Mexico?

| | |
|---|---|
| Less than 5 | 01 |
| 5-9 | 02 |
| 10-19 | 03 |
| 20 - 49 | 04 |
| 50 - 99 | 05 |
| 100 - 249 | 06 |
| 250 - 499 | 07 |
| 500 - 999 | 08 |
| 1,000 - 2,500 | 09 |
| More than 2,500 | 10 |
| Prefer not to say | 11 |
| Don't know | 12 |

Q74. (Gen 5) And this is my last question. How long has your company been in business?

Number of years______

# Appendix B: Residential Comprehensive Cooling Participant Survey Instrument

**Hello, my name is** *(your name)* **from Research & Polling, Inc. I am calling on behalf of PNM. I'm calling because our records show that you recently completed an energy efficiency project where you installed an energy efficient** *(measure 1)* **and received a rebate from PNM. I'd like to ask a short set of questions about your experience with this rebate program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about these energy efficiency upgrades and energy use in your home?**

Yes .................... 1
No ...................... 2
Never installed ... 3

**Q1-M1. (A 1) Just to confirm, our records show that you received a rebate from PNM when you installed a** *(measure 1)* **at your home in 2022. Is this correct?**

Yes .............. 1
No ................ 2
Don't know ... 3

**Q2-M1. (A 2) Is the** *(measure 1)* **still installed?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q3-M1. (A 3) Was the** *(measure 1)* **removed or never installed?** *(Among those who do not currently have measure 1 installed at their home.)*

Removed ..................... 01
Never installed ............ 02
Prefer not to answer .... 03
Don't know .................. 99

**Q4-M1. (A 3a) Why was the** *(measure 1)* **removed/never installed?** *(Among those who do not currently have measure 1 installed at their home or never installed measure 1.)*

**[Data Processing Use Only] POLLER NOTE: Was measure ever installed?**

Yes .. 1
No .... 2

**Q5-M1. (A 4) Is the** *(measure 1)* **still functioning properly?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q1-M2. (A 1) Just to confirm, our records show that you received a rebate from PNM when you installed a** *(measure 2)* **at your home in 2022. Is this correct?**

Yes ............. 1
No ................ 2
Don't know ... 3

**Q2-M2. (A 2) Is the** *(measure 2)* **still installed?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q3-M2. (A 3) Was the** *(measure 2)* **removed or never installed?** *(Among those who do not currently have measure 2 installed at their home.)*

Yes, it was removed .... 01
No ................................ 02
Prefer not to answer .... 03
Don't know .................. 99

**Q4-M2. (A 3a) Why was the** *(measure 2)* **removed/never installed?** *(Among those who do not currently have measure 2 installed at their home or never installed measure 2.)*

**[Data Processing Use Only] POLLER NOTE: Was measure ever installed?**

Yes .. 1
No .... 2

**Q5-M2. (A 4) Is the** *(measure 2)* **still functioning properly?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q6. (B 1) Did you go through a contractor to purchase the efficient equipment or did you purchase it directly from a retailer?**

Used a contractor ........ 1
Purchased at retailer ... 2
Prefer not to answer .... 3
Don't know ................. 4

**Q7. (B 2) Did you use a contractor to install the equipment or did you do it yourself?**

Contractor installed .... 1
Did it myself .............. 2
Prefer not to answer .. 3
Don't know ................ 4

**Q8. (C 1) How did you <u>first</u> hear about PNM's rebates for energy efficient equipment?**

Bill insert ................................................................ 01
PNM website ........................................................ 02
Digital/web advertisement (not on PNM website) ... 03
Television advertisement ....................................... 04
Radio advertisement ............................................. 05
Contractor ............................................................. 06
Friend or family ..................................................... 07
Social media ......................................................... 08
PNM representative ............................................... 09
Retailer ................................................................... 10
Plumber .................................................................. 11
Online search ......................................................... 12
Information on equipment itself ............................... 13
Prefer not to answer ............................................... 98
Don't know ............................................................. 99

**Q9. (C 2a)** Next I will read a list of reasons you may have considered when you decided to make your energy efficient upgrade. For each one, please tell me if it was *not at all important*, a *little important*, *somewhat important*, *very important* or *extremely important*. ***How important was <u>reducing environmental impact of your home</u> on your decision to make the upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q10. (C 2b)** ***How important was <u>upgrading out-of-date equipment</u> on your decision to make the upgrade?***

1 - Not Important At All .... 1

2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q11. (C 2c)** ***How important was <u>replacing faulty or failed equipment</u> on your decision to make the upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q12. (C 2d)** ***How important was <u>improving comfort of your home</u> on your decision to make the upgrade?*** *(Among those who installed a cooling measure)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q13. (C 2e)** ***How important was <u>improving air quality</u> on your decision to make the upgrade?*** *(Among those who installed a cooling measure.)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q14. (C 2f)** ***How important was <u>improving water circulation in your pool</u> on your decision to make the upgrade?*** *(Among those who installed a pool pump measure)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7

N/A .................................. 8

**Q15. (C 2g) *How important was <u>receiving the financial incentive</u> on your decision to make the upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q16. (C 2h) *How important was <u>reducing energy bill amounts</u> on your decision to make the upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q17. (C 2i) *How important was <u>the contractor recommendation</u> on your decision to make the upgrade?*** *(Among those who used a contractor to install the measure.)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q18. (C 2j) *How important was <u>the retailer recommendation</u> on your decision to make the upgrade?*** *(Among those who purchased the measure at a retailer.)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q19. (C 3) Were there any other reasons that you installed the equipment that were more important than the ones we have mentioned?**

No, none in particular ......... 97
Prefer not to answer............ 98
Don't know ......................... 99

**20. (D 1) Before participating in the PNM rebate program, do you recall receiving any other rebates from PNM for making energy efficiency upgrades at your home?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q21. (D 2a) *How influential was <u>the dollar amount of the rebate</u> on your decision to make the upgrade?***

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q22. (D 2b) *How influential was <u>the contractor recommendation</u> on your decision to make the upgrade?*** *(Among those who used a contractor to install the measure.)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q23. (D 2c) *How influential was <u>the retailer recommendation</u> your decision to make the upgrade?*** *(Among those who purchased the measure at a retailer.)*

| | |
|---|---|
| 0 - Not influential at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely influential | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q24. (D 2d)** ***How influential was <u>information from PNM marketing or informational materials</u> on your decision to make the upgrade?***

| | |
|---|---|
| 0 - Not influential at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely influential | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q25. (D 2e)** ***How influential was <u>previous participation in a PNM program</u> on your decision to make the upgrade?***

| | |
|---|---|
| 0 - Not influential at all | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely influential | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q26. (D 3) Did you first learn about the PNM rebate program BEFORE or AFTER you decided how energy efficient your equipment would be?**

| | |
|---|---|
| Before | 1 |

After ........................... 2
Prefer not to answer .. 3
Don't know ................. 4

**Q27. (D 4) Now I would like you to think about the efficiency level of the equipment upgrade. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have purchased the exact same efficiency level of equipment if the PNM rebate program was NOT available.**

0 - Not at all likely .............. 00
1 ......................................... 01
2 ......................................... 02
3 ......................................... 03
4 ......................................... 04
5 ......................................... 05
6 ......................................... 06
7 ......................................... 07
8 ......................................... 08
9 ......................................... 09
10 - Extremely likely ........... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A ..................................... 99

**Q28. (D 5) Now I would like you to think about the timing of the equipment purchase. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have installed equipment, of any efficiency level, within 12 months of when you actually did if the PNM rebate program was NOT available.**

0 - Not at all likely .............. 00
1 ......................................... 01
2 ......................................... 02
3 ......................................... 03
4 ......................................... 04
5 ......................................... 05
6 ......................................... 06
7 ......................................... 07
8 ......................................... 08
9 ......................................... 09
10 - Extremely likely ........... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A ..................................... 99

**Q29. (D 6) In your own words, how would you describe the influence the PNM rebate program had on your decision to install the new equipment?**

**Q30. (E 1) About how long did it take to receive your rebate after the equipment was installed?**

1 week or less ............................................. 1
More than a week, but less than 1 month ... 2
About 1 month ............................................. 3
Between 1 and 2 months ............................ 4

About 2 months .......................................... 5
More than 2 months .................................. 6
Have not received rebate yet ...................... 7
Prefer not to answer .................................. 8
Don't know ................................................ 9

**Q31. (F 1a)** For each of the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **PNM as an energy provider.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied ................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ..................... 7
Don't know .................................... 8

**Q32. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with PNM as an energy provider.)*

**Q33. (F 1b)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The rebate program overall.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied ................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ..................... 7
Don't know .................................... 8

**Q34. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the rebate program overall.)*

**Q35. (F 1c)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The equipment that was rebated through the program.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied ................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ..................... 7
Don't know .................................... 8

**Q36. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the equipment that was rebated through the program.)*

**Q37. (F 1d)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The contractor who installed the equipment.** *(Among those who used a contractor to install the measure.)*

Very Dissatisfied ........................... 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ...................... 7
Don't know .................................... 8

**Q38. Can you tell me why you gave that rating?** *(Among those who used a contractor to install the measure and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the contractor who installed the equipment.)*

**Q39. (F 1e)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time it took to receive your rebate.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ...................... 7
Don't know .................................... 8

**Q40. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time it took to receive your rebate.)*

**Q41. (F 1f)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The dollar amount of the rebate.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ...................... 7

Don't know .................................... 8

**Q42. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the dollar amount of the rebate.)*

**Q43. (F 1g)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **Interactions with PNM regarding this project.**

Very Dissatisfied ............................ 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ....................... 4
Very Satisfied ................................ 5
Not applicable ................................ 6
Prefer not to answer ...................... 7
Don't know .................................... 8

**Q44. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with interactions with PNM regarding this project.)*

**Q45. (F 1h)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The overall value of the equipment you received for the price you paid.**

Very Dissatisfied ............................ 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ....................... 4
Very Satisfied ................................ 5
Not applicable ................................ 6
Prefer not to answer ...................... 7
Don't know .................................... 8

**Q46. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the overall value of the equipment you received for the price you paid.)*

**Q47. (F 2) Do you have any recommendations for improving the PNM program?**

No ...................................... 97
Prefer not to answer............ 98
Don't know ......................... 99

**Q48. (Gen 1) Finally, we have a few questions about your firm for classification purposes only. Do you own or rent your home where the equipment was installed?**

Own .................................... 01
Rent ................................... 02

Prefer not to answer ........... 03
Don't know ........................ 99

**Q49. (Gen 1a) Do you pay your PNM bill, or does someone else (e.g., a landlord)?** *(Among those who answered that they own or rent the building where the project was completed.)*

Pay own ..................... 1
Someone else pays ... 2
Prefer not to answer .. 3
Don't know ................. 4

**Q50. (Gen2) Is your home a single-family home or part of a multifamily building with more than one unit?**

Single-family home .............................. 1
More than one residence in building ... 2
Prefer not to answer ............................ 3
Don't know .......................................... 9

**Q51. (Gen2a) How many units are in the structure?**

Number of units: ______

Prefer not to answer ......... 499
Don't know ........................ 500

**Q52. (Gen 3) Approximately what is the total square footage of your home?**

Less than 1,000 square feet .................. 1
Between 1,000 and 1,499 square feet ... 2
Between 1,500 and 1,999 square feet ... 3
Between 2,000 and 2,499 square feet ... 4
Between 2,500 and 2,499 square feet ... 5
Between 3,000 and 3,999 square feet ... 6
4,000 square feet or more ..................... 7
Prefer not to answer .............................. 8
Don't know ............................................. 9

**Q53. (Gen 4) Approximately what year was your home built?**

1939 or earlier ............. 01
1940 to 1949 ............... 02
1950 to 1959 ............... 03
1960 to 1969 ............... 04
1970 to 1979 ............... 05
1980 to 1989 ............... 06
1990 to 1999 ............... 07
2000 to 2009 ............... 08
2010 to 2019 ............... 09
2020 ............................ 10

Prefer not to answer .... 11
Don't know .................. 12

**Q54. (Gen 5) How many people live in your household?**

Number of people: ______

Prefer not to answer ......... 499
Don't know ........................ 500

**Q55. (Gen 6) How long have you lived in this home?**

Less than 6 years ...... 1
6 to 10 years ............. 2
11 to 15 years ............ 3
16 to 20 years ............ 4
21 to 25 years ............ 5
26 to 30 years ............ 6
More than 30 years .... 7
Prefer not to answer .. 8
Don't know ................. 9

# Appendix C: Residential Comprehensive Home Energy Checkup Participant Survey Instrument

**Hello, my name is** *(your name)* **from Research & Polling, Inc. I am calling on behalf of PNM. I'm calling because our records show that you recently installed energy efficient equipment and received a rebate from PNM at your home located at [SITE_ADDRESS]. I'd like to ask a short set of questions about your experience with this rebate program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about these energy efficiency upgrades and energy use in your home?**

Yes .................... 1
........................... 2
Never installed ... 3

**Q1-M1. (A 1) Our records show that you received a rebate from PNM when you installed a [MEASURE_TYPE1] at your home at [SITE_ADDRESS] in 2022. Is this correct?**

Yes .............. 1
No ................ 2
Don't know ... 3

**Q2-M1. (A 2) Is the [MEASURE_TYPE1] still installed?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q3-M1. (A 3) Was the [MEASURE_TYPE1] removed or never installed?** *(Among those who do not currently have measure 1 installed at their home.)*

Removed ..................... 01
Never installed ............ 02
Prefer not to answer .... 03
Don't know .................. 99

**Q4-M1. (A 3a) Why was the [MEASURE_TYPE1] removed/never installed?** *(Among those who do not currently have measure 1 installed at their home or never installed measure 1.)*

No reason in particular ....... 99

**[Data Processing Use Only] POLLER NOTE: Was measure installed?**

Yes .. 1
No .... 2

**Q5-M1. (A 4) Is the [MEASURE_TYPE1] still functioning properly?** *(Among those who currently have measure 1 installed)*

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q1-M2. (A 1) Our records show that you received a rebate from PNM when you installed a [MEASURE_TYPE2] at your home at [SITE_ADDRESS] in 2022. Is this correct?**

Yes .............. 1
No ................ 2
Don't know ... 3

**Q2-M2. (A 2) Is the [MEASURE_TYPE2] still installed?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q3-M2. (A 3) Was the [MEASURE_TYPE2] removed or never installed?** *(Among those who do not currently have measure 2 installed at their home.)*

Removed ..................... 01
Never installed ............ 02
Prefer not to answer .... 03
Don't know .................. 99

**Q4-M2. (A 3a) Why was the [MEASURE_TYPE2] removed/never installed?** *(Among those who do not currently have measure 2 installed at their home or never installed measure 2.)*

No reason in particular ....... 99

**[Data Processing Use Only] POLLER NOTE: Was measure installed?**

Yes .. 1
No .... 2

**Q5-M2. (A 4) Is the [MEASURE_TYPE2] still functioning properly?** *(Among those currently have measure 1 installed)*

| | |
|---|---|
| Yes | 1 |
| No | 2 |
| Prefer not to answer | 3 |
| Don't know | 4 |

**Q6. (B 1) Did you go through a contractor to purchase the efficient equipment or did you purchase it directly from a retailer?** *(Among group C)*

| | |
|---|---|
| Used a contractor | 1 |
| Purchased at retailer | 2 |
| Prefer not to answer | 3 |
| Don't know | 4 |

**Q7. (B 2) Did you use a contractor to install the equipment or did you do it yourself?** *(Among group C)*

| | |
|---|---|
| Contractor installed | 1 |
| Did it myself | 2 |
| Prefer not to answer | 3 |
| Don't know | 4 |

**Q8. (C 1) How did you <u>first</u> hear about PNM's Home Energy Checkup program?** *(Among group B)*

| | |
|---|---|
| Bill insert | 01 |
| PNM website | 02 |
| Digital/web advertisement (not on PNM website) | 03 |
| Television advertisement | 04 |
| Radio advertisement | 05 |
| Contractor | 06 |
| Friend or family | 07 |
| Social media | 08 |
| PNM representative | 09 |
| Landlord | 10 |
| Veteran program | 11 |
| Email | 12 |
| Santa Fe school district | 13 |
| Newspaper | 14 |
| Prefer not to answer | 98 |
| Don't know | 99 |

**Q9. (C 2a)** Next I will read a list of reasons you may have considered when you decided to pursue the Home Energy Checkup/make the energy efficient upgrade. For each one, please tell me if it was *not at all important*, a *little important*, *somewhat important*, *very important* or *extremely* *important*. ***How important was <u>reducing environmental impact of your home</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ........... 4
5 - Extremely Important ... 5
Don't Know ..................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q10. (C 2b)** ***How important was <u>upgrading out-of-date equipment</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ........... 4
5 - Extremely Important ... 5
Don't Know ..................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q11. (C 2c)** ***How important was <u>replacing faulty or failed equipment</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ........... 4
5 - Extremely Important ... 5
Don't Know ..................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q12. (C 2d)** ***How important was <u>improving comfort of your home</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ........... 4
5 - Extremely Important ... 5
Don't Know ..................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q13. (C 2e)** ***How important was <u>improving air quality</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1

2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q14. (C 2f)** ***How important was <u>receiving the financial incentive</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q15. (C 2g)** ***How important was <u>reducing energy bill amounts</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q16. (C 2h)** ***How important was <u>the contractor recommendation</u> on your decision to make the Home Energy Checkup/Energy Efficiency upgrade?*** *(Among those in group C who used a contractor to install the measure.)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q17. (C 2i)** ***How important was <u>the retailer recommendation</u> on your decision to conduct your project?*** *(Among those in group C who purchased the measure at a retailer.)*

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7

N/A .................................. 8

**Q18. (C 3) Were there any other reasons that you installed the equipment that were more important than the ones we have mentioned?**

No, none in particular ......... 97
Prefer not to answer........... 98
Don't know ......................... 99

**Q19. (D 1) Before participating in the PNM rebate program, do you recall receiving any other rebates from PNM for making energy efficiency upgrades at your home?** *(Among group C)*

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................ 4

**Q21. (D 2b) *How important was <u>the dollar amount of the rebate</u> on your decision to make the Energy Efficiency upgrade?*** *(Among group C)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A ..................................... 99

**Q22. (D 2c) *How important was <u>the contractor recommendation</u> on your decision to make the Energy Efficient upgrade?*** *(Among those in group C who used a contractor to install the measure.)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98

N/A .................................... 99

**Q23. (D 2d)** ***How important was <u>the retailer recommendation</u> your decision to make the Energy Efficient upgrade?*** *(Among those in group C who purchased the measure at a retailer.)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q24. (D 2e)** ***How important was <u>information from PNM marketing or informational materials</u> on your decision to make the Energy Efficient upgrade?*** *(Among group C)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q25. (D 2f)** ***How important was <u>previous participation in a PNM program</u> on your decision to make the Energy Efficient upgrade?*** *(Among group C)*

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q26. (D 3) Did you first learn about the PNM rebate program BEFORE or AFTER you decided how energy efficient your equipment would be?** *(Among group C)*

| | |
|---|---|
| Before | 1 |
| After | 2 |
| Prefer not to answer | 3 |
| Don't know | 4 |

**Q27. (D 4) Now I would like you to think about the efficiency level of the equipment upgrade. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have purchased the exact same efficiency level of equipment if the PNM rebate program was NOT available.** *(Among group C)*

| | |
|---|---|
| 0 - Not at all likely | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely likely | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q28. (D 5) Now I would like you to think about the timing of the equipment purchase. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have installed equipment, of any efficiency level, within 12 months of when you actually did if the PNM rebate program was NOT available.** *(Among group C)*

| | |
|---|---|
| 0 - Not at all likely | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely likely | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q29. (D 6) In your own words, how would you describe the influence the PNM rebate program had on your decision to install the new equipment?** *(Among group C)*

**Q30. (E 1) Did you schedule your Home Energy Checkup online or over the phone?** *(Among group B)*

Online .................. 1
Over the phone .... 2
Prefer not to say .. 3
Don't know ........... 4

**Q31. (E 2) About how long did it take to receive your Home Energy Checkup once you scheduled it with PNM?** *(Among group B)*

2 weeks or less ........................................................ 01
More than 2 weeks and up to 4 weeks/1 month ....... 02
More than 4 weeks and up to 6 weeks .................... 03
More than 6 weeks and up to 8 weeks/2 months ..... 04
More than 8 weeks and up to 10 weeks .................. 05
More than 10 weeks and up to 12 weeks/3 months . 06
More than 12 weeks and up to 14 weeks ................ 07
More than 14 weeks and up to 16 weeks/4 months . 08
More than 16 weeks/4 months ................................ 09
Prefer not to answer ............................................... 10
Don't know ............................................................. 11

**Q32. (E 1) About how long did it take to receive your rebate after the equipment was installed?** *(Among group C)*

1 week or less ........................................... 1
More than a week, but less than 1 month ... 2
About 1 month ............................................ 3
Between 1 and 2 months ............................ 4
About 2 months .......................................... 5
More than 2 months ................................... 6
Have not received rebate yet ...................... 7
Prefer not to answer ................................... 8
Don't know ................................................. 9

**Q33. (F 1a)** For each of the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **PNM as an energy provider.**

Very Dissatisfied ........................... 1
Somewhat Dissatisfied ................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ...................... 4
Very Satisfied ............................... 5
Not applicable ............................... 6
Prefer not to answer ..................... 7
Don't know .................................... 8

**Q34. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with PNM as an energy provider.)*

**Q35. (F 1b)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The rebate program overall.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q36. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the rebate program overall.)*

**Q37. (F 1c)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The equipment that was rebated through the program.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q38. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the equipment that was rebated through the program.)*

**Q39. (F 1d)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The contractor who installed the equipment.** *(Among group C and those who used a contractor to install the measure.)*

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q40. Can you tell me why you gave that rating?** *(Among those who used a contractor to install the measure and were* Very Dissatisfied *or* Somewhat Dissatisfied *with the contractor who installed the equipment.)*

**Q41. (F 1e)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time it took to receive your rebate.** *(Among group C)*

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q42. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time it took to receive your rebate.)*

**Q43. (F 1f)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The dollar amount of the rebate.** *(Among group C)*

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q44. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the dollar amount of the rebate.)*

**Q45. (F 1g)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **Interactions with PNM regarding this project.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q46. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with interactions with PNM regarding this project.)*

**Q47. (F 1h)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The overall value of the equipment you received for the price you paid.**

Very Dissatisfied ............................ 1
Somewhat Dissatisfied .................. 2
Neither Satisfied nor Dissatisfied ... 3
Somewhat Satisfied ....................... 4
Very Satisfied ................................ 5
Not applicable ................................ 6
Prefer not to answer ...................... 7
Don't know ..................................... 8

**Q48. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the overall value of the equipment you received for the price you paid.)*

**Q49. (F 2) Do you have any recommendations for improving the Home Energy Check-up program?** *(Among group B)*

No ..................................... 97
Prefer not to answer............ 98
Don't know ......................... 99

**Q50. (F 2) Do you have any recommendations for improving the PNM rebate program?** *(Among group C)*

No ..................................... 97
Prefer not to answer............ 98
Don't know ......................... 99

**Q51. (Gen 1) Finally, we have a few questions about your firm for classification purposes only. Do you own or rent your home where the equipment was installed?**

Own .................................... 01
Rent ................................... 02
Prefer not to answer ........... 03
We manage the property ... 04
Don't know ......................... 99

**Q52. (Gen 1a) Do you pay your PNM bill, or does someone else (e.g., a landlord)?** *(Among those who answered that they own or rent the building where the project was completed.)*

Pay own ..................... 1
Someone else pays ... 2
Prefer not to answer .. 3
Don’t know ................. 4

**Q53. (Gen2) Is your home a single-family home or part of a multifamily building with more than one unit?**

Single-family home .............................. 1
More than one residence in building ... 2
Prefer not to answer ............................ 3
Don't know .......................................... 9

**Q54. (Gen2a) How many units are in the structure?**

Number of units: ______

Prefer not to answer ......... 499
Don't know ........................ 500

**55. (Gen 3) Approximately what is the total square footage of your home?**

Less than 1,000 square feet .................. 1
Between 1,000 and 1,499 square feet ... 2
Between 1,500 and 1,999 square feet ... 3
Between 2,000 and 2,499 square feet ... 4
Between 2,500 and 2,499 square feet ... 5
Between 3,000 and 3,999 square feet ... 6
4,000 square feet or more ..................... 7
Prefer not to answer ............................. 8
Don't know ............................................ 9

**Q56. (Gen 4) Approximately what year was your home built?**

1939 or earlier ............. 01
1940 to 1949 ............... 02
1950 to 1959 ............... 03
1960 to 1969 ............... 04
1970 to 1979 ............... 05
1980 to 1989 ............... 06
1990 to 1999 ............... 07
2000 to 2009 ............... 08
2010 and later ............. 09
2020 ............................ 10
Prefer not to answer .... 11
Don't know .................. 12

**Q57. (Gen 5) How many people live in your household?**

Number of people ______

Prefer not to answer ......... 499
Don't know ........................ 500

**Q58. (Gen 6) How long have you lived in this home?**

| | |
|---|---|
| Less than 6 years | 1 |
| 6 to 10 years | 2 |
| 11 to 15 years | 3 |
| 16 to 20 years | 4 |
| 21 to 25 years | 5 |
| 26 to 30 years | 6 |
| More than 30 years | 7 |
| Prefer not to answer | 8 |
| Don't know | 9 |

# Appendix D: Residential Comprehensive Appliance Recycling Participant Survey Instrument

**I'M CALLING BECAUSE OUR RECORDS SHOW THAT YOU RECENTLY RECYCLED A [MEASURE_TYPE1] and received a rebate from PNM. I'd like to ask a short set of questions about your experience with this rebate program. Your time will help us improve this program for other customers like you. Are you the best person to talk to about the program and energy use in your home?**

Yes ............. 1
No ................ 2

**Q1. (A 1) Just to confirm, our records show that you received a rebate from PNM when you recycled a [MEASURE_TYPE1]. And this was done in approximately [MONTH, YEAR]. Is this correct?**

Yes ............. 1
No ................ 2
Don't know ... 3

**Q2. (A 2) Was the [MEASURE_TYPE1] still functioning properly?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q3. (A 3) Did you install a new [MEASURE_TYPE1] to replace the one that was recycled?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q4. (A 4) Did the recycled [MEASURE_TYPE1] serve as your primary or secondary MEASURE_TYPE1]?**

Primary ...................... 1
Secondary ................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q5. (A 5) Approximately how old was the [MEASURE_TYPE1] that was recycled?**

| | |
|---|---|
| 0-5 years | 1 |
| 6-10 years | 2 |
| 11-15 years | 3 |
| 16-20 years | 4 |
| More than 20 years | 5 |
| Don't know/won't say | 6 |

**Q6. (A 6) If you had not been able to recycle your old [MEASURE_TYPE1], what were you planning to do with it?**

| | |
|---|---|
| Take it to the dump | 01 |
| Put it in a trash can/dumpster | 02 |
| Schedule a large item pick up | 03 |
| Donate it to an organization | 04 |
| Give it to a family member/friend | 05 |
| Keep it as a spare | 06 |
| Sell it | 07 |
| Nothing in particular | 97 |
| Prefer not to answer | 98 |
| Don't know | 99 |

**Q7. (C 1) How did you <u>first</u> hear about PNM's rebates for recycling?**

| | |
|---|---|
| Bill insert | 01 |
| PNM website | 02 |
| Digital/web advertisement (not on PNM website) | 03 |
| Television advertisement | 04 |
| Radio advertisement | 05 |
| Contractor | 06 |
| Friend or family | 07 |
| Social media | 08 |
| PNM representative | 09 |
| Used before | 10 |
| Do not recall | 97 |
| Prefer not to answer | 98 |
| Don't know | 99 |

**Q8. (C 2a)** Next I will read a list of reasons you may have considered when you decided to recycle your [MEASURE_TYPE1]. For each one, please tell me if it was *not at all important*, a *little important*, *somewhat important*, *very important* or *extremely important*. ***How important was <u>reducing environmental impact of your home</u> on your decision to recycle your*** [MEASURE_TYPE1]***?***

| | |
|---|---|
| 1 - Not Important At All | 1 |
| 2 - A Little Important | 2 |
| 3 - Somewhat Important | 3 |
| 4 - Very Important | 4 |
| 5 - Extremely Important | 5 |
| Don't Know | 6 |
| Prefer not to answer | 7 |
| N/A | 8 |

**Q9. (C 2b) *How important was <u>upgrading out-of-date equipment</u> on your decision to recycle your*** [MEASURE_TYPE1]***?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q10. (C 2c) *How important was <u>reducing energy bill amounts</u> on your decision to recycle your*** [MEASURE_TYPE1]***?***

1 - Not Important At All .... 1
2 - A Little Important ........ 2
3 - Somewhat Important .. 3
4 - Very Important ............ 4
5 - Extremely Important ... 5
Don't Know ...................... 6
Prefer not to answer ........ 7
N/A .................................. 8

**Q11. (C 3) Were there any other reasons that you recycled the equipment that were more important than the ones we have mentioned?**

No, none in particular ............................................ 97
Prefer not to answer .............................................. 98
Don't know ............................................................ 99

**Q12. (D 3) Before participating in the PNM recycling program, do you recall receiving any other rebates from PNM for making energy efficiency upgrades at your home?**

Yes ............................ 1
No .............................. 2
Prefer not to answer .. 3
Don't know ................. 4

**Q13. (D 2a) *How influential was <u>the dollar amount of the rebate</u> on your decision to recycle your*** [MEASURE_TYPE1]***?***

0 - Not influential at all ....... 00
1 ......................................... 01
2 ......................................... 02
3 ......................................... 03
4 ......................................... 04
5 ......................................... 05
6 ......................................... 06
7 ......................................... 07

8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q14. (D 2d) *How influential was <u>information from PNM marketing or informational materials</u> on your decision to recycle your* [MEASURE_TYPE1]*?***

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q15. (D 2e) *How influential was <u>previous participation in a PNM program</u> on your decision to recycle your* [MEASURE_TYPE1]*?***

0 - Not influential at all ....... 00
1 ........................................ 01
2 ........................................ 02
3 ........................................ 03
4 ........................................ 04
5 ........................................ 05
6 ........................................ 06
7 ........................................ 07
8 ........................................ 08
9 ........................................ 09
10 - Extremely influential ... 10
Don't know ......................... 97
Prefer not to answer .......... 98
N/A .................................... 99

**Q16. (D 3) Did you first learn about the PNM rebate program BEFORE or AFTER you decided to recycle your equipment?**

Before ........................ 1
After ........................... 2
Prefer not to answer .. 3
Don't know ................. 4

**Q17. (D 4) Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have recycled the same equipment if the PNM rebate program was NOT available.**

| | |
|---|---|
| 0 - Not at all likely | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely likely | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q18. (D 5) Now I would like you to think about the timing of when you recycled the equipment. Using a scale from 0 to 10, where 0 means *not at all likely* and 10 means *extremely likely*, please rate the likelihood that you would have recycled the equipment within 12 months of when you actually did if the PNM rebate program was NOT available.**

| | |
|---|---|
| 0 - Not at all likely | 00 |
| 1 | 01 |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| 5 | 05 |
| 6 | 06 |
| 7 | 07 |
| 8 | 08 |
| 9 | 09 |
| 10 - Extremely likely | 10 |
| Don't know | 97 |
| Prefer not to answer | 98 |
| N/A | 99 |

**Q19. (D 6) In your own words, how would you describe the influence the PNM rebate program had on your decision to recycle the equipment?**

**Q20. (E 1) About how long did it take to receive your rebate after the equipment was recycled?**

| | |
|---|---|
| 1 week or less | 1 |
| More than a week, but less than 1 month | 2 |
| About 1 month | 3 |
| Between 1 and 2 months | 4 |
| About 2 months | 5 |
| More than 2 months | 6 |
| Have not received rebate yet | 7 |
| Prefer not to answer | 8 |
| Don't know | 9 |

**Q21. (F 1a)** For each of the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **PNM as an energy provider.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q22. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with PNM as an energy provider.)*

**Q23. (F 1b)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The recycling program overall.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q24. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the recycling program overall.)*

**Q25. (F 1e)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The amount of time it took to receive your rebate.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q26. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the amount of time it took to receive your rebate.)*

**Q27. (F 1f)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **The dollar amount of the rebate.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q28. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with the dollar amount of the rebate.)*

**Q29. (F 1g)** For the following, please tell me if you were *very dissatisfied*, *somewhat dissatisfied*, *neither satisfied nor dissatisfied*, *somewhat satisfied* or *very satisfied*. **Interactions with PNM regarding this project.**

| | |
|---|---|
| Very Dissatisfied | 1 |
| Somewhat Dissatisfied | 2 |
| Neither Satisfied nor Dissatisfied | 3 |
| Somewhat Satisfied | 4 |
| Very Satisfied | 5 |
| Not applicable | 6 |
| Prefer not to answer | 7 |
| Don't know | 8 |

**Q30. Can you tell me why you gave that rating?** *(Among those who were* Very Dissatisfied *or* Somewhat Dissatisfied *with interactions with PNM regarding this project.)*

**Q31. (F 2) Do you have any recommendations for improving the PNM Refrigerator Recycling program?**

| | |
|---|---|
| No | 97 |
| Prefer not to answer | 98 |
| Don't know | 99 |

**Q32. (Gen 1) Finally, we have a few questions about your household for classification purposes only. Do you own or rent your home where the recycled equipment was taken from?**

| | |
|---|---|
| Own | 01 |
| Rent | 02 |
| Prefer not to answer | 03 |
| Don't know | 99 |

**Q33. (Gen 1a) Do you pay your PNM bill, or does someone else (e.g., a landlord)?** *(Among those who answered that they rent the home where the equipment was taken from.)*

Pay own .................... 1
Someone else pays ... 2
Prefer not to answer .. 3
Don't know ................ 4

**Q34. (Gen2) Is your home a single-family home or part of a multifamily building with more than one unit?**

Single-family home ............................. 1
More than one residence in building ... 2
Prefer not to answer ............................ 3
Don't know .......................................... 9

**Q35. (Gen2a) How many units are in the structure?**

Number of units: ______

Prefer not to answer ......... 499
Don't know ........................ 500

**Q36. (Gen 3) Approximately what is the total square footage of your home?**

Less than 1,000 square feet .................. 1
Between 1,000 and 1,499 square feet ... 2
Between 1,500 and 1,999 square feet ... 3
Between 2,000 and 2,499 square feet ... 4
Between 2,500 and 2,499 square feet ... 5
Between 3,000 and 3,999 square feet ... 6
4,000 square feet or more ..................... 7
Prefer not to answer ............................. 8
Don't know ............................................ 9

**Q37. (Gen 4) Approximately what year was your home built?**

1939 or earlier ............. 01
1940 to 1949 ............... 02
1950 to 1959 ............... 03
1960 to 1969 ............... 04
1970 to 1979 ............... 05
1980 to 1989 ............... 06
1990 to 1999 ............... 07
2000 to 2009 ............... 08
2010 and later ............. 09
2020 ........................... 10
Prefer not to answer .... 11
Don't know ................. 12

**Q38. (Gen 5) How many people live in your household?**

Number of people in household
______

Prefer not to answer ......... 499
Don’t know ........................ 500

**Q39. (Gen 6) How long have you lived in this home?**

Less than 6 years ...... 1
6 to 10 years .............. 2
11 to 15 years ............ 3
16 to 20 years ............ 4
21 to 25 years ............ 5
26 to 30 years ............ 6
More than 30 years .... 7
Prefer not to answer .. 8
Don't know ...………... 9

# Appendix E: Commercial Comprehensive Contractor Interview Guide

INTRODUCTION

*TALKING POINTS FOR RECRUITMENT*

- EVERGREEN ECONOMICS IS CONDUCTING AN EVALUATION OF [UTILITY'S] [PROGRAM] FOR THE NEW MEXICO PUBLIC REGULATION COMMISSION AND THE STATE'S UTILITIES.
- WE HAVE IDENTIFIED SELECTED CONTRACTORS THAT INSTALLED EQUIPMENT THAT RECEIVED REBATES FROM THE EFFICIENCY PROGRAMS IN 2022 FOR BRIEF TELEPHONE INTERVIEWS.
- WE WOULD NEED ABOUT 20 MINUTES FOR THE INTERVIEW.
- YOUR RESPONSES WILL BE ANONYMOUS BUT WILL BE VERY HELPFUL IN HELPING THE STATE'S UTILITIES ENSURE THEIR ENERGY EFFICIENCY PROGRAMS BEST SERVE THEIR CUSTOMERS.
- WHEN WOULD BE A GOOD TIME TO TALK?

*TALKING POINTS FOR STARTING THE INTERVIEW*

- IDENTIFY SELF.
- THIS SHOULD TAKE ABOUT 20 MINUTES.
- YOUR RESPONSES WILL BE ANONYMOUS, SO PLEASE FEEL FREE TO SPEAK CANDIDLY.
- DO YOU HAVE ANY QUESTIONS BEFORE WE BEGIN?
- WOULD YOU FEEL COMFORTABLE IF I RECORD THIS CALL FOR NOTE TAKING PURPOSES? WE WILL NOT SHARE THE RECORDING WITH ANYONE OUTSIDE OUR COMPANY AND WILL NOT ATTRIBUTE ANYTHING YOU SAY BACK TO YOU.

**INTERVIEWEE BACKGROUND**

LET'S BEGIN WITH A COUPLE OF BACKGROUND QUESTIONS….

A1. TO START, PLEASE TELL ME A BIT ABOUT YOUR COMPANY.

PROBE TO UNDERSTAND:

- SERVICES OFFERED
- TYPES OF CUSTOMERS (ESP. SECTOR – RESIDENTIAL, COMMERCIAL, OR BOTH)
- REGIONS SERVED
- INTERVIEWEE ROLE

**PROGRAM AWARENESS AND ENGAGEMENT**

B1. DO YOU RECALL HOW YOU FIRST LEARNED ABOUT AND GOT INVOLVED WITH THE [RESIDENTIAL/COMMERCIAL] REBATE PROGRAMS THROUGH [UTILITY]?

LISTEN (AND PROBE AS NEEDED) FOR:

- ANY RESERVATIONS ABOUT PARTICIPATING
- ANY BARRIERS TO PARTICIPATING
- WHETHER OR NOT THEY WORK WITH ANY OTHER NEW MEXICO [UTILITY] REBATE PROGRAMS

B2. COULD YOU DESCRIBE WHAT INVOLVEMENT WITH NEW MEXICO [UTILITY] REBATE PROGRAMS AS A CONTRACTOR INVOLVES?

PROBE AS NEEDED:

- IN WHAT WAYS DO YOU INTERACT WITH NEW MEXICO [UTILITY] OR THEIR IMPLEMENTERS ABOUT THIS PROGRAM?
- WHAT INFORMATION OR SERVICES DO YOU RECEIVE FROM NEW MEXICO [UTILITY] (BEYOND THE ABILITY TO OFFER REBATES TO YOUR CUSTOMERS)?

B3. IN WHAT WAYS IS THE [UTILITY] PROGRAM HELPFUL TO YOU IN YOUR BUSINESS?

PROBE, AS NEEDED:

- REBATE
    - INCREASES CUSTOMER SATISFACTION WITH US
    - INCREASES BUSINESS
    - HELPS US UP-SALE TO HIGHER EFFICIENCY LEVELS
- ABILITY TO MENTION THE CONNECTION WITH THE [UTILITY] PROGRAM
- [UTILITY] MESSAGING TO CUSTOMERS ON BENEFITS OF [MEASURE(S)]

B4. WHAT SHARE OF YOUR [RESIDENTIAL/COMMERCIAL] PROJECTS WITHIN [UTILITY] TERRITORY WOULD YOU ESTIMATE CURRENTLY END UP QUALIFYING FOR AND RECEIVING A [UTILITY] REBATE?

- WHAT COULD [UTILITY] DO TO INVOLVE YOU MORE IN THE PROGRAM?

B5. DOES [UTILITY] MAKE IT CLEAR WHICH OF YOUR PRODUCTS OR SERVICES ARE ELIGIBLE FOR [UTILITY] REBATES?

PROBE AS NEEDED:

- IS THERE ANYTHING [UTILITY] SHOULD DO TO MORE CLEARLY COMMUNICATE THAT?

B6. HAVE THE PROGRAMS INFLUENCED WHAT EQUIPMENT YOU SUGGEST TO A CUSTOMER?

B7. DO YOU HAVE ANY SUGGESTIONS FOR [UTILITY] CONTRACTOR SERVICES AND SUPPORT – EITHER OVERALL OR FOR THE [PROGRAM] SPECIFICALLY?

**PROGRAM PROCESSES**

C1. IN WHAT WAYS ARE YOU INVOLVED WITH THE REBATE PORTION OF THE PROGRAM AND THE PAPERWORK AND PROCESS REQUIRED TO PARTICIPATE?

PROBE TO UNDERSTAND:

- WHETHER CONTRACTOR COMPLETES THE REBATE APPLICATION
- TIME REQUIRED FOR PAPERWORK AND WHETHER THAT IS A BURDEN
- WHETHER THE REBATE GOES DIRECTLY TO THE CUSTOMER OR CONTRACTOR (WITH A MARKDOWN ON THE CHARGE TO CUSTOMER)
- RECOMMENDED IMPROVEMENTS

C2. WHEN AND HOW DO YOU BRING UP EITHER [UTILITY] REBATES OR THE EQUIPMENT THEY REBATE WHEN TALKING WITH CUSTOMERS?

LISTEN FOR (AND PROBE AS NEEDED):

- WHAT SHARE OF CUSTOMERS ARE ALREADY AWARE OF REBATES BEFORE THE CONTRACTOR BRINGS IT UP
- WHAT IT IS THE MOST EFFECTIVE SALES TOOL OR MESSAGE TO GET CUSTOMERS TO UPGRADE TO HIGH EFFICIENCY
- WHAT ROLE THE [UTILITY] REBATES PLAY IN MOTIVATING UPGRADES
- WHAT PARTICULAR EQUIPMENT IS EASIER OR HARDER TO GET CUSTOMERS TO UPGRADE TO HIGH EFFICIENCY AND WHY

C3. DO YOU HAVE ANY COMMENTS ABOUT THE PROGRAM OFFERINGS? IS THERE ANYTHING MISSING? ANYTHING NOT NEEDED? OR ANYTHING THAT COULD BE BETTER?

MARKET RESPONSE

D1. OVERALL, TO WHAT DEGREE DO YOU SEE THE PROGRAM INCREASING THE INTEREST AND DEMAND FOR ENERGY EFFICIENT EQUIPMENT?

PROBE TO UNDERSTAND:

- WHY IS THAT?
- IS THE PROGRAM HAVING A LARGE OR SMALL EFFECT ON THE MARKET?

D2. ARE THERE MARKETS THAT YOU FEEL [UTILITY] [RESIDENTIAL/COMMERCIAL] ENERGY EFFICIENCY PROGRAMS ARE REACHING WELL? NOT WELL?

PROBE TO UNDERSTAND:

- SUGGESTED APPROACHES THAT MIGHT EXPAND THE REACH OF THE PROGRAM INTO MARKETS THAT MAY BE UNDERSERVED BY THE PROGRAM.

D3. OVERALL, WHAT ISSUE(S), IF ANY, MAY AFFECT FUTURE PROGRAM PARTICIPATION BY CUSTOMERS? WHAT ABOUT FUTURE PROGRAM PARTICIPATION BY CONTRACTORS? [INTERVIEWER NOTE: EXAMPLE ISSUES ARE CHANGES TO BUILDING CODES AND STANDARDS BEING PROMOTED AND PROGRAM INCENTIVE LEVELS].

**PROGRAM SATISFACTION**

E1. FINALLY, I'D LIKE TO ASK ABOUT YOUR AND YOUR CUSTOMERS' SATISFACTION WITH THE [UTILITY] [PROGRAM]. PLEASE RATE YOUR OVERALL SATISFACTION WITH THE PROGRAM ON A 1 TO 5 SCALE WHERE 1 IS NOT AT ALL SATISFIED, 2 IS SOMEWHAT DISSATISFIED, 3 IS NEITHER SATISFIED NOR DISSATISFIED, 4 IS SOMEWHAT SATISFIED AND 5 IS VERY SATISFIED?

- WHAT IS YOUR SATISFACTION?
- HOW DO YOU THINK YOUR CUSTOMERS WOULD RATE THE PROGRAM?

[IF RATING < 5] WHAT COULD [UTILITY] DO TO INCREASE YOUR SATISFACTION WITH THE PROGRAM?

PROBE IF NEEDED:

- WHAT IS WORKING BEST?
- WHAT IS MOST CHALLENGING OR NEEDS IMPROVEMENT?

E2. HAVE YOU HAD ANY FEEDBACK FROM YOUR CUSTOMERS ABOUT THEIR EXPERIENCES WITH THE [PROGRAM] THAT YOU THINK [UTILITY] SHOULD KNOW?

E3. ASIDE FROM ANYTHING WE'VE ALREADY DISCUSSED, WAS THERE EVER AN OCCASION WHEN THE PROGRAM DIDN'T MEET YOUR EXPECTATIONS? PLEASE EXPLAIN.

CLOSING

F1. IS THERE ANYTHING ELSE WE DIDN'T COVER THAT YOU'D LIKE TO MENTION OR DISCUSS ABOUT YOUR EXPERIENCES WITH THE [UTILITY] [PROGRAM]?

[THANK AND END]

# Appendix F: Power Saver Detailed Evaluation Methods and Findings

Power Saver is a direct load control program offered to residential, small commercial (< 50 kW), and medium commercial (50 kW – 150 kW) Public Service New Mexico (PNM) customers. There are five program components:

- Residential Digital Control Unit (DCU)
- Small Commercial DCU
- Medium Commercial DCU
- Residential Two-Way Smart Thermostat
- Residential Bring Your Own Thermostat (BYOT)

To facilitate load control in the DCU program components, participants must have a device attached to the exterior of their air conditioning unit. This device is capable of receiving a radio signal that will turn off the unit's compressor for an interval of time. For the smart thermostat components, load curtailment is achieved via communication with the WiFi-enabled thermostat. Residential and small commercial participants receive an annual $25 incentive for their participation. Medium commercial participants receive an annual incentive of $9 per ton of refrigerated air conditioning.

There were four Power Saver events during the summer 2022 demand response (DR) season, which began May 15th and ended September 30th. Table 1 provides some information on the 2022 events. During the first two events, all five program components were dispatched. For the latter two events, only the Residential DCU and Small Commercial DCU components were dispatched. For all segments other than Residential BYOT, each event used an adaptive 50% cycling strategy where curtailment is based on the runtime in the previous hour. For the BYOT component, thermostat devices are curtailed using a 50% cycling strategy performed by the thermostat manufacturer.

**Table 1: 2022 Power Saver Event Summary**

| Date | Day of Week | Start Time (MDT) | End Time (MDT) | Daily High at KABQ (F) |
|---|---|---|---|---|
| 6/10/2022 | Friday | 3:00 PM | 7:00 PM | 100 |
| 7/11/2022 | Monday | 3:00 PM | 7:00 PM | 96 |
| 7/18/2022 | Monday | 3:00 PM | 7:00 PM | 98 |
| 7/19/2022 | Tuesday | 3:00 PM | 7:00 PM | 101 |

The average load reduction delivered by the Power Saver program during summer 2022 event hours was **34.0 MW**. Under planning conditions, we estimate the load reduction capability of the Power Saver program to be **36.3 MW**. The realized gross energy savings for summer 2022 was **366.0 MWh**. The energy savings estimate for the program takes into account the load shed during the event and the post-event snapback and is a function of the number of events called.

After the conclusion of the summer 2022 season, Itron provided the evaluation team with a series of datasets for the evaluation. These files included:

- For Residential DCU and Small Commercial sites, 5-minute load data from 6/1/2022 to 9/30/2022
- For Medium Commercial DCU sites, 5-minute load data from 6/1/2022 to 9/30/2022
- For Residential DCU and Small Commercial sites, an M&V list that provided the location type (residential or commercial), the group (control or curtailment), and/or the dates each load control device was active
- For Medium Commercial sites, an M&V list that provided the dates each load control device was active
- For the Two-Way Smart Thermostat and BYOT groups, 5-minute runtime data from 6/1/2022 to 9/30/2022

The evaluation team also received Itron's Power Saver impact evaluation report, which detailed the methods Itron employed in calculating customer baselines (CBLs) for the five different DR program components. A CBL is an estimate of what participant loads would have been absent the DR event dispatch. For each DR program component, the report also showed the load impact, which is the difference between the CBL and the metered load, for each 5-minute interval of each curtailment day. The key steps in the evaluation verified savings analysis were:

1) For each DR program component, reproduce the performance estimates calculated by Itron using the contractually-agreed upon CBL method.
2) Modify the CBL methodology and produce ex post estimates of what the per-device impact was during the 2022 DR season.

3) Where possible, leverage additional historical data from 2015 through 2022 to produce ex ante estimates of what the per-device impact at peaking conditions (5-6 PM at 100°F) will be in future summers.
4) Scale the per-device estimates by the number of active program devices to calculate the aggregate load reduction capability (MW) of the Power Saver program.

Table 2 and Table 3 summarize our findings for residential and commercial segments, respectively. The main driver in the difference between Itron and Evergreen load reduction estimates is that Itron commonly summarized impacts with the maximum (e.g., the largest 5-minute impact in a one-hour interval is the impact for that hour), whereas the evaluation team summarized impacts with an average. Multiplying our per-device reduction estimates by the number of devices in each class leads to a 2022 average total estimated load reduction of approximately 33.69 MW, 1.11 MW, 0.54 MW, 2.48 MW, and 1.28 MW for the Residential DCU, Two-Way Smart Thermostat, BYOT, Small Commercial, and Medium Commercial segments respectively. In aggregate, the average 2022 performance prior to making offline and operability adjustments is 39.10 MW. This is approximately 69% of Itron's pre-adjustment estimate for the 2022 season (56.80 MW). After making an online adjustment for the thermostat groups of (82% for Two-Way Smart Thermostats and 85% for BYOT) and an operability adjustment for the three DCU segments (87%), the aggregate evaluation-calculated impact for 2022 is 33.95 MW (compared to 49.48 MW from Itron after adjustment).

The evaluation team used Power Saver results from 2015 to 2022 to estimate the load relief capability under extreme conditions. At 100% operability, we estimate the program is capable of delivering 41.77 MW of load reduction under planning conditions of 100°F between 5:00 PM and 6:00 PM MDT. Of the estimated 41.77 MW of load reduction capability, 35.81 MW comes from the Residential DCU segment, 1.32 MW comes from the Two-Way Smart Thermostat segment, 0.59 MW comes from the BYOT segment, and 2.66 MW and 1.39 MW come from the Small and Medium Commercial segments, respectively. Factoring in the operability/online adjustments, the aggregate program can provide 36.25 MW of load relief.

**Table 2: Residential Results**

| | | Unit | Residential DCU | | Two-Way Smart Thermostats | | BYOT Smart Thermostats | |
|---|---|---|---|---|---|---|---|---|
| | | | Measured | Adjusted | Measured | Adjusted | Measured | Adjusted |
| Number of Devices | | # | 49,589 | 49,589 | 759 | 759 | 775 | 775 |
| Itron | 2022 Load Reduction Estimate | kW / device[1] | 0.90 | 0.78 | 1.58 | 1.30 | 1.95 | 1.66 |
| Itron | 2022 Load Reduction Estimate | Total MW | 44.46 | 38.68 | 1.20 | 0.99 | 1.51 | 1.29 |
| Evaluation | 2022 Load Reduction Estimate | kW / device | 0.68 | 0.59 | 1.46 | 1.20 | 0.70 | 0.60 |
| Evaluation | 2022 Load Reduction Estimate | Total MW | 33.69 | 29.31 | 1.11 | 0.91 | 0.54 | 0.46 |
| Evaluation | Ex Ante Load Reduction Estimate[2] | kW / device | 0.72 | 0.63 | 1.74 | 1.42 | 0.76 | 0.64 |
| Evaluation | Ex Ante Load Reduction Estimate[2] | Total MW | 35.81 | 31.15 | 1.32 | 1.08 | 0.59 | 0.50 |
| Evaluation | 2022 Energy Savings | kWh / device | 1.84 | 1.60 | 4.52 | 3.70 | 2.63 | 2.24 |
| Evaluation | 2022 Energy Savings | Total MWh | 365.21 | 317.73 | 6.86 | 5.62 | 4.08 | 3.47 |

[1] An operability adjustment of 87% is applied to the 2022 kW factors for Residential DCU, Small Commercial DCU, and Medium Commercial DCU. An online adjustment of 82% is applied to Residential Two-Way Smart Thermostats, and an online adjustment of 85% is applied to Residential BYOT.

[2] Ex ante program capability is reported in the 5 PM – 6 PM MDT hour at 100°F.

### Table 3: Commercial Results

| | | Unit | Small Commercial | | Medium Commercial | |
|---|---|---|---|---|---|---|
| | | | Measured | Adjusted | Measured | Adjusted |
| Number of Devices (Number of Locations) | | # | 5,464 | 5,464 | 3,209 (439) | 3,209 (439) |
| Itron | 2022 Load Reduction Estimate | kW / device | 1.09 | 0.95 | 1.19 | 1.04 |
| | | Total MW | 5.97 | 5.19 | 3.83 | 3.34 |
| Evaluation | 2022 Load Reduction Estimate | kW / device | 0.45 | 0.39 | 2.91 | 2.53 |
| | | Total MW | 2.48 | 2.15 | 1.28 | 1.11 |
| | Ex Ante Load Reduction Estimate | kW / device | 0.49 | 0.42 | 3.16 | 2.75 |
| | | Total MW | 2.66 | 2.31 | 1.39 | 1.21 |
| | 2022 Energy Savings | kWh / device | 1.72 | 1.50 | 1.16 | 1.01 |
| | | Total MWh | 37.60 | 32.71 | 7.47 | 6.50 |

# 1 Methodology

This section discusses the methods used to validate Itron's impact estimates and those used by the evaluation team to provide their ex post and ex ante impact estimates.

## 1.1 Residential DCU Impact Validation

The impact evaluation for the Residential DCU class relies on an alternating treatment design. Under this approach, load in the group that was not dispatched serves as a proxy for what curtailment group load would have been if the DR event had not been initiated. Both groups contained approximately 130 devices.

Impact estimates were derived using 5-minute interval kW data collected by DENT Elite Pro SP Portable Power Data Loggers and PowerCAMP and IntelliMEASURE M&V equipment. Steps taken are as follows:

1. For both the control and curtailment groups, calculate the average demand (kW) for each 5-minute interval.
2. For both the control and curtailment groups, calculate a fifteen-minute rolling average demand. Suppose the average demand for the control group is 3 kW during interval $t$, 4 kW during interval $t + 1$, and 5 kW during interval $t + 2$. The fifteen-minute rolling average demand for interval $t$ would then be 4 kW.
3. For each interval, find the difference between the rolling averages for the control and curtailment groups (where difference = control – curtailment).
4. The impact for any given event hour is the maximum difference across the 12 intervals in the hour, as calculated in step 3.
5. The maximum difference across all qualified event hours[3] is the kW per device impact estimate for the 2022 DR season.
6. Adjust the residential impacts for an operability factor of 87%. The determination of the operability percentage is detailed in detail in Section 1.6.

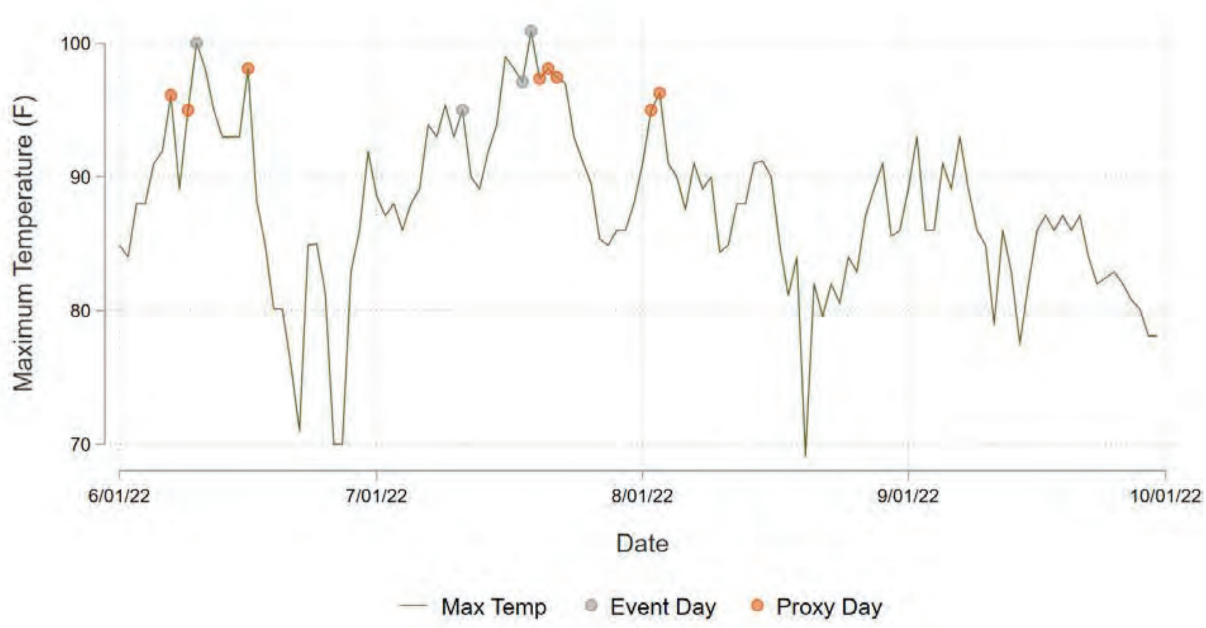
## 1.2 Estimate of Residential DCU Impacts

In 2018, the Residential DCU segment of Power Saver switched to alternating dispatch between M&V groups to determine which devices were called to reduce load on event days. In theory, this means that any difference in the behavior of the two groups is removed when we look at events across the whole summer. Because dispatch alternates between the two groups, any bias in impacts should be minimal, on average. Nevertheless, to assess the differences between the groups, the evaluation team compared the load profiles of the two groups on proxy days. Proxy days are non-event days that were chosen from non-holiday weekdays where the maximum

[3] 'Qualified' hours were defined as hours where the outdoor temperature is at least 97 degrees (F).

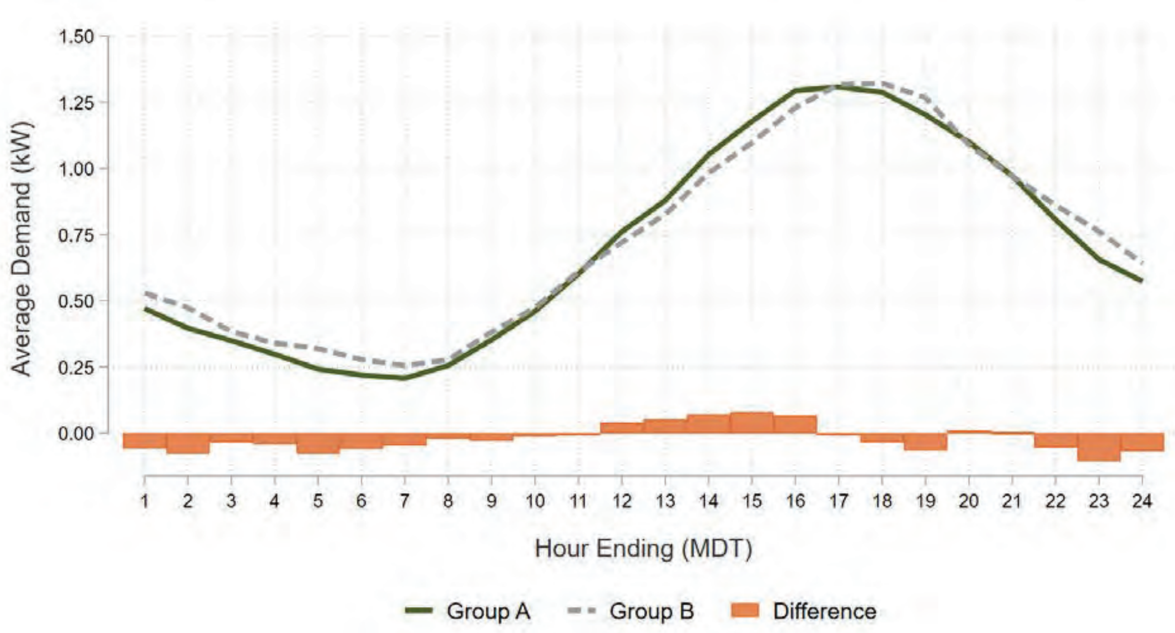
temperature was at least as hot as the event days. There were eight proxy days used to develop this comparison. Figure 1 shows the maximum temperature and distribution of proxy days throughout the summer, compared to the event days and non-event days.

**Figure 1: Albuquerque Weather on Event and Proxy Days**




The average hourly load profiles for the two residential M&V groups, averaged across all proxy days, are shown in Figure 2. The average difference between the two groups is 0.02 kW, with a maximum difference of 0.10 kW. The average difference during typical event hours is 0.01 kW and the maximum is 0.07 kW. Group B tends to have slightly higher average cooling load than Group A. This means when Group B is curtailed, impact estimates that rely on a simple difference will be understated. When Group A is curtailed and Group B acts as the control group, a simple difference in average group loads will overstate the load reduction.

**Figure 2: Residential DCU Load Shapes on Event-Like Days**




The evaluation team felt that taking the simple difference between the two groups would not be sufficient to calculate an unbiased ex post event impact. Instead, we used a difference-in-differences approach. Table 4 provides an illustration. In this illustration, Group A is the curtailment group. The difference-in-difference calculation nets out the proxy day difference from the event day difference.

**Table 4: Difference-in-Difference Illustration**

| Hour Ending (MDT) | Proxy Day Difference (kW) | Event Day Difference (kW) | Difference-in-Difference (kW) |
|---|---|---|---|
| 3:00 PM | 0.08 | 0.54 | 0.46 |
| 4:00 PM | 0.07 | 0.70 | 0.63 |
| 5:00 PM | -0.01 | 0.61 | 0.62 |
| 6:00 PM | -0.03 | 0.58 | 0.61 |

As described further in Section 2, the evaluation team also believes that the Itron method for calculating the impacts for the Residential DCU segment overstates the actual program performance because the impact for each hour is defined as the *maximum* difference out of the twelve 5-minute intervals within the hour (see step 4 of Section 1.1). We believe that using the maximum difference of all intervals within each hour, as opposed to the average difference, overstates the amount of load shed produced by a typical DR event because it counts favorable noise. In Section 2, we develop an alternative DR impact methodology that relies on the average impact rather than the maximum, and use this methodology to produce ex ante estimates for future program planning.

## 1.3 Two-Way Smart Thermostat, BYOT, Small Commercial, and Medium Impact Validation

The impact evaluation for the Small Commercial, Medium Commercial, Two-Way Smart Thermostat, and BYOT components relies on a "high X of Y" customer baseline (CBL) approach with a multiplicative day-of adjustment. Under this approach, the average load for three of the previous five eligible[4] days is used as a proxy for what load would have been if the DR event had not been called. In selecting which three days to use, the criterion is greatest maximum load between 1:00 PM and 8:00 PM. For a hypothetical event that lasts from 3:00 PM until 7:00 PM, the steps to calculating the impact estimate are as follows:

1. Calculate the unadjusted baseline.
    - For each of the five eligible days prior to the event day, calculate the average demand between 1:00 PM and 8:00 PM across the entire M&V population. Select the three days with the greatest average demand (i.e., "high 3 of 5").
    - Across the three baseline days, calculate the average demand across the entire M&V population for each 5-minute interval. This essentially collapses the three baseline days into one baseline day.
    - For each 5-minute interval, calculate a 15-minute rolling average kW load. As an example, suppose the average 5-minute interval load is 10 kW at time $t$, 12 kW at time $t + 1$, and 14 kW at time $t + 2$. The 15-minute rolling average kW load at time $t$ would be (10 + 12 + 14)/3 = 12 kW. This value (12 kW) would be the unadjusted CBL at time $t$.
2. Calculate 15-minute rolling average demand (kW) for the entire M&V population.
    - Across the entire M&V population, calculate average demand for each 5-minute interval.
    - For each 5-minute interval, calculate a 15-minute rolling average as described above.
3. Calculate the multiplicative adjustment factor.
    - For the twelve 5-minute intervals preceding the event, sum up the 15-minute rolling average demand for the unadjusted baseline.
    - For the twelve 5-minute intervals preceding the event, sum up the 15-minute rolling average demand for the M&V population.
    - Divide the second sum by the first sum. This quotient is the adjustment factor.
4. Calculate the impact.

[4] Eligible days are weekdays that are neither holidays or DR event days.

- Multiply the unadjusted baseline by the adjustment factor. This yields the adjusted CBL.
- For each 5-minute interval, subtract the 15-minute rolling average demand for the entire M&V population (as calculated in Step 2) from the adjusted baseline. Note that this yields 12 impacts in every hour.
- For Two-Way and BYOT add 0.1 kW to impacts to account for the thermostats curtailing the air handler fan in addition to the AC compressor.
- For each event hour, take the maximum 5-minute impact. This value serves as the impact estimate for the event hour.
- The maximum 5-minute impact across all qualified event hours (when temperature exceeds 97°F) is the 2022 Power Saver impact estimate.

### 1.3.1 BYOT Connected Load Assumption

BYOT Smart Thermostats are not installed by Itron field technicians. As a result, A/C tonnage and amperage information is missing for all participants who have enrolled in the BYOT program component. In the absence of A/C unit nameplate information, a default value is used as the connected load estimate. This default connected load value is estimated from the 2020 Two-Way Smart Thermostat residential population. This value is then used to convert A/C runtime to power draw (kW) for each 5-minute interval.

Itron uses a connected load of 4.19 kW. The evaluation team used a connected load of 3.22 kW to calculate BYOT 5-minute kW interval data based on the formulas and assumptions below drawn from the Smart Thermostat and High Efficiency Air Conditioner measures in the New Mexico 2021 Technical Reference Manual.

$$Connected\ Load = \frac{Capacity_{cool}}{1000\frac{W}{kW}} \times \frac{1}{EER} = 3.22\ kW$$

Where:

- $Capacity_{cool}$ = 36,000 BTU/hour (2021 TRM Section 4.20.3)
- EER = -0.02 * $SEER^2$ + 1.12 * SEER (2021 TRM Section 4.6.4)
    - Assuming SEER = 13 (2021 TRM Section 4.20.3)

## 1.4 Estimate of Two-Way Smart Thermostat, BYOT, Small Commercial, and Medium Commercial Impacts

Reported impacts for the Two-Way Smart Thermostat, BYOT, Small Commercial, and Medium Commercial offerings rely on a CBL method where the key step involves taking the maximum 5-minute rolling average difference within each hour. The maximum difference for the hour is the reported impact. The evaluation team feels that using the maximum difference, rather than the average difference, overstates the capability of the program by including favorable noise into the impact calculation. Therefore, the evaluated impact estimates for these program offerings use the same general baseline method as summarized in Section 1.3 except that the rolling 5-minute impacts are summarized by the mean rather than the maximum by hour.

Figure 3 illustrates why using the maximum 5-minute impact within each hour overstates the true DR program impact, using the BYOT program as an example. The figure shows the baseline (green) and average participant load (gray) for each 5-minute interval on 7/11/2022. Within a given event hour, the average participant load ranges from as low as 0.42 kW to as high as 1.74 kW. The average participant load across the event period was 1.10 kW. Therefore, taking the maximum of the 5-minute impacts within a given hour will yield an inflated impact value compared to taking the average 5-minute impact.

**Figure 3: BYOT Baseline and Actual Load for July 11, 2022**

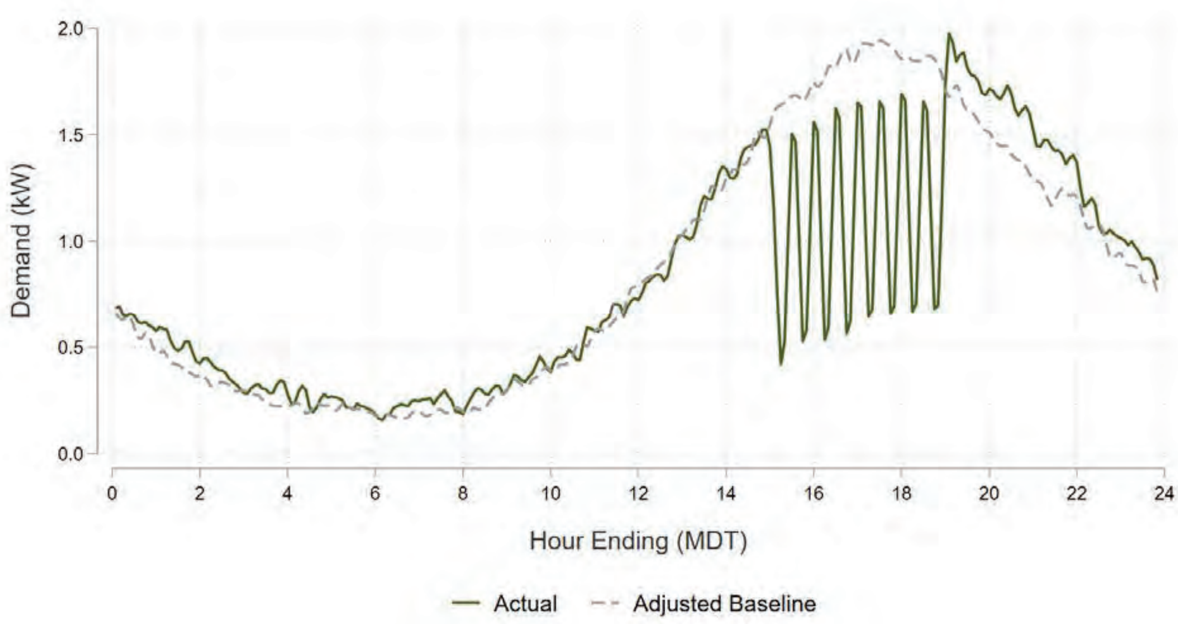
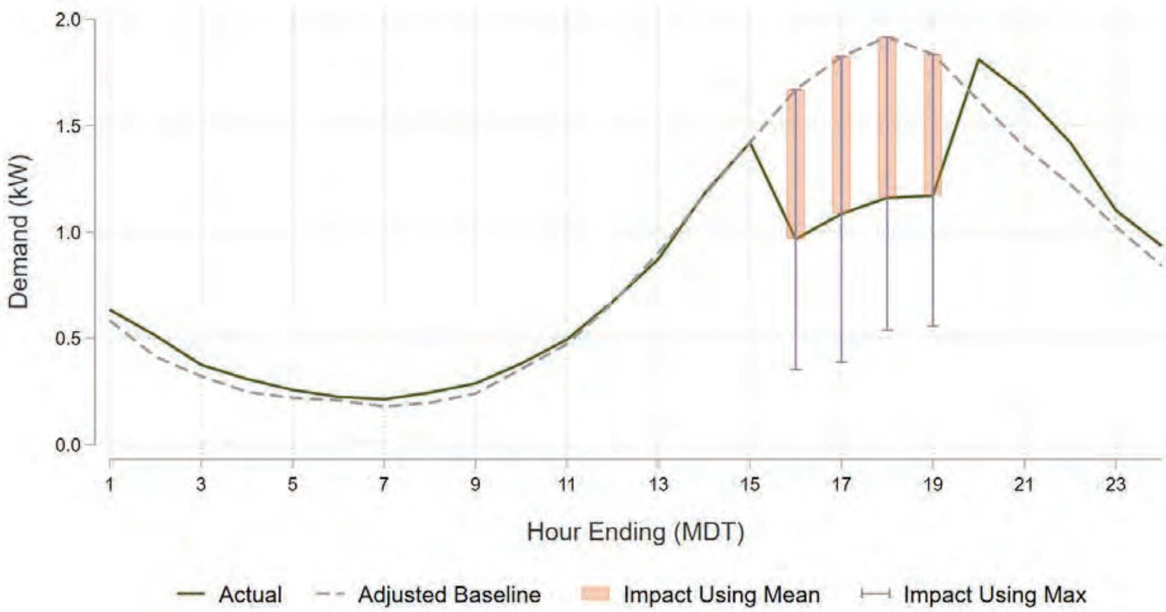



Figure 4 compares the impacts using the two different methods. As in Figure 3, the green and gray lines represent the customer baseline and participant load on 7/11/2022; the key difference is that the values shown are the average for each hour, as opposed to the granular 5-minute intervals. The orange bars represent the hourly DR impacts using the average 5-minute impact within each hour, while the purple capped lines represent the hourly DR impacts using the Itron maximum methodology. Note that the average impacts (orange) are equal to the difference between the baseline and the average participants' loads, while the Itron impacts (purple) far overstate actual DR program performance. Again, this is an artifact of using the highest 5-minute impact within each hour. The degree to which impacts are overstated using the Itron method depends on how much loads vary within each hour.

**Figure 4: BYOT Baseline and Actual Load for July 11, 2022 with Impacts Calculated Using Mean and Max Methodologies**




## 1.5 Ex Ante Impacts

Of particular interest for ex ante load considerations is how sensitive the program performance is to temperature and time of day. When multiple years of data are included in such an analysis, a wider range of program conditions can be investigated which leads to a more robust understanding of the capability of the program.

To produce an ex ante impact estimate for Residential DCU customers, the evaluation team leveraged 2015-2022 verified load reduction estimates. In 2015, 2016, 2017, and 2019, only one of the Residential DCU M&V groups was consistently curtailed while the other group acted as a control. In 2018, 2020, 2021, and 2022, the curtailment groups switched between event days. Because some differences exist between the two groups in terms of load profile on event-like days, the evaluation team used a difference-in-differences impact estimation method, which was described in Section 1.2, to estimate the impacts for these earlier summers.[5] Ex post impacts in

[5] There were not many non-event weekdays during the summer of 2015 where the maximum outdoor temperature exceeded 94 degrees (F), so a threshold of 91 degrees (F) was used for the 2015 data instead. The temperature threshold for the summer of 2016 was 94 degrees (F), just like the threshold for the summer of 2017. In 2018, the groups were similar in terms of non-event day usage, so the difference-in-differences method was not necessary.

2018 were not calculated via difference-in-differences, as statistically significant differences between the groups were not found.

To produce an ex ante impact estimate for the Small Commercial segment, the evaluation team leveraged 2015-2022 verified load reduction estimates. Prior to 2019, impacts for the Small Commercial segment were calculated in a manner similar to the Residential DCU segment – an M&V group was split into curtailment and control groups. The control group was used as a baseline for the curtailment group. Since 2019, the full M&V group was curtailed for all events, and the program implementer relied on an X-of-Y baseline method to estimate impacts (same method as the one used for the Large Commercial segment). Therefore, the ex ante estimate is a function of historical ex post estimates that were developed using slightly different methods over the years.

For the Medium Commercial segment, we leveraged 2017-2022 verified load reduction estimates. The same approach for estimating ex post results for the Medium Commercial segment was used in each year.

For the Two-Way Smart Thermostat segment, we leveraged 2019-2022 verified load reduction estimates. The 2019 approach relied on control groups. Since then, the approach has relied on the X-of-Y baseline method described above.

For the BYOT segment, we leveraged 2020-2022 verified load reduction estimates. The same approach for estimating ex post results was used in each year.

Once data had been compiled for each customer segment, regression modeling was used to estimate the effect temperature and time of day have on demand reductions. The resulting regression model was used to predict impacts for a range of planning scenarios. Two event days (7/31/2015 and 7/13/2020) were excluded from the regressions because weather conditions on these days differed from typical planning scenarios. The former date had relatively low temperatures throughout the event, while the latter experienced storm conditions midway through the event. The regression equation specified was:

$$\Delta kW_h = \alpha + \beta * T_t + \sum_{h=15}^{h=20} \gamma_h * I_h + \sum_{h=15}^{h=20} \delta_h * I_h * T_h + \varepsilon_h$$

Where the variables have the following interpretations:

**Table 5: Ex Ante Regression Terms**

| Variable | Interpretation |
| --- | --- |
| $\alpha$ | Constant term |
| $\beta$ | The incremental kW usage associated with a warming of 1 degree Fahrenheit |
| $T_t$ | Outdoor air temperature in hour h |
| $\gamma_h$ | Incremental kW usage associated with each hour |
| $I_h$ | Indicator variable equal to 1 if the hour is 14, 15, 16, etc., and 0 if not |
| $\delta_h$ | Incremental kW usage associated with a 1-degree increase in outdoor temperature in hour h |
| $\varepsilon_h$ | The error term |

## 1.6 Operability Adjustments

To reach a true estimate of program capability, ex post and ex ante impacts in this analysis need to be adjusted for operability. In a previous evaluation, the evaluation team recommended adjusting residential impacts by 8% based on operability inspections that occurred during Summer 2018. Our 2018 Evaluation Report covered the inspection process and key findings in detail. Itron's 2018 report adopted this recommendation. In 2022, the adjustment factor was 87% for the Residential DCU, Small Commercial, and Medium Commercial programs. The 87% operability adjustment value represents a weighted average of 85% and 95% where the two values correspond to sites that have not been visited in the past two years and sites that have been visited in the past two years, respectively. Separately, Itron's report notes that an 82% online factor (not operability factor) is applied to the Two-Way Smart Thermostat group and an 85% online factor is applied to the BYOT group. We have adopted these adjustments as well. Unless otherwise noted, results in this analysis are reported without the operability adjustment applied.

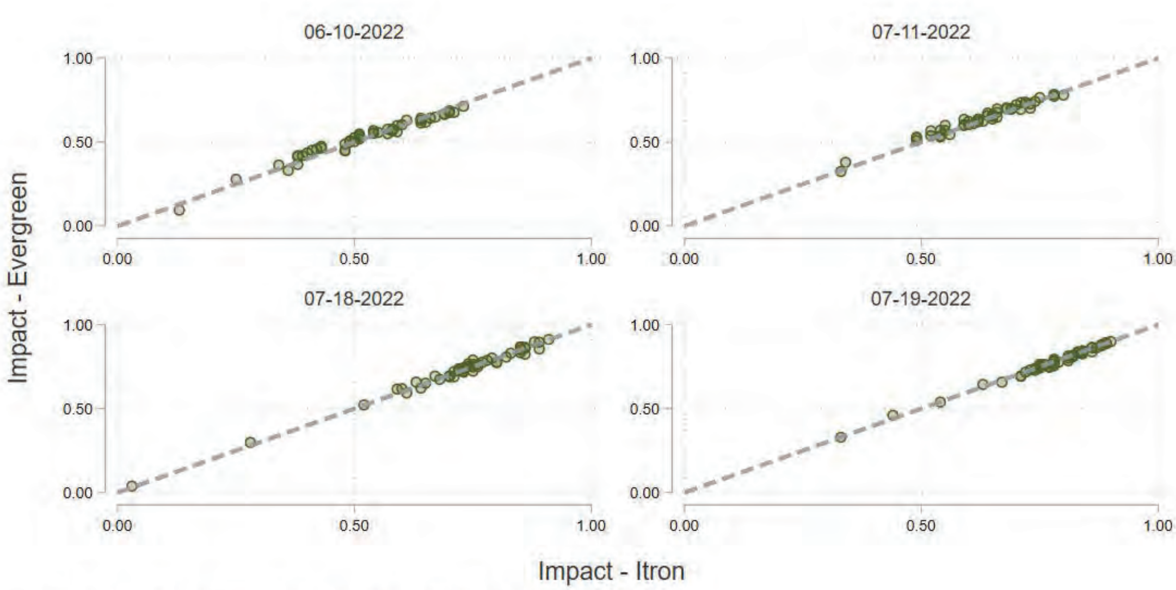
# 2 Residential DCU Results

This section reviews the Residential DCU impacts calculated by Itron and validated by the evaluation team. Additionally, the team provides feedback on the evaluation approach used by Itron and provides an alternative impact analysis for summer 2022 events. Finally, multiple years of event history are combined to develop ex ante impacts for various temperature scenarios.

## 2.1 Validation of Calculations

After receiving the participant load data from Itron, the evaluation team attempted to reproduce the impacts in Itron's Power Saver impact evaluation report. Figure 5 compares the impacts as calculated by Itron and by the evaluation team at the 5-minute level for each event day. There is strong but imperfect alignment. The average difference between Itron's impacts and the evaluation teams validated impacts is 0.003 kW (with the evaluation teams validated impacts being slightly larger, on average). For reference, Itron's Residential DCU impact estimates are shown in Table 6. Note that an asterisk (*) denotes a qualifying event hour. The maximum impact during qualifying event hours was 0.90 kW per device for the Residential DCU class without any adjustment for operability.

**Figure 5: Residential DCU Impact Verification**




The dotted line represents what a perfect match would look like.

**Table 6: Residential Impact Estimates (kW) by Date and Time[6]**

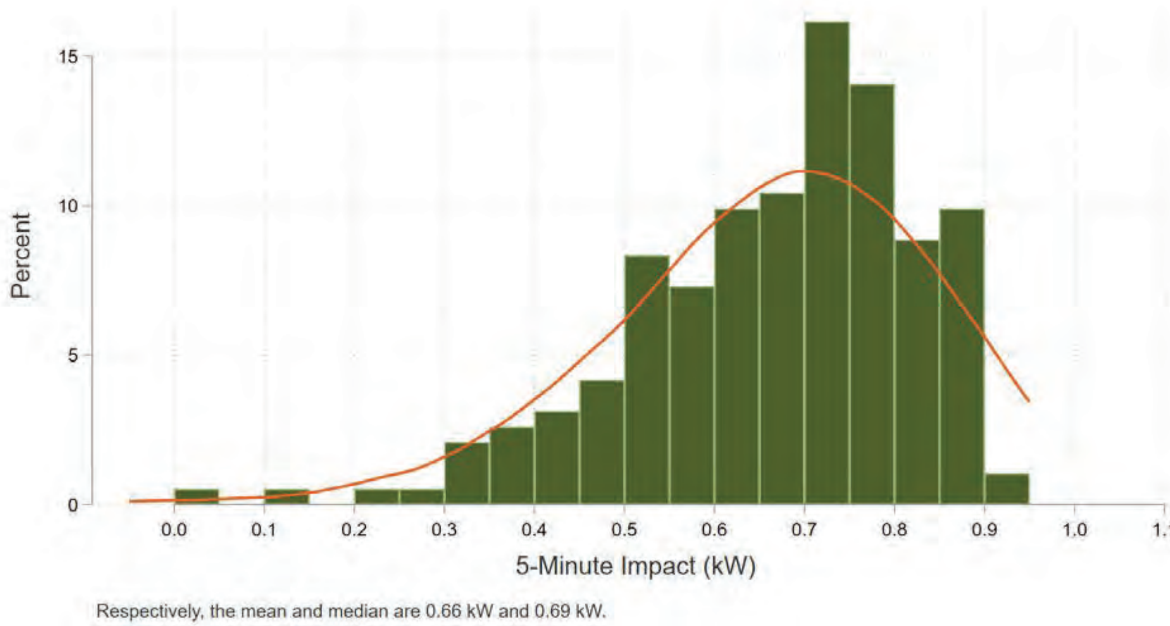
| Date | Hour Ending (MDT) | | | |
|---|---|---|---|---|
| | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM |
| 6/10/2022 | 0.67 | 0.71* | 0.70* | 0.73* |
| 7/11/2022 | 0.80 | 0.78 | 0.75 | 0.69 |
| 7/18/2022 | 0.86* | 0.89* | 0.89* | 0.91 |
| 7/19/2022 | 0.89* | 0.90* | 0.88* | 0.89* |

## 2.2 Ex Post Impacts

For the Residential DCU segment, Itron's per device kW impact estimate for the 2022 season is the maximum difference between 5-minute rolling average loads for the control and curtailment groups (0.90 kW). (See Section 1.1 for more details.) The critical word here is *maximum*. The evaluation team feels that using the maximum difference overstates the amount of load shed produced by a typical Power Saver DR event by counting favorable noise. This is especially true from a system planning perspective, as using the maximum is a poor basis for the estimated load relief upon dispatch. Figure 6 shows the distribution of impacts at the 5-minute level – 0.90 kW clearly overstates the center of the distribution.

[6] Source: Itron's 2022 PNM Power Saver Program Report. Table 37.

**Figure 6: Distribution of 5-Minute Residential DCU Impacts**




Rather than the maximum difference, the evaluation team feels that using an average impact across an hour returns an unbiased estimate of Power Saver program impacts during DR events. To account for differences between the two M&V groups, the evaluation team opted for a difference-in-difference approach for estimating ex post impacts. This approach was described in Section 1.2. Results for the 2022 DR season are summarized in Table 7. Qualifying event hours are denoted with an asterisk (*). Note that the curtailment group rotated between events, which is why the sign of the non-event-day difference changes from one event to the next.

**Table 7: Impact Calculations**

| Date | # of Curtailed Devices | Hour Ending (MDT) | Temp. (F) | Control kW | Curtail kW | Non-Event Diff. (kW) | Impact (kW) |
|---|---|---|---|---|---|---|---|
| 6/10/2022 | 132 | 16 | 96 | 1.09 | 0.69 | -0.07 | 0.47 |
| | | 17* | 97 | 1.24 | 0.70 | 0.01 | 0.54 |
| | | 18* | 100 | 1.32 | 0.75 | 0.03 | 0.54 |
| | | 19* | 97 | 1.31 | 0.74 | 0.07 | 0.50 |
| 7/11/2022 | 123 | 16 | 95 | 1.23 | 0.65 | 0.07 | 0.52 |
| | | 17 | 94 | 1.29 | 0.61 | -0.01 | 0.68 |
| | | 18 | 93 | 1.31 | 0.64 | -0.03 | 0.71 |
| | | 19 | 91 | 1.24 | 0.63 | -0.07 | 0.67 |
| 7/18/2022 | 128 | 16* | 98 | 1.38 | 0.79 | -0.07 | 0.65 |
| | | 17* | 97 | 1.55 | 0.79 | 0.01 | 0.75 |
| | | 18* | 97 | 1.53 | 0.79 | 0.03 | 0.70 |
| | | 19 | 96 | 1.57 | 0.76 | 0.07 | 0.75 |
| 7/19/2022 | 123 | 16* | 101 | 1.53 | 0.81 | 0.07 | 0.65 |
| | | 17* | 100 | 1.55 | 0.77 | -0.01 | 0.79 |
| | | 18* | 101 | 1.58 | 0.80 | -0.03 | 0.82 |
| | | 19* | 99 | 1.58 | 0.79 | -0.07 | 0.86 |

The average impact during qualifying event hours was 0.68 kW. As of the end of summer 2022, there were 49,589 active residential DCUs. Thus, the average qualifying event hour aggregate impact was 33.69 MW. Adjusted for 87% operability, the aggregate impact was 29.31 MW.

Figure 7 visualizes the impact estimates and Figure 8 compares the evaluation teams ex post hourly impacts with the impacts calculated by Itron. The evaluation teams impact is lower in all cases, by about 0.15 kW on average.

**Figure 7: Residential DCU DR Impacts by Date**

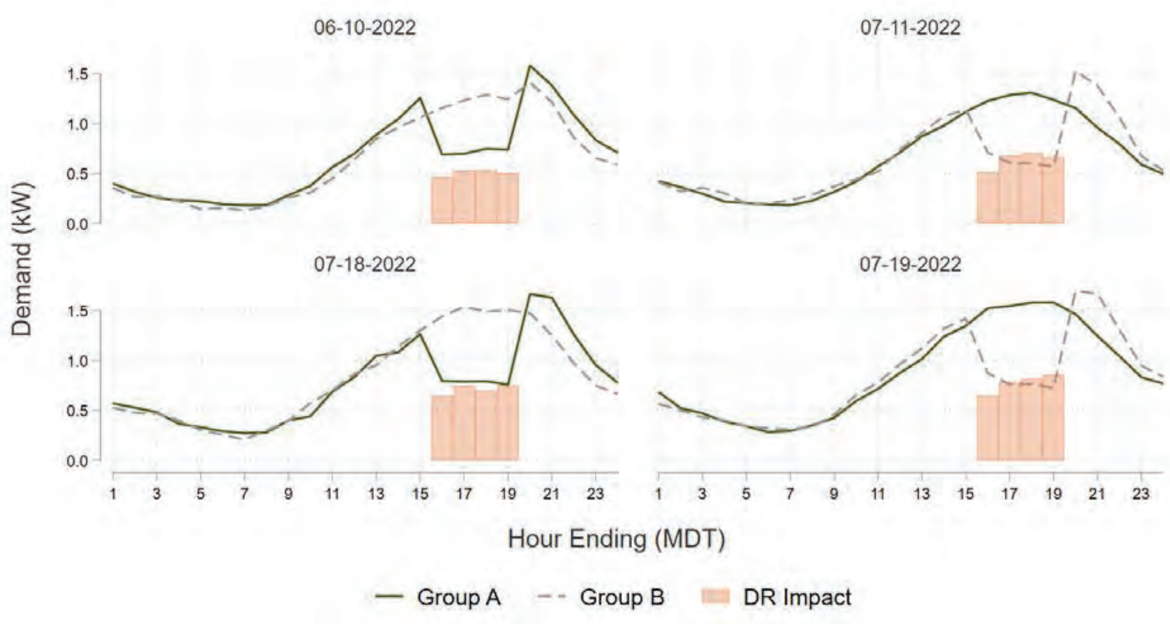
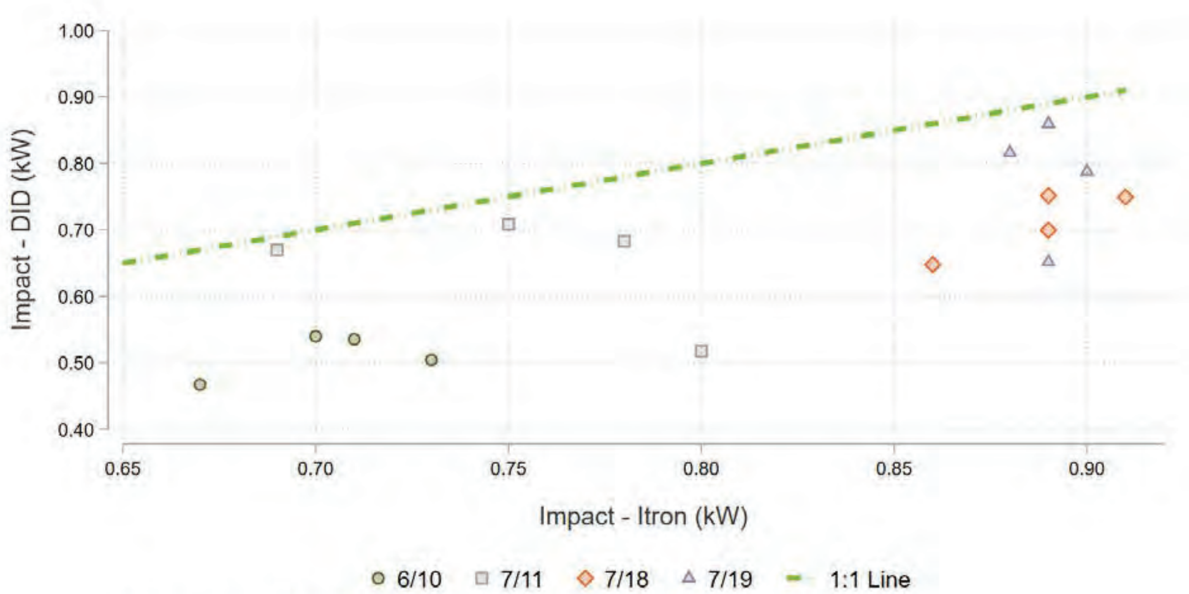



**Figure 8: Comparison of Evaluated Ex Post Impacts and Itron Impacts**




The 1:1 line shows what the trend would look like if the DID and Itron impacts were identical.

### 2.2.1 Net Energy Savings

The evaluation team estimated net energy impacts for the Residential DCU program offering by summing ex post impacts from the onset of each event through the end of the event day. The calculation of impacts is exactly as described earlier in this section. Table 8 shows the energy savings estimates (per device) for each event day. On average, net daily energy savings were 1.84 kWh per device. Multiplying by the number of events (four) and the number of active devices (49,589) yields an aggregate savings estimate of 365.21 MWh for the Residential DCU segment. After applying the operability factor of 87%, the aggregate energy savings estimate is 317.73 MWh.

**Table 8: Per Device Energy Savings by Event Day**

| Date | Event Start (MDT) | Event Savings (kWh) | Snapback (kWh) | Net Savings (kWh) |
|---|---|---|---|---|
| 6/10/2022 | 3:00 PM | 2.05 | -0.86 | 1.18 |
| 7/11/2022 | 3:00 PM | 2.58 | -1.18 | 1.40 |
| 7/18/2022 | 3:00 PM | 2.85 | -1.17 | 1.67 |
| 7/19/2022 | 3:00 PM | 3.12 | -1.11 | 2.01 |
| **Average** | **---** | **2.98** | **-1.14** | **1.84** |

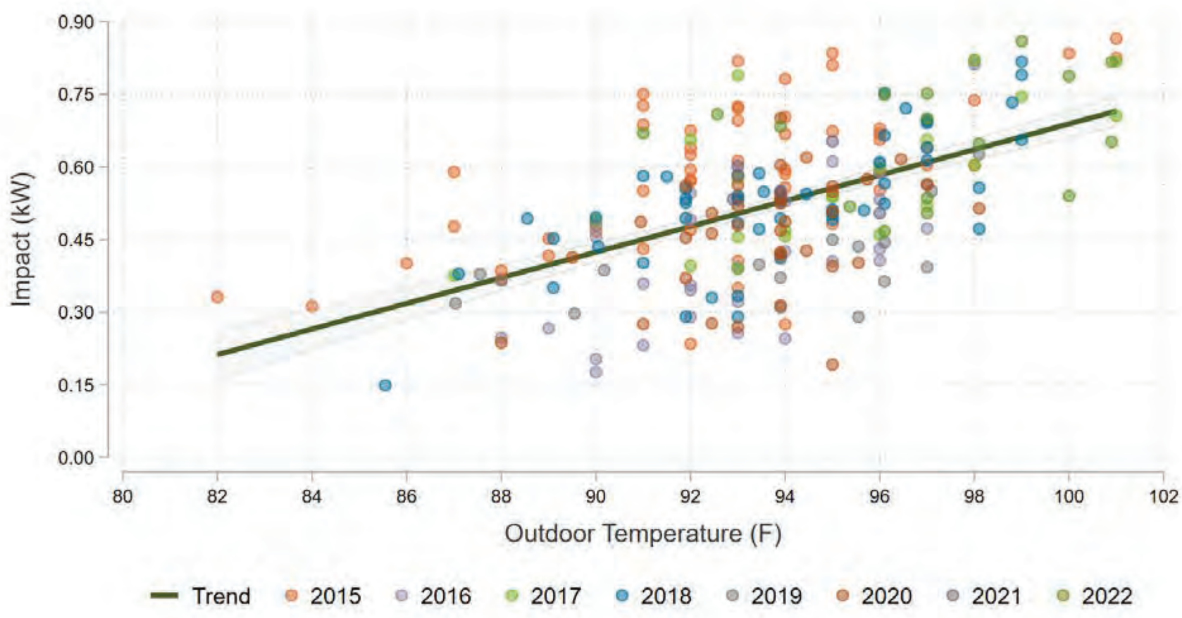
## 2.3 Ex Ante Impacts

While ex post impact estimates serve to measure prior program performance, ex ante impact estimates are forward-looking. In other words, ex ante estimates represent expected demand reductions in future years at peaking conditions.

To develop an ex ante impact estimate for the Residential DCU component of Power Saver, the evaluation team leveraged linear regression to model historical ex post impacts as a function of temperature and time. Figure 9 highlights the relationship between historical ex post impact estimates (2015-2022) and outdoor air temperature (in Albuquerque). There is a clear trend in the figure – the hotter it is outside, the greater the impacts tend to be.

The specification of the ex ante regression model was shown in Section 1.5, and the results from the model are described in more detail below. The evaluation team predicts that the impact of a Residential DCU DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 0.72 kW per device.

**Figure 9: Hourly Impacts against Outdoor Temperature (F)**




The regression was run on full event hours (some events in prior summers started mid-hour) and weighted by the number of curtailed devices (each summer had slightly different numbers of dispatched devices). Regression output is shown in the table below. In the table, note an "hour ending" convention is used (so hour 15 refers to the hour from 2:00 PM through 3:00 PM). In general, earlier hours corresponded to higher kW values, with a drop over time in impacts as less load is available to shed. Temperature has a positive coefficient, indicating that higher temperatures produce larger load reductions. Note that any coefficient with "*" next to it is statistically significant at the 95% confidence level.

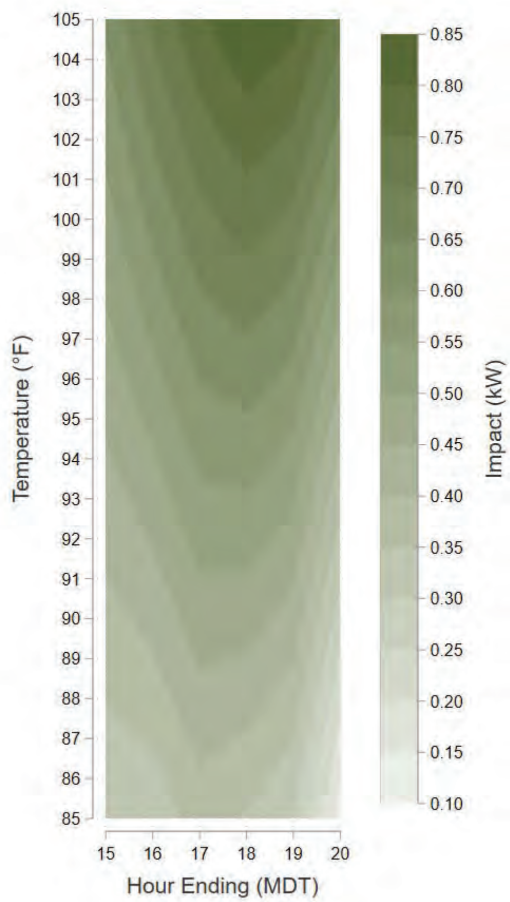
**Table 9: Residential DCU Ex Ante Regression Output**

| Term | Variable | Coefficient (b) | Standard Error | P-Value |
|---|---|---|---|---|
| $\beta$ | Temperature | 0.015* | 0.001 | 0.000 |
| $\gamma_h$ | Hour 15 | | (base – omitted) | |
| | Hour 16 | -0.405* | 0.074 | 0.000 |
| | Hour 17 | -0.444* | 0.075 | 0.000 |
| | Hour 18 | -0.834* | 0.070 | 0.000 |
| | Hour 19 | -0.932* | 0.077 | 0.000 |
| | Hour 20 | -1.428* | 0.143 | 0.000 |
| $\delta_h$ | Hour_15_x_Temp | | (base – omitted) | |
| | Hour_16_x_Temp | 0.005* | 0.001 | 0.000 |
| | Hour_17_x_Temp | 0.006* | 0.001 | 0.000 |
| | Hour_18_x_Temp | 0.010* | 0.001 | 0.000 |
| | Hour_19_x_Temp | 0.011* | 0.001 | 0.000 |
| | Hour_20_x_Temp | 0.015* | 0.002 | 0.000 |
| $\alpha$ | Constant | -0.962* | 0.056 | 0.000 |

Using the regression coefficients shown in the table above, the evaluation team created a time-temperature matrix (TTM) that shows expected load reductions (per device) for different outdoor temperatures and at different times of the day. The TTM is shown in Table 10. The evaluation team predicts that the impact of a Residential DCU DR event at peaking conditions is 0.72 kW per device.

**Table 10: Residential DCU Time-Temperature Matrix**

| Temp | Hour Ending MDT | | | | | |
|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 |
| 105 | 0.61 | 0.71 | 0.79 | 0.85 | 0.82 | 0.72 |
| 104 | 0.59 | 0.69 | 0.77 | 0.82 | 0.79 | 0.69 |
| 103 | 0.58 | 0.67 | 0.75 | 0.80 | 0.77 | 0.66 |
| 102 | 0.56 | 0.65 | 0.73 | 0.77 | 0.74 | 0.63 |
| 101 | 0.55 | 0.63 | 0.71 | 0.75 | 0.71 | 0.60 |
| 100 | 0.53 | 0.61 | 0.69 | 0.72 | 0.69 | 0.57 |
| 99 | 0.52 | 0.59 | 0.66 | 0.70 | 0.66 | 0.54 |
| 98 | 0.50 | 0.57 | 0.64 | 0.67 | 0.64 | 0.51 |
| 97 | 0.49 | 0.55 | 0.62 | 0.65 | 0.61 | 0.48 |
| 96 | 0.47 | 0.53 | 0.60 | 0.62 | 0.58 | 0.45 |
| 95 | 0.46 | 0.51 | 0.58 | 0.60 | 0.56 | 0.42 |
| 94 | 0.44 | 0.49 | 0.56 | 0.57 | 0.53 | 0.39 |
| 93 | 0.43 | 0.47 | 0.54 | 0.55 | 0.51 | 0.36 |
| 92 | 0.41 | 0.45 | 0.52 | 0.52 | 0.48 | 0.34 |
| 91 | 0.40 | 0.43 | 0.50 | 0.50 | 0.46 | 0.31 |
| 90 | 0.38 | 0.42 | 0.48 | 0.47 | 0.43 | 0.28 |
| 89 | 0.37 | 0.40 | 0.46 | 0.45 | 0.40 | 0.25 |
| 88 | 0.35 | 0.38 | 0.43 | 0.42 | 0.38 | 0.22 |
| 87 | 0.34 | 0.36 | 0.41 | 0.39 | 0.35 | 0.19 |
| 86 | 0.32 | 0.34 | 0.39 | 0.37 | 0.33 | 0.16 |
| 85 | 0.31 | 0.32 | 0.37 | 0.34 | 0.30 | 0.13 |




To get an idea of the Residential DCU resource capability on aggregate, the number of active devices can be multiplied by the values shown in Table 10. As of the end of summer 2022, there were 49,589 active residential DCUs. Thus, the expected aggregate impact of an event hour ending at 6:00 PM (MDT) when the outdoor temperature is 100 degrees would be 35.81 MW. Residential DCU results are subject to an operability adjustment to better reflect the fact that not all devices in the population will be able to curtail load when called due to damage, wiring, or connection issues. The operability-adjusted aggregate impact is 87% of the unadjusted impact, or 31.15 MW.

# 3 Two-Way Smart Thermostat

For the Two-Way Smart Thermostat program offering, usage during the curtailment event is compared to usage on high load days preceding the event. This section reviews the Two-Way

Smart Thermostat impacts calculated by Itron and validated by the evaluation team. Additionally, we provide feedback on the evaluation approach used by Itron and provide an alternative impact analysis for summer 2022 events. Finally, multiple years of event history are combined to develop ex ante impacts for various temperature scenarios.

## 3.1 Validation of Calculations

After receiving the participant load data from Itron, the evaluation team attempted to reproduce the impacts in Itron's Power Saver impact evaluation report. Figure 10 compares the impacts as calculated by Itron and by the evaluation team at the 5-minute level for each event day. There is nearly perfect alignment. The average difference between Itron's impacts and the evaluation teams validated impacts is 0.005 kW (with the evaluation teams validated impacts being slightly larger, on average). Itron's Two-Way Smart Thermostat impact estimates are shown in Table 11. Note that an asterisk (*) denotes a qualifying event hour. The maximum impact during qualifying event hours was 1.58 kW per device for the Two-Way Smart Thermostat component without any adjustment for offline devices.

**Figure 10: Two-Way Smart Thermostat Impact Verification**

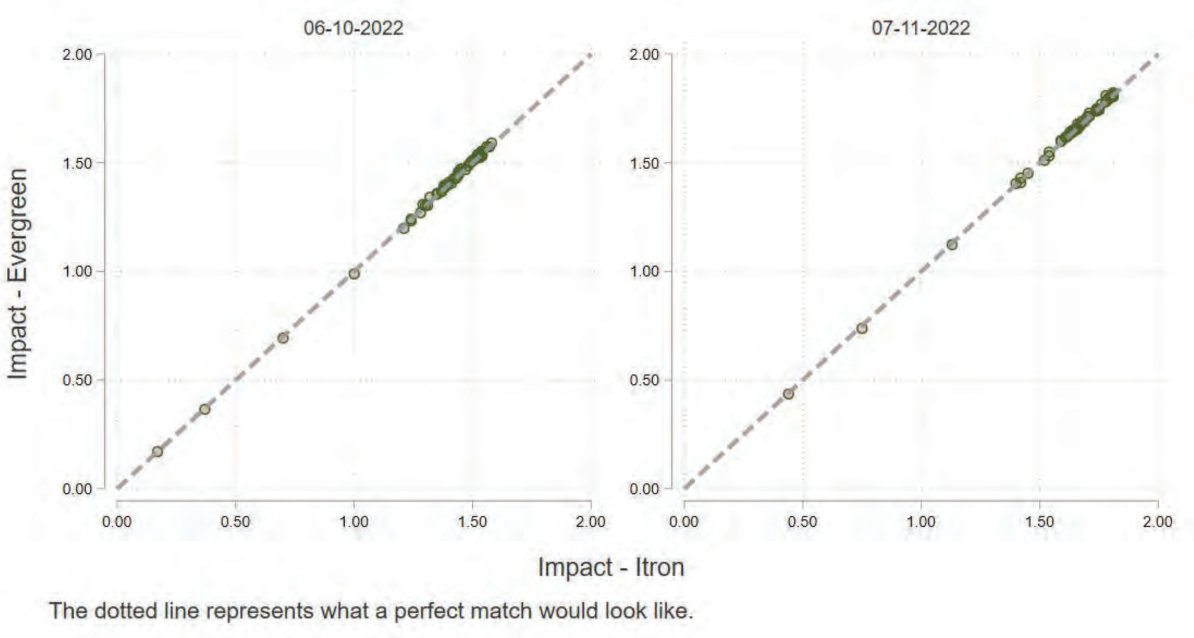


**Table 11: Two-Way Smart Thermostat Impact Estimates (kW) by Date and Time[7]**

| Date | Hour Ending (MDT) | | | |
|---|---|---|---|---|
| | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM |
| 6/10/2022 | 1.54 | 1.54* | 1.58* | 1.53* |
| 7/11/2022 | 1.64 | 1.81 | 1.81 | 1.81 |

## 3.2 Ex Post Impacts

As discussed in Section 1.4, the evaluation team thinks the method used to estimate impacts for the Two-Way Smart Thermostat program offering overstates the true average impact. For each event hour during the 2022 DR season, Table 12 shows the impact estimates produced by the evaluation team.[8] Qualifying event hours are denoted with an asterisk (*). Our methods differed from Itron's just slightly – in any place where Itron summarized with a maximum, we replaced it with an average.

**Table 12: Two-Way Smart Thermostat Impact Results**

| Date | # of Curtailed Devices | Hour Ending (MDT) | Temp. | CBL kW | Observed kW | Impact |
|---|---|---|---|---|---|---|
| 6/10/2022 | 532 | 16 | 96 | 1.91 | 0.95 | 1.06 |
| | | 17* | 97 | 2.08 | 0.72 | 1.46 |
| | | 18* | 100 | 2.19 | 0.78 | 1.51 |
| | | 19* | 97 | 2.17 | 0.85 | 1.42 |
| 7/11/2022 | 535 | 16 | 95 | 2.21 | 0.98 | 1.33 |
| | | 17 | 94 | 2.39 | 0.78 | 1.71 |
| | | 18 | 93 | 2.45 | 0.83 | 1.72 |
| | | 19 | 91 | 2.47 | 0.88 | 1.69 |

The average impact during qualifying event hours was 1.46 kW. As of the end of summer 2022, there were 759 active Two-Way Smart Thermostat devices. Thus, the average qualifying event

[7] Source: Itron's 2022 PNM Power Saver Program Report. Table 40.

[8] Note that the Two-Way devices include a 0.1 kW adjustment to the impact to account for the thermostat curtailment on the air handler fan for systems set to "auto".

hour aggregate impact was 1.11 MW. Adjusted by an 82% online factor, the aggregate impact was 0.91 MW.

Figure 11 visualizes the impact estimates and Figure 12 compares the evaluation teams ex post hourly impacts with the impacts calculated by Itron. The evaluation teams impact is lower in all cases, by about 0.17 kW on average.

**Figure 11: Two-Way Smart Thermostat DR Impacts by Date**

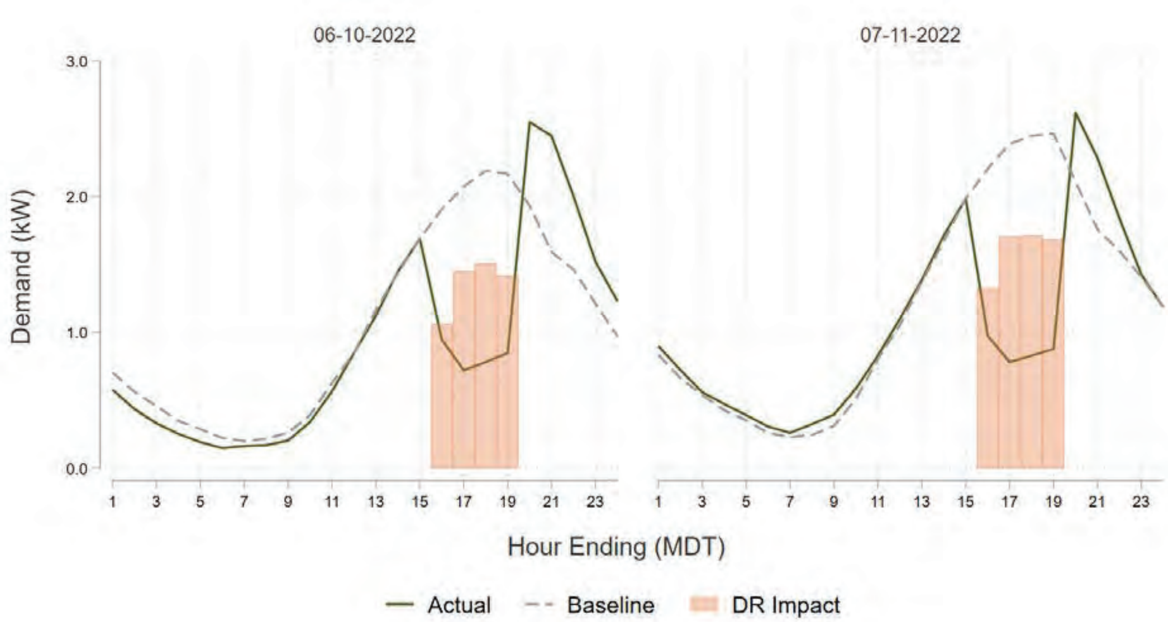
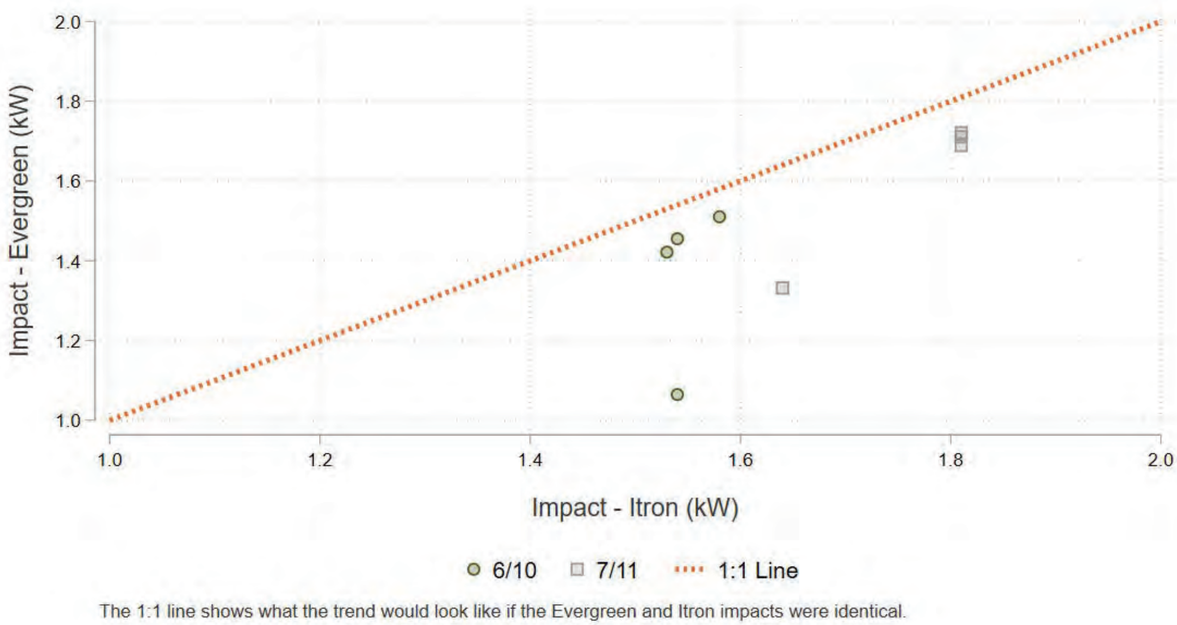


**Figure 12: Comparison of Evaluated Ex Post Impacts and Itron Impacts**




### 3.2.1 Net Energy Savings

The evaluation team estimated net energy impacts for the Two-Way Smart Thermostat program offering by summing ex post impacts from the onset of each event through the end of the event day. The calculation of impacts is exactly as described earlier in this section. Table 13 shows the energy savings estimates for each event day. On average, net daily energy savings were 4.52 kWh per device. Multiplying this estimate by the number of event days (two) and the number of active devices (759) yields an aggregate savings estimate of 6.86 MWh for the Two-Way Smart Thermostat program offering. After applying an online factor of 82%, the aggregate energy savings estimate is 5.62 MWh.

**Table 13: Per Device Energy Savings by Event Day**

| Date | Event Start (MDT) | Event Savings (kWh) | Snapback (kWh) | Net Savings (kWh) |
|---|---|---|---|---|
| 6/10/2022 | 3:00 PM | 5.45 | -2.08 | 3.37 |
| 7/11/2022 | 3:00 PM | 6.45 | -0.79 | 5.66 |
| **Average** | | **5.95** | **-1.44** | **4.52** |

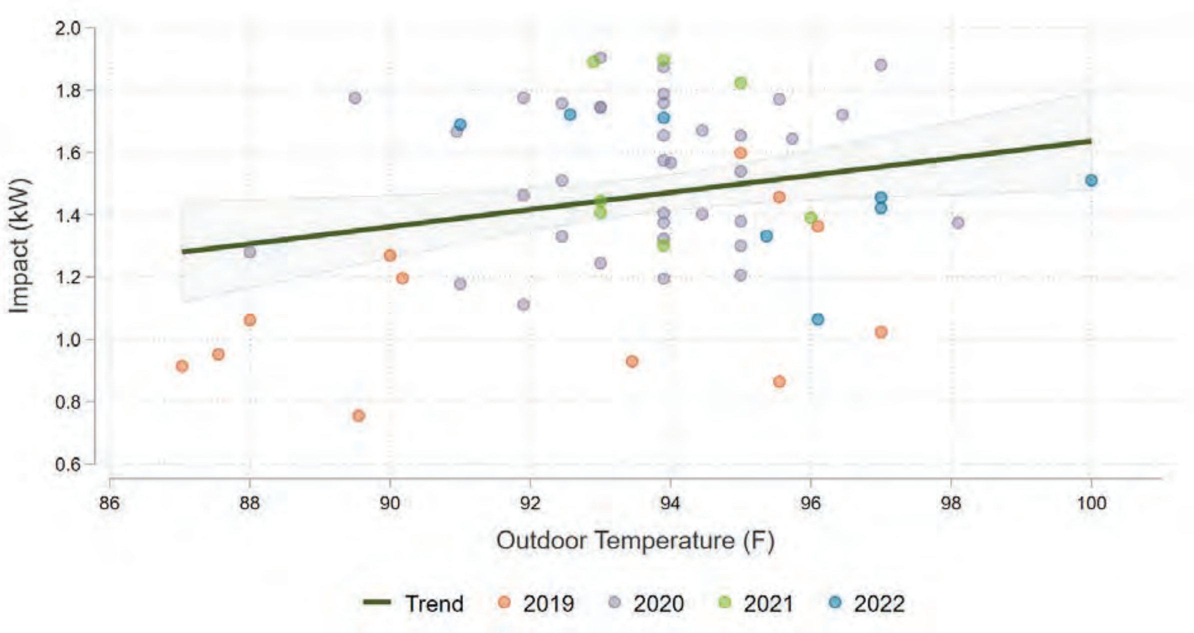
## 3.3 Ex Ante Impacts

While ex post impact estimates serve to measure prior program performance, ex ante impact estimates are forward-looking. In other words, ex ante estimates represent expected demand reductions in future years at peaking conditions.

To develop an ex ante impact estimate for the Residential Two-Way Smart Thermostat component of Power Saver, the evaluation team leveraged linear regression to model historical ex post impacts as a function of temperature and time. Figure 13 highlights the relationship between historical ex post impact estimates (2019-2022) and outdoor air temperature (in Albuquerque).[9] There is a clear trend in the figure – the hotter it is outside, the greater the impacts tend to be.

The specification of the ex ante regression model was shown in Section 1.5, and the results from the model are described in more detail below. The evaluation team predicts that the impact of a Residential Two-Way Smart Thermostat DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 1.74 kW per device.

**Figure 13: Hourly Impacts against Outdoor Temperature (F)**




The ex-ante regression model was run on full event hours and weighted by the number of curtailed devices (each summer had slightly different numbers of dispatched devices). Regression output is shown below. In the table, note an "hour ending" convention is used (so hour 15 refers

[9] Note that the baseline method used to calculate ex post impacts for 2020-2022 differed slightly from the control group method used to calculate ex post impacts in 2019.

to the hour from 2:00 PM through 3:00 PM). Note that any coefficient with "*" next to it is statistically significant at the 95% confidence level. Temperature has a positive coefficient, indicating that higher temperatures produce higher impacts. The interaction terms, represented by $\delta_h$, are mostly negative, indicating that the incremental effect of temperature in a given hour actually decreases the impact. It should be noted that hour ending 20 was extremely rare and accounted for only three of the 64 event hours during the past four years. In addition, hour ending 15 is not included in the regression due to a lack of data.

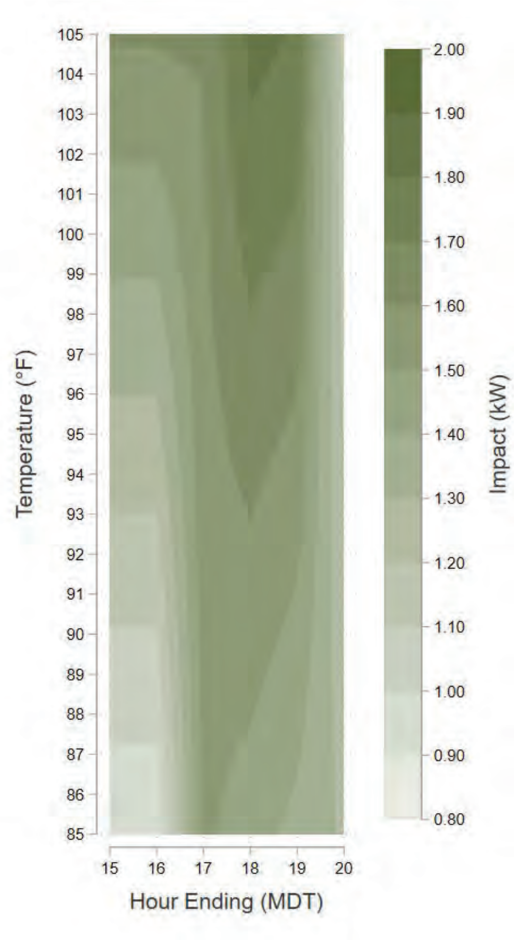
**Table 14: Two-Way Smart Thermostat Ex Ante Regression Output**

| Term | Variable | Coefficient (b) | Standard Error | P-Value |
|---|---|---|---|---|
| $\beta$ | Temperature | 0.034* | 0.002 | 0.000 |
| $\gamma_h$ | Hour 16 | | (base – omitted) | |
| | Hour 17 | 3.151* | 0.194 | 0.000 |
| | Hour 18 | 1.816* | 0.180 | 0.000 |
| | Hour 19 | 1.589* | 0.177 | 0.000 |
| | Hour 20 | 4.083* | 0.287 | 0.000 |
| $\delta_h$ | Hour_16_x_Temp | | (base – omitted) | |
| | Hour_17_x_Temp | -0.030* | 0.002 | 0.000 |
| | Hour_18_x_Temp | -0.015* | 0.002 | 0.000 |
| | Hour_19_x_Temp | -0.013* | 0.002 | 0.000 |
| | Hour_20_x_Temp | -0.044* | 0.003 | 0.000 |
| $\alpha$ | Constant | -2.011* | 0.152 | 0.000 |

Using the regression coefficients shown in Table 29, the evaluation team created a time-temperature matrix (TTM) that shows expected load reductions (per device) for different outdoor temperatures and at different times of the day. The TTM is shown in Table 30. The evaluation team predicts that the impact of a Two-Way Smart Thermostat DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 1.74 kW per device.

**Table 15: Two-Way Smart Thermostat Time-Temperature Matrix**

| Temp | Hour Ending MDT | | | | |
|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 |
| 105 | 1.61 | 1.61 | 1.83 | 1.79 | 1.10 |
| 104 | 1.58 | 1.60 | 1.81 | 1.77 | 1.11 |
| 103 | 1.54 | 1.60 | 1.80 | 1.75 | 1.12 |
| 102 | 1.51 | 1.59 | 1.78 | 1.73 | 1.13 |
| 101 | 1.47 | 1.59 | 1.76 | 1.71 | 1.14 |
| 100 | 1.44 | 1.59 | 1.74 | 1.69 | 1.15 |
| 99 | 1.40 | 1.58 | 1.72 | 1.66 | 1.16 |
| 98 | 1.37 | 1.58 | 1.70 | 1.64 | 1.17 |
| 97 | 1.34 | 1.57 | 1.68 | 1.62 | 1.18 |
| 96 | 1.30 | 1.57 | 1.66 | 1.60 | 1.18 |
| 95 | 1.27 | 1.56 | 1.64 | 1.58 | 1.19 |
| 94 | 1.23 | 1.56 | 1.62 | 1.56 | 1.20 |
| 93 | 1.20 | 1.55 | 1.60 | 1.54 | 1.21 |
| 92 | 1.16 | 1.55 | 1.58 | 1.52 | 1.22 |
| 91 | 1.13 | 1.55 | 1.56 | 1.50 | 1.23 |
| 90 | 1.09 | 1.54 | 1.54 | 1.47 | 1.24 |
| 89 | 1.06 | 1.54 | 1.52 | 1.45 | 1.25 |
| 88 | 1.02 | 1.53 | 1.51 | 1.43 | 1.26 |
| 87 | 0.99 | 1.53 | 1.49 | 1.41 | 1.27 |
| 86 | 0.96 | 1.52 | 1.47 | 1.39 | 1.28 |
| 85 | 0.92 | 1.52 | 1.45 | 1.37 | 1.29 |




To get an idea of Two-Way Smart Thermostat resource capability on aggregate, the number of active facilities can be multiplied by the values shown in Table 30. As of the end of summer 2022, there were 759 active Two-Way Smart Thermostat devices. Thus, the expected aggregate impact of an event hour ending at 6:00 PM (MDT) when the outdoor temperature is 100 degrees would be 1.32 MW. Two-Way Smart Thermostat results are subject to an offline adjustment to reflect the fact that not all thermostats in the population will be able to curtail load when called due to being offline. The offline-adjusted aggregate impact is 82% of the unadjusted impact, or 1.08 MW.

# 4 Bring Your Own Thermostat (BYOT)

For the BYOT program offering, usage during the curtailment event is compared to usage on high load days preceding the event. This section reviews the BYOT impacts calculated by Itron and validated by the evaluation team. Additionally, we provide feedback on the evaluation approach used by Itron and provide an alternative impact analysis for summer 2022 events. Finally, multiple years of event history are combined to develop ex ante impacts for various temperature scenarios.

## 4.1 Validation of Calculations

After receiving the participant load data from Itron, the evaluation team attempted to reproduce the impacts in Itron's Power Saver impact evaluation report. Figure 14 compares the impacts as calculated by Itron and by the evaluation team at the 5-minute level for each event day. For the event on 7/11, there is nearly perfect alignment between Itron's impacts and Evergreen's validated impacts. For the 6/10 event, however, Itron used an alternative baseline adjustment mechanism. The contract language is specific and does not allow for ad hoc judgment calls on methods, so the alternative baseline adjustment mechanism used for the 6/10 event was not appropriate.

The evaluation teams replicated Two-Way Smart Thermostat impact estimates are shown in Table 16. Note that an asterisk (*) denotes a qualifying event hour. The maximum impact during qualifying event hours was 1.74 kW per device for the BYOT component without any adjustment for offline devices. Itron claimed an impact of 1.95 kW per device due to the ad hoc baseline adjustment mentioned in the previous paragraph.

**Figure 14: BYOT Impact Verification**

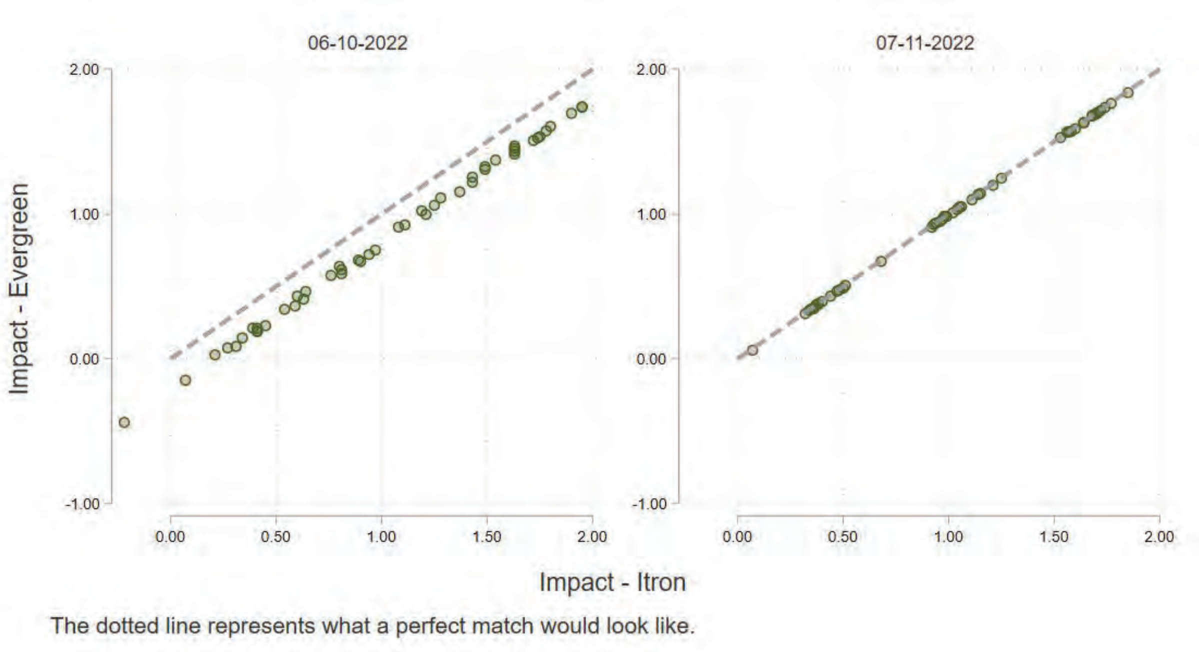


**Table 16: BYOT Impact Estimates (kW) by Date and Time**

| Date | Hour Ending (MDT) | | | |
|---|---|---|---|---|
| | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM |
| 6/10/2022 | 1.37 | 1.60* | 1.74* | 1.74* |
| 7/11/2022 | 1.68 | 1.84 | 1.76 | 1.63 |

## 4.2 Ex Post Impacts

As discussed in Section 1.4, the evaluation team thinks the method used to estimate impacts for the BYOT program offering overstates the true average impact. For each event hour during the 2022 DR season, Table 17 shows the impact estimates produced by the evaluation team[10]. Qualifying event hours are denoted with an asterisk (*). Our methods differed from Itron's in two ways. First, any calculation based on a maximum was replaced with a calculation based on an average. Second, the evaluation team opted for a lower connected load when converting A/C runtime to electric demand.

**Table 17: BYOT Impact Results**

| Date | # of Curtailed Devices | Hour Ending (MDT) | Temp. | CBL kW | Observed kW | Impact |
|---|---|---|---|---|---|---|
| 6/10/2022 | 158 | 16 | 96 | 1.65 | 1.18 | 0.57 |
| | | 17* | 97 | 1.82 | 1.24 | 0.67 |
| | | 18* | 100 | 2.04 | 1.35 | 0.79 |
| | | 19* | 97 | 2.01 | 1.47 | 0.64 |
| 7/11/2022 | 194 | 16 | 95 | 1.67 | 0.97 | 0.80 |
| | | 17 | 94 | 1.82 | 1.08 | 0.84 |
| | | 18 | 93 | 1.92 | 1.16 | 0.86 |
| | | 19 | 91 | 1.84 | 1.17 | 0.76 |

[10] Note that the BYOT devices include a 0.1 kW adjustment to the impact to account for the thermostat curtailment of the air handler fan for system set to 'auto'.

The average impact during qualifying event hours was 0.70 kW. As of the end of summer 2022, there were 775 active BYOT devices. Thus, the average qualifying event hour aggregate impact was 0.54 MW. Adjusted by an 85% online factor, the aggregate impact was 0.46 MW.

Figure 15 visualizes the impact estimates and Figure 16 compares the evaluation teams ex post hourly impacts with the impacts calculated by Itron. The evaluation teams impact is lower in all cases, by about 1.03 kW on average.

**Figure 15: BYOT DR Impacts by Date**

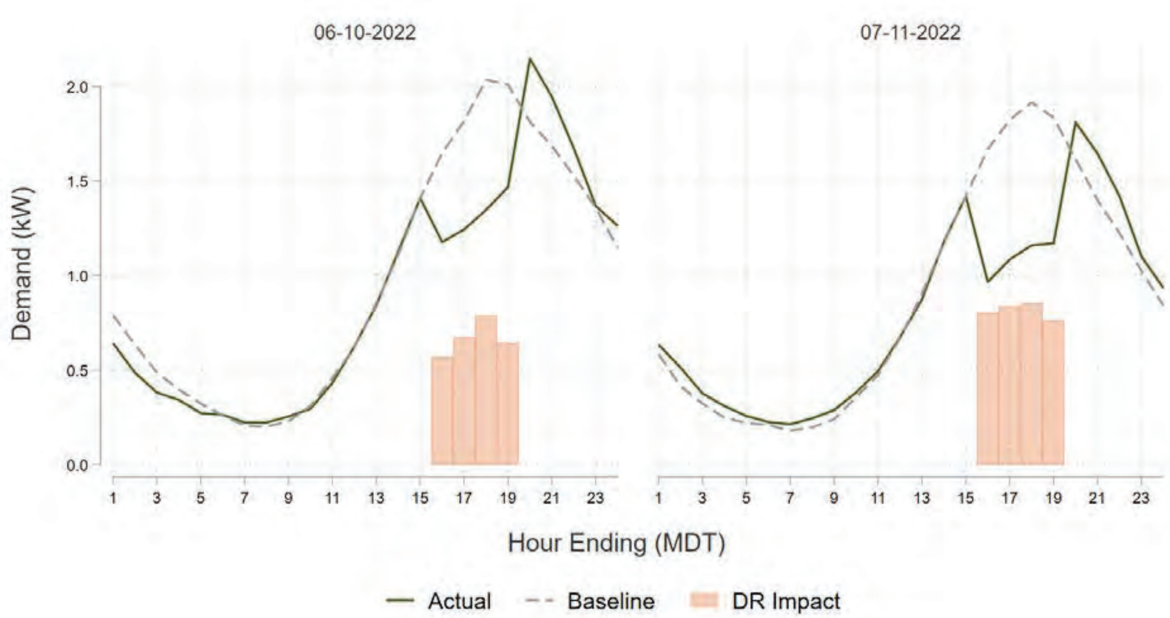
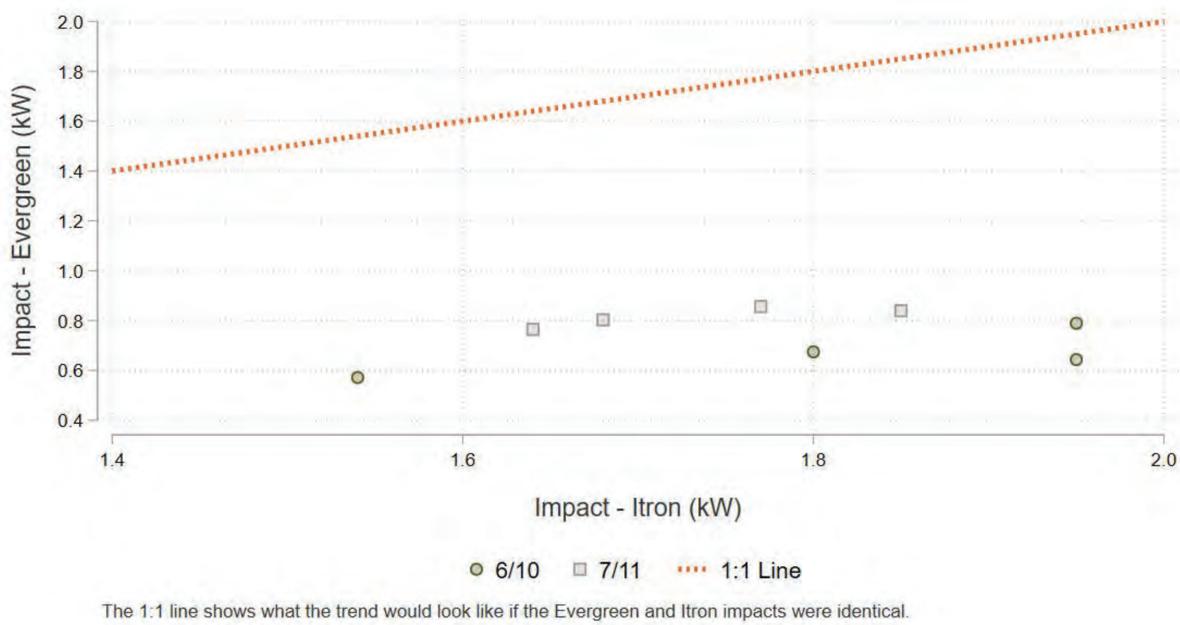


**Figure 16: Comparison of Evaluated Ex Post Impacts and Itron Impacts**




### 4.2.1 Net Energy Savings

The evaluation team estimated net energy impacts for the BYOT program offering by summing ex post impacts from the onset of each event through the end of the event day. The calculation of impacts is exactly as described earlier in this section. Table 18 shows the energy savings estimates for each event day. On average, net daily energy savings were 2.63 kWh per device. Multiplying this estimate by the number of events (two) and active devices (775) yields an aggregate savings estimate of 4.08 MWh for the BYOT program offering. After applying an online factor of 85%, the aggregate energy savings estimate is 3.47 MWh.

**Table 18: Per Device Energy Savings by Event Day**

| Date | Event Start (MDT) | Event Savings (kWh) | Snapback (kWh) | Net Savings (kWh) |
|---|---|---|---|---|
| 6/10/2022 | 3:00 PM | 2.68 | -0.37 | 2.31 |
| 7/11/2022 | 3:00 PM | 3.26 | -0.31 | 2.96 |
| **Average** | | **2.97** | **-0.34** | **2.63** |

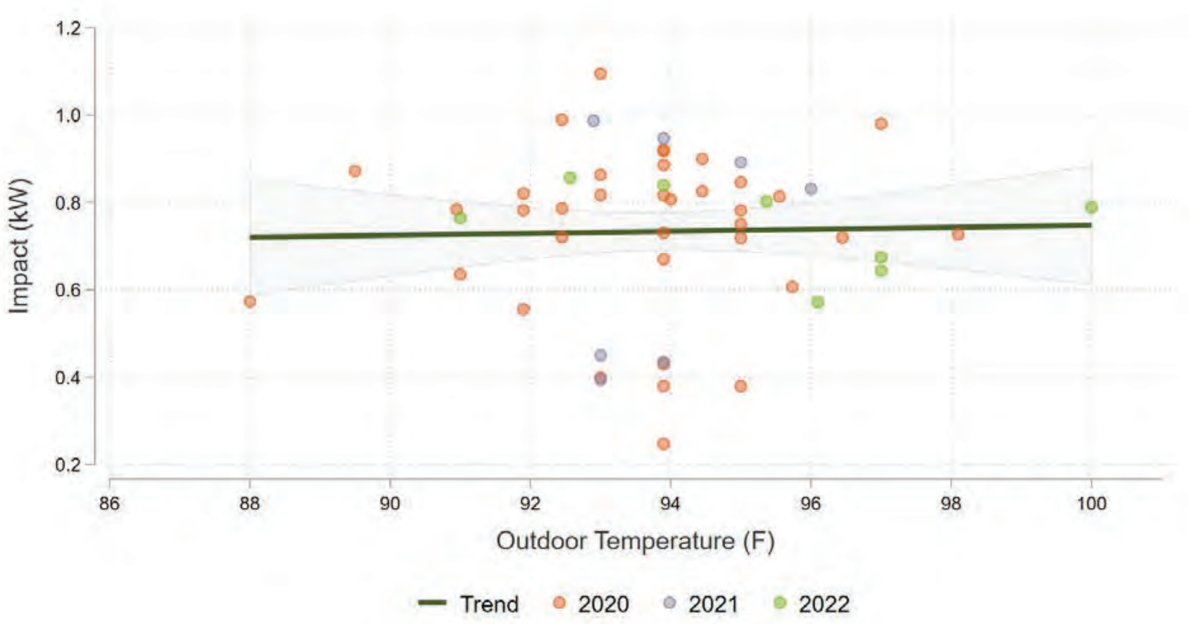
## 4.3 Ex Ante Impacts

While ex post impact estimates serve to measure prior program performance, ex ante impact estimates are forward-looking. In other words, ex ante estimates represent expected demand reductions in future years at peaking conditions.

To develop an ex ante impact estimate for the Residential Two-Way Smart Thermostat component of Power Saver, the evaluation team leveraged linear regression to model historical ex post impacts as a function of temperature and time. Figure 17 highlights the relationship between historical ex post impact estimates (2020-2022) and outdoor air temperature (in Albuquerque). The trend in the figure is weak, implying DR impacts are not strongly linked to temperature.

The specification of the ex ante regression model was shown in Section 1.5, and the results from the model are described in more detail below. The evaluation team predicts that the impact of a Residential BYOT DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 0.76 kW per device.

**Figure 17: Hourly Impacts against Outdoor Temperature (F)**




The ex-ante regression model was run on full event hours and weighted by the number of curtailed devices (each summer had slightly different numbers of dispatched devices). Regression output is shown below. In the table, note an "hour ending" convention is used (so hour 15 refers to the hour from 2:00 PM through 3:00 PM). Note that any coefficient with "*" next to it is statistically significant at the 95% confidence level. Temperature has a positive coefficient, indicating that higher temperatures produce higher impacts. The interaction terms, represented by $\delta_h$, are all negative, indicating that the incremental effect of temperature in a given hour actually decreases the impact. It should be noted that hour ending 20 was extremely rare and accounted for only three of the 52 event hours during the past four years. In addition, hour ending 15 is not included in the regression due to a lack of data.

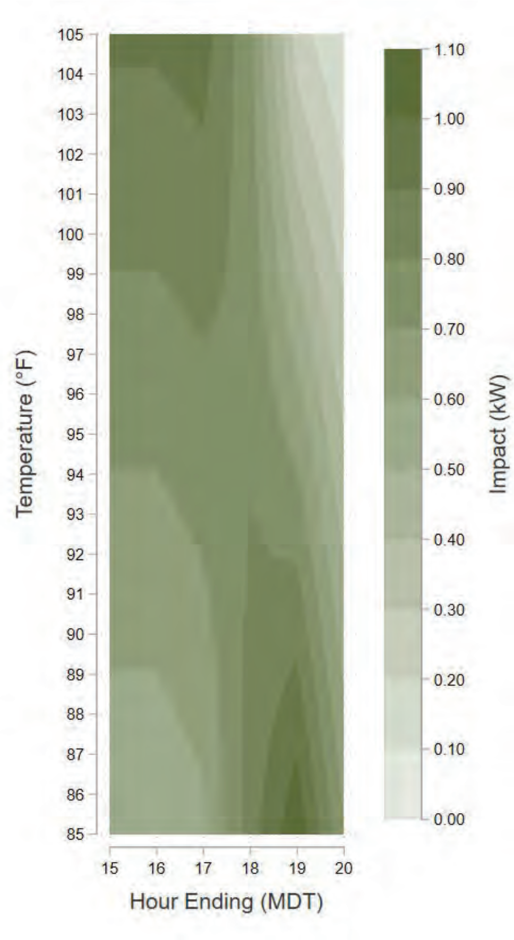
**Table 19: BYOT Ex Ante Regression Output**

| Term | Variable | Coefficient (b) | Standard Error | P-Value |
|---|---|---|---|---|
| $\beta$ | Temperature | 0.020* | 0.003 | 0.000 |
| $\gamma_h$ | Hour 16 | | (base – omitted) | |
| | Hour 17 | 0.175 | 0.367 | 0.634 |
| | Hour 18 | 2.590* | 0.343 | 0.000 |
| | Hour 19 | 5.796* | 0.348 | 0.000 |
| | Hour 20 | 4.477* | 0.473 | 0.000 |
| $\delta_h$ | Hour_16_x_Temp | | (base – omitted) | |
| | Hour_17_x_Temp | -0.001 | 0.004 | 0.716 |
| | Hour_18_x_Temp | -0.027* | 0.004 | 0.000 |
| | Hour_19_x_Temp | -0.062* | 0.004 | 0.000 |
| | Hour_20_x_Temp | -0.050* | 0.005 | 0.000 |
| $\alpha$ | Constant | -1.176* | 0.296 | 0.000 |

Using the regression coefficients shown in Table 19, the evaluation team created a time-temperature matrix (TTM) that shows expected load reductions (per device) for different outdoor temperatures and at different times of the day. The TTM is shown in Table 20. Using the model, the evaluation team predicts that the impact of a BYOT DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 0.76 kW per device.

**Table 20: BYOT Time-Temperature Matrix**

| Temp | Hour Ending MDT | | | | |
|---|---|---|---|---|---|
| | 16 | 17 | 18 | 19 | 20 |
| 105 | 0.92 | 0.94 | 0.72 | 0.25 | 0.10 |
| 104 | 0.90 | 0.92 | 0.73 | 0.29 | 0.13 |
| 103 | 0.88 | 0.91 | 0.74 | 0.33 | 0.16 |
| 102 | 0.86 | 0.89 | 0.74 | 0.37 | 0.19 |
| 101 | 0.84 | 0.87 | 0.75 | 0.41 | 0.22 |
| 100 | 0.82 | 0.85 | 0.76 | 0.46 | 0.25 |
| 99 | 0.80 | 0.83 | 0.76 | 0.50 | 0.28 |
| 98 | 0.78 | 0.81 | 0.77 | 0.54 | 0.31 |
| 97 | 0.76 | 0.80 | 0.78 | 0.58 | 0.34 |
| 96 | 0.74 | 0.78 | 0.78 | 0.62 | 0.37 |
| 95 | 0.72 | 0.76 | 0.79 | 0.66 | 0.40 |
| 94 | 0.70 | 0.74 | 0.80 | 0.71 | 0.43 |
| 93 | 0.68 | 0.72 | 0.80 | 0.75 | 0.46 |
| 92 | 0.66 | 0.70 | 0.81 | 0.79 | 0.49 |
| 91 | 0.64 | 0.68 | 0.82 | 0.83 | 0.53 |
| 90 | 0.62 | 0.67 | 0.82 | 0.87 | 0.56 |
| 89 | 0.60 | 0.65 | 0.83 | 0.91 | 0.59 |
| 88 | 0.58 | 0.63 | 0.84 | 0.96 | 0.62 |
| 87 | 0.56 | 0.61 | 0.84 | 1.00 | 0.65 |
| 86 | 0.54 | 0.59 | 0.85 | 1.04 | 0.68 |
| 85 | 0.52 | 0.57 | 0.85 | 1.08 | 0.71 |




To get an idea of BYOT resource capability on aggregate, the number of active participants can be multiplied by the values shown in Table 30. As of the end of summer 2022, there were 775 active BYOT participants. Thus, the expected aggregate impact of an event hour ending at 6:00 PM (MDT) when the outdoor temperature is 100 degrees would be 0.59 MW. Residential BYOT results are subject to an offline adjustment to reflect the fact that not all thermostats in the population will be able to curtail load when called due to being offline. The offline-adjusted aggregate impact is 85% of the unadjusted impact, or 0.50 MW.

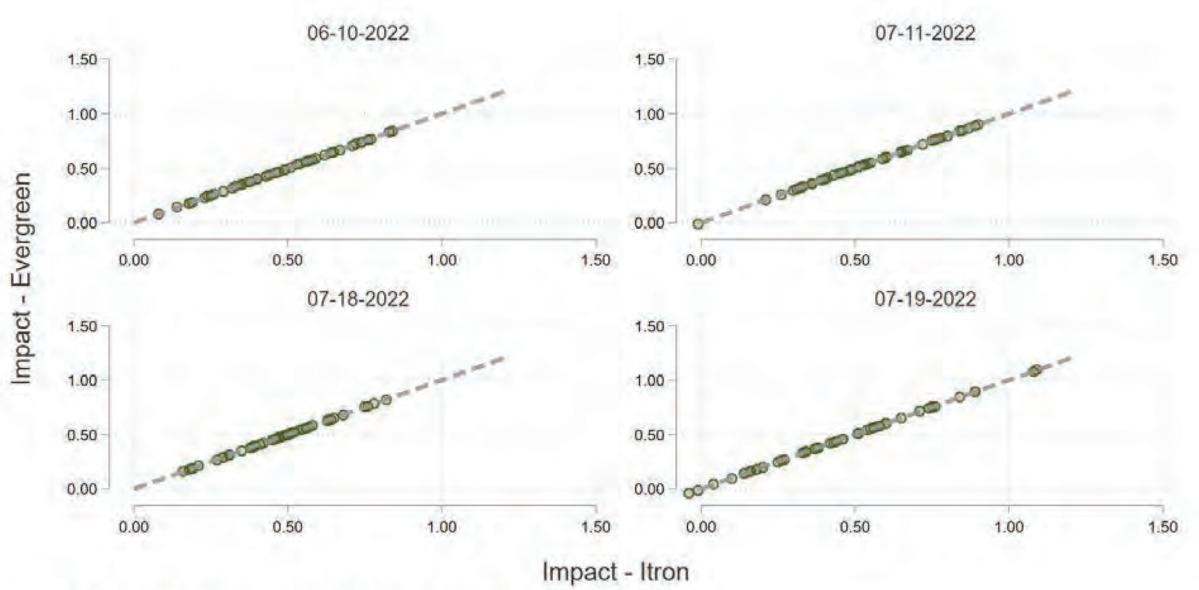
# 5 Small Commercial Results

For the Small Commercial program component, usage during the curtailment event is compared to usage on high load days preceding the event. This section reviews the Small Commercial impacts calculated by Itron and validated by the Evergreen team. Additionally, we provide feedback on the evaluation approach used by Itron and provide an alternative impact analysis for summer 2022 events. Finally, multiple years of event history are combined to develop ex ante impacts for various temperature scenarios.

## 5.1 Validation of Calculations

After receiving the participant load data from Itron, the evaluation team attempted to reproduce the impacts in Itron's Power Saver impact evaluation report. Figure 18 compares the impacts as calculated by Itron and by the evaluation teams at the 5-minute level for each event day. There is nearly perfect alignment. The average difference between Itron's impacts and the evaluation teams validated impacts is 0.001 kW (with the evaluation teams validated impacts being slightly smaller, on average). For reference, Itron's Small Commercial DCU impact estimates are shown in Table 21. Note that an asterisk (*) denotes a qualifying event hour. The maximum impact during qualifying event hours was 1.09 kW per device for the Small Commercial DCU class without any adjustment for operability.

**Figure 18: Small Commercial Impact Verification**




The dotted line represents what a perfect match would look like.

**Table 21: Small Commercial Impact Estimates (kW) by Date and Time[11]**

| Date | Hour Ending (MDT) | | | |
|---|---|---|---|---|
| | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM |
| 6/10/2022 | 0.84 | 0.83* | 0.59* | 0.35* |
| 7/11/2022 | 0.90 | 0.89 | 0.85 | 0.54 |
| 7/18/2022 | 0.82* | 0.56* | 0.58* | 0.50 |
| 7/19/2022 | 1.09* | 0.75* | 0.76* | 0.43* |

## 5.2 Ex Post Impacts

As discussed in Section 1.4, the evaluation team thinks the method used to estimate impacts for the Small Commercial program offering overstates the true average impact. For each event hour during the 2022 DR season, Table 22 shows the impact estimates produced by the evaluation team. Qualifying event hours are denoted with an asterisk (*). Our methods differed from Itron's in that in any calculation based on a maximum was replaced with a calculation based on an average.

**Table 22: Impact Calculations for the Small Commercial Segment**

| Date | # of Curtailed Devices | Hour Ending (MDT) | Temp. | CBL kW | Observed kW | Impact |
|---|---|---|---|---|---|---|
| 6/10/2022 | 40 | 16 | 96 | 1.71 | 1.05 | 0.66 |
| | | 17* | 97 | 1.52 | 0.95 | 0.56 |
| | | 18* | 100 | 1.29 | 0.87 | 0.42 |
| | | 19* | 97 | 1.01 | 0.78 | 0.22 |
| 7/11/2022 | 40 | 16 | 95 | 1.80 | 1.26 | 0.54 |
| | | 17 | 94 | 1.68 | 1.03 | 0.65 |
| | | 18 | 93 | 1.45 | 0.90 | 0.55 |
| | | 19 | 91 | 1.22 | 0.81 | 0.40 |
| 7/18/2022 | 40 | 16* | 98 | 1.75 | 1.12 | 0.63 |
| | | 17* | 97 | 1.45 | 1.03 | 0.42 |
| | | 18* | 97 | 1.28 | 0.82 | 0.47 |

[11] Source: Itron's 2022 PNM Power Saver Program Report. Table 38.

| Date | # of Curtailed Devices | Hour Ending (MDT) | Temp. | CBL kW | Observed kW | Impact |
|---|---|---|---|---|---|---|
| | | 19 | 96 | 1.03 | 0.69 | 0.34 |
| 7/19/2022 | 40 | 16* | 101 | 1.89 | 1.22 | 0.67 |
| | | 17* | 100 | 1.57 | 1.12 | 0.45 |
| | | 18* | 101 | 1.39 | 0.90 | 0.49 |
| | | 19* | 99 | 1.11 | 0.91 | 0.20 |

The average impact during qualifying event hours was 0.45 kW. As of the end of summer 2022, there were 5,464 active small commercial DCUs. Thus, the average qualifying event hour aggregate impact was 2.48 MW. Adjusted for 87% operability, the aggregate impact was 2.15 MW.

Figure 19 visualizes the impact estimates and Figure 20 compares the evaluation teams ex post hourly impacts with the impacts calculated by Itron. The evaluation teams impact is lower in all cases, by about 0.22 kW on average.

**Figure 19: Small Commercial DCU DR Impacts by Date**

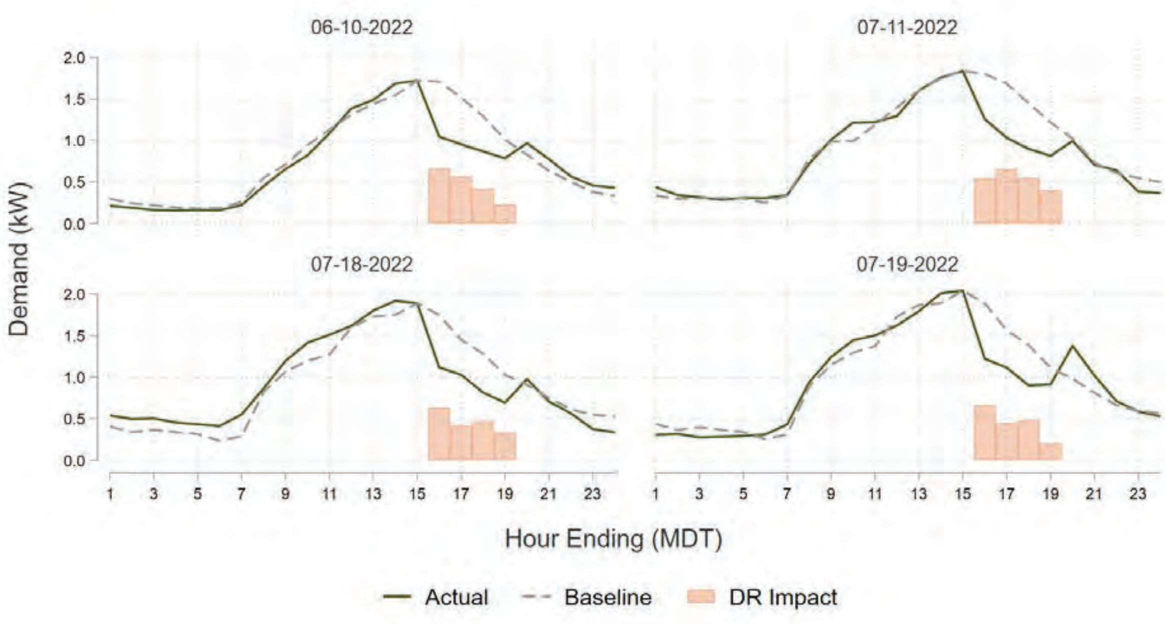
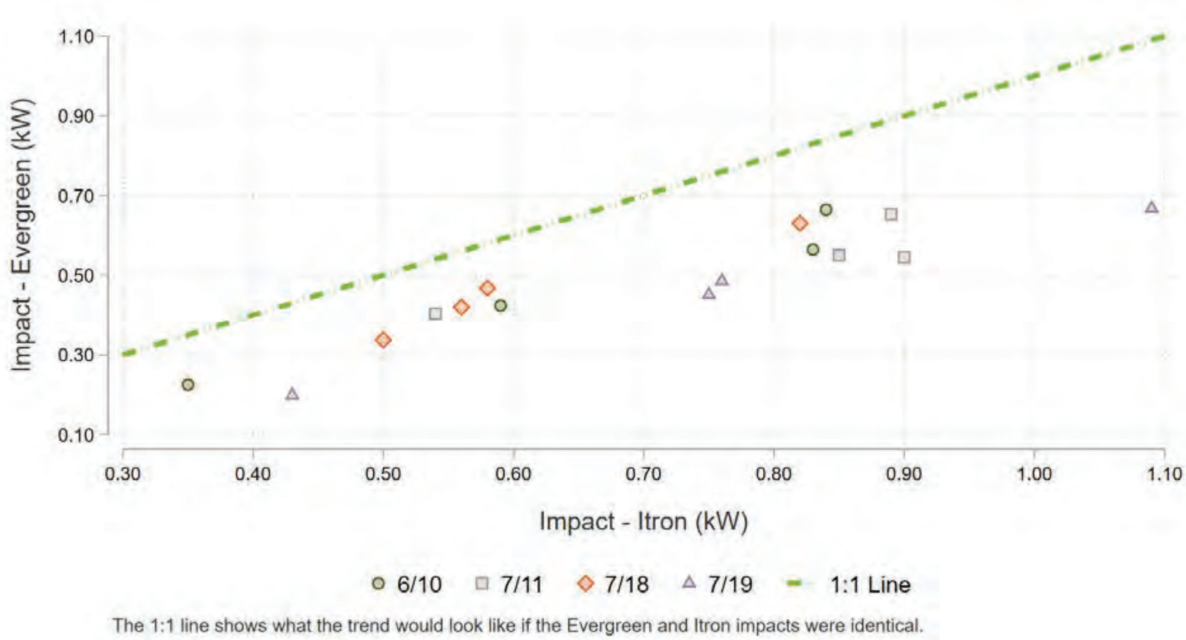


**Figure 20: Comparison of Evaluated Ex Post Impacts and Itron Impacts**




### 5.2.1 Net Energy Savings

The evaluation team estimated net energy impacts for the Small Commercial program offering by summing ex post impacts from the onset of each event through the end of the event day. The calculation of impacts is exactly as described earlier in this section. Table 23 shows the energy savings estimates (per device) for each event day. On average, net daily energy savings were 1.72 kWh per device. Multiplying by the number of events (four) and the number of active devices (5,464) yields an aggregate savings estimate of 37.60 MWh for the Small Commercial DCU segment. After applying the operability factor of 87%, the aggregate energy savings estimate is 32.71 MWh.

**Table 23: Per Device Energy Savings by Event Day**

| Date | Event Start (MDT) | Event Savings (kWh) | Snapback (kWh) | Net Savings (kWh) |
|---|---|---|---|---|
| 6/10/2022 | 3:00 PM | 1.88 | -0.52 | 1.35 |
| 7/11/2022 | 3:00 PM | 2.15 | 0.31 | 2.46 |
| 7/18/2022 | 3:00 PM | 1.85 | 0.39 | 2.24 |
| 7/19/2022 | 3:00 PM | 1.80 | -0.60 | 1.20 |
| **Average** | | **1.83** | **-0.11** | **1.72** |

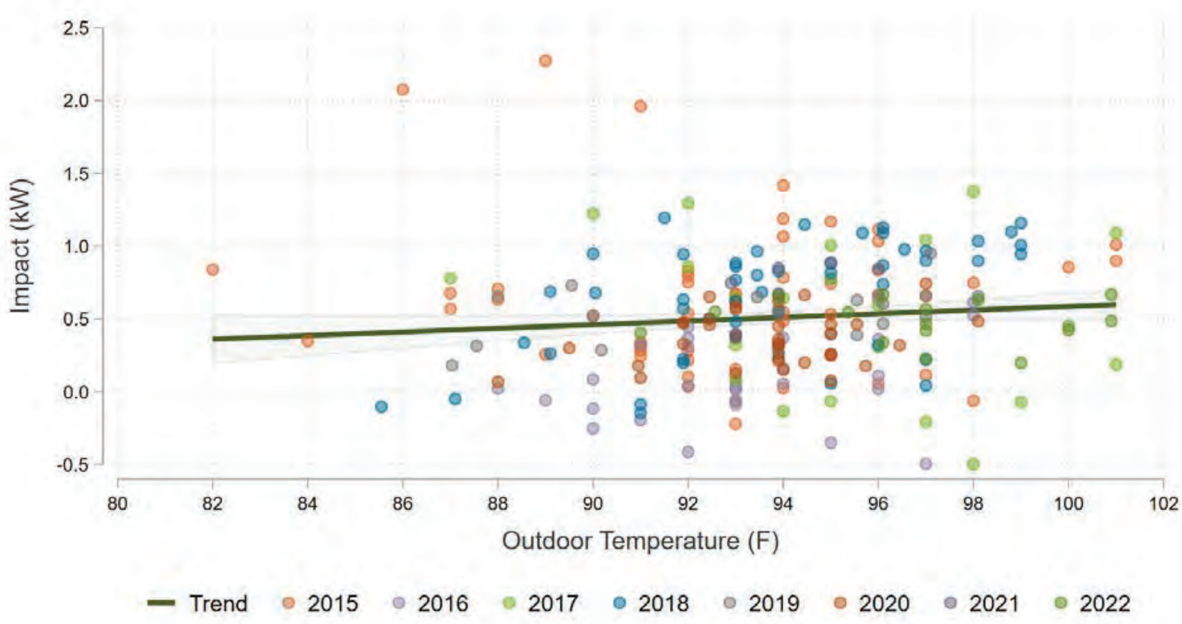
## 5.3 Ex Ante Impacts

While ex post impact estimates serve to measure prior program performance, ex ante impact estimates are forward-looking. In other words, ex ante estimates represent expected demand reductions in future years at peaking conditions.

To develop an ex ante impact estimate for the Small Commercial DCU component of Power Saver, the evaluation team leveraged linear regression to model historical ex post impacts as a function of temperature and time. Figure 21 highlights the relationship between historical ex post impact estimates (2015-2022) and outdoor air temperature (in Albuquerque). The trend in temperature is quite subtle; there are only slight increases in impact magnitude as temperature increases.

The specification of the ex ante regression model was shown in Section 1.5, and the results from the model are described in more detail below. The evaluation team predicts that the impact of a Small Commercial DCU DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 0.49 kW per device.

**Figure 21: Hourly Impacts against Outdoor Temperature (F)**




The regression was run on full event hours (some events in prior summers started mid-hour) and weighted by the number of curtailed devices (each summer had slightly different numbers of dispatched devices). Regression output is shown below in Table 24. In the table, note an "hour ending" convention is used (so hour 15 refers to the hour from 2:00 PM through 3:00 PM). In general, earlier hours corresponded to higher kW values, with a drop over time in impacts as less load is available to shed. Temperature has a negative coefficient, indicating that higher temperatures produce lower impacts after accounting for the hour and the interaction between temperature and time. The interaction terms, represented by $\delta_h$, are all positive, indicating that the incremental effect of temperature in a given hour increases the impact. Results for hour 20 should be interpreted with caution as only seven data points were available to fit the model. Due to year-to-year variability, none of the estimates in this regression are statistically significant.

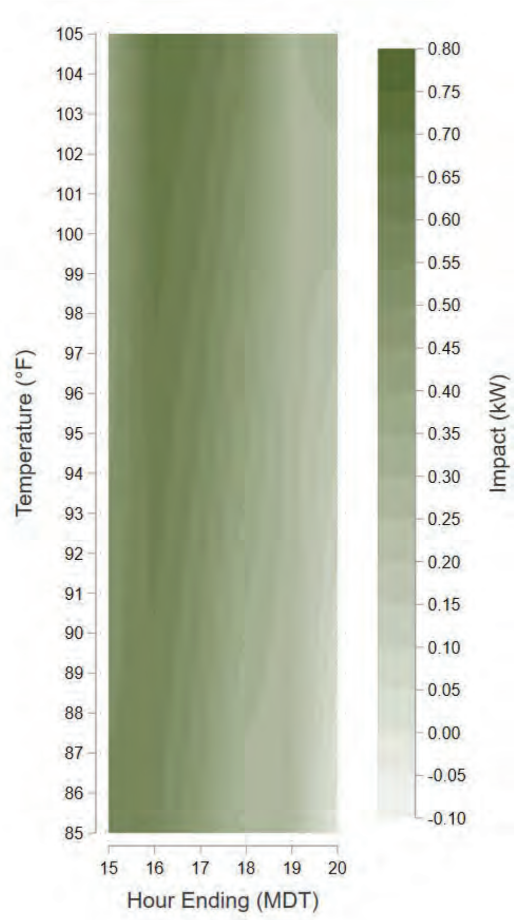
**Table 24: Small Commercial Ex Ante Regression Output**

| Term | Variable | Coefficient (b) | Standard Error | P-Value |
|---|---|---|---|---|
| $\beta$ | Temperature | -0.008 | 0.023 | 0.722 |
| $\gamma_h$ | Hour 14 | | (base – omitted) | |
| | Hour 15 | -1.290 | 2.600 | 0.620 |
| | Hour 16 | -1.683 | 2.600 | 0.518 |
| | Hour 17 | -2.245 | 2.461 | 0.363 |
| | Hour 18 | -1.121 | 2.614 | 0.668 |
| | Hour 19 | -2.859 | 4.447 | 0.521 |
| $\delta_h$ | Hour_14_x_Temp | | (base – omitted) | |
| | Hour_15_x_Temp | 0.015 | 0.028 | 0.592 |
| | Hour_16_x_Temp | 0.018 | 0.028 | 0.514 |
| | Hour_17_x_Temp | 0.023 | 0.027 | 0.393 |
| | Hour_18_x_Temp | 0.010 | 0.028 | 0.735 |
| | Hour_19_x_Temp | 0.027 | 0.049 | 0.587 |
| $\alpha$ | Constant | 1.257 | 2.075 | 0.545 |

Using the regression coefficients shown in Table 24, the evaluation team created a time-temperature matrix (TTM) that shows expected load reductions (per device) for different outdoor temperatures and at different times of the day. The TTM is shown in Table 25. For the 5-6 PM interval at 100°F, the expected load impact is 0.49 kW per device. The expected load impact is lower for the 5-6 PM interval relative to earlier in the day because of the small commercial load profile – there is less load available for curtailment in the evening (see Figure 19).

### Table 25: Small Commercial Time-Temperature Matrix

| Temp | Hour Ending MDT | | | | | |
|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 |
| 105 | 0.41 | 0.70 | 0.65 | 0.56 | 0.29 | 0.34 |
| 104 | 0.41 | 0.70 | 0.64 | 0.55 | 0.29 | 0.33 |
| 103 | 0.42 | 0.69 | 0.63 | 0.53 | 0.29 | 0.31 |
| 102 | 0.43 | 0.68 | 0.62 | 0.52 | 0.29 | 0.29 |
| 101 | 0.44 | 0.68 | 0.61 | 0.50 | 0.29 | 0.27 |
| 100 | 0.45 | 0.67 | 0.60 | 0.49 | 0.28 | 0.25 |
| 99 | 0.45 | 0.66 | 0.59 | 0.47 | 0.28 | 0.23 |
| 98 | 0.46 | 0.66 | 0.58 | 0.46 | 0.28 | 0.21 |
| 97 | 0.47 | 0.65 | 0.57 | 0.44 | 0.28 | 0.20 |
| 96 | 0.48 | 0.64 | 0.56 | 0.43 | 0.28 | 0.18 |
| 95 | 0.49 | 0.63 | 0.55 | 0.41 | 0.28 | 0.16 |
| 94 | 0.49 | 0.63 | 0.54 | 0.40 | 0.28 | 0.14 |
| 93 | 0.50 | 0.62 | 0.53 | 0.38 | 0.27 | 0.12 |
| 92 | 0.51 | 0.61 | 0.52 | 0.37 | 0.27 | 0.10 |
| 91 | 0.52 | 0.61 | 0.51 | 0.35 | 0.27 | 0.09 |
| 90 | 0.53 | 0.60 | 0.50 | 0.34 | 0.27 | 0.07 |
| 89 | 0.54 | 0.59 | 0.49 | 0.32 | 0.27 | 0.05 |
| 88 | 0.54 | 0.59 | 0.48 | 0.31 | 0.27 | 0.03 |
| 87 | 0.55 | 0.58 | 0.47 | 0.29 | 0.27 | 0.01 |
| 86 | 0.56 | 0.57 | 0.46 | 0.28 | 0.26 | -0.01 |
| 85 | 0.57 | 0.56 | 0.45 | 0.27 | 0.26 | -0.03 |




To get an idea of the Small Commercial resource capability on aggregate, the number of active devices can be multiplied by the values shown in Table 25. As of the end of summer 2022, there were 5,464 active small commercial devices. Thus, the expected aggregate impact of an event hour ending at 6:00 PM (MDT) when the outdoor temperature is 100 degrees would be 2.66 MW. Small Commercial DCU results are subject to an operability adjustment to better reflect the fact that not all devices in the population will be able to curtail load when called due to damage, wiring, or connection issues. The operability-adjusted aggregate impact is 87% of the unadjusted impact, or 2.31 MW.

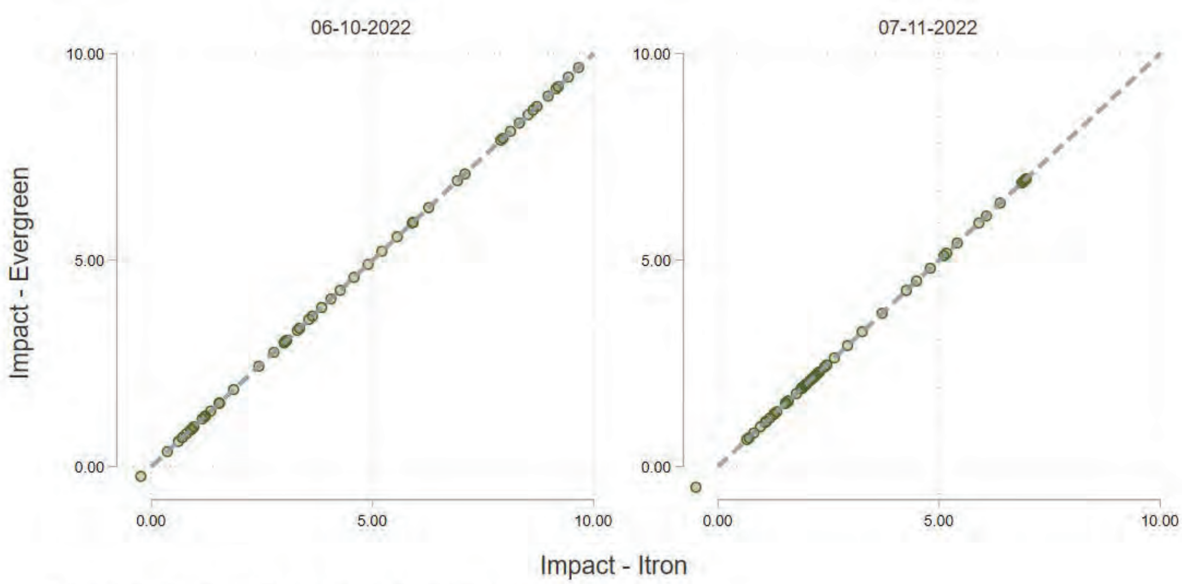
# 6 Medium Commercial

For the Medium Commercial program component, usage during the curtailment event is compared to usage on high load days preceding the event. This section reviews the Medium Commercial impacts calculated by Itron and validated by the evaluation team. Additionally, we provide feedback on the evaluation approach used by Itron and provide an alternative impact analysis for summer 2022 events. Finally, multiple years of event history are combined to develop ex ante impacts for various temperature scenarios.

## 6.1 Validation of Calculations

After receiving the participant load data from Itron, the evaluation team attempted to reproduce the impacts in Itron's Power Saver impact evaluation report. Figure 22 compares the impacts as calculated by Itron and by the evaluation team at the 5-minute level for each event day. There is essentially perfect alignment. The average difference between Itron's impacts and the evaluation teams validated impacts is less than 0.001 kW (with the evaluation teams validated impacts being slightly smaller, on average). For reference, Itron's Medium Commercial DCU impact estimates are shown in Table 26. Note that an asterisk (*) denotes a qualifying event hour. The maximum impact during qualifying event hours was 8.72 kW per facility for the Medium Commercial DCU class without any adjustment for operability.

**Figure 22: Medium Commercial Impact Verification**




The dotted line represents what a perfect match would look like.

**Table 26: Medium Commercial Impact Estimates (kW) by Date and Time[12]**

| Date | Hour Ending (MDT) | | | |
|---|---|---|---|---|
| | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM |
| 6/10/2022 | 9.66 | 8.72* | 3.64* | 1.53* |
| 7/11/2022 | 6.94 | 6.97 | 2.63 | 1.89 |

## 6.2 Ex Post Impacts

As discussed in Section 1.4, the evaluation team believes that the method used to estimate impacts for the Medium Commercial program offering overstates the true average impact. For each event hour during the 2022 DR season, Table 27 shows the impact estimates produced by the evaluation team. Qualifying event hours are denoted with an asterisk (*). Our methods differed from Itron's in that in any calculation based on a maximum was replaced with a calculation based on an average.

**Table 27: Medium Commercial Impact per Facility Results**

| Date | # of Facilities | Hour Ending (MDT) | Temp. | CBL kW | Observed kW | Impact (kW) |
|---|---|---|---|---|---|---|
| 6/10/2022 | 45 | 16 | 96 | 60.02 | 51.62 | 8.41 |
| | | 17* | 97 | 54.61 | 49.10 | 5.51 |
| | | 18* | 100 | 50.58 | 48.03 | 2.55 |
| | | 19* | 97 | 47.72 | 47.05 | 0.67 |
| 7/11/2022 | 44 | 16 | 95 | 60.53 | 55.24 | 5.29 |
| | | 17 | 94 | 53.82 | 50.77 | 3.05 |
| | | 18 | 93 | 49.43 | 47.65 | 1.78 |
| | | 19 | 91 | 45.79 | 45.26 | 0.53 |

The average impact during qualifying event hours was 2.91 kW per facility. As of the end of summer 2022, there were 3,209 active medium commercial DCUs across 439 facilities, indicating there were approximately 7.31 devices per facility. Thus, the evaluation teams per-device estimate

[12] Source: Itron's 2022 PNM Power Saver Program Report. Table 39.

during qualifying hours is 0.40 kW and the average qualifying event hour aggregate impact was 1.28 MW. Adjusted for 87% operability, the aggregate impact was 1.11 MW.

Figure 23 visualizes the impact estimates (per facility) and Figure 24 compares the evaluation teams ex post hourly impacts with the impacts calculated by Itron. The evaluation teams impact is lower in all cases, by about 1.77 kW on average.

**Figure 23: Medium Commercial DCU DR Impacts by Date**

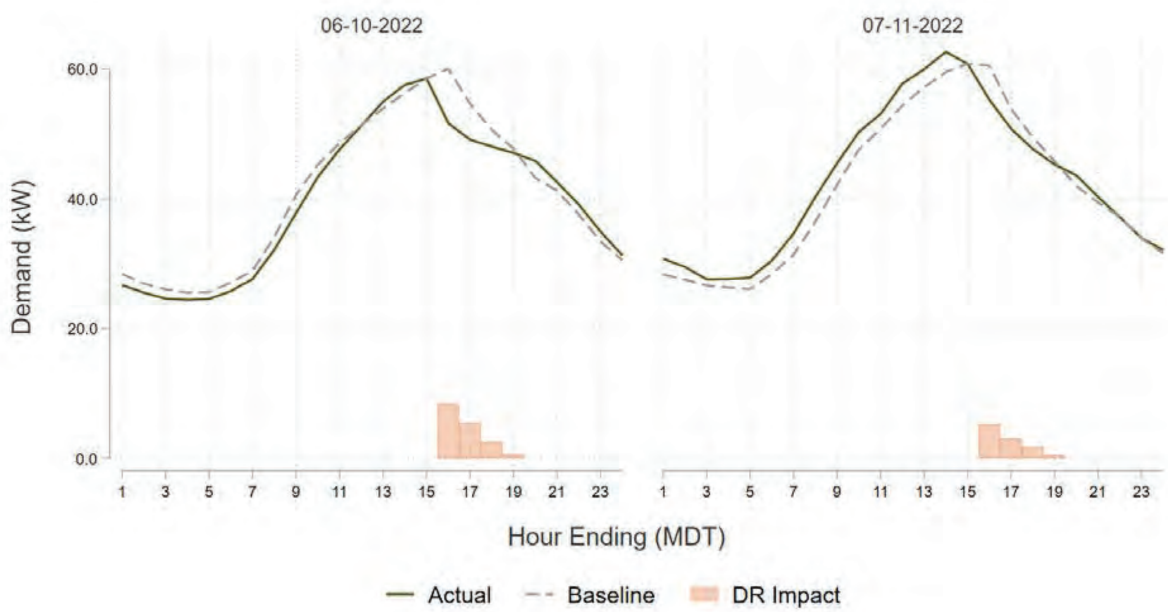
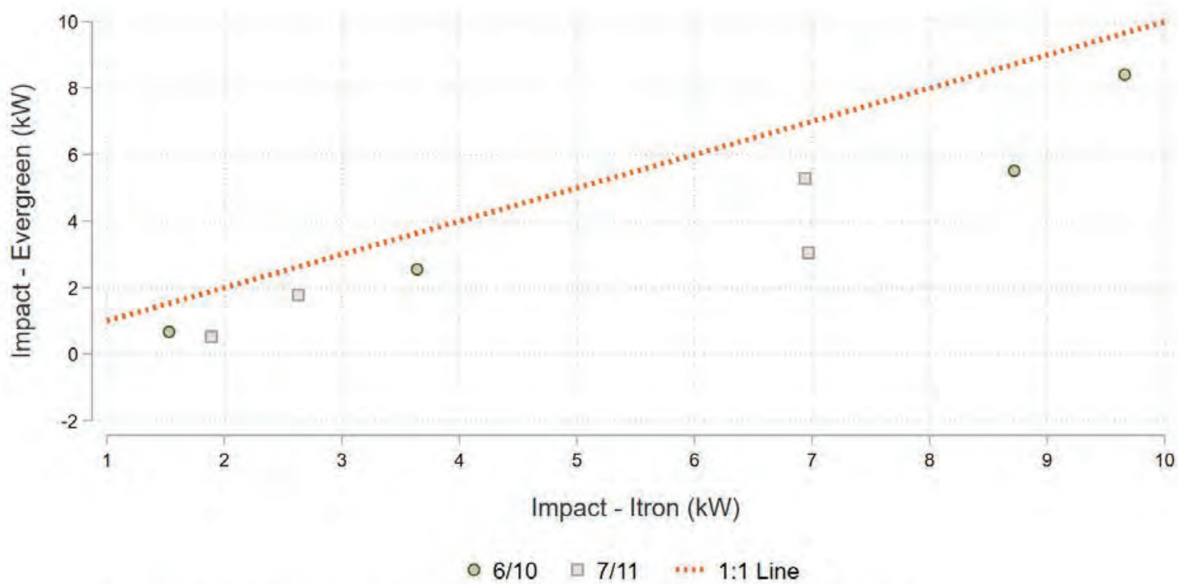


**Figure 24: Comparison of Evaluated Ex Post Impacts and Itron Impacts**




The 1:1 line shows what the trend would look like if the Evergreen and Itron impacts were identical.

### 6.2.1 Net Energy Savings

The evaluation team estimated net energy impacts for the Medium Commercial program offering by summing ex post impacts from the onset of each event through the end of the event day. The calculation of impacts is exactly as described earlier in this section. Table 28 shows the energy savings estimates (per facility) for each event day. On average, net daily energy savings were 8.50 kWh per facility. Multiplying this estimate by the number of events (two) and by the number of active facilities (439) yields an aggregate savings estimate of 7.47 MWh for the Medium Commercial program offering. After applying the 87% operability factor, the aggregate energy savings estimate is 6.50 MWh.

**Table 28: Energy Savings per Facility by Event Day**

| Date | Event Start (MDT) | Event Savings (kWh) | Snapback (kWh) | Net Savings (kWh) |
|---|---|---|---|---|
| 6/10/2022 | 3:00 PM | 17.15 | -7.76 | 9.39 |
| 7/11/2022 | 3:00 PM | 10.64 | -3.02 | 7.62 |
| **Average** | | **13.89** | **-5.39** | **8.50** |

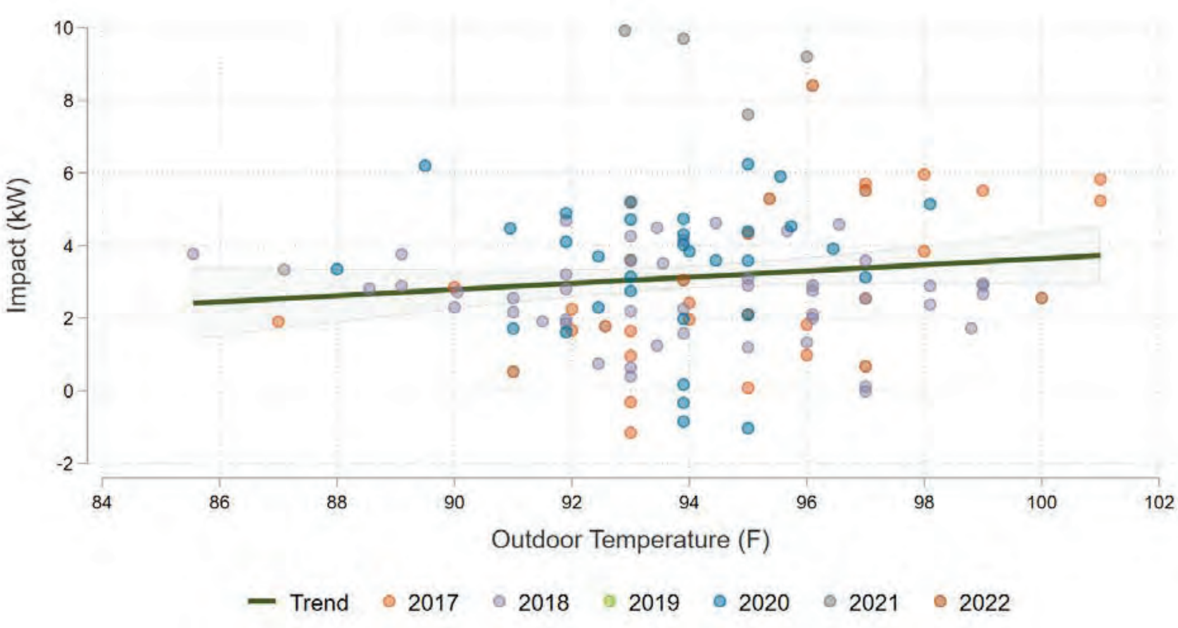
## 6.3 Ex Ante Impacts

While ex post impact estimates serve to measure prior program performance, ex ante impact estimates are forward-looking. In other words, ex ante estimates represent expected demand reductions in future years at peaking conditions.

To develop an ex ante impact estimate for the Medium Commercial DCU component of Power Saver, the evaluation team leveraged linear regression to model historical ex post impacts as a function of temperature and time. Figure 25 highlights the relationship between historical ex post impact estimates (2017-2022) and outdoor air temperature (in Albuquerque). The trend in temperature is quite subtle; there are only slight increases in impact magnitude as temperature increases. It is interesting to note that the 2018-2022 load impacts did not demonstrate much temperature sensitivity, while 2017 impacts did. With a small sample and large, variable customer loads, any change in sample composition can dramatically affect the overall result, meaning that any trends should be observed with caution.

The specification of the ex ante regression model was shown in Section 1.5, and the results from the model are described in more detail below. The evaluation team predicts that the impact of a Medium Commercial DCU DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 3.16 kW per facility or 0.43 kW per device.

**Figure 25: Hourly Impacts against Outdoor Temperature (F)**




The ex-ante regression model was run on full event hours (some events in prior summers started mid-hour) and weighted by the number of curtailed devices (each summer had slightly different numbers of dispatched devices). Regression output is shown in Table 29. In the table, note an "hour ending" convention is used (so hour 15 refers to the hour from 2:00 PM through 3:00 PM). There is no clear relationship between event hour and impact. Temperature has a positive coefficient, indicating that higher temperatures produce higher impacts. The interaction terms, represented by $\delta_h$, are mostly negative, indicating that the incremental effect of temperature in a given hour actually decreases the impact. Due to the small sample sizes and year-to-year variability, none of the estimates in this regression are statistically significant. Results for hours 15 and 20 should be interpreted with caution, as there were only three historical events that began at 2:00 PM and only six historical events that ended later than 7:00 PM.

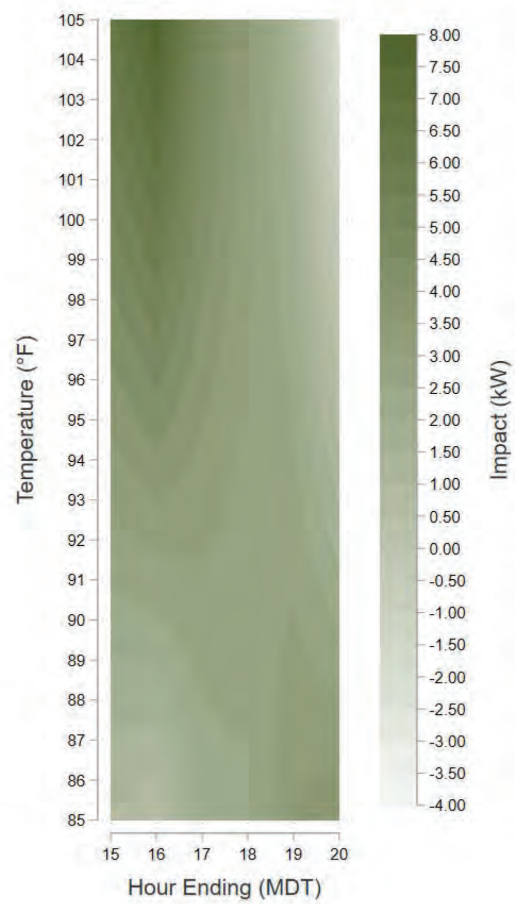
**Table 29: Medium Commercial Ex Ante Regression Output**

| Term | Variable | Coefficient (b) | Standard Error | P-Value |
|---|---|---|---|---|
| $\beta$ | Temperature | 0.267 | 0.376 | 0.479 |
| $\gamma_h$ | Hour 15 | | (base – omitted) | |
| | Hour 16 | -8.673 | 38.271 | 0.821 |
| | Hour 17 | 11.181 | 37.317 | 0.765 |
| | Hour 18 | 20.089 | 36.421 | 0.582 |
| | Hour 19 | 34.066 | 36.440 | 0.352 |
| | Hour 20 | 52.095 | 42.033 | 0.218 |
| $\delta_h$ | Hour_15_x_Temp | | (base – omitted) | |
| | Hour_16_x_Temp | 0.098 | 0.417 | 0.814 |
| | Hour_17_x_Temp | -0.118 | 0.406 | 0.771 |
| | Hour_18_x_Temp | -0.219 | 0.397 | 0.583 |
| | Hour_19_x_Temp | -0.370 | 0.397 | 0.354 |
| | Hour_20_x_Temp | -0.577 | 0.461 | 0.213 |
| $\alpha$ | Constant | -21.719 | 34.324 | 0.528 |

Using the regression coefficients shown in Table 29, the evaluation team created a time-temperature matrix (TTM) that shows expected load reductions (per facility) for different outdoor temperatures and at different times of the day. The TTM is shown in Table 30. Using the model, the evaluation team predicts that the impact of a Medium Commercial DR event at peaking conditions (5:00 PM – 6:00 PM MDT when outdoor temperature is 100 degrees) is 3.16 kW per facility, or 0.43 kW per device.

### Table 30: Medium Commercial Time-Temperature Matrix

| Temp | Hour Ending MDT | | | | | |
|---|---|---|---|---|---|---|
| | 15 | 16 | 17 | 18 | 19 | 20 |
| 105 | 6.27 | 7.90 | 5.02 | 3.40 | 1.50 | -2.26 |
| 104 | 6.01 | 7.53 | 4.87 | 3.36 | 1.60 | -1.95 |
| 103 | 5.74 | 7.17 | 4.72 | 3.31 | 1.70 | -1.63 |
| 102 | 5.47 | 6.80 | 4.57 | 3.26 | 1.81 | -1.32 |
| 101 | 5.21 | 6.44 | 4.43 | 3.21 | 1.91 | -1.01 |
| 100 | 4.94 | 6.07 | 4.28 | 3.16 | 2.01 | -0.70 |
| 99 | 4.68 | 5.71 | 4.13 | 3.12 | 2.12 | -0.39 |
| 98 | 4.41 | 5.34 | 3.98 | 3.07 | 2.22 | -0.08 |
| 97 | 4.14 | 4.98 | 3.83 | 3.02 | 2.32 | 0.23 |
| 96 | 3.88 | 4.61 | 3.68 | 2.97 | 2.43 | 0.54 |
| 95 | 3.61 | 4.25 | 3.54 | 2.92 | 2.53 | 0.85 |
| 94 | 3.34 | 3.89 | 3.39 | 2.88 | 2.63 | 1.16 |
| 93 | 3.08 | 3.52 | 3.24 | 2.83 | 2.74 | 1.47 |
| 92 | 2.81 | 3.16 | 3.09 | 2.78 | 2.84 | 1.78 |
| 91 | 2.54 | 2.79 | 2.94 | 2.73 | 2.94 | 2.10 |
| 90 | 2.28 | 2.43 | 2.80 | 2.68 | 3.05 | 2.41 |
| 89 | 2.01 | 2.06 | 2.65 | 2.64 | 3.15 | 2.72 |
| 88 | 1.74 | 1.70 | 2.50 | 2.59 | 3.25 | 3.03 |
| 87 | 1.48 | 1.33 | 2.35 | 2.54 | 3.36 | 3.34 |
| 86 | 1.21 | 0.97 | 2.20 | 2.49 | 3.46 | 3.65 |
| 85 | 0.94 | 0.60 | 2.06 | 2.45 | 3.56 | 3.96 |




To get an idea of Medium Commercial resource capability on aggregate, the number of active facilities can be multiplied by the values shown in Table 30. As of the end of summer 2022, there were 439 active Medium Commercial facilities. Thus, the expected aggregate impact of an event hour ending at 6:00 PM (MDT) when the outdoor temperature is 100 degrees would be 1.39 MW. Medium Commercial DCU results are subject to an operability adjustment to better reflect the fact that not all devices in the population will be able to curtail load when called due to damage, wiring, or connection issues. The operability-adjusted aggregate impact is 87% of the unadjusted impact, or 1.21 MW.

# 7 Recommendations

After our review of the 2022 Power Saver program, the evaluation team offers the following recommendations:

- Ex post impacts provide a helpful look at program performance. For planning purposes, a consistent, weather-normalized impact estimate should be used. The evaluation team recommends that ex ante program impacts from 5:00 PM to 6:00 PM MDT at 100°F, de-rated for operability, be used for reporting, cost-effectiveness, and planning.
- The Itron contract definition of capacity performance is upwardly biased by capturing favorable noise along with the program impact. If there is a chance to review the terms, we recommend collapsing to the hourly mean rather than the maximum.
- For the BYOT component, Itron used an alternative baseline adjustment mechanism for one of the events rather than the contractually-agreed upon adjustment. The resulting impact estimates were higher than they would have been using the adjustment method called for in Itron's contract with PNM and in Itron's M&V Plan for the year. Importantly, all of the qualifying event hours for the BYOT component occurred during the event in which Itron employed the alternative adjustment. Thus, the kW reduction estimate for this component is overstated in Itron's report. Itron should refrain from ad hoc adjustments to the terms agreed to in the contract and laid out in the M&V plan.
- The connected load assumption used to convert air conditioner runtime to electric demand for the thermostat program components is high given the average air conditioner size in the region. It is also higher than the assumed value in the smart thermostat protocol of the New Mexico TRM. We revised the assumption for the ex post analysis of BYOT, but not for Two-Way because Itron technicians record A/C nameplate information during installation of Two-Way thermostats. Currently the BYOT and Two-Way thermostat offerings represent a small fraction of the Power Saver resource capability, but as they grow it will be important to base the load impact calculations on sound assumptions.

# Appendix G: Peak Saver Detailed Evaluation Methods and Findings

Public Service New Mexico (PNM) offers the Peak Saver program to non-residential customers with peak load contributions of at least 50 kW. The program compensates participants for reducing electric load upon dispatch during high periods of high system load. Enbala implemented the Peak Saver program in 2022, handling the enrollment, dispatch, and settlement with participating facilities and three demand response events. The events are summarized in Table 31.

**Table 31: 2022 Peak Saver Event Summary**

| Date | Weekday | Participants | Start Time (MDT) | End Time (MDT) | Daily High at KABQ (F) |
|---|---|---|---|---|---|
| 06/10/2022 | Friday | 159 | 3:00 PM | 7:00 PM | 100 |
| 07/11/2022 | Monday | 159 | 2:00 PM | 6:00 PM | 95 |
| 09/02/2022 | Friday | 159 | 5:00 PM | 7:00 PM | 93 |

After the 2022 demand response (DR) season concluded, Enbala provided the evaluation team with one-minute interval load data and end-of-season summary information on performance metrics for each site/event combination. The interval data spanned from May 19$^{th}$ to September 4$^{th}$ and included load impacts calculated using a customer baseline (CBL) method outlined in the PNM-Enbala contract. A CBL is an estimate of participant loads absent the DR event dispatch, and load impacts are the difference between CBL and the metered load during the event. The relevant CBLs were also included in the one-minute load data.

Using these data sources, the evaluation team completed our verified savings analysis. The three key steps in the analysis were:

1) Reproducing the performance estimates calculated by Enbala using the contractually-agreed upon CBL method;
2) Assessing the accuracy of the contract CBL method by examining its ability to predict loads on non-event weekdays; and
3) Modifying the CBL methodology to reduce bias and calculate verified impacts for each event.

The subsequent sections describe the findings of our analysis.

# 1 Validation of Settlement Calculations

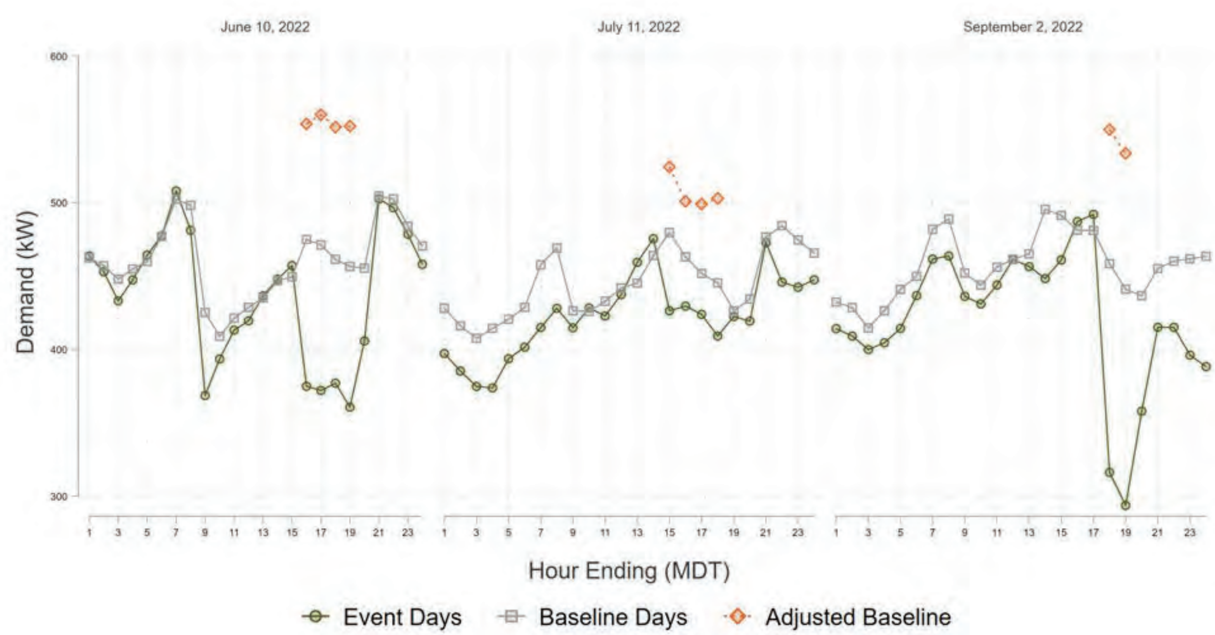
The settlement calculations called for a "high 3-of-5" baseline with an uncapped, asymmetric day-of adjustment. To determine the high 3-of-5 days, the following process was used:

- Select the five non-holiday, non-event weekdays that immediately precede the event; and
- Out of those five days, pick the three days with the highest average demand during the hours in which the event occurred. In the case of a tie, the baseline day chosen was the one closest to the event day.

Our team was successful in replicating almost all of the settlement baselines. Enbala's average settlement baseline for all sites and event hours was 532.85 kW, while our team's average settlement baseline was 532.86 kW. Any variances between the settlement baseline and our team's baseline were minimal, with differences typically less than 0.01 percent. The baseline calculations adhered to a highly consistent rule set, with the exception of one participant with solar and negative loads during daytime hours. Section 2.3 details the methodological considerations for net exporting sites.

Figure 26 shows the average hourly event day loads for the full population, the average hourly loads on the high 3-of-5 baseline days, and the average hourly baselines for the event intervals. Note dispatch hours varied across events days (3:00 PM to 7:00 PM on June 10th, 2:00 PM to 6:00 PM on July 11th, and 5:00 PM to 7:00 PM on September 2nd).

**Figure 26: Peak Saver Loads and Baselines**



Once we validated that the baselines were calculated according to the contract methods, our team proceeded to the performance metric calculations. The performance metrics are defined as follows:

- **10-Minute Participant Capacity Performance** – The difference between the CBL and the lowest actual electrical demand measured by a one-minute interval reading between eight and ten minutes after the start of an event.
- **Average Participant Capacity Performance** – The average difference between the CBL and the participant's actual electric demand beginning ten minutes after the initiation of the event.
- **Participant Event Capacity Performance** – Weighted average of 10-Minute Participant Capacity Performance (40% weight) and Average Participant Capacity Performance (60% weight).
- **Energy Delivered** – The difference (in kWh) between the adjusted CBL and the metered load summed across all DR event hours.

Using the settlement baselines, all performance calculations were replicated without problem. Table 32 shows portfolio performance metrics by date.

**Table 32: Peak Saver Performance Metrics by Date – Contract Settlement Method**

| Date | 10-Minute Participant Capacity (kW) | Average Participant Capacity (kW) | Participant Event Capacity Performance (kW) | Energy Delivered (kWh) |
|---|---|---|---|---|
| 06/10/2022 | 29,543 | 27,456 | 28,882 | 111,137 |
| 07/11/2022 | 17,476 | 11,761 | 14,578 | 50,955 |
| 09/02/2022 | 37,736 | 36,316 | 37,032 | 71,673 |
| **Average** | **28,252** | **25,178** | **26,831** | **77,922** |

# 2 Assessment of CBL Accuracy

Developing an unbiased prediction of what load would have been absent a demand response event is essential to producing a defensible demand response impact estimate. This hypothetical non-event load is the customer baseline (CBL). If the CBL methodology tends to produce unbiased estimates of load (i.e., average error of zero), then demand response impact estimates will also be unbiased. If the CBL tends to overpredict or underpredict load, then demand response impacts will be overstated or understated.

This section details our review of the Enbala contract CBL methodology (described at the beginning of Validation of Settlement Calculations). Specifically, we assess the ability of the CBL methodology to predict load on non-event weekdays, and we explore the distribution of adjustment factors.

## 2.1 Placebo Event Analysis

Assessing the accuracy of a baseline on an event day is not possible because the counterfactual is unknown. In other words, we do not know what the demand would have been if the event was not called. However, on non-event weekdays there is no demand response, so using the same algorithm to generate a baseline should reasonably predict the metered load. For these days, the true value of demand response is 0 kW so if the baseline yields a non-zero impact estimate, it can be attributed to error. Individual errors are expected as the lookback window is not intended to be a perfect predictor of future load. That said, an unbiased baseline methodology should produce a distribution of errors which is centered around zero, on average.

To evaluate the accuracy of the settlement CBL, the Evergreen team analyzed the central tendency of prediction errors by creating placebo event days from each non-event weekday for which there was sufficient data to calculate a high 3-of-5 baseline. The team assumed that each placebo event would start at 3:00 PM and last for four hours until 7:00 PM. This timing mimics several historical Peak Saver DR events. For each placebo event, the aggregate hourly CBL was calculated by summing the average hourly CBLs during the event window at each site. The same method was used to calculate the aggregate metered load. Since demand response was not dispatched, the impact estimate (the difference between CBL and metered load) should be zero. Any deviation from zero is considered error. Notably, negative impacts were not zeroed out, and sites with solar power were excluded from this analysis. For sites with solar, the baseline adjustment mechanism used in the settlement CBL is affected by cloud coverage as well as gross load. That’s problematic, of course, but it’s a separate issue that we did not want to confound with the results of the exercise described in this section.

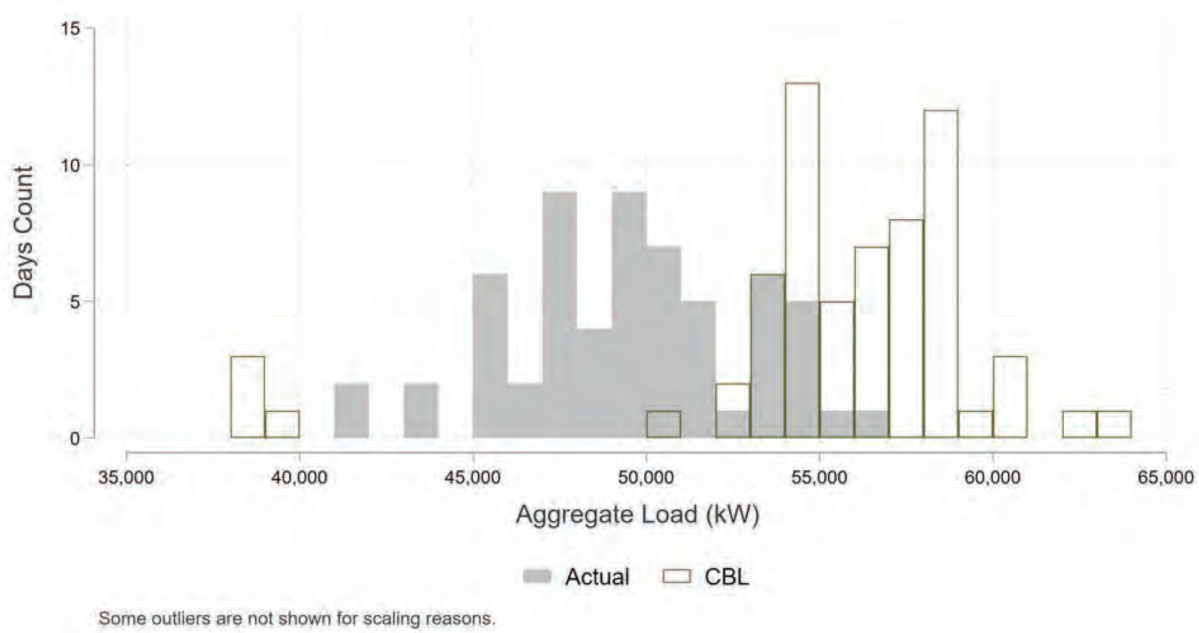
Results for the settlement baseline, aggregated by month, are shown in Table 33. On average, the baseline produced about 6.5 MW of upwards bias (meaning the baseline overstated load by 6.5 MW). The average percent bias across the 67 placebo events was 14 percent. Since actual DR reductions are not 100 percent of load, the bias in impact estimates for actual events is necessarily greater than 14 percent.

### Table 33: CBL Accuracy Assessment for Placebo Events

| Month | Number of Placebo Events | Avg. Daily High Temp at KABQ | Avg. Aggregate Metered Load (kW) | Avg. Aggregate CBL (kW) | Avg. Error (kW) |
|---|---|---|---|---|---|
| June | 22 | 87.5 | 43,381 | 50,559 | 7,178 |
| July | 20 | 92.3 | 47,815 | 54,616 | 6,802 |
| August | 23 | 87.3 | 49,805 | 55,815 | 6,009 |
| September | 2 | 91.0 | 25,252 | 27,710 | 2,458 |
| **Weighted Average** | **---** | **89.0** | **46,369** | **52,892** | **6,524** |

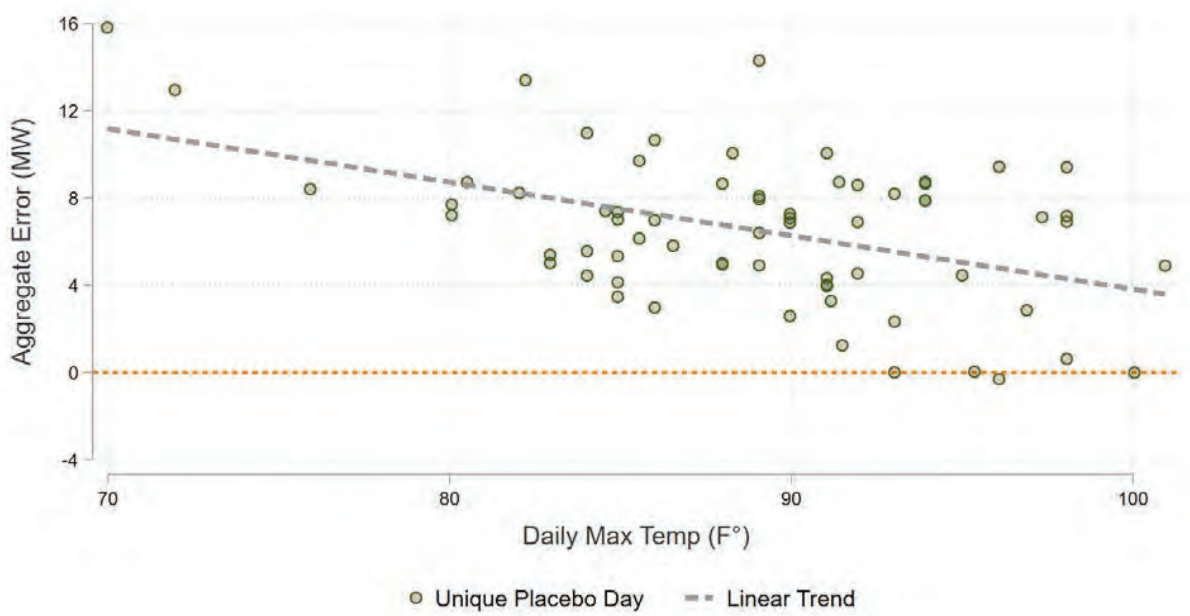
Figure 27 compares actual aggregate load from the placebo event days (gray bars) to aggregate baselines (translucent bars). Ideally, the two distributions would be approximately identical. It is clear from the distribution that the CBL is upward biased

### Figure 27: Histogram of Placebo Event Days – Settlement Method




The placebo days summarized in Table 33 are not perfect representations of actual event days, which tend to be the hottest days of the summer. DR events are called because system operators expect higher than normal loads which will approach the constraints of the system. As a result, the performance of a baseline on hot days is much more important for assessing accuracy than its performance on a mild day. As shown in Figure 28, the settlement method shows less bias at extreme temperatures. That said, the average error on a placebo day with a maximum temperature of at least 90 degrees was still over 5.2 MW.

**Figure 28: Enbala Average Aggregate Baseline Error vs. Temperature**




The Evergreen Team believes that the primary reason for the large errors in the settlement CBL is the asymmetric application of the weather-sensitive adjustment. The baseline can only be adjusted up, not down, which naturally biases the error upward. The unadjusted baseline actually produces less aggregate error than the adjusted baseline. While adjusting the baseline using event day loads has been shown to improve accuracy, the adjustment needs to be bi-directional. In most organized demand response markets, including PJM, CAISO, and ISO New England, a symmetric adjustment is employed.

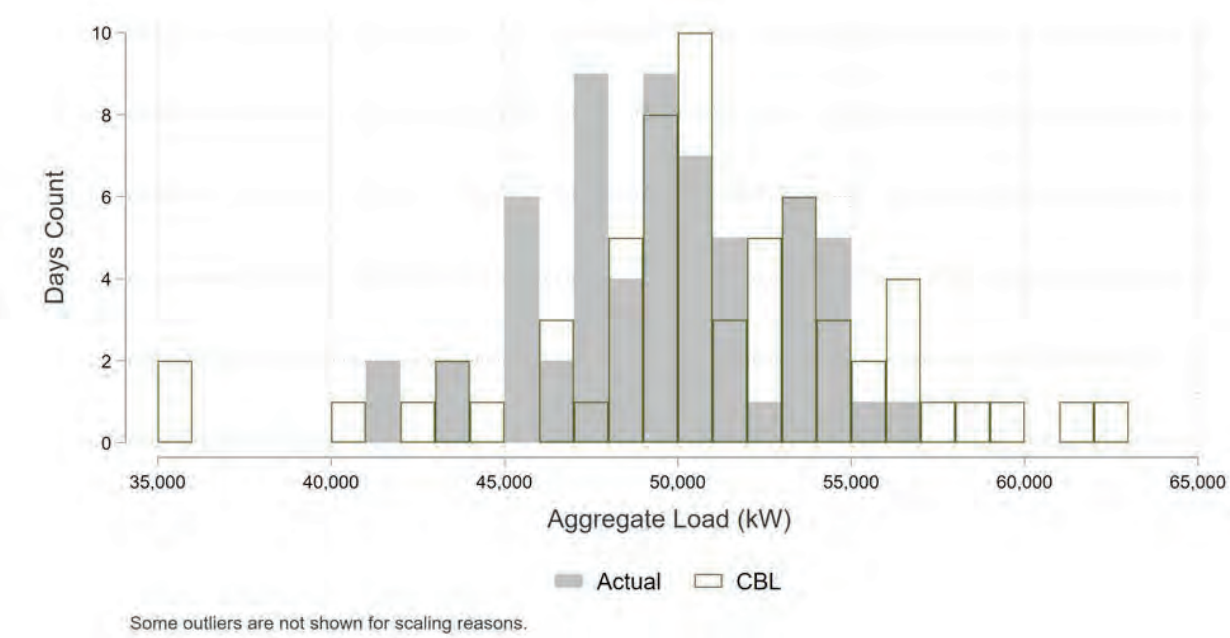
To demonstrate the impact of a symmetric adjustment, we modified the CBL methodology to allow for adjustments in both directions. Using this new adjusted baseline, we conducted the same accuracy test described earlier. The results, presented in Table 34, show an average error of less than 1.6 MW.

**Table 34: Accuracy Assessment with Symmetric Adjustment**

| Month | Number of Placebo Events | Avg. Daily High Temp at KABQ | Avg. Aggregate Metered Load (kW) | Avg. Aggregate CBL (kW) | Avg. Error (kW) |
|---|---|---|---|---|---|
| June | 22 | 87.5 | 43,381 | 44,967 | 1,586 |
| July | 20 | 92.3 | 47,815 | 50,104 | 2,289 |
| August | 23 | 87.3 | 49,805 | 50,799 | 994 |
| September | 2 | 91.0 | 25,252 | 26,076 | 824 |
| **Weighted Average** | --- | **89.0** | **46,369** | **47,939** | **1,570** |

Figure 29 shows the same histogram as Figure 27 but using the symmetric adjustment rather than the asymmetric adjustment. It is clear that the actual and counterfactual loads are better aligned in this case.

**Figure 29: Histogram of Placebo Event Days – Symmetric Adjustment**



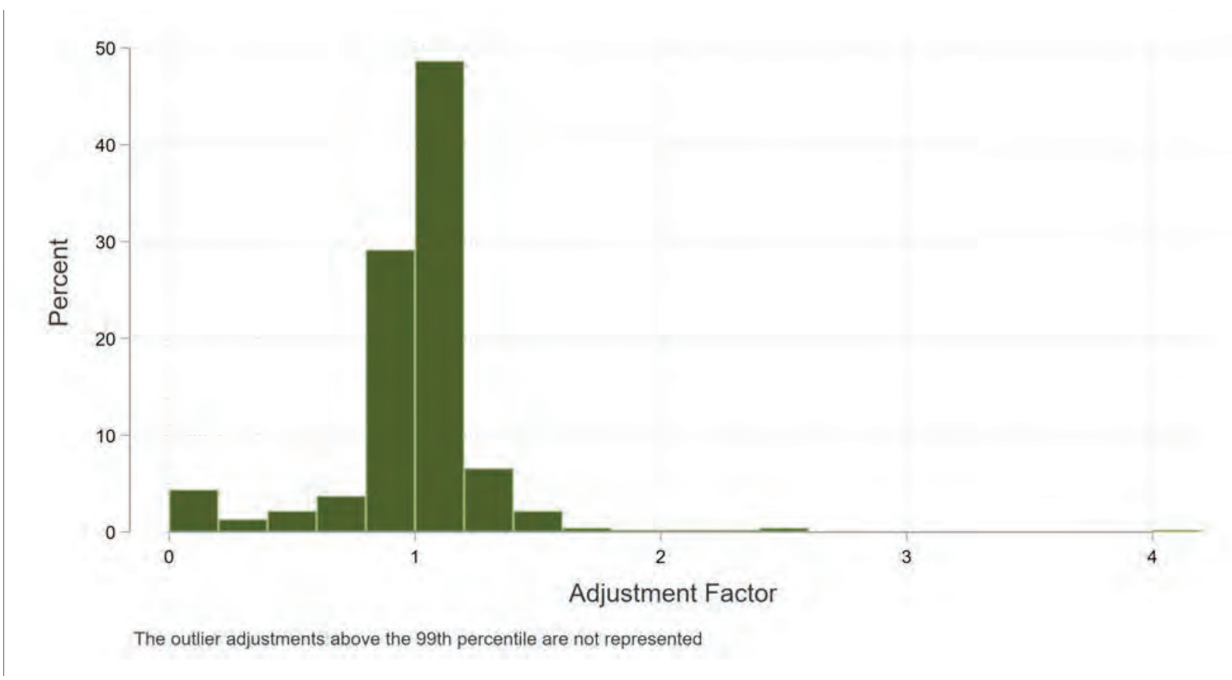

Using an asymmetric adjustment yielded an average error of 6.5 MW and an upwards bias of 14 percent. Using a symmetric adjustment yielded an average error under 1.6 MW and an upwards bias of 3.2 percent. While the baseline with a symmetric adjustment still overestimates on average, the distribution of errors falls on both sides of zero and the mean prediction is much closer to true load.

## 2.2 Adjustment Factors

As demonstrated above, the application of the adjustment factor plays a significant role in the accuracy of the CBL. Because the adjustment in the settlement CBL is applied as a multiplicative adjustment, even values that appear close to 1 (i.e., 1.1) can result in significant adjustments for large customers. The average symmetric adjustment factor across event days and sites was 1.10. The median factor, which is unaffected by extreme values, was 1.02.

Figure 30 shows the distribution of adjustment factors (except for the top 1 percent of observations). Recall that the adjustment factors are only applied if they increase the baseline in the contract CBL. In other words, any factor less than one is rounded up to one. In the majority of cases, the adjustments produced baseline values that were reasonable in the context of their distribution of load throughout the summer. Still, there were a handful of adjustment factors larger than two. Even for the most extreme cases of weather sensitivity, adjusting the baseline by a factor of two or more is dubious. Undoubtedly, leaving the asymmetric adjustment factor uncapped leads to an upwards bias in event day baselines, particularly when the adjustment is not symmetric. This again means impacts are, on average, being overstated using the settlement baseline calculation method. This can be addressed by subjecting the adjustment factor to a cap which prevents the adjustment factor (and the CBL) from taking on extreme values.

**Figure 30: Distribution of Adjustment Factors**




Extreme adjustment factors were relatively uncommon in the 2022 evaluation, with only one site receiving an adjustment larger than 10 (25.3). The Evergreen team investigated load at this site to see if we could determine what happened. Figure 31 shows average hourly demand for the baseline days and hourly demand for the event day in question. The settlement baseline is orders of magnitude higher than the hourly demand during the event hours. Figure 32 shows the same graph with the settlement baseline removed for clarity. Note the change in scale of the y-axis. The customer's highest metered load for the whole summer was only 133 kW. Perhaps the site did curtail load during the event, but a baseline of 800 kW is unreasonable for this site. This investigation helps to highlight the problematic nature of an uncapped adjustment in conjunction with erratic load patterns.

**Figure 31: Investigating a Large Adjustment Factor**

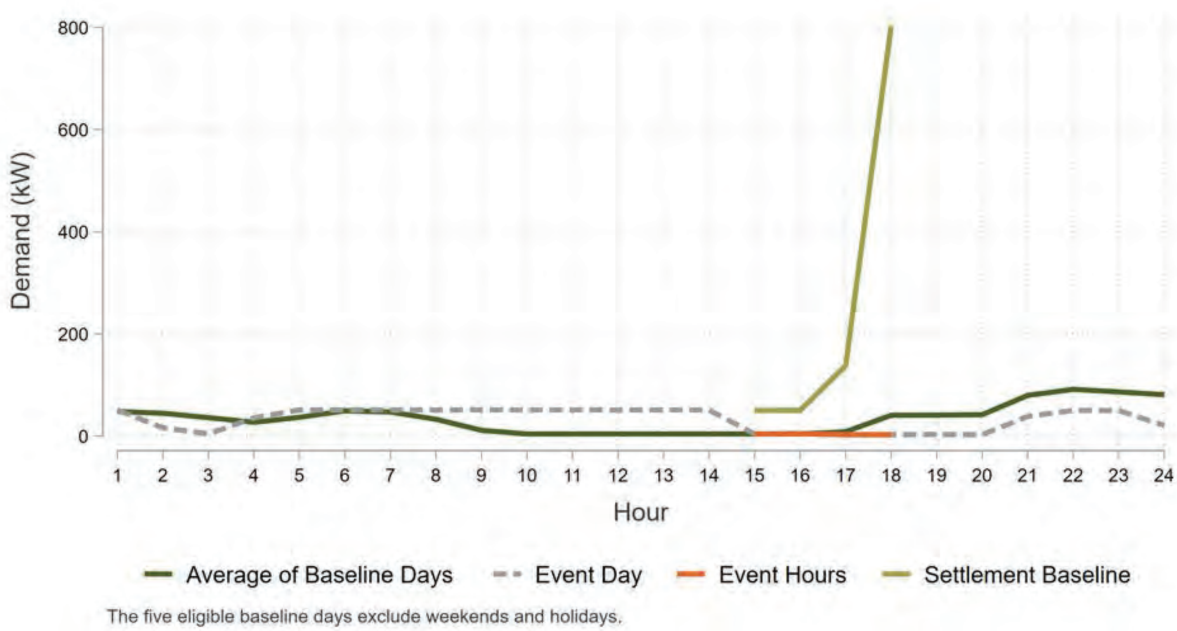
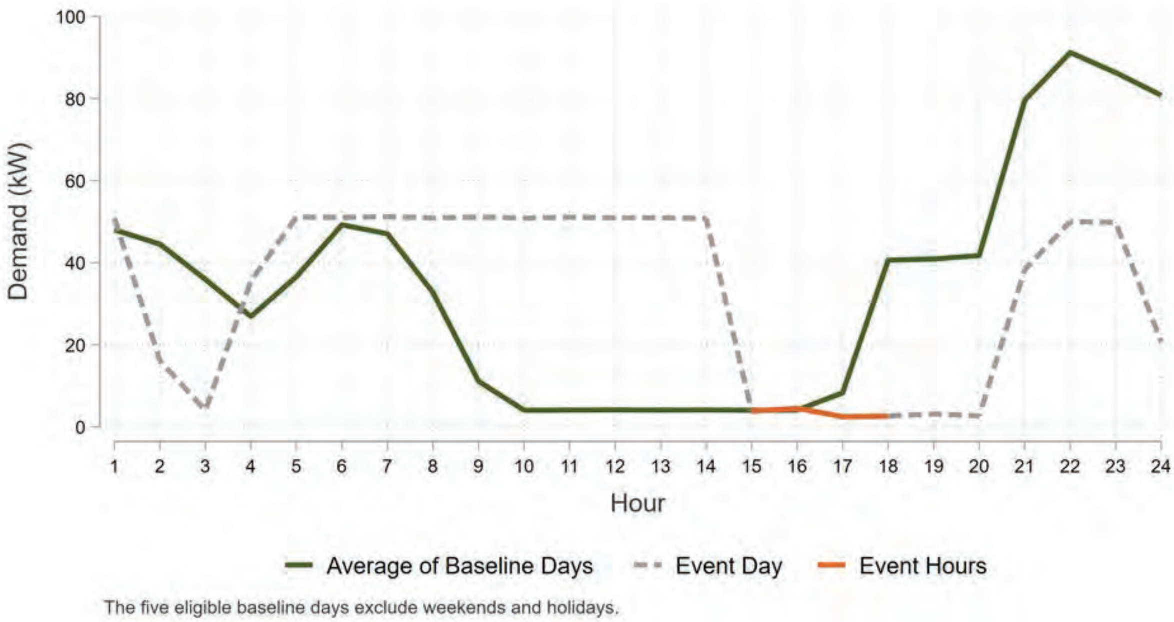


**Figure 32: Investigating a Large Adjustment Factor – Settlement Baseline Removed**




For sites with solar power, the adjustment factor is dependent on a cloud coverage effect that is not accounted for. If cloud cover begins mid-way through the adjustment window on the event day, net utility-supplied load for the hour will increase. If the lookback days were all sunny, then average load during the adjustment window on the lookback days will necessarily be lower than average load during the same window on the event day. This will result in a large adjustment ratio.

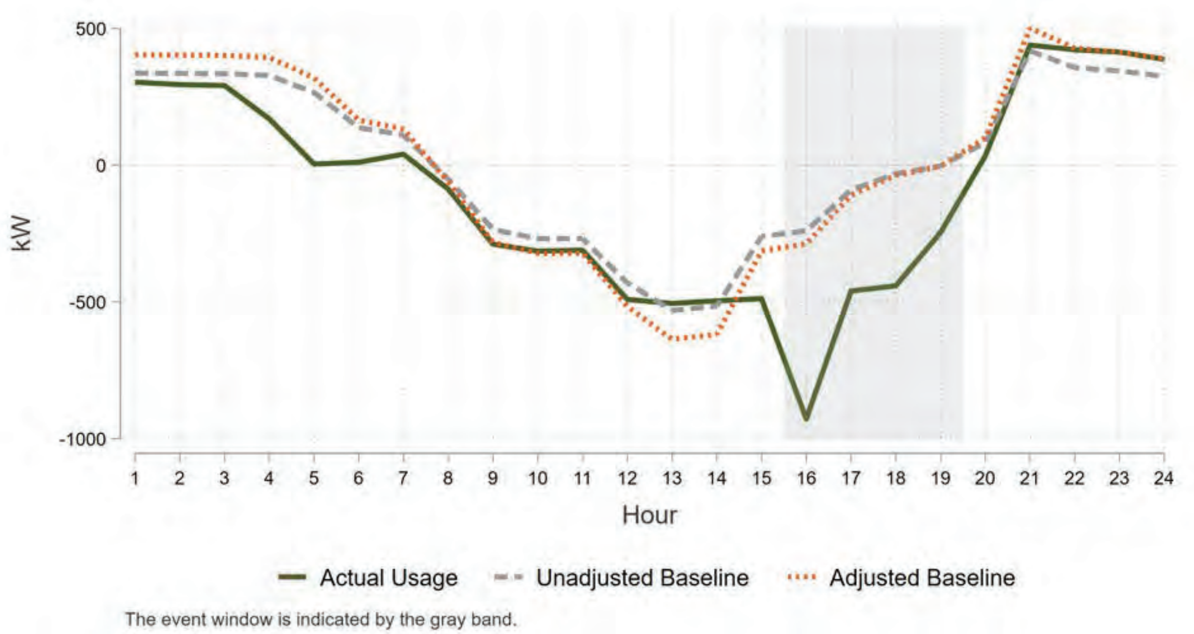
A similar effect may occur if sites engage in pre-cooling or pre-pumping in response to the pending demand response event. There is nothing wrong or nefarious about such behavior, but when this occurs, the adjustment factor will be artificially inflated.

The adjustment factor is intended to correct for the differences in load between event and baseline days that result from the non-random selection of event-days. Event days are typically the hottest days of the summer and, as such, may be reasonably expected to have higher demand than baseline days. However, a weather adjustment need not be applied to sites which do not have weather sensitive load. It is our view that sites identified as weather sensitive are the only ones which should receive an adjustment to the baseline (excluding those with solar power and those who pre-pump in preparation for the demand response event).

## 2.3 Solar Plus Storage

Sites that are exporting to the grid during typical event hours create an interesting baseline issue because DR actions make the load more negative. A multiplicative adjustment greater than 1.0 makes the CBL more negative, which lowers the estimated DR performance. During the 2022 evaluation, one site which had solar paired with a behind-the-meter battery encountered this issue. Figure 33 illustrates this occurrence on the June 10th event. The negative baseline values reflect that this site is a net exporter on the baseline days. Their net exports were larger on the event day than the baseline days, resulting in an adjustment factor greater than 1. This ultimately led to the adjusted baseline falling beneath the unadjusted baseline. To resolve this issue, the Enbala team used the unadjusted baseline rather than the adjusted baseline.

**Figure 33: Multiplicative Adjustment Factor and Battery Discharge**




# 3 Evaluated Impacts

## 3.1 Approach

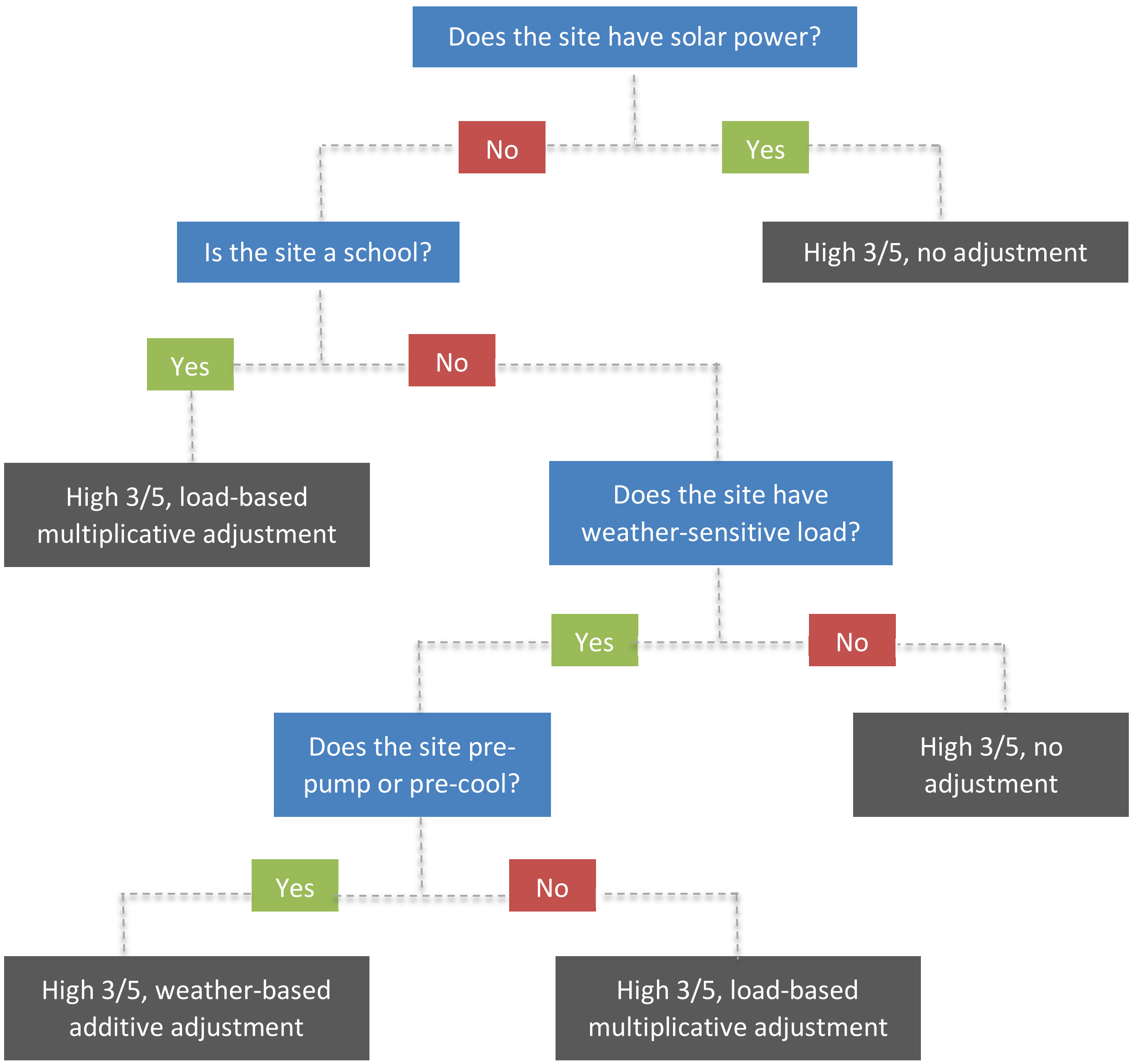
Based on our review of the contract CBL methodology used to generate the settlement baselines and impact estimates, the Evergreen team calculated the evaluated CBL (and the performance metrics they feed into) using the following methodology:

- The multiplicative adjustment factor is symmetric, meaning it can increase or decrease baselines, rather than only serving to increase baselines;
- The multiplicative adjustment factor is capped at ±20 percent rather than uncapped;
- The multiplicative adjustment factor is only applied to sites that (1) have weather sensitive loads, (2) do not have solar power, and (3) do not pre-pump or pre-cool prior to demand response events; and

- For sites that meet the first two requirements listed above but not the third, an additive adjustment factor based on weather was applied rather than an adjustment factor based on pre-event load.

Additionally, all schools without solar power were given the load-based multiplicative adjustment factor. A CBL method flow chart is presented in Figure 34.

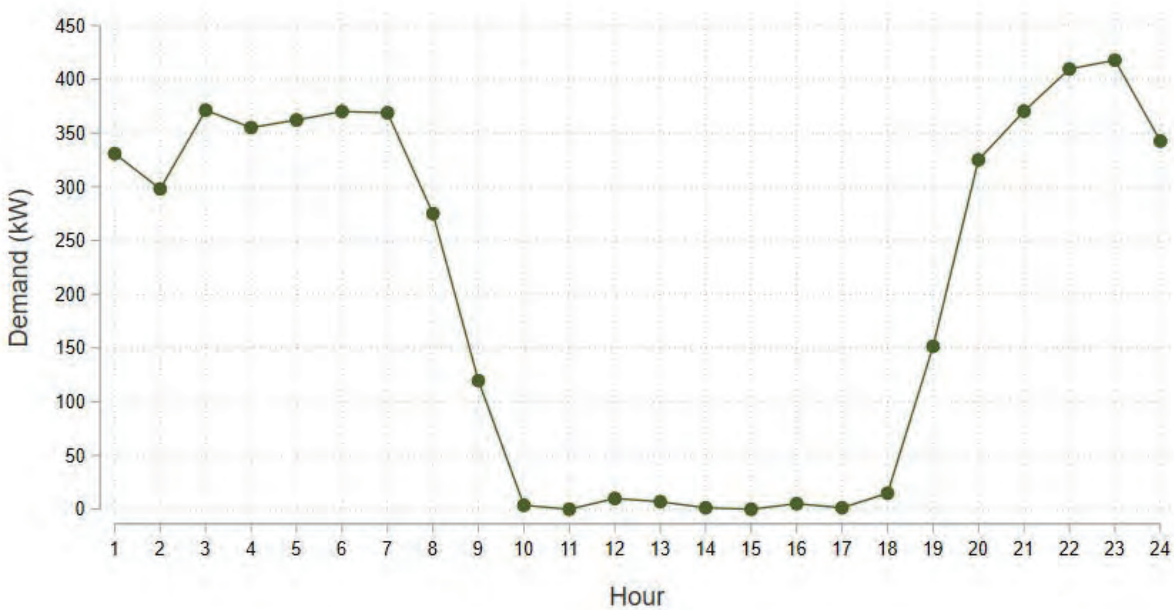
**Figure 34: Adjustment Factor Assignment**




To determine which sites have solar power, our team reviewed hourly load profiles for the full population of program participants. Sites that showed the distinct solar net load profile, as in

Figure 35, were treated as solar sites. Additionally, Enbala provided the Evergreen team with a list of sites with known solar power. In total, 33 of 159 sites were considered sites with solar power.

**Figure 35: Example of Solar Load Profile**




Regarding weather-sensitive loads, the Evergreen team estimated weather sensitivity at each site by assessing the relationship between load and temperature during the combined event hours (2:00 PM – 7:00 PM, which includes the most common adjustment window) on non-event, non-holiday weekdays during the 2022 summer. Sites were considered to be weather sensitive if (1) the correlation between temperature and load was positive and (2) temperature was found to be a statistically significant predictor of load. In total, 106 of the 159 sites met these criteria.

Regarding pre-pumping or pre-cooling, our team reviewed hourly load profiles on event days and baseline days for the full population of program participants. Figure 36 illustrates this exercise. Sites with a notable incline in pre-event load, relative to load during the same hours on baseline days, were treated as pre-pumpers or pre-coolers. This is a reasonable action for a demand response participant. The issue is that pre-pumping behavior inflates the baseline adjustment, which is calculated based on pre-event load. In total, only nine of 159 sites were considered pre-pumpers. (Note we're using "pre-pumping" as a catch-all term to identify any load-shifting behaviors that precede a DR event.)

**Figure 36: Example of Pre-Pumper Load Profile**

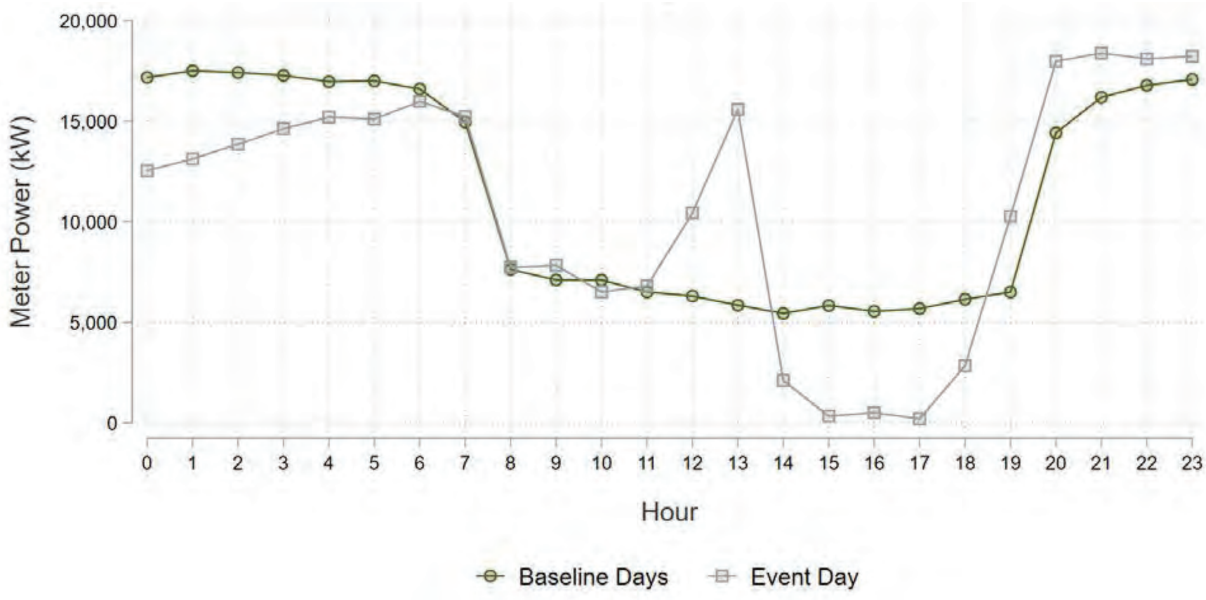



Table 35 shows the distribution of CBL methodology for the 2022 verified savings analysis. Note the weather-based adjustment is an additive adjustment similar to the weather-based adjustment used by PJM.[13] The adjustment is calculated as:

$$Adjustment = Slope * (\Delta_{Temp})$$

In the equation above, "Slope" is a value that quantifies the relationship between outdoor temperature and load for the facility (i.e., for each one-degree increase in temperature, how much does load increase on average?). This value is determined via the regression modeling. The second component, $\Delta_{Temp}$, represents the difference between the average outdoor temperature during the event and the average outdoor temperature during the event window on the three selected baseline days.

[13] Available at https://www.pjm.com/-/media/markets-ops/demand-response/dsr-weather-sensitive-adjustment-using-wsa-factor-method.ashx?la=en

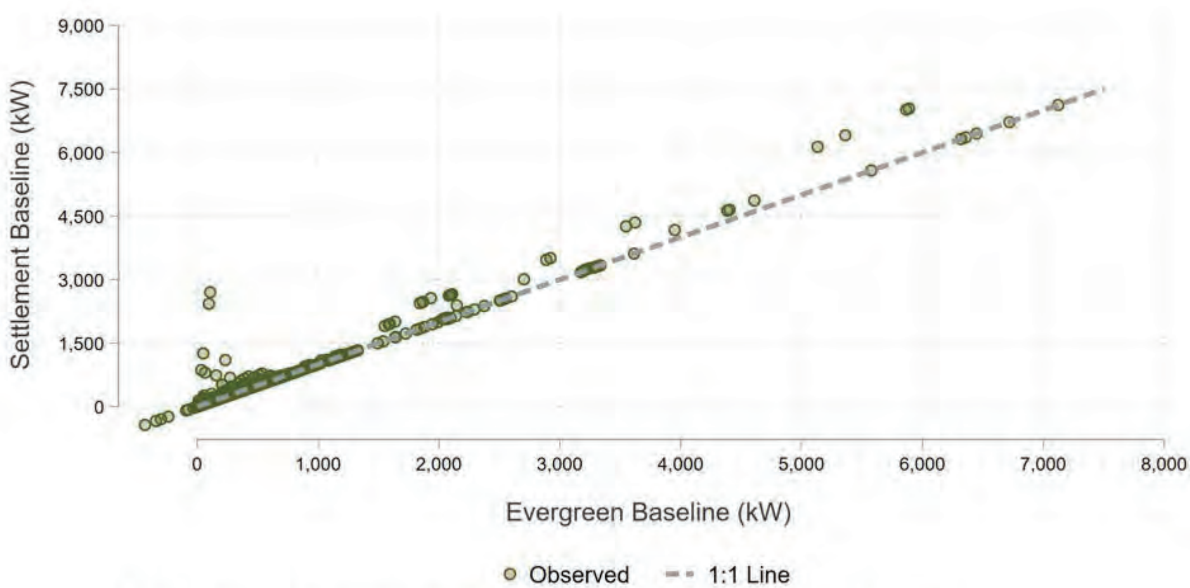
**Table 35: Distribution of CBL Method**

| CBL Approach | Number of Sites |
|---|---|
| High 3/5, no adjustment | 71 |
| High 3/5, load-based multiplicative adjustment | 86 |
| High 3/5, weather-based additive adjustment | 2 |
| **Total** | **159** |

## 3.2 CBL Comparison

Because the Evergreen team calculated baselines in a manner that was similar to settlement baseline methodology, the baselines themselves were largely similar. The correlation between the two methods can be seen in Figure 37, which compares the baselines calculated by our team with the settlement baselines. One site, whose demand is significantly higher than the other sites, is shown in a separate figure (Figure 38) due to the vast difference in scale.

**Figure 37: Baseline Comparison – All Sites but One**




The 1:1 line represents what the trend would look like if the two methods produced identical baselines.

**Figure 38: Baseline Comparison – Separate Site**

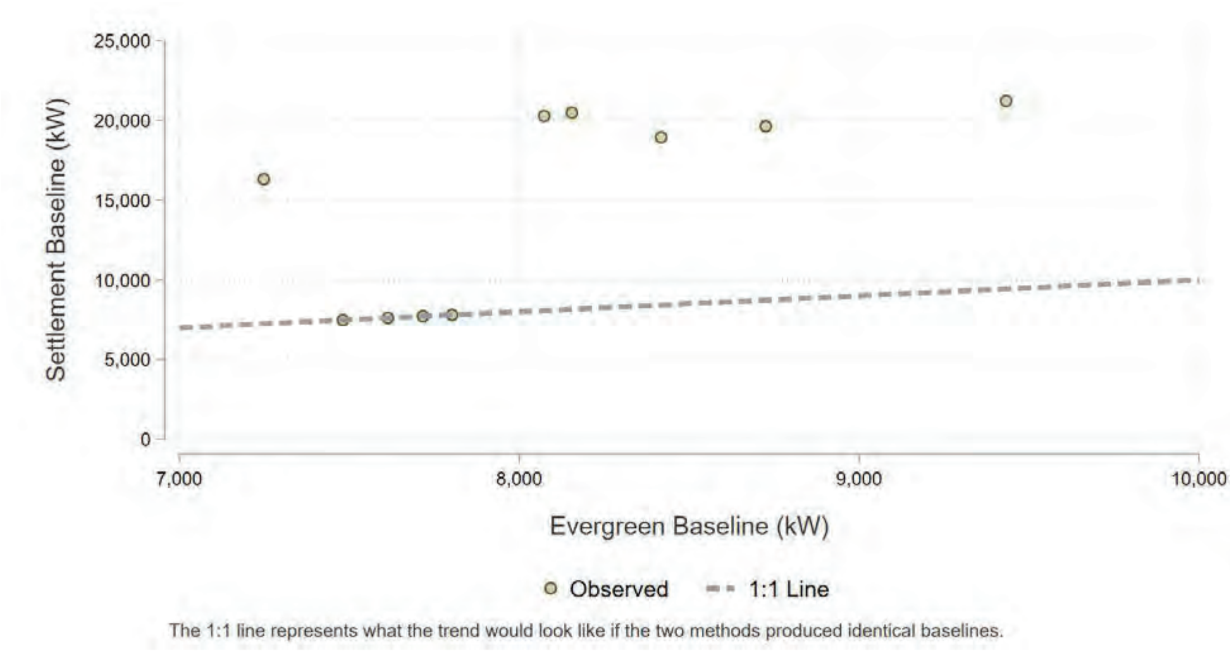



Table 36 and Table 37 show the average aggregate baseline under the settlement method and under the Evergreen method. The settlement method is naturally going to produce a much larger baseline since it uses an asymmetric adjustment mechanism. Table 37 singles out a site that has significantly higher demand, which is absent from Table 36. This site accounts for 60 percent of the differences in baselines. Notably, the settlement baseline for this site matches the Evergreen baseline for the 7/11 event.

**Table 36: Baseline Comparison – All Sites but One**

| Date | Settlement Baseline (kW) | Evergreen Baseline (kW) | Difference (kW) |
|---|---|---|---|
| 06/10/2022 | 66,329 | 63,305 | 3,024 |
| 07/11/2022 | 70,394 | 64,075 | 6,319 |
| 09/02/2022 | 62,533 | 60,983 | 1,550 |
| **Average** | **66,419** | **62,788** | **3,631** |

**Table 37: Baseline Comparison – Other Site**

| Date | Settlement Baseline (kW) | Evergreen Baseline (kW) | Difference (kW) |
|---|---|---|---|
| 06/10/2022 | 19,026 | 8,456 | 3,940 |
| 07/11/2022 | 7,653 | 7,653 | 0 |
| 09/02/2022 | 20,380 | 8,114 | 12,266 |
| **Average** | **15,686** | **8,074** | **5,402** |

## 3.3 Performance Metrics

The results of the Evergreen team's 2022 Peak Saver Demand Response evaluation are shown in Table 38. For comparison, the savings produced by the program implementer are shown in Table 39. Note that we do not zero out any negative performance metrics in our evaluated impacts but the program implementer does zero out the verified capacity performance if it is negative. On average, the verified capacity performance estimates using the Evergreen methodology are 58 percent of the values calculated by Enbala using the settlement CBL. Section 2 described some of the drivers leading to lower estimates for the Evergreen method.

Our findings indicate the Peak Saver program is approximately a 15.4 MW capacity resource, down from the 2021 estimate (17.5 MW). Importantly, there was substantial variation in verified capacity performance between the three events in the 2022 season (15.3 MW in June, 7.9 MW in July, and 23.1 MW in September). A few key sources of the variation in verified capacity performance include:

1. **The program is top heavy.** Figure 39 shows participant-level verified capacity performance for each event day. It is clear that a handful of sites will drive the overall results. The top three sites (in terms of average demand reductions) accounted for approximately 65% of the verified capacity performance in the June event, 40% of the verified capacity performance in the July event, and 61% of the verified capacity performance in the September event. These three sites alone account for over half of the verified capacity performance, on average. The largest participant in the program contributed 5.5 MW in the June event, 0.9 MW in the July event, and 6.9 MW in the September event.
2. **Variation in reference loads.** Aggregate daily peak demand for the Peak Saver participant population ranged from about 65 MW to about 82 MW during the 2022 summer. This is a wide range (~17 MW) – so wide, in fact, it's larger than the average capacity performance for 2022 (15.4 MW). The amount of load a participant can shed is a function the amount of available load. Schools are an obvious example (nearly one-third of Peak Saver participants are schools), but a number of other Peak Saver participants showed significant variation in reference loads from week-to-week (and even day-to-day). The program allows for separate nominations by month but few sites vary their nominations in practice.

3. **Event conditions.** Temperatures might have also contributed to the lower performance of the program. While temperatures ranged from 94°F to 97°F during the summer 2021 event hours, average event-hour temperature in summer 2022 was 94.5°F with a broader temperature range between 87°F to 100°F. Higher temperatures during event hours in 2021 could therefore explain some part of the decreased performance of the Peak Saver program in 2022.

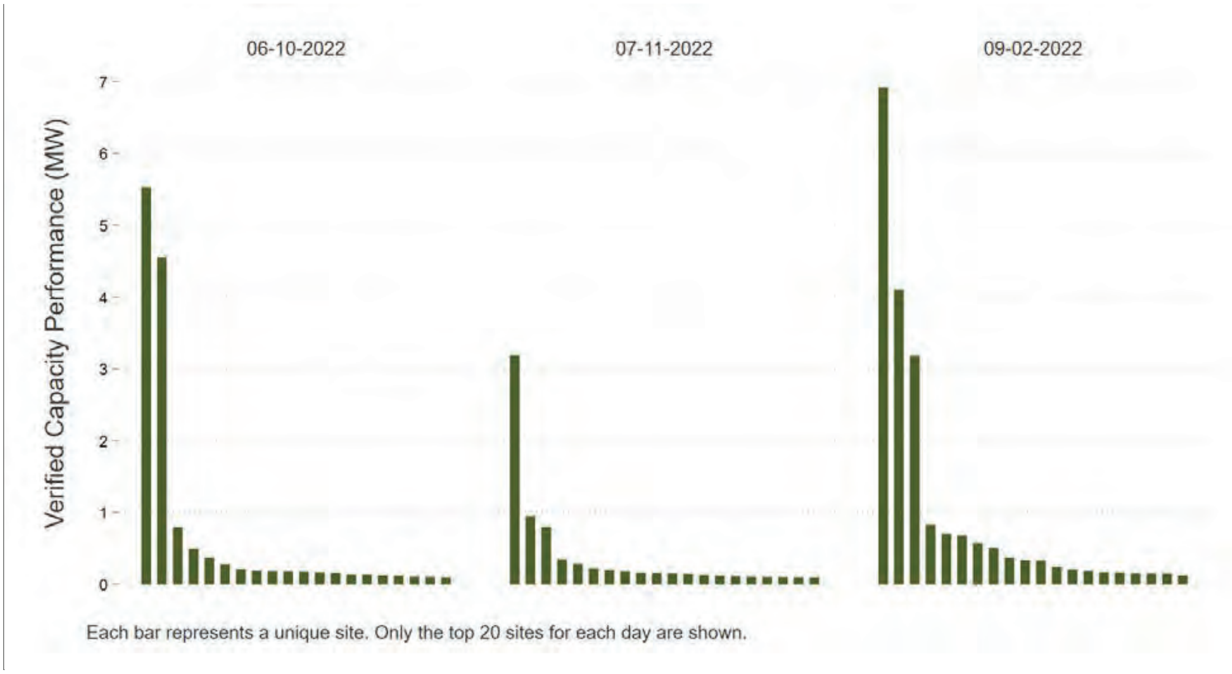
**Table 38: Evaluated Performance Summary by Event**

| Event Date | 10-Minute Capacity Performance (kW) | Average Capacity Performance (kW) | Verified Capacity Performance (kW) | Energy Performance During Event Hours (kWh) |
|---|---|---|---|---|
| 06/10/2022 | 17,525 | 13,877 | 15,336 | 54,781 |
| 07/11/2022 | 11,509 | 5,488 | 7,896 | 22,111 |
| 09/02/2022 | 23,944 | 22,561 | 23,114 | 43,345 |
| **Average** | **17,659** | **13,975** | **15,449** | **40,079** |

**Table 39: Performance Summary – Program Implementer**

| Event Date | 10-Minute Capacity Performance (kW) | Average Capacity Performance (kW) | Verified Capacity Performance (kW) | Energy Performance During Event Hours (kWh) |
|---|---|---|---|---|
| 06/10/2022 | 29,543 | 27,456 | 28,882 | 111,137 |
| 07/11/2022 | 17,476 | 11,761 | 14,578 | 50,955 |
| 09/02/2022 | 37,736 | 36,316 | 37,032 | 71,673 |
| **Average** | **28,252** | **25,178** | **26,831** | **77,922** |

**Figure 39: Site-Level Verified Capacity Performance by Date**




## 3.4 Energy Savings

Table 40 compares aggregate energy savings during the event with the aggregate daily energy savings. Here, a "day" is defined as all hours following the beginning of the event (including the event hours), with the adjustment factor applied to all hours.[14] Comparing the energy savings during the event and the daily energy savings helps illustrate the extent to which event load was shifted to other hours.

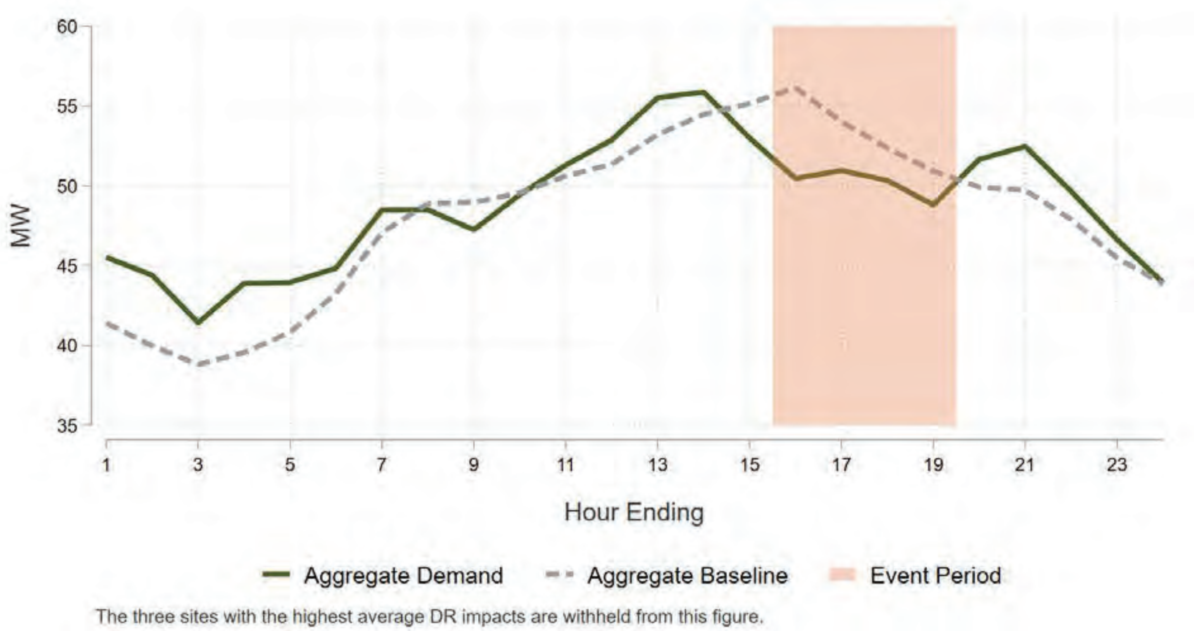
Although the capacity value of DR dominates its energy value, the table provides no evidence of consumption snapbacks *in aggregate*. That said, this aggregate comparison is muddied by the program's top-heaviness. There is evidence of consumption snapback when some of the larger sites are withheld. Figure 40 shows the aggregate hourly loads and baselines on June 10th but withholds three of the program participants. In this figure, post-event snapback is evident.

[14] For sites designated as pre-pumpers, we also included the hour before the event in the calculation of the daily energy impact.

**Table 40: Energy Savings – Event Hours and Hours Around Events**

| Event Date | Event Energy Impact (kWh) | Daily Energy Impact (kWh) |
|---|---|---|
| 06/10/2022 | 54,781 | 49,382 |
| 07/11/2022 | 22,111 | 34,298 |
| 09/02/2022 | 43,345 | 72,243 |
| **Total** | **120,237** | **155,922** |

**Figure 40: Load Shifting**




# 4 Recommendations

After our review of the 2022 Peak Saver program, the Evergreen team offers the following recommendations:

- Make the multiplicative adjustment symmetric rather than asymmetric. As discussed in the assessment of CBL accuracy presented in Section 2.1, using an asymmetric adjustment results in an upwards bias in the baseline. Biasing the baseline inherently biases the performance metrics. The bias is greatly reduced when using a symmetric adjustment.
- Set a cap for the multiplicative adjustment factor to prevent unrealistic baselines.
- Examine load data for solar patterns or pre-pumping/pre-cooling on event days. Pre-pumping/pre-cooling on event days is fine, but sites that do so should not receive the

adjustment factor (or the adjustment factor should be based on weather rather than load). For sites with solar, consider using a smaller adjustment factor cap, using an additive adjustment, or removing the adjustment factor altogether.

- Compare DR nominations with the average demand on typical summer afternoons. If any nominations seem too high, update them. (We'll note that nominations for some sites do change throughout the summer.)
- PNM should also consider collecting all meter channels for sites with solar PV. This would allow the CBL to fully capture the load shape of sites that are net exporters during key times of day. It's possible that these sites reduced load and thus became larger exporters than they would have been on a non-event day, but the available data doesn't allow for a measurement. Also, an additive adjustment may work better than a multiplicative one for sites whose load can cross zero during the event period or adjustment window.

Set DR performance equal to the battery discharge to measure the performance of solar + storage sites provided that the battery system records telemetry, the site does not discharge their battery on non-event days, and does not engage in other curtailment activities within the facility.

# 5 Appendix

The table below offers a year-over-year comparison of the Peak Savers performance metrics for the years 2018 through 2022. The relevant performance metrics are:

- **10-Minute Participant Capacity Performance** – The difference between the CBL and the lowest actual electrical demand measured by a one-minute interval reading between eight and ten minutes after the start of an event.
- **Average Participant Capacity Performance** – The average difference between the CBL and the participant's actual electric demand beginning ten minutes after the initiation of the event.
- **Participant Event Capacity Performance** – Weighted average of 10-Minute Participant Capacity Performance (40% weight) and Average Participant Capacity Performance (60% weight).
- **Energy Delivered** – The difference (in kWh) between the adjusted CBL and the metered load summed across all DR event hours.

Per the settlement baselines, Table 12 shows average portfolio performance metrics by year as calculated by the evaluation team. Table 13 shows average portfolio performance metrics by year as calculated by the program implementer.

**Table 12: Historical Evaluated Performance Summary Averages**

| Year | Participants | Events | 10-Minute Capacity Performance (kW) | Average Capacity Performance (kW) | Verified Capacity Performance (kW) | Energy Performance During Event Hours (kWh) |
|---|---|---|---|---|---|---|
| 2018 | 86 | 12 | 17,558 | 13,655 | 15,216 | 57,371 |
| 2019 | 92 | 3 | 17,460 | 15,342 | 16,189 | 60,250 |
| 2020 | 130 | 10 | 13,433 | 12,528 | 12,890 | 52,991 |
| 2021 | 157 | 2 | 18,975 | 16,532 | 17,509 | 64,662 |
| 2022 | 159 | 3 | 17,659 | 13,975 | 15,449 | 40,079 |
| **Weighted Average** | **125** | **6** | **16,278** | **13,672** | **14,714** | **54,956** |

**Table 13: Historical Performance Summary Averages - Program Implementer**

| Year | Participants | Events | 10-Minute Capacity Performance (kW) | Average Capacity Performance (kW) | Verified Capacity Performance (kW) | Energy Performance During Event Hours (kWh) |
|---|---|---|---|---|---|---|
| 2018 | 86 | 12 | 28,337 | 24,438 | 25,998 | 96,437 |
| 2019 | 92 | 3 | 30,419 | 27,645 | 28,754 | 109,958 |
| 2020 | 130 | 10 | 18,728 | 17,806 | 18,175 | 70,905 |
| 2021 | 157 | 2 | 42,182 | 41,420 | 42,176 | 165,911 |
| 2022 | 159 | 3 | 28,252 | 25,178 | 26,831 | 77,922 |
| **Weighted Average** | **125** | **6** | **26,257** | **23,754** | **24,828** | **92,059** |

## 5.1 Nominations

The following sections detail comparisons between monthly site-level DR kW commitments ("nominations"), average demand, and DR impacts. Section 5.1.1 seeks to answer the question: How do nominations compare to average demand? Section **Error! Reference source not found.** seeks to answer the question: How do nominations compare with verified DR performance? Throughout these two sections, note that results are presented at the participant level rather than the site level. That is, if one participant has three sites in the program, those three sites will be aggregated.

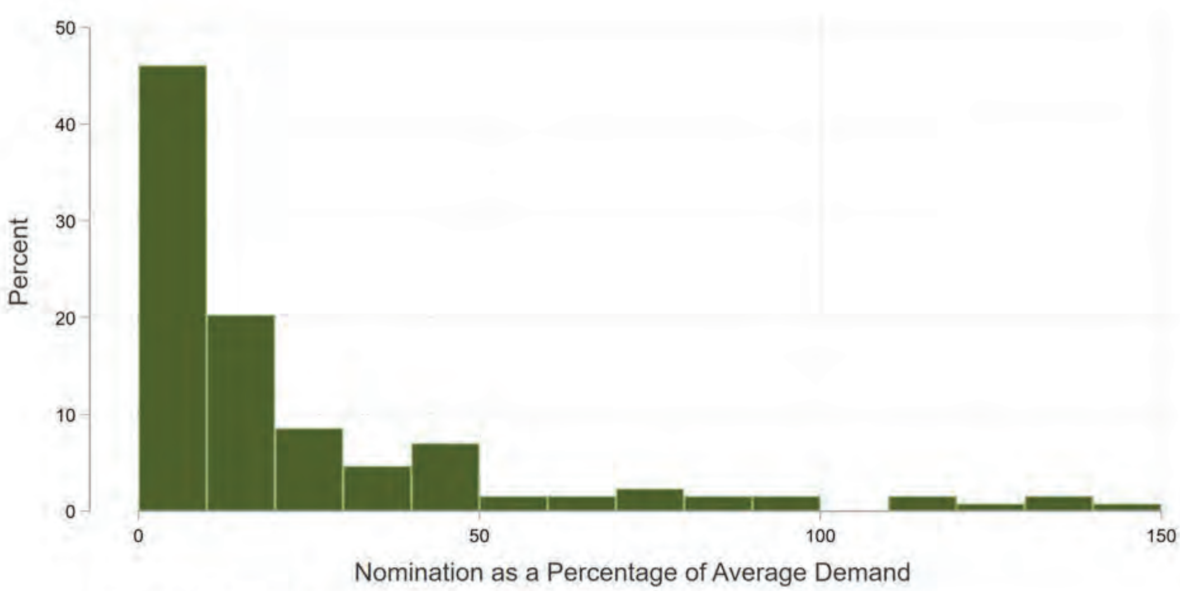
It is important to note that nominations may change throughout the summer for some participants, but this is not the case for the majority. Out of the 131 participants, only 29 had changes in nominations over the 2022 summer. For the comparisons made in Section 5.1.1, the average nomination between June 2022 and September 2022 was used, while Section **Error! Reference source not found.** uses the actual values for each site on each participating event day.

### 5.1.1 Comparing DR Nominations and Average Demand

In comparing DR nominations to load, our team only investigated the most common event hours (3:00 PM – 7:00 PM) on non-event, non-holiday weekdays. Additionally, any hours where the temperature was below 80 were removed. Under these conditions, we calculated average hourly demand for each participant, then compared these averages to the average nomination. For the comparison, two metrics were calculated: raw differences and ratios. Raw differences are simply the difference between average demand and the average nomination. Ratios were calculated as the average nomination divided by average load (and multiplied by 100%).

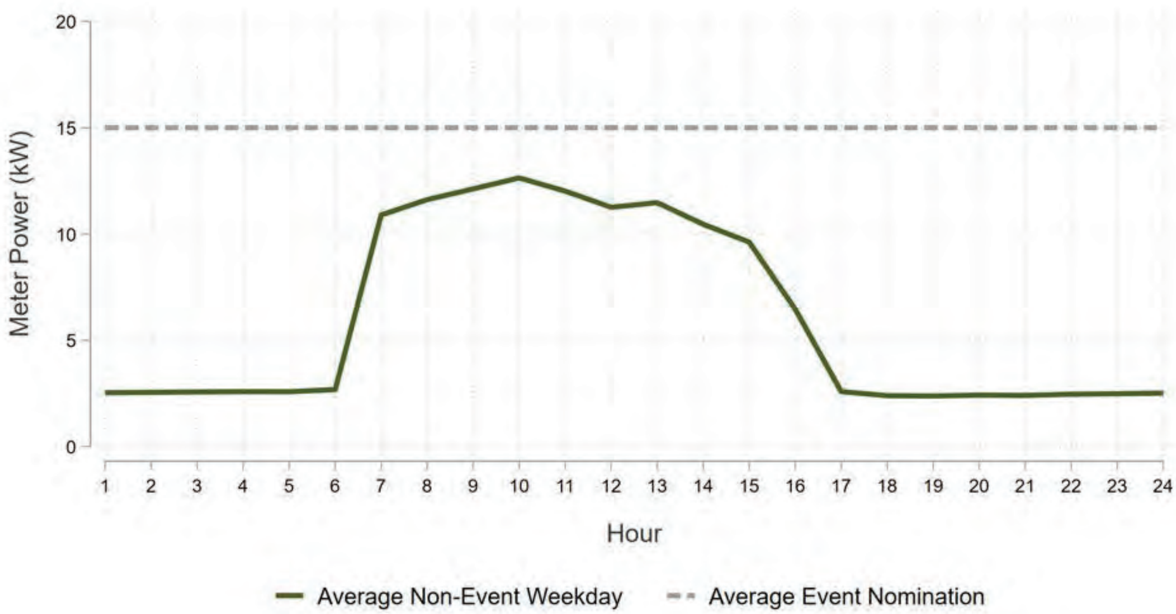
Figure 41 shows the distribution of ratios (ratio = average nomination / average demand * 100%). A value greater than 100 percent implies the average nomination exceeds average demand. Most sites had ratios close to 100 percent, indicating that the average nomination and demand were similar. However, there was one large outlier with a ratio of 472. This outlier site had a nomination of 15 kW (represented by the grey line in Figure 42**Error! Reference source not found.**), but average demand at this site between 3:00 PM and 7:00 PM on the day types considered was less than 5 kW.

**Figure 41: Nominations as a Percentage of Demand**




A value over 100% implies the average nomination exceeds average demand at the site.

**Figure 42: Investigating Nomination as a Percentage of Average Demand**




For most participants, DR nominations make sense relative to their average hourly demand on non-event summer afternoons. For a handful of others, we would recommend reviewing the loads and nominations with Enbala (and possibly the customer).

### 5.1.2 Comparing DR Nominations and DR Performance

This section compares DR nominations with verified performance metrics (as calculated by the Evergreen team). The metric our team reviewed was the percent of the nomination achieved, calculated as follows:

$$Percent\ of\ Nomination\ Achieved = 100\% * \frac{Verified\ Reduction}{Nominated\ Reduction}$$

Figure 43 shows the distribution of these percentages. For each participant, unique percentages were calculated for each event, using the nomination for the relevant month. Sites that did not participate in a certain event day are not included in this analysis. Instances where actual reductions do not exceed nominated reductions result in percentages that are less than 100 percent, and vice-versa. The majority of the distribution falls below 100 percent, implying that most sites did not achieve their nominated load reduction on most event days. An achievement percentage less than zero means the DR performance for the event was negative.

**Figure 43: Distribution of Percent Differences**

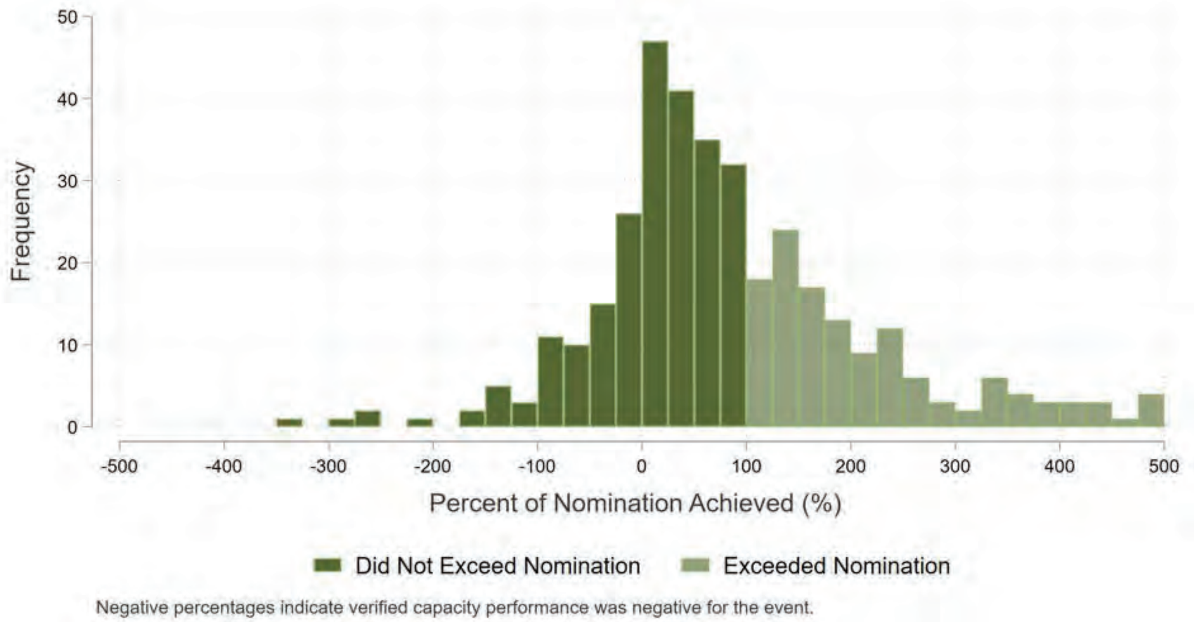



Table 41 groups participants based on how their verified reductions compared to their nominated reductions. Several participants made a bulk nomination for their multiple sites. Of the 131 participants, 44 exceeded their nomination on average.[15] Another 67 participants – accounting for roughly 89 percent of the total nominations – did not exceed their nomination but did provide demand reductions. Figure 44 shows, on average, what percentage of their nomination each site achieved. The 16 participants with negative verified reductions are not included in the figure. Four of these 16 sites have solar PV and six of them are schools.

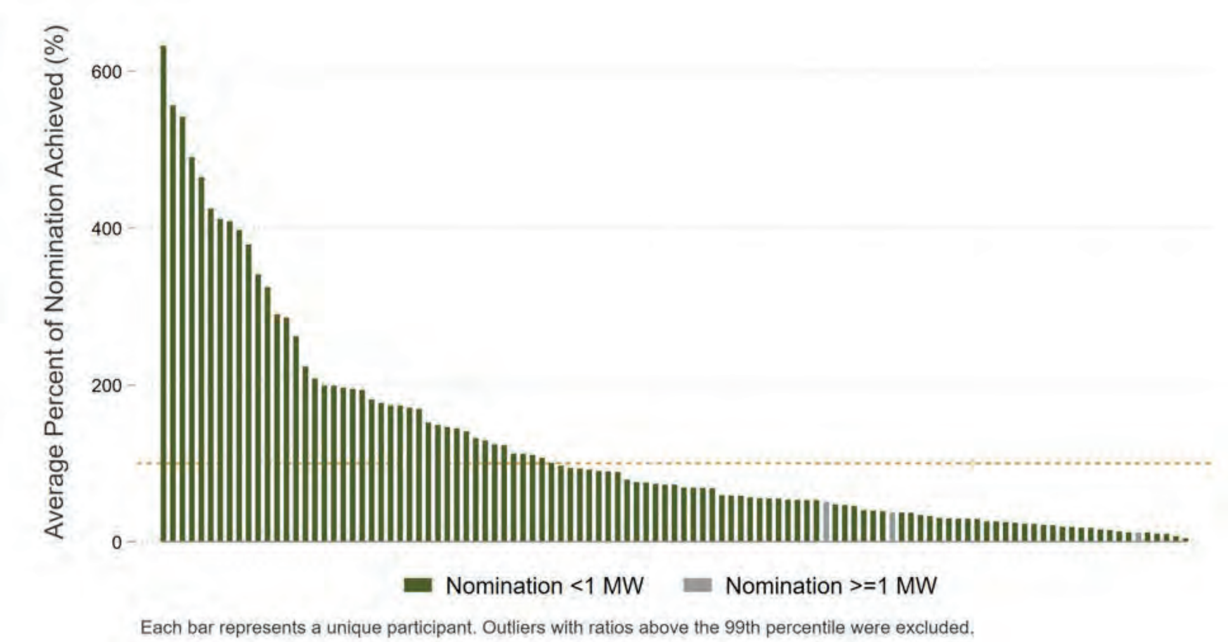
[15] Recall that sites are aggregated to the participant level. Some participants had multiple sites.

## Table 41: Comparing Performance and Nominations

| Result | Frequency | Aggregate Nomination (kW)[1] |
|---|---|---|
| Did Not Exceed Nomination | 67 | 22,300 |
| Exceeded Nomination | 44 | 2,020 |
| Negative Performance | 16 | 660 |
| Nomination of 0 kW | 4 | 0 |
| **Total** | **131** | **24,980** |

[1] Participant-level nominations are averaged across the summer before aggregating.

## Figure 44: Average Performance by Site



# Appendix H: Commercial Comprehensive Desk Review Results Summary

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project ID** | PNM-22-04735 | PNM-22-04726 | PNM-22-04724 | PNM-22-04722 | PNM-22-04713 | PNM-22-04698 | PNM-22-04697 |
| **Utility** | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| **Program** | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| **Component** | Retrofit Rebate | Multifamily | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | New Construction | New Construction |
| **Sampling Group** | Custom | Multifamily | Lighting | Lighting | HVAC | New Construction | New Construction |
| **Project Description** | Custom - High Efficient Transformers and Building Envelopment improvement | Exterior LED fixture retrofit | Lowe's Multisite Lighting Retrofit | Installation of new high-efficiency lighting fixtures | 10 Ton Roof Top AC unit retrofitting in a retail space | HVAC + LPD | Energy efficient lighting installation in exterior spaces ( Soccer and Baseball field) |
| **Building Type** | Miscellaneous | Multifamily | Retail | Heavy Industry | Retail | Education | Exterior |
| **Other Building Type** | | | | | | | |
| **Site Visit Being Conducted** | No | No | No | No | No | Yes | No |
| **Gross Reported kWh** | 74,606 | 89,876 | 1,245,693 | 149,361 | 1,551 | 19,844 | 223,452 |
| **Gross Reported kW** | 35.00 | 0.00 | 51.99 | 19.96 | 0.39 | 4.53 | 0.00 |
| **Gross Verified kWh** | 58,034 | 89,876 | 1,253,720 | 145,888 | 1,503 | 20,685 | 248,280 |
| **Gross Verified kW** | 2.38 | 0.00 | 59.38 | 19.62 | 0.92 | 6.63 | 0.00 |
| **kWh Realization Rate** | 0.78 | 1.00 | 1.01 | 0.98 | 0.97 | 1.04 | 1.11 |
| **kW Realization Rate** | 0.07 | | 1.14 | 0.98 | 2.35 | 1.46 | |
| **Calculation Assessment** | Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for." | | | | | | |
| **Reasons for RR(s) <> 1** | For Efficient Transformer Measure :<br>Change in calculation approach. Baseline transformer efficiency values are much lower than that of federal minimum efficiency levels. PNM Workpaper methodology used in "NEMA Premium Low Voltage Dry-Type Distribution Transformers " measure seemed more appropriate and savings calculations are revised accordingly. This Resulted in the reduction of both kWh and kW savings.<br>For Building Envelope Improvement Measure :<br>Sensible Heat Coefficient used in heating load reduction calculation is changed to 1.08 from 0.85 ( (Btu/hr)/cfmDeg.F). This resulted in the increase of kWh savings. | | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.196 and 1.283) and CF (0.83) associated with a Retail/Service building type. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.024 and 1.054) and CF (0.85) associated with a Heavy Industry building type listed in the workpapers. The evaluation team calculated the controls savings using a controls factor of 0.24 and 20,915 connected Watts. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | The discrepancy between the ex ante and ex post savings is not known. The evaluation team used the savings methodology in the NM TRM to calculate the savings for one, 9.4 ton unitary AC with an efficiency of 12.4 in a Retail/Service building type. | The ex ante LPD calculation used the "Education, K-12 School" building type for operating hours, HVAC EIF interactive factor, and CDF. The application lists the building type as "College/University," which was used in the ex post calculation. These changes affected RRs.<br><br>It is unclear why kWh RR increased for the HVAC measures. kW increased due to the use of the College/University CF (0.87, Las Cruces) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34, Albuquerque). | Reported savings consider Factor of Safety of 10% which is causing variation of roughly 11% in the verified savings . The evaluation team removed the Safety Factor when calculating the verified savings. No other adjustments were made. |

| Project ID | PNM-22-04693 | PNM-22-04663 | PNM-22-04661 | PNM-22-04659 | PNM-22-04658 | PNM-22-04643 | PNM-22-04639 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | New Construction |
| Sampling Group | Lighting | HVAC | HVAC | HVAC | Custom | Lighting | New Construction |
| Project Description | Replacing exterior HID with LED | VFD retrofitting in a retail facility | VSD on Supply Fans | VSD on Supply Fans | Installation of new high-efficient stage lighting | Installation of new high-efficiency lighting fixtures | Custom (LPD + HVAC) |
| Building Type | K-12 School | Retail | Retail | Retail | Miscellaneous | Retail/Service | Office |
| Other Building Type | | | | | | | |
| Site Visit Being Conducted | No | No | No | No | No | No | Yes |
| Gross Reported kWh | 352,371 | 30,495 | 67,089 | 81,320 | 17,555 | 1,256,963 | 13,976 |
| Gross Reported kW | 0.00 | 4.29 | 9.44 | 11.44 | 12.15 | 37.72 | 3.06 |
| Gross Verified kWh | 352,371 | 30,495 | 67,089 | 81,320 | 20,859 | 1,272,898 | 10,531 |
| Gross Verified kW | 0.00 | 4.29 | 9.44 | 11.44 | 15.12 | 40.86 | 2.47 |
| kWh Realization Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.19 | 1.01 | 0.75 |
| kW Realization Rate | | 1.00 | 1.00 | 1.00 | 1.24 | 1.08 | 0.81 |
| Calculation Assessment | | | | | Custom calculation was used to determine the Ex-Ante Savings. No HVAC interactive factors were used in the analysis so confirmation required whether the space is conditioned or not. Building type is mentioned as "Miscellaneous" in the Application while it is mentioned as " Assembly" in UCT document. Hours of Use is considered to be 20 hours per week ( confirmation required ). | | Both measures were calculated using utility workpapers. There were no issues with the LPD calculation. The ex post approach for the heat pump calculation used deemed savings and bonus savings from the workpaper workbook. |
| Reasons for RR(s) <> 1 | | | | | HVAC Interactive factors were not considered in the Ex-Ante analysis. Ex post analysis used TRM values for HVAC interactive factors considering the space type to be " Assembly " | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.196 and 1.283) and CF (0.83) associated with a Retail/Service building type. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | RRs decreased for the LPD calculations. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis, which decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. The removal of ineligible fixtures and reduction in square footage decreased RRs.<br><br>It is unclear why kWh RR increased for the HVAC measure. kW increased due to the use of the Office CF (0.67) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34). |

| Project ID | PNM-22-04638 | PNM-22-04631 | PNM-22-04624 | PNM-22-04623 | PNM-22-04622 | PNM-22-04602 | PNM-22-04597 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Multifamily |
| Sampling Group | Custom | Custom | Lighting | Lighting | Lighting | HVAC | Multifamily |
| Project Description | LED Grow Lights and Dehumidifiers | Custom Refrigeration | Exterior Lighting Replacement | Interior LED lighting and controls | Exterior LED pole lamps replacing HID | VSD on Supply Fans | Air-cooled chiller retrofit (27.6 Tons) |
| Building Type | Warehouse/ Industrial | Grocery | Exterior | Retail | Exterior | Retail | Miscellaneous |
| Other Building Type | | | | | Restaurant | | Apartments |
| Site Visit Being Conducted | Yes | Yes | Yes | No | No | No | No |
| Gross Reported kWh | 253,526 | 127,724 | 1,699,022 | 19,058 | 22,213 | 66,072 | 1,622 |
| Gross Reported kW | 31.19 | 10.83 | 0.00 | 5.60 | 0.00 | 9.30 | 3.94 |
| Gross Verified kWh | 241,026 | 127,724 | 1,699,046 | 25,419 | 20,848 | 66,073 | 974 |
| Gross Verified kW | 34.43 | 10.83 | 0.00 | 6.18 | 0.00 | 9.30 | 1.57 |
| kWh Realization Rate | 0.95 | 1.00 | 1.00 | 1.33 | 0.94 | 1.00 | 0.60 |
| kW Realization Rate | 1.10 | 1.00 | | 1.10 | | 1.00 | 0.40 |
| Calculation Assessment | LED Grow Lights used algorithms for Commercial Grow Lights from version 10 of the IL TRM. A custom calculation was used for the Dehumidifiers referencing "FES- A22 Dehumidification for Indoor Horticultural Facilities." For both kWh and kW calculations, energy efficient kWh/kW was subtracted from base kWh/kW, respectively. | The custom calculation determined the annual kWh/ft avoided by retrofitting 230 linear feet of medium temperature glass doors onto existing cases. The annual energy consumption with the glass doors was subtracted from the annual energy consumption without the glass doors. Demand savings were calculated similarly. Assumptions from the ex ante calculator included:<br>-Use of actual running time of condensing unit (off during defrosts)<br>-Use of actual operation time of fans, defrost heat<br>-Use of 24 hr/day operation of lights, anti-condensate heat<br>-Case refrigeration requirement (Q) was determined in accordance with ASHRAE 72 or 117<br>-Compressor suction temp was evap temp - 2°F for medium temp, evap temp - 3°F for low temp EER is determined via ARI 1200, Table 1<br>-Existing lighting was shown as Efficient Lights LEDs | Prescriptive (TRM, Workpaper) | | | The calculation approach used the prescribed measure for Variable-Speed Drives for HVAC Applications in the 2021 PNM workpaper. Energy and demand savings for HVAC VFDs were estimated from a study sponsored by Northeast Energy Efficiency Partnerships. HVAC applications specific to heating or cooling were adjusted for New Mexico climate zones. Annual kWh and kW savings for Supply Fans are listed per HP in the workpaper and are based on the Albuquerque climate zone. The annual energy savings for Supply Fans is 2033 kWh. This value was multiplied by equipment quantity and HP. Demand savings for Supply Fans is 0.286. This value was multiplied by equipment quantity and HP. | Difference in kWh savings is probably due to cooling EFLH. Difference in kW savings is probability due to a different baseline efficiency considered. |
| Reasons for RR(s) <> 1 | kWh and kW RRs were affected by a modification to the Energy Factor_EE (EF) for the Quest 225 unit. The algorithm provided requires this variable to be in L/kWh. The ex ante calculation used 6.1, which is the efficiency in PINTS/kWh. According to the Quest website (specifications were not provided for this model), EF for a water removal of 225 pints/day is 2.9 L/kWh. This change reduced RRs. | | | The evaluation team calculated the ex post savings using the fixture types, fixture quantities, and fixture input power that were listed on the Lighting tab of the Final Application. The ex post calculations used the HOUs, CF, and HVAC factors for a Retail/Service building type listed in the 2021 PNM workpapers. The lighting controls ex post calculations used a savings factor of 0.24 for 400 controlled watts. | App summary states 22,213 kWh savings, ex ante calcs via final app state 20,792 kWh savings. - Ex post savings have 99.7% RR against ex ante, discrepancy due to HOU update from 52 hr/wk to 52.14 hr/wk. | | The evaluation team referenced the PY2021 PNM workpapers to calculate the verified ex post savings. Based on the supplied documentation, the reason for the discrepancy in savings is not clear. |

| Project ID | PNM-21-04545 | PNM-21-04539 | PNM-21-04495 | PNM-21-04462 | PNM-21-04418 | PNM-21-04416 | PNM-21-04414 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | New Construction | New Construction | Retrofit Rebate | Multifamily | BTU | Multifamily | BTU |
| Sampling Group | New Construction | New Construction | Lighting | Multifamily | Building Tune-Up | Multifamily | Building Tune-Up |
| Project Description | New construction lighting and HVAC | Installation of new high efficiency Lighting and HVAC units in a Warehouse | Lighting Retrofit | NC multifamily lighting and ASHP | Other | LED lighting retrofit | Other |
| Building Type | Warehouse/ Industrial | Warehouse/ Industrial | Retail | Multifamily | Hospital | Multifamily | Office |
| Other Building Type | | Office & Parking Lots | | | | | |
| Site Visit Being Conducted | Yes | Yes | No | Yes | No | No | No |
| Gross Reported kWh | 3,030,582 | 500,212 | 144,089 | 358,999 | 61,620 | 85,366 | 59,250 |
| Gross Reported kW | 332.49 | 72.31 | 18.80 | 51.79 | 0.00 | 16.10 | 0.00 |
| Gross Verified kWh | 3,030,945 | 547,743 | 153,142 | 147,204 | 61,620 | 41,459 | 59,250 |
| Gross Verified kW | 386.46 | 90.81 | 20.75 | 25.03 | 0.00 | 1.97 | 0.00 |
| kWh Realization Rate | 1.00 | 1.10 | 1.06 | 0.41 | 1.00 | 0.49 | 1.00 |
| kW Realization Rate | 1.16 | 1.26 | 1.10 | 0.48 | | 0.12 | |
| Calculation Assessment | The custom lighting calculation used 24/7 hours of operation with a 10% safety factor instead of NM TRM hours. | | | | | | |
| Reasons for RR(s) <> 1 | Ex post energy savings were slightly higher due to the removal of certain light fixtures in the custom lighting calculation. These fixtures were "Not Approved" on the electrical drawings. The fixtures used will need to be verified onsite. The ex post coincident demand savings were higher for HVAC calculations. The ex ante analysis appeared to multiply the demand savings by a CF of 0.34, which corresponds to "Commercial, General." The ex post analysis used a CF of 0.55, which corresponds to a Warehouse. | The discrepancy between the ex ante and ex post savings is not clear based on the supplied project documentation.<br><br>The evaluation team calculated the verified savings using the project specific details listed in the supplied project files. The ex post savings used HOU, HVAC factors, and CF values for an office, warehouse, and exterior building types. The evaluation team was able to use the appropriate factors for each building type based on the project documentation. | Baseline wattage and quantity has discrepancy in Lighting sheet and Lighting SOW sheet. Quantity of proposed fixture differs from Invoice and Lighting sheet. Proposed Fixture wattage is used as per DLC certificate. | Lighting - As ex-ante calculation file is not provided, exact reason for variation could not be identified. RR variation could be due to difference in the Baseline LPD values, HVAC interactive factors and CF between ex-ante and ex-post calculations. Ex-post analysis referred to PNM workpapers. As per post inspection file, ex-ante analysis had considered the building type as 'Medical' in place of 'Multifamily' in their analysis. The building type as per the application is Multifamily.<br><br>ASHP- As ex-ante calculation file is not provided, exact reason for variation could not be identified. RR variation could be due to differences in the EFLH and CF values between ex-ante and ex-post analysis. Ex-post analysis have referred to both PNM 2019 (for qualifying and baseline efficiency) and PNM 2021 (EFLH cooling, EFLH heating and CF as Multifamily was not a building type in PNM 2019 workpaper) workpapers. | | RR variation due to difference in HOU, HVAC interactive factors and CF for the Interior fixtures between ex-ante and ex-post analysis. As ex-ante calculation file has not been provided, it's not clear as to what factors and HOU were used in ex-ante analysis.<br><br>Ex-post analysis have used the factors corresponding to the Multifamily building type as mentioned in the application for the interior fixtures.<br><br>Baseline fixture wattage and qty. are taken from the 'Lighting' sheet in Final Application excel file.<br><br>Baseline incandescent fixture information is not provided. The fixture qty. is 121. Ex-post analysis have referred to PNM 2021 workpaper for baseline incandescent fixture wattage. | |

| Project ID | PNM-21-04354 | PNM-21-04339 | PNM-21-04323 | PNM-21-04277 | PNM-20-04194 | PNM-20-04137 | PNM-20-04135 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | New Construction | Multifamily | Retrofit Rebate | Retrofit Rebate | Multifamily | Multifamily | Multifamily |
| Sampling Group | New Construction | Multifamily | Other | Lighting | Multifamily | Multifamily | Multifamily |
| Project Description | Energy Efficient Lighting installation in a light manufacturing facility | New Construction Lighting and HVAC | Lighting Retrofit and LED Refrigeration case lighting | Retrofit of interior lighting and HVAC. | 0 | 0 | Installation of Efficient Light Fixtures for NC Building |
| Building Type | Warehouse/ Industrial | Multifamily | Retail | Office | Multifamily | Miscellaneous | Miscellaneous |
| Other Building Type | | | | | | | Residential - Multifamily |
| Site Visit Being Conducted | No | No | No | No | No | No | Yes |
| Gross Reported kWh | 38,165 | 71,463 | 27,390 | 304,923 | 133,200 | 64,284 | 385,457 |
| Gross Reported kW | 12.62 | 7.82 | 4.85 | 103.06 | 20.10 | 4.79 | 22.34 |
| Gross Verified kWh | 60,901 | 82,177 | 27,183 | 271,014 | 153,308 | 47,922 | 364,555 |
| Gross Verified kW | 13.81 | 7.85 | 4.98 | 50.29 | 22.86 | 6.57 | 30.75 |
| kWh Realization Rate | 1.60 | 1.15 | 0.99 | 0.89 | 1.15 | 0.75 | 0.95 |
| kW Realization Rate | 1.09 | 1.00 | 1.03 | 0.49 | 1.14 | 1.37 | 1.38 |
| Calculation Assessment | | | * Interior space lighting retrofit measure calculation is done using custom calculation approach. DLC certificates provided for Post fixture wattages. Annual hours of use considered to be 5068 ( Not from TRM )<br>* Refrigerated case lighting retrofit calculation is done using deemed values from TRM | | | SEER baseline value for AC is taken from Workpaper 2019, factor of safety is not considered in kWh saving calculations, | The calculation methodology is based on Utility Workpaper and New Mexico TRM 2021 |
| Reasons for RR(s) <> 1 | The facility is broadly classified as a Workshop. However, it has an office, a juice processing space and a refrigerated product storage. This means HVAC interaction factors could vary from space to space in the interior. The lighting is intended to operate for 24 hours, but occupancy sensors are installed, which may affect the operating hours. These two reasons are the causes for RR variation. | Lighting- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference between the LPD Baseline, HVAC Interactive factors and CF between ex-ante and ex-post analysis. Ex-post analysis have referred to the PNM workpapers for these factors. Source of ex-ante factors is not clear.<br><br>ASHP- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference in capacity and EFLH values between ex-ante and ex-post analysis. Ex-post analysis have referred to both PNM 2019 (for qualifying and baseline SEER values) and PNM 2021 (EFLH cooling, EFLH heating and CF as Multifamily was not a building type in PNM 2019 workpaper) workpapers. Capacity used in ex-post calculations is as per the attached AHRI certificates. | HVAC interactive factors were not considered for lighting retrofit measure in the Ex-Ante calculation. Annual Hours of use value updated from TRM | Occupancy sensor savings have been claimed but exact information of sensor is not provided. HVAC savings calculation is done using TRM methodology. | Lighting- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference between the LPD Baseline, HVAC Interactive factors and CF between ex-ante and ex-post analysis. Ex-post analysis have referred to the PNM workpapers for these factors.<br><br>ASHP & RTU- Exact reason for kWh RR variation could not be identified. | The discrepancy in savings is not known for the kWh savings. Difference in kW RR is due to difference in CF assumption for both lighting and HVAC. | Discrepancy between Tracking Data and Application Summary (Dt. 7/12/2022) is observed.<br>Ex-post new fixtures exterior lighting calculations were based on calculated LPD. Slight reduction in kWh is observed because of rounding error. Slight variation in peak kW savings for interior lighting is observed. No ex ante calculation file for lighting was present, so exact reason for the discrepancy cannot be determined.<br>Ex ante considered TRM based value of 127 kWh for Efficient rated unit electricity consumption for ENERGY STAR Washer. Ex post considered 123 kWh as per specifications sheet.<br>Ex post calculations for ASHP were based on NM 2021 TRM section 4.13 Heat Pumps for Residential areas. No ex ante calculation file for this measure was present, so exact reason for the discrepancy cannot be determined. |

| Project ID | PNM-20-03988 | PNM-19-03861 | PM-22-05849 | 19884 | 19808 | 19761 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Midstream | Multifamily | Multifamily | Multifamily |
| Sampling Group | Custom | HVAC | Midstream | Multifamily | Multifamily | Multifamily |
| Project Description | Custom - Transformers | VRFs, Transformers (custom), Wall insulation (custom) | Installing high-efficient Refrigerators | Replacing existing lighting fixtures with energy efficient LED fixtures in exterior spaces | LED Retrofit | Replacement of Existing Lighting Fixtures with LED Fixtures |
| Building Type | Office | Office | Retail | Miscellaneous | Multifamily- common areas | Exterior |
| Other Building Type | | | | Exterior and Interior | | |
| Site Visit Being Conducted | No | Yes | No | No | No | No |
| Gross Reported kWh | 130,319 | 367,045 | 3,911 | 13,191 | 72,745 | 38,255 |
| Gross Reported kW | 124.94 | 191.00 | 0.45 | 0.33 | 0.22 | 1.63 |
| Gross Verified kWh | 130,320 | 258,653 | 4,169 | 13,960 | 73,089 | 35,771 |
| Gross Verified kW | 124.93 | 216.07 | 0.45 | 0.04 | 0.03 | 0.00 |
| kWh Realization Rate | 1.00 | 0.70 | 1.07 | 1.06 | 1.00 | 0.94 |
| kW Realization Rate | 1.00 | 1.13 | 0.99 | 0.11 | 0.12 | 0.00 |
| Calculation Assessment | Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for." | The ex post approach for the VRF calculation used deemed savings and bonus savings from the workpaper workbook.<br><br>Transformers -<br><br>Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for."<br><br>Wall Insulation -<br><br>kW: The kW usage for the following factors were initially considered: space cooling, heat rejection, refrigeration, space heat, HP supp., hot water, vent. fans, pumps and aux., ext. usage, misc. equip, task lights, and area lights. The kW usage of those factors were totaled for each month from January to December for both the roof and the wall insulation. kW from the walls was subtracted from kW from the roof for each month. The sum of the savings for each month resulted in an annual savings of 164 kW.<br><br>kWh: The kWh (on-peak and off-peak) usage for each factor above was totaled for each month from January to December for both the roof and the wall insulation. Total kWh from the walls was subtracted from total kWh from the roof for each month. The sum of the savings for each month resulted in an annual savings of 102,063 kWh. | Energy saving per Cu.ft of refrigerated volume was obtained from Work paper and Volume was obtained from Energy star certificate | Weekly operating hours are listed in the application summary which are multiplied by 52.1429 to get the annual operating hours. | | Weekly operating hours are listed in the application summary which are multiplied by 52.1429 to get the annual operating hours. |
| Reasons for RR(s) <> 1 | | kWh and kW RRs are affected by the VRF measure. It is unclear why kWh RR increased for the VRF measure. kW increased due to the use of the Office CF (0.67) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34). | 9 Out of 12 refrigerator units were considered as glass door refrigerators but those models are actually solid door refrigerators as per the Energy Star Certificates | RR variation is probably due to a different value of HVAC factor considered for Multifamily unit> interior spaces rather than exterior spaces (which is 1). Higher kW savings also indicates that a non-zero CF value is considered for exterior spaces, which may result in the higher peak savings. | Reported peak demand savings of 0.22kW is actually just the kW reduction without the CF and HVAC interactive factors applied. | All measures seem to be installed in Exterior spaces (from the pictures), however there are demand savings reported, which means a non-zero CF value is used. RR variation could be due to difference in baseline wattages between ex ante and ex post and HVAC factor considered for Multifamily unit, interior spaces rather than exterior spaces. |

| Project ID | 19495 | PM-21-05702 | 19801 | 19818 | 19858 | 19902 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Multifamily | Midstream | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Sampling Group | Multifamily | Midstream | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | LED lighting retrofit | HVAC | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures | Installation of LED light fixtures (exterior) and removal of MH fixtures | Installation of interior and exterior LED fixtures |
| Building Type | Multifamily - common areas IQ | Miscellaneous | Miscellaneous | Miscellaneous | Exterior | Retail |
| Other Building Type | | Commercial, General | Commercial, General | Commercial, General | Commercial, General for interior fixtures | Gas station |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 145,079 | 216,188 | 64,224 | 136,146 | 159,956 | 11,641 |
| Gross Reported kW | 4.90 | 21.95 | 7.80 | 9.43 | 8.77 | 0.74 |
| Gross Verified kWh | 163,639 | 384,294 | 76,190 | 145,406 | 167,099 | 12,792 |
| Gross Verified kW | 0.60 | 46.22 | 6.68 | 8.47 | 7.87 | 0.79 |
| kWh Realization Rate | 1.13 | 1.78 | 1.19 | 1.07 | 1.04 | 1.10 |
| kW Realization Rate | 0.12 | 2.11 | 0.86 | 0.90 | 0.90 | 1.07 |
| Calculation Assessment | | | | | | |
| Reasons for RR(s) <> 1 | Ex-ante savings could not be replicated. Variation could be due to difference in the baseline wattages, HVAC interactive factors and CF between the ex-ante and ex-post analysis.<br><br>Ex-ante calculations were not provided. | For Heat Pumps and VRF systems, the cooling and heating savings are calculated separate which resulted in a reduction in heating kWh Savings. Ex-Ante calculation used the cumulative table ( Both Heating and Cooling Savings<br>For Heat Pumps, conversion factor used to arrive at Heating demand savings was 12/3.412 instead of 12 for units Less than or equal 5.4 tons (HSPF considered not COP). It was corrected for Ex-Post calculations and the Heating kWh savings increased.<br>" Commercial, General" Building type was used in most of the cases for calculating the Peak KW Savings. Ex-Post calculation considers particular building types mentioned in the files. This resulted in an increase in Ex-Post Peak Coincident kW savings. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation assumed all fixtures were interior and used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. The CF for one fixture was changed to 0 in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), has all line items are marked "N." The ex post calculation assumed one line item was an exterior fixture based on the photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Other Notes:<br>• 3-4' 40W T12, Magnetic Ballast (2) - Not available in Fixture List on PNM workpaper. This assumes a ballast factor of approximately 1.19 for 3 40 W fixtures.<br>• 2-4' 40W T12, Magnetic Ballast (1)) - Not available in Fixture List on PNM workpaper. This assumes a ballast factor of approximately 1.075 for 2 40 W fixtures.<br>• What is the justification for HOU for some locations (i.e., 168 hours per week for a storage rooms; are there no controls?); there may be an opportunity for the installation of controls | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications).<br><br>Lastly, the tracking data and ex ante calculation are missing line item #23 (see post inspection document>Lighting Summary Table, page 2 of 3>"Item #" column). The ex post calculation included line item #23 because it was verified as installed in the project documentation, including a photo. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The post inspection document (Lighting Summary Table, page 2 of 3) lists fixtures (that are being removed) in column name "Outside" as "N," which is assumed to mean "no." There were no photos in the project documentation of these removed fixtures to indicate whether they were interior or exterior. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for indoor fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type. These modifications increased RRs.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 2-4' 32W-T8-HPEB1-R). The ex ante calculation used 74 W, whereas the ex post calculation used 70 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). |

| Project ID | 19938 | 19797 | 19326 | 19563 | 19612 | 19643 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Sampling Group | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures | Lighting Retrofit | Replacement of Light Fixtures with LED | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs |
| Building Type | Restaurant - Sit Down | Warehouse/ Industrial | Miscellaneous | Miscellaneous | Miscellaneous | Exterior |
| Other Building Type | | | Car Dealership | Entertainment | Church | |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 4,473 | 123,912 | 105,313 | 155,649 | 59,746 | 73,345 |
| Gross Reported kW | 1.02 | 24.61 | 23.76 | 24.94 | 0.00 | 0.00 |
| Gross Verified kWh | 5,032 | 126,788 | 124,013 | 179,685 | 59,746 | 87,714 |
| Gross Verified kW | 0.74 | 14.50 | 21.33 | 14.39 | 0.00 | 0.00 |
| kWh Realization Rate | 1.13 | 1.02 | 1.18 | 1.15 | 1.00 | 1.20 |
| kW Realization Rate | 0.73 | 0.59 | 0.90 | 0.58 | | |
| Calculation Assessment | | | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. |
| Reasons for RR(s) <> 1 | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for both interior and exterior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The CF for exterior fixtures was changed to 0 in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3) lists some fixtures as having a location "Outside" in the Location column. In another column in the same table (column name "Outside"), all items are marked "N." The ex post calculation assumed the "Outside" space types were indeed exterior fixtures based on the pre- and post-inspection photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 2-4' 32W-T8-HPEB1-R). The ex ante calculation used 74 W, whereas the ex post calculation used 70 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RRs (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for both interior and exterior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Storage – Unconditioned.<br><br>It is important to note there is conflicting information in the project documentation. In the post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), all items are marked "N." The ex post calculation assumed that some space types were indeed exterior fixtures based on the photographs in the project documentation. As such, the CF for exterior fixtures was changed to 0 in the ex post calculation.<br><br>These modifications increased kWh RR and decreased kW RR. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Note: It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation assumed all fixtures were interior (with the exception of line item #77) and used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. The CF for several exterior fixtures were changed to 0 in the ex post calculation. The ex ante calculated assumed these fixtures were interior. These modifications increased kWh RR and decreased kW RR.<br><br>It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), has all line items are marked "N," with the exception of line item #77. | | The ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 175 Watt Metal Halide). The ex ante calculation used 150.5 W, whereas the ex post calculation used 215 W, based on the PNM workpaper fixture list. The 175 W MH fixture was verified in the project photos. This modification increased the kWh RR. |

| Project ID | 19704 | 19723 | 19766 | 19788 | 20066 | 20072 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Retrofit Lighting | Retrofit Lighting |
| Sampling Group | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures |
| Building Type | Exterior | Miscellaneous | Miscellaneous | Warehouse/ Industrial | Miscellaneous | Miscellaneous |
| Other Building Type | | Government City/County | Shipping Service Center | | Commercial, General | Commercial, General |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 45,694 | 66,101 | 384,261 | 18,739 | 239,979 | 347,729 |
| Gross Reported kW | 0.00 | 10.94 | 57.44 | 6.01 | 25.10 | 83.73 |
| Gross Verified kWh | 45,694 | 78,726 | 451,244 | 19,638 | 280,434 | 409,766 |
| Gross Verified kW | 0.00 | 9.83 | 51.41 | 4.60 | 22.75 | 72.42 |
| kWh Realization Rate | 1.00 | 1.19 | 1.17 | 1.05 | 1.17 | 1.18 |
| kW Realization Rate | | 0.90 | 0.89 | 0.77 | 0.91 | 0.86 |
| Calculation Assessment | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) |
| Reasons for RR(s) <> 1 | The ex post calculation includes custom LED signage kWh. No custom calculations were present in project documentation. It is important to include custom calculations in project files so that savings can be reproduced.<br><br>Additionally, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage did not greatly influence savings due to the low quantity of these fixtures. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for the fixtures. All fixtures are interior as depicted in the photos in the project documentation. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type. The building type selected was Storage - Unconditioned. The project documentation only described the building type as "warehouse" and did not specify whether or not it was conditioned. It is assumed this space is unconditioned. These modifications increased kWh RR and decreased kW RR.<br><br>Other Notes:<br>• 4-4' 32W-T8-HPEB1 is not in the Fixture List on the PNM workpaper.<br>• Some of the lamps in the fixture are burnt out from the photos. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 4-4' 54W-T5-EB1). The ex ante calculation used 226 W, whereas the ex post calculation used 234 W, based on the PNM workpaper fixture list. This modification (increase) to the baseline fixture wattage led to a slight increase in the RRs. It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for ALL fixtures (note: there was an assumption that all fixtures were interior). The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. For exterior fixtures, a CF of 0 was used in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table) lists two fixtures as having a location "Outside" in the Location column. In another column in the same table (column name "Outdoor"), all items are marked "N." The ex post calculation assumed the "Outside" space types were indeed exterior fixtures based on the pre- and post-inspection photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR. It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List. |

| **Project ID** | PNM-21-04441 | PNM-21-04453 | PNM-22-04609 | PM-22-05980 | PM-22-06116 | PNM-21-04415 | PNM-21-04583 |
|---|---|---|---|---|---|---|---|
| **Utility** | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| **Program** | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| **Component** | New Construction Lighting | New Construction Lighting, HVAC, and Custom | New Construction Lighting | Retrofit HVAC | Energy Star Refrigerators/Freezers | Building Tune-Up | Retrofit Custom |
| **Sampling Group** | New Construction | New Construction | New Construction | Midstream | Midstream | Building Tune-Up | Custom |
| **Project Description** | New construction interior and exterior lights | Installation of HVAC, interior and exterior lighting. Also custom geothermal source heat pump installed. | Horticulture Lighting | HVAC | Energy Star Refrigerators/Freezers | Other | Water-Cooled Chillers, VSD on HVAC Motors, Motors & VSDs, HVAC Controls, Cooling Tower |
| **Building Type** | Retail | Miscellaneous | Miscellaneous | Miscellaneous | Miscellaneous | Office | Office |
| **Other Building Type** | | Commercial, General (Library) | Horticultural | | | | |
| **Site Visit Being Conducted** | No | No | No | No | No | No | No |
| **Gross Reported kWh** | 49,318 | 67,879 | 120,914 | 79,752 | 10,644 | 61,620 | 855,559 |
| **Gross Reported kW** | 7.33 | 21.24 | 0.00 | 8.40 | 1.17 | 0.00 | 74.21 |
| **Gross Verified kWh** | 49,921 | 61,101 | 119,738 | 104,588 | 10,356 | 61,620 | 855,559 |
| **Gross Verified kW** | 7.32 | 21.11 | 0.00 | 17.23 | 1.12 | 0.00 | 74.21 |
| **kWh Realization Rate** | 1.01 | 0.90 | 0.99 | 1.31 | 0.97 | 1.00 | 1.00 |
| **kW Realization Rate** | 1.00 | 0.99 | | 2.05 | 0.96 | | 1.00 |
| **Calculation Assessment** | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) & Custom Calculation | Custom Calculation | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Custom Calculation |
| **Reasons for RR(s) <> 1** | The discrepancy in savings is due to operational hours and interactive factor selection. The ex post calculation used a Retail building type (with the exception of exterior light fixtures). | The discrepancy in savings is due to operational hours and interactive factor selection. The building type was modified to Commercial, General to be consistent across all prescriptive measures in this project (with the exception of exterior light fixtures). | The discrepancy in savings is due to the use of DLC tested wattage in the ex post calculation. Also, it is important to note that both the ex ante and ex post calculations are assuming no cooling. | The evaluation team used the prescriptive savings methodology from the NM TRM to calculate savings for these HVAC measures. The discrepancy in savings is not known. | No ex-ante calcs or line-by-line savings provided. The discrepancy could be due to different volume values stated. | | |

| Project ID | PNM-22-04608 | PNM-22-04715 | PNM-22-04795 | PNM-22-04813 | PNM-22-04817 |
|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Custom | New Construction Lighting | New Construction Lighting | Retrofit Lighting | Custom Horticultural Lighting, Custom Horticultural Dehumidification |
| Sampling Group | Custom | New Construction | New Construction | New Construction | Custom |
| Project Description | HVAC & indoor horticulture lighting | LPD + HVAC | LPD + HVAC | Installation of new high efficiency HVAC/ custom HVAC units and lighting/ custom lighting measures | LED Grow Lights, Dehumidifiers |
| Building Type | Miscellaneous | Health | Health | Miscellaneous | Warehouse/Industrial |
| Other Building Type | Horticultural | Hospital | Medical/Hospital | | Light Industry |
| Site Visit Being Conducted | No | No | No | No | No |
| Gross Reported kWh | 424,745 | 1,585,948 | 610,919 | 3,086,174 | 1,002,404 |
| Gross Reported kW | 84.60 | 231.17 | 81.40 | 225.81 | 61.35 |
| Gross Verified kWh | 474,856 | 1,321,318 | 534,205 | 2,525,343 | 1,072,257 |
| Gross Verified kW | 100.96 | 204.76 | 106.97 | 334.79 | 209.92 |
| kWh Realization Rate | 1.12 | 0.83 | 0.87 | 0.82 | 1.07 |
| kW Realization Rate | 1.19 | 0.89 | 1.31 | 1.48 | 3.42 |
| Calculation Assessment | Custom Calculation | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) & Custom Calculation | Custom Calculation |
| Reasons for RR(s) <> 1 | Lighting (Retrofit & NC): The evaluation team referenced the IL TRM for this measure and used NM interactive factors for Commercial/General. HVAC interactive factors were considered for the LED lights in the ex post calculation while the ex ante calculation did not. Annual hrs & CF 0.9 is considered for both measures as per ex ante calculations.<br>HVAC VRF & AC : CF 0.9 is considered for both measures as per ex ante calculations. | LPD<br>RRs decreased due to the interior LPD calculation. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis. Additional fixtures were removed from the analysis because the submittals stated these fixtures were not approved. These modifications decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. The removal of ineligible fixtures and reduction in square footage decreased RRs.<br><br>HVAC<br>The ex ante calculation used a CF of 0.49 (Commercial, General), whereas the ex post calculation used a CF of 0.63 (Medical). This modification increased the kW savings for the water-cooled chiller measure.<br><br>It is unclear why kWh RR increased for the HVAC measure. Since the ex ante calculation was not provided, the exact reason cannot be determined. The discrepancy may be due to the use of a different EFLH for the ex post calculation based on the building type. | LPD<br>RRs decreased due to a modification to the LPD calculation for the warehouse. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis, which decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Additionally, one fixture type was given as 19.1 W in the ex ante calculation. The ex post calculation used 19.9 W per DLC. The removal of ineligible fixtures, reduction in square footage, and use of DLC wattage decreased RRs.<br><br>VRF<br>It is unclear why kWh RR increased for the VRF measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34).<br><br>ASHP<br>It is unclear why kWh RR decreased for the ASHP measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34).<br><br>Unitary & Split AC<br>It is unclear why kWh RR increased for the Unitary & Split AC measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34). | Interior kWh and kW RRs are affected by a modification to the LPD calculation for the warehouse. One fixture type was not DLC or Energy Star certified and was removed from the analysis. It was assumed that the square footage illuminated by the ineligible fixture was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Additionally, DLC wattages were used in place of the wattages from ComCheck, which also affected RRs. Lastly, a CF was applied twice in the ex ante calculation. It was applied only once in the ex post analysis, which increased kW savings.<br><br>The exterior kWh RR is affected by a modification to the LPD calculation. One fixture type was not DLC or Energy Star certified and was removed from the analysis. Additionally, several fixture IDs from the ComCheck document were not in the exterior spec sheets in the project documentation. Since there was no way to verify the model numbers for these fixtures, they were removed from the analysis. It was assumed that the square footage illuminated by the ineligible fixtures (including those missing from the spec sheets) was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Furthermore, DLC wattages were used in place of the wattages from ComCheck, which also affected RRs. Lastly, the ex post analysis used HOU per the PNM workpaper for exterior fixtures. | Dehumidification: No ex-ante calculations were provided, and as such the discrepancy in savings could not be determined. The ex-post calculation references FES- A22 Dehumidification for Indoor Horticultural Facilities.<br><br>Horticultural Lighting: Ex-ante and ex-post calculation methodologies are consistent. The discrepancy in savings is due to the modification of quantities and wattages per invoices and DLC tested wattages, respectively. There is a large discrepancy in ex-ante vs ex-post peak kW; however, kW savings are consistent between both calculations. Assuming CF used in ex-ante peak kW inconsistent with methodology followed, could not verify as no ex-ante peak kW calcs were provided. |

| | |
|---|---|
| Project ID | PNM-19-03602 |
| Utility | PNM |
| Program | Commercial Comprehensive |
| Component | HVAC Custom |
| Sampling Group | Custom |
| Project Description | RCx Tier 2 |
| Building Type | Health |
| Other Building Type | Health Care |
| Site Visit Being Conducted | No |
| Gross Reported kWh | 950,950 |
| Gross Reported kW | 172.50 |
| Gross Verified kWh | 950,950 |
| Gross Verified kW | 172.50 |
| kWh Realization Rate | 1.00 |
| kW Realization Rate | 1.00 |
| Calculation Assessment | Custom Calculation |
| Reasons for RR(s) <> 1 | |

| Project ID | PNM-22-04735 | PNM-22-04726 | PNM-22-04724 | PNM-22-04722 | PNM-22-04713 | PNM-22-04698 | PNM-22-04697 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Multifamily | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | New Construction | New Construction |
| Sampling Group | Custom | Multifamily | Lighting | Lighting | HVAC | New Construction | New Construction |
| Project Description | Custom - High Efficient Transformers and Building Envelopment improvement | Exterior LED fixture retrofit | Lowe's Multisite Lighting Retrofit | Installation of new high-efficiency lighting fixtures | 10 Ton Roof Top AC unit retrofitting in a retail space | HVAC + LPD | Energy efficient lighting installation in exterior spaces ( Soccer and Baseball field) |
| Building Type | Miscellaneous | Multifamily | Retail | Heavy Industry | Retail | Education | Exterior |
| Other Building Type | | | | | | | |
| Site Visit Being Conducted | No | No | No | No | No | Yes | No |
| Gross Reported kWh | 74,606 | 89,876 | 1,245,693 | 149,361 | 1,551 | 19,844 | 223,452 |
| Gross Reported kW | 35.00 | 0.00 | 51.99 | 19.96 | 0.39 | 4.53 | 0.00 |
| Gross Verified kWh | 58,034 | 89,876 | 1,253,720 | 145,888 | 1,503 | 20,685 | 248,280 |
| Gross Verified kW | 2.38 | 0.00 | 59.38 | 19.62 | 0.92 | 6.63 | 0.00 |
| kWh Realization Rate | 0.78 | 1.00 | 1.01 | 0.98 | 0.97 | 1.04 | 1.11 |
| kW Realization Rate | 0.07 | | 1.14 | 0.98 | 2.35 | 1.46 | |
| Calculation Assessment | Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for." | | | | | | |
| Reasons for RR(s) <> 1 | For Efficient Transformer Measure : Change in calculation approach. Baseline transformer efficiency values are much lower than that of federal minimum efficiency levels. PNM Workpaper methodology used in "NEMA Premium Low Voltage Dry-Type Distribution Transformers " measure seemed more appropriate and savings calculations are revised accordingly. This Resulted in the reduction of both kWh and kW savings.<br>For Building Envelope Improvement Measure : Sensible Heat Coefficient used in heating load reduction calculation is changed to 1.08 from 0.85 ( (Btu/hr)/cfmDeg.F). This resulted in the increase of kWh savings. | | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.196 and 1.283) and CF (0.83) associated with a Retail/Service building type. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.024 and 1.054) and CF (0.85) associated with a Heavy Industry building type listed in the workpapers. The evaluation team calculated the controls savings using a controls factor of 0.24 and 20,915 connected Watts. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | The discrepancy between the ex ante and ex post savings is not known. The evaluation team used the savings methodology in the NM TRM to calculate the savings for one, 9.4 ton unitary AC with an efficiency of 12.4 in a Retail/Service building type. | The ex ante LPD calculation used the "Education, K-12 School" building type for operating hours, HVAC EIF interactive factor, and CDF. The application lists the building type as "College/University," which was used in the ex post calculation. These changes affected RRs.<br><br>It is unclear why kWh RR increased for the HVAC measures. kW increased due to the use of the College/University CF (0.87, Las Cruces) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34, Albuquerque). | Reported savings consider Factor of Safety of 10% which is causing variation of roughly 11% in the verified savings . The evaluation team removed the Safety Factor when calculating the verified savings. No other adjustments were made. |

| Project ID | PNM-22-04693 | PNM-22-04663 | PNM-22-04661 | PNM-22-04659 | PNM-22-04658 | PNM-22-04643 | PNM-22-04639 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | New Construction |
| Sampling Group | Lighting | HVAC | HVAC | HVAC | Custom | Lighting | New Construction |
| Project Description | Replacing exterior HID with LED | VFD retrofitting in a retail facility | VSD on Supply Fans | VSD on Supply Fans | Installation of new high-efficient stage lighting | Installation of new high-efficiency lighting fixtures | Custom (LPD + HVAC) |
| Building Type | K-12 School | Retail | Retail | Retail | Miscellaneous | Retail/Service | Office |
| Other Building Type | | | | | | | |
| Site Visit Being Conducted | No | No | No | No | No | No | Yes |
| Gross Reported kWh | 352,371 | 30,495 | 67,089 | 81,320 | 17,555 | 1,256,963 | 13,976 |
| Gross Reported kW | 0.00 | 4.29 | 9.44 | 11.44 | 12.15 | 37.72 | 3.06 |
| Gross Verified kWh | 352,371 | 30,495 | 67,089 | 81,320 | 20,859 | 1,272,898 | 10,531 |
| Gross Verified kW | 0.00 | 4.29 | 9.44 | 11.44 | 15.12 | 40.86 | 2.47 |
| kWh Realization Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.19 | 1.01 | 0.75 |
| kW Realization Rate | | 1.00 | 1.00 | 1.00 | 1.24 | 1.08 | 0.81 |
| Calculation Assessment | | | | | Custom calculation was used to determine the Ex-Ante Savings. No HVAC interactive factors were used in the analysis so confirmation required whether the space is conditioned or not. Building type is mentioned as "Miscellaneous" in the Application while it is mentioned as " Assembly" in UCT document. Hours of Use is considered to be 20 hours per week ( confirmation required ). | | Both measures were calculated using utility workpapers. There were no issues with the LPD calculation. The ex post approach for the heat pump calculation used deemed savings and bonus savings from the workpaper workbook. |
| Reasons for RR(s) <> 1 | | | | | HVAC Interactive factors were not considered in the Ex-Ante analysis. Ex post analysis used TRM values for HVAC interactive factors considering the space type to be " Assembly " | The evaluation team calculated the verified savings using the fixture quantities, fixture types, input fixture power, and annual hours of use listed in the Lighting SOW tab of the Final Application file for this project. For the interior lighting fixtures, the evaluation team used the interactive effects factors (1.196 and 1.283) and CF (0.83) associated with a Retail/Service building type. The evaluation team was not able to identify the discrepancy in energy and peak demand saving using the supplied project documentation. | RRs decreased for the LPD calculations. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis, which decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. The removal of ineligible fixtures and reduction in square footage decreased RRs.<br><br>It is unclear why kWh RR increased for the HVAC measure. kW increased due to the use of the Office CF (0.67) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34). |

| Project ID | PNM-22-04638 | PNM-22-04631 | PNM-22-04624 | PNM-22-04623 | PNM-22-04622 | PNM-22-04602 | PNM-22-04597 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Retrofit Rebate | Multifamily |
| Sampling Group | Custom | Custom | Lighting | Lighting | Lighting | HVAC | Multifamily |
| Project Description | LED Grow Lights and Dehumidifiers | Custom Refrigeration | Exterior Lighting Replacement | Interior LED lighting and controls | Exterior LED pole lamps replacing HID | VSD on Supply Fans | Air-cooled chiller retrofit (27.6 Tons) |
| Building Type | Warehouse/ Industrial | Grocery | Exterior | Retail | Exterior | Retail | Miscellaneous |
| Other Building Type | | | | | Restaurant | | Apartments |
| Site Visit Being Conducted | Yes | Yes | Yes | No | No | No | No |
| Gross Reported kWh | 253,526 | 127,724 | 1,699,022 | 19,058 | 22,213 | 66,072 | 1,622 |
| Gross Reported kW | 31.19 | 10.83 | 0.00 | 5.60 | 0.00 | 9.30 | 3.94 |
| Gross Verified kWh | 241,026 | 127,724 | 1,699,046 | 25,419 | 20,848 | 66,073 | 974 |
| Gross Verified kW | 34.43 | 10.83 | 0.00 | 6.18 | 0.00 | 9.30 | 1.57 |
| kWh Realization Rate | 0.95 | 1.00 | 1.00 | 1.33 | 0.94 | 1.00 | 0.60 |
| kW Realization Rate | 1.10 | 1.00 | | 1.10 | | 1.00 | 0.40 |
| Calculation Assessment | LED Grow Lights used algorithms for Commercial Grow Lights from version 10 of the IL TRM. A custom calculation was used for the Dehumidifiers referencing "FES- A22 Dehumidification for Indoor Horticultural Facilities." For both kWh and kW calculations, energy efficient kWh/kW was subtracted from base kWh/kW, respectively. | The custom calculation determined the annual kWh/ft avoided by retrofitting 230 linear feet of medium temperature glass doors onto existing cases. The annual energy consumption with the glass doors was subtracted from the annual energy consumption without the glass doors. Demand savings were calculated similarly. Assumptions from the ex ante calculator included:<br>-Use of actual running time of condensing unit (off during defrosts)<br>-Use of actual operation time of fans, defrost heat<br>-Use of 24 hr/day operation of lights, anti-condensate heat<br>-Case refrigeration requirement (Q) was determined in accordance with ASHRAE 72 or 117<br>-Compressor suction temp was evap temp - 2°F for medium temp, evap temp - 3°F for low temp EER is determined via ARI 1200, Table 1<br>-Existing lighting was shown as Efficient Lights LEDs | Prescriptive (TRM, Workpaper) | | | The calculation approach used the prescribed measure for Variable-Speed Drives for HVAC Applications in the 2021 PNM workpaper. Energy and demand savings for HVAC VFDs were estimated from a study sponsored by Northeast Energy Efficiency Partnerships. HVAC applications specific to heating or cooling were adjusted for New Mexico climate zones. Annual kWh and kW savings for Supply Fans are listed per HP in the workpaper and are based on the Albuquerque climate zone. The annual energy savings for Supply Fans is 2033 kWh. This value was multiplied by equipment quantity and HP. Demand savings for Supply Fans is 0.286. This value was multiplied by equipment quantity and HP. | Difference in kWh savings is probably due to cooling EFLH. Difference in kW savings is probability due to a different baseline efficiency considered. |
| Reasons for RR(s) <> 1 | kWh and kW RRs were affected by a modification to the Energy Factor_EE (EF) for the Quest 225 unit. The algorithm provided requires this variable to be in L/kWh. The ex ante calculation used 6.1, which is the efficiency in PINTS/kWh. According to the Quest website (specifications were not provided for this model), EF for a water removal of 225 pints/day is 2.9 L/kWh. This change reduced RRs. | | | The evaluation team calculated the ex post savings using the fixture types, fixture quantities, and fixture input power that were listed on the Lighting tab of the Final Application. The ex post calculations used the HOUs, CF, and HVAC factors for a Retail/Service building type listed in the 2021 PNM workpapers. The lighting controls ex post calculations used a savings factor of 0.24 for 400 controlled watts. | App summary states 22,213 kWh savings, ex ante calcs via final app state 20,792 kWh savings. - Ex post savings have 99.7% RR against ex ante, discrepancy due to HOU update from 52 hr/wk to 52.14 hr/wk. | | The evaluation team referenced the PY2021 PNM workpapers to calculate the verified ex post savings. Based on the supplied documentation, the reason for the discrepancy in savings is not clear. |

| Project ID | PNM-21-04545 | PNM-21-04539 | PNM-21-04495 | PNM-21-04462 | PNM-21-04418 | PNM-21-04416 | PNM-21-04414 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | New Construction | New Construction | Retrofit Rebate | Multifamily | BTU | Multifamily | BTU |
| Sampling Group | New Construction | New Construction | Lighting | Multifamily | Building Tune-Up | Multifamily | Building Tune-Up |
| Project Description | New construction lighting and HVAC | Installation of new high efficiency Lighting and HVAC units in a Warehouse | Lighting Retrofit | NC multifamily lighting and ASHP | Other | LED lighting retrofit | Other |
| Building Type | Warehouse/ Industrial | Warehouse/ Industrial | Retail | Multifamily | Hospital | Multifamily | Office |
| Other Building Type | | Office & Parking Lots | | | | | |
| Site Visit Being Conducted | Yes | Yes | No | Yes | No | No | No |
| Gross Reported kWh | 3,030,582 | 500,212 | 144,089 | 358,999 | 61,620 | 85,366 | 59,250 |
| Gross Reported kW | 332.49 | 72.31 | 18.80 | 51.79 | 0.00 | 16.10 | 0.00 |
| Gross Verified kWh | 3,030,945 | 547,743 | 153,142 | 147,204 | 61,620 | 41,459 | 59,250 |
| Gross Verified kW | 386.46 | 90.81 | 20.75 | 25.03 | 0.00 | 1.97 | 0.00 |
| kWh Realization Rate | 1.00 | 1.10 | 1.06 | 0.41 | 1.00 | 0.49 | 1.00 |
| kW Realization Rate | 1.16 | 1.26 | 1.10 | 0.48 | | 0.12 | |
| Calculation Assessment | The custom lighting calculation used 24/7 hours of operation with a 10% safety factor instead of NM TRM hours. | | | | | | |
| Reasons for RR(s) <> 1 | Ex post energy savings were slightly higher due to the removal of certain light fixtures in the custom lighting calculation. These fixtures were "Not Approved" on the electrical drawings. The fixtures used will need to be verified onsite. The ex post coincident demand savings were higher for HVAC calculations. The ex ante analysis appeared to multiply the demand savings by a CF of 0.34, which corresponds to "Commercial, General." The ex post analysis used a CF of 0.55, which corresponds to a Warehouse. | The discrepancy between the ex ante and ex post savings is not clear based on the supplied project documentation.<br><br>The evaluation team calculated the verified savings using the project specific details listed in the supplied project files. The ex post savings used HOU, HVAC factors, and CF values for an office, warehouse, and exterior building types. The evaluation team was able to use the appropriate factors for each building type based on the project documentation. | Baseline wattage and quantity has discrepancy in Lighting sheet and Lighting SOW sheet. Quantity of proposed fixture differs from Invoice and Lighting sheet. Proposed Fixture wattage is used as per DLC certificate. | Lighting - As ex-ante calculation file is not provided, exact reason for variation could not be identified. RR variation could be due to difference in the Baseline LPD values, HVAC interactive factors and CF between ex-ante and ex-post calculations. Ex-post analysis referred to PNM workpapers. As per post inspection file, ex-ante analysis had considered the building type as 'Medical' in place of 'Multifamily' in their analysis. The building type as per the application is Multifamily.<br><br>ASHP- As ex-ante calculation file is not provided, exact reason for variation could not be identified. RR variation could be due to differences in the EFLH and CF values between ex-ante and ex-post analysis. Ex-post analysis have referred to both PNM 2019 (for qualifying and baseline efficiency) and PNM 2021 (EFLH cooling, EFLH heating and CF as Multifamily was not a building type in PNM 2019 workpaper) workpapers. | | RR variation due to difference in HOU, HVAC interactive factors and CF for the Interior fixtures between ex-ante and ex-post analysis. As ex-ante calculation file has not been provided, it's not clear as to what factors and HOU were used in ex-ante analysis.<br><br>Ex-post analysis have used the factors corresponding to the Multifamily building type as mentioned in the application for the interior fixtures.<br><br>Baseline fixture wattage and qty. are taken from the 'Lighting' sheet in Final Application excel file.<br><br>Baseline incandescent fixture information is not provided. The fixture qty. is 121. Ex-post analysis have referred to PNM 2021 workpaper for baseline incandescent fixture wattage. | |

| Project ID | PNM-21-04354 | PNM-21-04339 | PNM-21-04323 | PNM-21-04277 | PNM-20-04194 | PNM-20-04137 | PNM-20-04135 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | New Construction | Multifamily | Retrofit Rebate | Retrofit Rebate | Multifamily | Multifamily | Multifamily |
| Sampling Group | New Construction | Multifamily | Other | Lighting | Multifamily | Multifamily | Multifamily |
| Project Description | Energy Efficient Lighting installation in a light manufacturing facility | New Construction Lighting and HVAC | Lighting Retrofit and LED Refrigeration case lighting | Retrofit of interior lighting and HVAC. | 0 | 0 | Installation of Efficient Light Fixtures for NC Building |
| Building Type | Warehouse/ Industrial | Multifamily | Retail | Office | Multifamily | Miscellaneous | Miscellaneous |
| Other Building Type | | | | | | | Residential - Multifamily |
| Site Visit Being Conducted | No | No | No | No | No | No | Yes |
| Gross Reported kWh | 38,165 | 71,463 | 27,390 | 304,923 | 133,200 | 64,284 | 385,457 |
| Gross Reported kW | 12.62 | 7.82 | 4.85 | 103.06 | 20.10 | 4.79 | 22.34 |
| Gross Verified kWh | 60,901 | 82,177 | 27,183 | 271,014 | 153,308 | 47,922 | 364,555 |
| Gross Verified kW | 13.81 | 7.85 | 4.98 | 50.29 | 22.86 | 6.57 | 30.75 |
| kWh Realization Rate | 1.60 | 1.15 | 0.99 | 0.89 | 1.15 | 0.75 | 0.95 |
| kW Realization Rate | 1.09 | 1.00 | 1.03 | 0.49 | 1.14 | 1.37 | 1.38 |
| Calculation Assessment | | | * Interior space lighting retrofit measure calculation is done using custom calculation approach. DLC certificates provided for Post fixture wattages. Annual hours of use considered to be 5068 ( Not from TRM )<br>* Refrigerated case lighting retrofit calculation is done using deemed values from TRM | | | SEER baseline value for AC is taken from Workpaper 2019, factor of safety is not considered in kWh saving calculations, | The calculation methodology is based on Utility Workpaper and New Mexico TRM 2021 |
| Reasons for RR(s) <> 1 | The facility is broadly classified as a Workshop. However, it has an office, a juice processing space and a refrigerated product storage. This means HVAC interaction factors could vary from space to space in the interior. The lighting is intended to operate for 24 hours, but occupancy sensors are installed, which may affect the operating hours. These two reasons are the causes for RR variation. | Lighting- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference between the LPD Baseline, HVAC Interactive factors and CF between ex-ante and ex-post analysis. Ex-post analysis have referred to the PNM workpapers for these factors. Source of ex-ante factors is not clear.<br><br>ASHP- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference in capacity and EFLH values between ex-ante and ex-post analysis. Ex-post analysis have referred to both PNM 2019 (for qualifying and baseline SEER values) and PNM 2021 (EFLH cooling, EFLH heating and CF as Multifamily was not a building type in PNM 2019 workpaper) workpapers. Capacity used in ex-post calculations is as per the attached AHRI certificates. | HVAC interactive factors were not considered for lighting retrofit measure in the Ex-Ante calculation. Annual Hours of use value updated from TRM | Occupancy sensor savings have been claimed but exact information of sensor is not provided. HVAC savings calculation is done using TRM methodology. | Lighting- Exact reason for kWh RR variation could not be identified as ex-ante calculations were not provided. Variation could be due to difference between the LPD Baseline, HVAC Interactive factors and CF between ex-ante and ex-post analysis. Ex-post analysis have referred to the PNM workpapers for these factors.<br><br>ASHP & RTU- Exact reason for kWh RR variation could not be identified. | The discrepancy in savings is not known for the kWh savings. Difference in kW RR is due to difference in CF assumption for both lighting and HVAC. | Discrepancy between Tracking Data and Application Summary (Dt. 7/12/2022) is observed.<br>Ex-post new fixtures exterior lighting calculations were based on calculated LPD. Slight reduction in kWh is observed because of rounding error. Slight variation in peak kW savings for interior lighting is observed. No ex ante calculation file for lighting was present, so exact reason for the discrepancy cannot be determined.<br>Ex ante considered TRM based value of 127 kWh for Efficient rated unit electricity consumption for ENERGY STAR Washer. Ex post considered 123 kWh as per specifications sheet.<br>Ex post calculations for ASHP were based on NM 2021 TRM section 4.13 Heat Pumps for Residential areas. No ex ante calculation file for this measure was present, so exact reason for the discrepancy cannot be determined. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Project ID | PNM-20-03988 | PNM-19-03861 | PM-22-05849 | 19884 | 19808 | 19761 |
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Rebate | Retrofit Rebate | Midstream | Multifamily | Multifamily | Multifamily |
| Sampling Group | Custom | HVAC | Midstream | Multifamily | Multifamily | Multifamily |
| Project Description | Custom - Transformers | VRFs, Transformers (custom), Wall insulation (custom) | Installing high-efficient Refrigerators | Replacing existing lighting fixtures with energy efficient LED fixtures in exterior spaces | LED Retrofit | Replacement of Existing Lighting Fixtures with LED Fixtures |
| Building Type | Office | Office | Retail | Miscellaneous | Multifamily- common areas | Exterior |
| Other Building Type | | | | Exterior and Interior | | |
| Site Visit Being Conducted | No | Yes | No | No | No | No |
| Gross Reported kWh | 130,319 | 367,045 | 3,911 | 13,191 | 72,745 | 38,255 |
| Gross Reported kW | 124.94 | 191.00 | 0.45 | 0.33 | 0.22 | 1.63 |
| Gross Verified kWh | 130,320 | 258,653 | 4,169 | 13,960 | 73,089 | 35,771 |
| Gross Verified kW | 124.93 | 216.07 | 0.45 | 0.04 | 0.03 | 0.00 |
| kWh Realization Rate | 1.00 | 0.70 | 1.07 | 1.06 | 1.00 | 0.94 |
| kW Realization Rate | 1.00 | 1.13 | 0.99 | 0.11 | 0.12 | 0.00 |
| Calculation Assessment | Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for." | The ex post approach for the VRF calculation used deemed savings and bonus savings from the workpaper workbook.<br><br>Transformers -<br><br>Calculations used entered data of baseline and ex post losses. Ex post losses are subtracted from baseline losses to estimate the transformer peak demand and energy savings. For peak demand savings, the ex ante calculation used the Building Type "Office" with a CDF of 0.7 for all spaces. The building type on the application is listed as "Office." According to IL TRM, "CF for distribution transformers is 1.0 by definition. By including the load factor in the demand savings calculation, the load profile is accounted for."<br><br>Wall Insulation -<br><br>kW: The kW usage for the following factors were initially considered: space cooling, heat rejection, refrigeration, space heat, HP supp., hot water, vent. fans, pumps and aux., ext. usage, misc. equip, task lights, and area lights. The kW usage of those factors were totaled for each month from January to December for both the roof and the wall insulation. kW from the walls was subtracted from kW from the roof for each month. The sum of the savings for each month resulted in an annual savings of 164 kW.<br><br>kWh: The kWh (on-peak and off-peak) usage for each factor above was totaled for each month from January to December for both the roof and the wall insulation. Total kWh from the walls was subtracted from total kWh from the roof for each month. The sum of the savings for each month resulted in an annual savings of 102,063 kWh. | Energy saving per Cu.ft of refrigerated volume was obtained from Work paper and Volume was obtained from Energy star certificate | Weekly operating hours are listed in the application summary which are multiplied by 52.1429 to get the annual operating hours. | | Weekly operating hours are listed in the application summary which are multiplied by 52.1429 to get the annual operating hours. |
| Reasons for RR(s) <> 1 | | kWh and kW RRs are affected by the VRF measure. It is unclear why kWh RR increased for the VRF measure. kW increased due to the use of the Office CF (0.67) in the ex post calculation. The ex ante analysis used the Commercial, General CF (0.34). | 9 Out of 12 refrigerator units were considered as glass door refrigerators but those models are actually solid door refrigerators as per the Energy Star Certificates | RR variation is probably due to a different value of HVAC factor considered for Multifamily unit> interior spaces rather than exterior spaces (which is 1). Higher kW savings also indicates that a non-zero CF value is considered for exterior spaces, which may result in the higher peak savings. | Reported peak demand savings of 0.22kW is actually just the kW reduction without the CF and HVAC interactive factors applied. | All measures seem to be installed in Exterior spaces (from the pictures), however there are demand savings reported, which means a non-zero CF value is used. RR variation could be due to difference in baseline wattages between ex ante and ex post and HVAC factor considered for Multifamily unit, interior spaces rather than exterior spaces. |

| Project ID | 19495 | PM-21-05702 | 19801 | 19818 | 19858 | 19902 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Multifamily | Midstream | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Sampling Group | Multifamily | Midstream | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | LED lighting retrofit | HVAC | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures | Installation of LED light fixtures (exterior) and removal of MH fixtures | Installation of interior and exterior LED fixtures |
| Building Type | Multifamily - common areas IQ | Miscellaneous | Miscellaneous | Miscellaneous | Exterior | Retail |
| Other Building Type | | Commercial, General | Commercial, General | Commercial, General | Commercial, General for interior fixtures | Gas station |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 145,079 | 216,188 | 64,224 | 136,146 | 159,956 | 11,641 |
| Gross Reported kW | 4.90 | 21.95 | 7.80 | 9.43 | 8.77 | 0.74 |
| Gross Verified kWh | 163,639 | 384,294 | 76,190 | 145,406 | 167,099 | 12,792 |
| Gross Verified kW | 0.60 | 46.22 | 6.68 | 8.47 | 7.87 | 0.79 |
| kWh Realization Rate | 1.13 | 1.78 | 1.19 | 1.07 | 1.04 | 1.10 |
| kW Realization Rate | 0.12 | 2.11 | 0.86 | 0.90 | 0.90 | 1.07 |
| Calculation Assessment | | | | | | |
| Reasons for RR(s) <> 1 | Ex-ante savings could not be replicated. Variation could be due to difference in the baseline wattages, HVAC interactive factors and CF between the ex-ante and ex-post analysis.<br><br>Ex-ante calculations were not provided. | For Heat Pumps and VRF systems, the cooling and heating savings are calculated separate which resulted in a reduction in heating kWh Savings. Ex-Ante calculation used the cumulative table ( Both Heating and Cooling Savings<br>For Heat Pumps, conversion factor used to arrive at Heating demand savings was 12/3.412 instead of 12 for units Less than or equal 5.4 tons (HSPF considered not COP). It was corrected for Ex-Post calculations and the Heating kWh savings increased.<br>" Commercial, General" Building type was used in most of the cases for calculating the Peak KW Savings. Ex-Post calculation considers particular building types mentioned in the files. This resulted in an increase in Ex-Post Peak Coincident kW savings. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation assumed all fixtures were interior and used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. The CF for one fixture was changed to 0 in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), has all line items are marked "N." The ex post calculation assumed one line item was an exterior fixture based on the photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Other Notes:<br>• 3-4' 40W T12, Magnetic Ballast (2) - Not available in Fixture List on PNM workpaper. This assumes a ballast factor of approximately 1.19 for 3 40 W fixtures.<br>• 2-4' 40W T12, Magnetic Ballast (1)) - Not available in Fixture List on PNM workpaper. This assumes a ballast factor of approximately 1.075 for 2 40 W fixtures.<br>• What is the justification for HOU for some locations (i.e., 168 hours per week for a storage rooms; are there no controls?); there may be an opportunity for the installation of controls | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications).<br><br>Lastly, the tracking data and ex ante calculation are missing line item #23 (see post inspection document>Lighting Summary Table, page 2 of 3>"Item #" column). The ex post calculation included line item #23 because it was verified as installed in the project documentation, including a photo. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The post inspection document (Lighting Summary Table, page 2 of 3) lists fixtures (that are being removed) in column name "Outside" as "N," which is assumed to mean "no." There were no photos in the project documentation of these removed fixtures to indicate whether they were interior or exterior. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for indoor fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type. These modifications increased RRs.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 2-4' 32W-T8-HPEB1-R). The ex ante calculation used 74 W, whereas the ex post calculation used 70 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). |

| Project ID | 19938 | 19797 | 19326 | 19563 | 19612 | 19643 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Sampling Group | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures | Lighting Retrofit | Replacement of Light Fixtures with LED | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs |
| Building Type | Restaurant - Sit Down | Warehouse/ Industrial | Miscellaneous | Miscellaneous | Miscellaneous | Exterior |
| Other Building Type | | | Car Dealership | Entertainment | Church | |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 4,473 | 123,912 | 105,313 | 155,649 | 59,746 | 73,345 |
| Gross Reported kW | 1.02 | 24.61 | 23.76 | 24.94 | 0.00 | 0.00 |
| Gross Verified kWh | 5,032 | 126,788 | 124,013 | 179,685 | 59,746 | 87,714 |
| Gross Verified kW | 0.74 | 14.50 | 21.33 | 14.39 | 0.00 | 0.00 |
| kWh Realization Rate | 1.13 | 1.02 | 1.18 | 1.15 | 1.00 | 1.20 |
| kW Realization Rate | 0.73 | 0.59 | 0.90 | 0.58 | | |
| Calculation Assessment | | | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. |
| Reasons for RR(s) <> 1 | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for both interior and exterior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The CF for exterior fixtures was changed to 0 in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3) lists some fixtures as having a location "Outside" in the Location column. In another column in the same table (column name "Outside"), all items are marked "N." The ex post calculation assumed the "Outside" space types were indeed exterior fixtures based on the pre- and post-inspection photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 2-4' 32W-T8-HPEB1-R). The ex ante calculation used 74 W, whereas the ex post calculation used 70 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RRs (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for both interior and exterior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Storage – Unconditioned.<br><br>It is important to note there is conflicting information in the project documentation. In the post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), all items are marked "N." The ex post calculation assumed that some space types were indeed exterior fixtures based on the photographs in the project documentation. As such, the CF for exterior fixtures was changed to 0 in the ex post calculation.<br><br>These modifications increased kWh RR and decreased kW RR. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Note: It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation assumed all fixtures were interior (with the exception of line item #77) and used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. The CF for several exterior fixtures were changed to 0 in the ex post calculation. The ex ante calculated assumed these fixtures were interior. These modifications increased kWh RR and decreased kW RR.<br><br>It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table, page 2 of 3, column name "Outdoor"), has all line items are marked "N," with the exception of line item #77. | | The ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 175 Watt Metal Halide). The ex ante calculation used 150.5 W, whereas the ex post calculation used 215 W, based on the PNM workpaper fixture list. The 175 W MH fixture was verified in the project photos. This modification increased the kWh RR. |

| Project ID | 19704 | 19723 | 19766 | 19788 | 20066 | 20072 |
|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Retrofit Lighting | Retrofit Lighting |
| Sampling Group | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) | Direct Install (Quicksaver) |
| Project Description | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Replacement of Conventional Light Fixtures with LEDs | Installation of interior and exterior LED fixtures | Installation of interior and exterior LED fixtures |
| Building Type | Exterior | Miscellaneous | Miscellaneous | Warehouse/ Industrial | Miscellaneous | Miscellaneous |
| Other Building Type | | Government City/County | Shipping Service Center | | Commercial, General | Commercial, General |
| Site Visit Being Conducted | No | No | No | No | No | No |
| Gross Reported kWh | 45,694 | 66,101 | 384,261 | 18,739 | 239,979 | 347,729 |
| Gross Reported kW | 0.00 | 10.94 | 57.44 | 6.01 | 25.10 | 83.73 |
| Gross Verified kWh | 45,694 | 78,726 | 451,244 | 19,638 | 280,434 | 409,766 |
| Gross Verified kW | 0.00 | 9.83 | 51.41 | 4.60 | 22.75 | 72.42 |
| kWh Realization Rate | 1.00 | 1.19 | 1.17 | 1.05 | 1.17 | 1.18 |
| kW Realization Rate | | 0.90 | 0.89 | 0.77 | 0.91 | 0.86 |
| Calculation Assessment | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Savings are calculated based on reduction in wattages between baseline and efficient Light fixtures. Interactive Factors and Coincidence Factor is taken based on the building type. | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) |
| Reasons for RR(s) <> 1 | The ex post calculation includes custom LED signage kWh. No custom calculations were present in project documentation. It is important to include custom calculations in project files so that savings can be reproduced.<br><br>Additionally, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage did not greatly influence savings due to the low quantity of these fixtures. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR (which was counterbalanced by the aforementioned modifications). | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for the fixtures. All fixtures are interior as depicted in the photos in the project documentation. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type. The building type selected was Storage - Unconditioned. The project documentation only described the building type as "warehouse" and did not specify whether or not it was conditioned. It is assumed this space is unconditioned. These modifications increased kWh RR and decreased kW RR.<br><br>Other Notes:<br>• 4-4' 32W-T8-HPEB1 is not in the Fixture List on the PNM workpaper.<br>• Some of the lamps in the fixture are burnt out from the photos. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 4-4' 54W-T5-EB1). The ex ante calculation used 226 W, whereas the ex post calculation used 234 W, based on the PNM workpaper fixture list. This modification (increase) to the baseline fixture wattage led to a slight increase in the RRs. It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List. | RRs are affected by the use of HVAC EIF, HVAC DIF, and CF for interior fixtures. The ex ante calculation used 1 for HVAC EIF, HVAC DIF, and CF for ALL fixtures (note: there was an assumption that all fixtures were interior). The ex post calculation selected HVAC EIF, HVAC DIF, and CF factors based on building type for interior fixtures. The building type selected was Commercial, General. For exterior fixtures, a CF of 0 was used in the ex post calculation. It is important to note there is conflicting information in the project documentation. The post inspection document (Lighting Summary Table) lists two fixtures as having a location "Outside" in the Location column. In another column in the same table (column name "Outdoor"), all items are marked "N." The ex post calculation assumed the "Outside" space types were indeed exterior fixtures based on the pre- and post-inspection photographs in the project documentation. These modifications increased kWh RR and decreased kW RR.<br><br>Also, the ex ante and ex post calculations had a discrepancy for one baseline fixture type (i.e., 400 Watt Metal Halide). The ex ante calculation used 458 W, whereas the ex post calculation used 456 W, based on the PNM workpaper fixture list. This modification to the baseline fixture wattage led to a slight decrease in the RR. It is recommended to use the baseline fixture nomenclature per the PNM Workpaper Fixture List. |

| Project ID | PNM-21-04441 | PNM-21-04453 | PNM-22-04609 | PM-22-05980 | PM-22-06116 | PNM-21-04415 | PNM-21-04583 |
|---|---|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | New Construction Lighting | New Construction Lighting, HVAC, and Custom | New Construction Lighting | Retrofit HVAC | Energy Star Refrigerators/Freezers | Building Tune-Up | Retrofit Custom |
| Sampling Group | New Construction | New Construction | New Construction | Midstream | Midstream | Building Tune-Up | Custom |
| Project Description | New construction interior and exterior lights | Installation of HVAC, interior and exterior lighting. Also custom geothermal source heat pump installed. | Horticulture Lighting | HVAC | Energy Star Refrigerators/Freezers | Other | Water-Cooled Chillers, VSD on HVAC Motors, Motors & VSDs, HVAC Controls, Cooling Tower |
| Building Type | Retail | Miscellaneous | Miscellaneous | Miscellaneous | Miscellaneous | Office | Office |
| Other Building Type | | Commercial, General (Library) | Horticultural | | | | |
| Site Visit Being Conducted | No | No | No | No | No | No | No |
| Gross Reported kWh | 49,318 | 67,879 | 120,914 | 79,752 | 10,644 | 61,620 | 855,559 |
| Gross Reported kW | 7.33 | 21.24 | 0.00 | 8.40 | 1.17 | 0.00 | 74.21 |
| Gross Verified kWh | 49,921 | 61,101 | 119,738 | 104,588 | 10,356 | 61,620 | 855,559 |
| Gross Verified kW | 7.32 | 21.11 | 0.00 | 17.23 | 1.12 | 0.00 | 74.21 |
| kWh Realization Rate | 1.01 | 0.90 | 0.99 | 1.31 | 0.97 | 1.00 | 1.00 |
| kW Realization Rate | 1.00 | 0.99 | | 2.05 | 0.96 | | 1.00 |
| Calculation Assessment | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) & Custom Calculation | Custom Calculation | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Custom Calculation |
| Reasons for RR(s) <> 1 | The discrepancy in savings is due to operational hours and interactive factor selection. The ex post calculation used a Retail building type (with the exception of exterior light fixtures). | The discrepancy in savings is due to operational hours and interactive factor selection. The building type was modified to Commercial, General to be consistent across all prescriptive measures in this project (with the exception of exterior light fixtures). | The discrepancy in savings is due to the use of DLC tested wattage in the ex post calculation. Also, it is important to note that both the ex ante and ex post calculations are assuming no cooling. | The evaluation team used the prescriptive savings methodology from the NM TRM to calculate savings for these HVAC measures. The discrepancy in savings is not known. | No ex-ante calcs or line-by-line savings provided. The discrepancy could be due to different volume values stated. | | |

| Project ID | PNM-22-04608 | PNM-22-04715 | PNM-22-04795 | PNM-22-04813 | PNM-22-04817 |
|---|---|---|---|---|---|
| Utility | PNM | PNM | PNM | PNM | PNM |
| Program | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive | Commercial Comprehensive |
| Component | Retrofit Custom | New Construction Lighting | New Construction Lighting | Retrofit Lighting | Custom Horticultural Lighting, Custom Horticultural Dehumidification |
| Sampling Group | Custom | New Construction | New Construction | New Construction | Custom |
| Project Description | HVAC & indoor horticulture lighting | LPD + HVAC | LPD + HVAC | Installation of new high efficiency HVAC/ custom HVAC units and lighting/ custom lighting measures | LED Grow Lights, Dehumidifiers |
| Building Type | Miscellaneous | Health | Health | Miscellaneous | Warehouse/Industrial |
| Other Building Type | Horticultural | Hospital | Medical/Hospital | | Light Industry |
| Site Visit Being Conducted | No | No | No | No | No |
| Gross Reported kWh | 424,745 | 1,585,948 | 610,919 | 3,086,174 | 1,002,404 |
| Gross Reported kW | 84.60 | 231.17 | 81.40 | 225.81 | 61.35 |
| Gross Verified kWh | 474,856 | 1,321,318 | 534,205 | 2,525,343 | 1,072,257 |
| Gross Verified kW | 100.96 | 204.76 | 106.97 | 334.79 | 209.92 |
| kWh Realization Rate | 1.12 | 0.83 | 0.87 | 0.82 | 1.07 |
| kW Realization Rate | 1.19 | 0.89 | 1.31 | 1.48 | 3.42 |
| Calculation Assessment | Custom Calculation | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) | Prescriptive (TRM, Workpaper) & Custom Calculation | Custom Calculation |
| Reasons for RR(s) <> 1 | Lighting (Retrofit & NC): The evaluation team referenced the IL TRM for this measure and used NM interactive factors for Commercial/General. HVAC interactive factors were considered for the LED lights in the ex post calculation while the ex ante calculation did not. Annual hrs & CF 0.9 is considered for both measures as per ex ante calculations.<br>HVAC VRF & AC : CF 0.9 is considered for both measures as per ex ante calculations. | LPD<br>RRs decreased due to the interior LPD calculation. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis. Additional fixtures were removed from the analysis because the submittals stated these fixtures were not approved. These modifications decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. The removal of ineligible fixtures and reduction in square footage decreased RRs.<br><br>HVAC<br>The ex ante calculation used a CF of 0.49 (Commercial, General), whereas the ex post calculation used a CF of 0.63 (Medical). This modification increased the kW savings for the water-cooled chiller measure.<br><br>It is unclear why kWh RR increased for the HVAC measure. Since the ex ante calculation was not provided, the exact reason cannot be determined. The discrepancy may be due to the use of a different EFLH for the ex post calculation based on the building type. | LPD<br>RRs decreased due to a modification to the LPD calculation for the warehouse. Several fixtures were not DLC or Energy Star Certified and were removed from the analysis, which decreased the total proposed watts. It was assumed that the square footage illuminated by these ineligible fixtures was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Additionally, one fixture type was given as 19.1 W in the ex ante calculation. The ex post calculation used 19.9 W per DLC. The removal of ineligible fixtures, reduction in square footage, and use of DLC wattage decreased RRs.<br><br>VRF<br>It is unclear why kWh RR increased for the VRF measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34).<br><br>ASHP<br>It is unclear why kWh RR decreased for the ASHP measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34).<br><br>Unitary & Split AC<br>It is unclear why kWh RR increased for the Unitary & Split AC measure. It is possible the ex ante calculation used a different building type. kW increased due to the use of CF (0.78) for the Medical building type in the ex post calculation. The ex ante analysis used the Commercial, General building type which has a lower CF (0.34). | Interior kWh and kW RRs are affected by a modification to the LPD calculation for the warehouse. One fixture type was not DLC or Energy Star certified and was removed from the analysis. It was assumed that the square footage illuminated by the ineligible fixture was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Additionally, DLC wattages were used in place of the wattages from ComCheck, which also affected RRs. Lastly, a CF was applied twice in the ex ante calculation. It was applied only once in the ex post analysis, which increased kW savings.<br><br>The exterior kWh RR is affected by a modification to the LPD calculation. One fixture type was not DLC or Energy Star certified and was removed from the analysis. Additionally, several fixture IDs from the ComCheck document were not in the exterior spec sheets in the project documentation. Since there was no way to verify the model numbers for these fixtures, they were removed from the analysis. It was assumed that the square footage illuminated by the ineligible fixtures (including those missing from the spec sheets) was proportional to the percentage of total fixtures they represented. This square footage was removed from the total floor area represented by the project. Furthermore, DLC wattages were used in place of the wattages from ComCheck, which also affected RRs. Lastly, the ex post analysis used HOU per the PNM workpaper for exterior fixtures. | Dehumidification: No ex-ante calculations were provided, and as such the discrepancy in savings could not be determined. The ex-post calculation references FES- A22 Dehumidification for Indoor Horticultural Facilities.<br><br>Horticultural Lighting: Ex-ante and ex-post calculation methodologies are consistent. The discrepancy in savings is due to the modification of quantities and wattages per invoices and DLC tested wattages, respectively. There is a large discrepancy in ex-ante vs ex-post peak kW; however, kW savings are consistent between both calculations. Assuming CF used in ex-ante peak kW inconsistent with methodology followed, could not verify as no ex-ante peak kW calcs were provided. |

| | |
|---|---|
| Project ID | PNM-19-03602 |
| Utility | PNM |
| Program | Commercial Comprehensive |
| Component | HVAC Custom |
| Sampling Group | Custom |
| Project Description | RCx Tier 2 |
| Building Type | Health |
| Other Building Type | Health Care |
| Site Visit Being Conducted | No |
| Gross Reported kWh | 950,950 |
| Gross Reported kW | 172.50 |
| Gross Verified kWh | 950,950 |
| Gross Verified kW | 172.50 |
| kWh Realization Rate | 1.00 |
| kW Realization Rate | 1.00 |
| Calculation Assessment | Custom Calculation |
| Reasons for RR(s) <> 1 | |

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**ELECTRIC SERVICES**

Advice Notice No. 604 April 17, 2023



NEW MEXICO PUBLIC REGULATION COMMISSION

Public Service Company of New Mexico hereby gives notice to the New Mexico Public Regulation Commission and to the public of the filing and publishing of the following revisions in its Rates that are attached hereto:

| **RATE NUMBER** | **TITLE OF RATE** | **CANCELING RATE NUMBER** | **DATE EFFECTIVE** |
|---|---|---|---|
| | Table of Contents | Advice Notice No. 603 | December 28, 2023 |
| 29th Revised Rider No. 16 | Energy Efficiency Rider | 28th Revised Rider No. 16 | December 28, 2023 |

Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy and Case Management

GCG #530704

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**ELECTRIC SERVICES**

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/s/ Mark Fenton
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Executive Director, Regulatory Policy and Case Management

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
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Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy and Case Management

DESCRIPTION: This Energy Efficiency Surcharge is a mechanism for recovery of costs associated with energy efficiency programs approved by the New Mexico Public Regulation Commission. The surcharge may also include the costs associated with removal of disincentives to, and a provision of incentives for, expenditures on energy efficiency and load management measures.

APPLICABILITY: This Rider shall be applicable to all PNM retail customers receiving electric service, with an opportunity to participate in the energy efficiency programs approved by the Commission, except the following: 6, 10A/10B, 20, 33B, and 36B.

APPLICATION: The energy efficiency surcharge shall be added to each customer's bill. The surcharge shall be calculated by multiplying the total charges other than franchise fees and taxes by the surcharge rate approved by the Commission. The Program Plan Costs amount of the energy efficiency surcharge shall not exceed $75,000 per year.

RATES, TERMS AND PROCEDURES:

I. Purpose

This Rider establishes detailed procedures which will permit the Company to recover from its customers Rider No. 16 Amounts as determined and ordered by the Commission to be administered through this mechanism. This mechanism is specific as to Amounts pertaining to Affected Customer Classes.

II. Definitions

The following definitions shall apply to this Rider:

1. Affected Customer Classes: Customer classes subject to Rider No. 16.

2. Amortization Period: The Amortization Period for program costs approved by the Commission will comply with the period specified in the respective Commission Order for each Rider No. 16 Amount.

3. Annual Projected Sales Revenues: Revenues for the Company projected for the Amortization Period, which includes Revenue, excluding franchise fees and taxes, for Affected Customer Class.

4. Billing Cycle: A period of time employed by the Company's billing system and used by the Company to render bills for service to customers. The Company employs twenty-one (21)

billing cycles, which constitute a billing month and may or may not coincide with a calendar month.

5. M&V Report: The annual monitoring and verification report of the independent evaluator for the prior calendar year.

6. Rider No. 16 Amounts: The dollar amounts of Rider No. 16, shall be approved by the Commission, and will be collected from Electric Service Customers within the Affected Customer Classes. A separate pool of dollar amounts will be set up for each identified component of this rider identifying the dollars to be recovered compared to the actual Dollars recovered for each rider component.

7. Reconciliation Amounts: Consists of Rider No. 16 Amounts that were under-recovered/credited or over-recovered/credited during their respective amortization terms.

8. Electric Service Customer: A customer receiving electric service directly from the Company within the Company's New Mexico service territory.

III. Methodology for Developing and Administering the Rider No. 16 Amounts

1. Effective Date: The date specified by the Commission to begin billing this rate.

2. Rider No. 16 Amounts: The amounts to be collected are approved by the Commission. This mechanism is designed to accommodate only those amounts ordered for collection on a percentage of bill basis whereby the billing factors will be derived using Annual Projected Sales Revenue associated with Electric Service Customers within Affected Customer Classes adjusted for anticipated savings from the energy efficiency programs approved by the Commission.

3. Reconciliation Amounts: Reconciliation Amounts will be summed with and absorbed into existing Rider No. 16 Amounts by pool and will assume that respective amount's collection conditions and terms. This transaction will be specifically noted and identified in the next subsequent Energy Efficiency Surcharge Factor filing.

IV. Calculation of the Energy Efficiency Surcharge Factors

For purposes of determining the Energy Efficiency Surcharge Factors, each of the Rider No. 16 Amounts, is fully amortized (paid) over their respective periods commencing with the first Billing Cycle of the month following approval of any of the Rider No. 16 Amounts or any alternative effective date as determined by the Commission. The total combined Energy Efficiency Surcharge Factor is 3.952 % of Affected Customer Classes bills in 2024. The total Factor is determined as follows: x x

(A) Each Energy Efficiency Surcharge Factor for Customers is determined by dividing the annual recovery amounts by the combined total Annual Projected Sales Revenue for Affected Customer Classes;

(B) Reconciliation Amounts incapable of generating a factor out to five (5) decimal places are summed with and absorbed into existing Rider No. 16 Amounts and their disposition is recognized within the existing factor.

(C) The total combined Energy Efficiency Surcharge Factor is comprised of the following elements for bills beginning with the first billing cycle for January 2024: x

| Rate Element | Amount to be Recovered | Element Rate | |
|---|---|---|---|
| 1) 2024 Total Program Costs | $34,517,198 | 3.707% | x |
| 2) 2022 Budget Reconciliation | $ 649,373 | | x |
| 3) 2024 Net Program Budget (1 + 2) | $35,166,571 | | x |
| 4) 2024 Base Level Incentive (1 x 7.1%) | $ 2,450,721 | 0.246% | x |
| Total (1 + 4) | $36,967,919 | 3.952% | x |

The recovery period will be as specified in the Commission's Final Order approving PNM's energy efficiency plan. x x

The profit incentive may increase in accordance with the methodology approved by the NMPRC based on actual energy savings as verified by the M&V Report.

V. Annual Reconciliation Filings

The Company shall file with the Commission an annual report on its energy efficiency programs. The initial report was due on April 1, 2009, and covered the period from the effective date of Rider No. 16 through December 31, 2008. Subsequent reports shall be filed as required by Commission rule or order. These reports will contain: x

1. Energy Efficiency Surcharge Factor Report: Schedules shall contain sufficient information describing:

   a. A Summary of the Energy Efficiency Surcharge Factors;
   b. Calculation of each Energy Efficiency Surcharge Factor, for each package of programs

and Incentive/Disincentive Adder Revenues and by each Affected Customer Class;

c. Calculation of the Energy Efficiency Surcharge Factor to be applied for the subsequent 12 months;
d. A Summary of Annual Projected Sales Revenue, less anticipated savings;
e. A Summary consisting of the beginning balance of each Rider No. 16 Amount, the sum total of the annual transactions, and the ending balance; and
f. A detail listing of expenditures and collections for each Rider No. 16 Amount, for each package of programs and Incentive/Disincentive Adder Revenues, by Affected Customer Class.

2. <u>M&V Report</u>: The M&V Report shall be submitted with the annual reconciliation filing as a separate document.

3. <u>Amounts Not Generating a Factor</u>: If the sum of all Rider No. 16 Amounts have been depleted to the extent that an annual factor cannot be calculated out to five (5) decimals, the residual amount will be held by the Company until:

   a. Additional Rider No. 16 Amounts occur and these amounts can be combined with these existing amounts to create an annual factor; or
   b. The disposition of this amount is determined in conjunction with a subsequent proceeding before the Commission.

4. <u>Other Annual Reconciliation Filings Content</u>: The Annual Reconciliation Filings shall contain sufficient information describing:

   a. Any material change in Rider No. 16 Amounts and explanations of the sources of those changes;
   b. Any material difference in respective annual projected kWhs and anticipated savings, and the reasons for any proposed difference; and
   c. The addition/deletion of and to any individual Rider No. 16 Amounts due to accounting adjustments, the M&V Report or other reasons, including a true-up of the Incentive/Disincentive calculation for M & V and performance results.

Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy & Case Management

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | **Case No. 23-00___-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

**DIRECT TESTIMONY**

**OF**

**SHARON K. JAMES**

**April 17, 2023**

**NMPRC CASE NO. 23-00___-UT**
**INDEX TO THE DIRECT TESTIMONY OF SHARON K. JAMES**
**WITNESS FOR**
**PUBLIC SERVICE COMPANY OF NEW MEXICO**

**DIRECT TESTIMONY OF**
**SHARON K. JAMES**
**CASE NO. 23-00___-UT**

**Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.**

**A.** My name is Sharon K. James. I am a Program Manager, Energy Efficiency Reporting and Budget, for Public Service Company of New Mexico ("PNM"). My business address is Public Service Company of New Mexico, 414 Silver Ave. SW, Albuquerque, New Mexico 87102.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.**

**A.** I graduated from the College of Santa Fe, Albuquerque campus, in 2008 with a Bachelor of Arts degree in Organizational Behavior. I have been employed by PNM since 1994 and have held positions in Marketing and in Energy Efficiency since the programs were first mandated by the NM Efficient Use of Energy Act. My resume is attached to my Direct Testimony as PNM Exhibit SKJ-1.

**Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES AS MANAGER, ENERGY EFFICIENCY DESIGN.**

**A.** As a Program Manager in Energy Efficiency Design, I am responsible for the research and development of PNM's energy efficiency and load management programs as well as preparation of regulatory filings and reporting on these programs. My responsibilities include researching potential new programs, performing cost-effectiveness analyses, soliciting public input on proposed plans, evaluating and selecting third-party implementation contractors, supporting the forecasting of energy and demand impact, tracking actual performance and customer participation, preparing annual reports for filing with the Commission, and preparing testimony and exhibits for energy efficiency cases.

**Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

**A.** My testimony is in support of the portfolio of energy efficiency and load management programs presented in PNM's 2024 Energy Efficiency and Load Management Program Plan ("2024 Plan"), which PNM proposes to implement beginning January 1, 2024. The 2024 Plan will cover plan years 2024, 2025, and 2026, consistent with the requirements of 17.7.2.8(A) NMAC. The 2024 Plan is PNM Exhibit SKJ-2 attached to my direct testimony. My testimony:

1. introduces PNM's other witnesses in this case who are presenting direct testimony;
2. summarizes PNM's Application and PNM's 2024 Plan and discusses the public advisory process PNM has implemented;
3. describes PNM's proposed energy efficiency ("EE") programs and demand response ("DR") programs;
4. discusses overall plan development, including costs, forecasted customer participation rates, utility cost test ("UCT") calculations, targeted customer segments and the measurement and verification ("M&V") process for the 2024 Plan;

5. summarizes the requirements of the Efficient Use of Energy Act ("EUEA")[1] and the Energy Efficiency Rule ("EE Rule")[2];
6. describes PNM's proposed profit incentive mechanism and shows that it is consistent with previous Commission orders, the EUEA, the EE Rule, and the Public Utility Act ("PUA"),[3] and should be approved; and
7. describes PNM's requested variances from the data filing requirements of 17.9.530 NMAC and from certain requirements of 17.7.2 NMAC.

**Q. CAN YOU DESCRIBE THE 2019 AMENDMENTS TO THE EUEA?**

**A.** Legislation was passed in 2019 that amended the EUEA. The changes include: 1) a requirement to fund investor-owned utility energy efficiency (EE) and load management (LM) at a minimum of 3% and a maximum of 5% of retail kilowatt-hour sales for the electric utilities; 2) a new savings goal of 5% of 2020 retail kilowatt-hour sales by 2025 based on programs implemented in years 2021 through 2025; 3) direction to the New Mexico Public Regulation Commission ("NMPRC" or "Commission") to approve a rate adjustment mechanism which decouples the revenue per customer from the quantity of electricity actually sold, upon petition by the public utility to identify and remove regulatory disincentives; and 4) a requirement that the discount rate not be adjusted for taxes when considering the lifecycle costs and benefits of EE and LM programs.

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[1] NMSA 1978, §§ 62-17-1 to 11 (2005, as amended through 2020).
[2] 17.7.2 NMAC.
[3] NMSA 1978, §§ 62-1-7 to-6-28 and 62-8-1 to -13-15.

**Q. DOES PNM'S APPLICATION COMPLY WITH THESE AMENDMENTS?**

A. Yes. PNM also notes that the Commission conducted a rulemaking to amend the EE Rule, 17.7.2 NMAC, in Case No. 19-00168-UT, with the stated purpose of implementing the 2019 EUEA amendments. The amendments adopted in that proceeding became effective on October 26, 2021.

**Q. WHAT OTHER PNM WITNESSES ARE PROVIDING DIRECT TESTIMONY IN THIS CASE?**

A. Mr. Nicholas Phillips, PNM's Director of Integrated Resource Planning, presents the avoided energy and capacity costs that I use in the UCT calculations, and the methodology used to derive the avoided costs.

Mr. Abraham Casas, PNM's Senior Pricing Analyst, supports PNM's Advice Notice No. 604, the 29th Revised EE Rider No. 16 ("EE Rider"), through which PNM proposes to recover the costs of implementing its EE and LM programs and a reasonable profit incentive in 2024, 2025 and 2026. He also describes PNM's plan for reconciling the EE Rider based on actual revenues and energy efficiency savings realized in 2022.

## I. SUMMARY OF PNM'S APPLICATION

**Q. PLEASE SUMMARIZE PNM'S APPLICATION IN THIS CASE.**

A. PNM's Application requests approval of its 2024 Plan, a reasonable profit incentive and the EE Rider. In the 2024 Plan, PNM proposes to continue all of its existing energy efficiency and load management programs that were approved in Case No. 20-00087-UT

(PNM's last Energy Efficiency application), with updated participation targets, budgets, and other modifications.

PNM solicited and received comments and recommendations from interested parties on its 2024 Plan through the public advisory process. PNM held two public advisory meetings related to the 2024 Plan. Among those parties in attendance at either individual, or all meetings included Staff, Western Resource Advocates ("WRA"), Coalition for Clean Affordable Energy ("CCAE"), Southwest Energy Efficiency Project ("SWEEP"), and NM Gas Company. PNM carefully considered those comments and recommendations and incorporated many of them into the 2024 Plan. The portfolio of programs in the 2024 Plan is cost effective in 2024, 2025 and 2026, as required by the EUEA, NMSA 1978, Section 62-17-5(C). Based on projected 2023 sales and current rates, the 2024 Plan complies with the minimum of 3% and no more than 5% program funding requirement of Section 62-17-6(A) of the EUEA with 4.01% funding in 2024, 4.11% in 2025, and 4.24% in 2026, taking into account the $75,000 customer bill impact cap, customer self-directed program credits, and customer self-directed program exemptions. In order to account for rate changes and/or sales variations in the later years of the 2024 Plan, PNM proposes to update its budget and incentive with each annual reconciliation filing, as further described later in my testimony.

The 2024 Plan proposes annual funding of $ 34,517,198, $35,367,236 and $36,479,038 based on program plans proposed for 2024, 2025 and 2026 respectively and complying with the EUEA requirement to spend no less than 3% and no more than 5% of customers' estimated bills. The 2024 Plan proposes base level profit incentives of $2,450,721,

$2,511,074 and $2,590,012, equal to 7.1% of the estimated 2024, 2025 and 2026 calendar year budgets, respectively. As I describe in more detail later in my testimony, PNM proposes to recover the base level incentives if it achieves annual savings in years 2024 and 2025 adequate for PNM to meet its 2025 energy efficiency savings requirement of 5.0% of 2020 sales to New Mexico customers, as required by Section 62-17-5(G) of the EUEA. An energy savings goal has not yet been established for 2026; PNM proposes to utilize energy savings of 80 GWh as the target for 2026, subject to modification once the Commission sets the goals for the 2026 through 2030 timeframe.

The 2024 Plan is cost effective, with a UCT ratio of 1.60 for the portfolio of programs in 2024, 1.59 in 2025 and 1.64 in 2026. The cost-effectiveness of the portfolio has been calculated in accordance with Section 62-17-5(C) of the EUEA. In addition, more than 5% of the 2024 Plan funding is devoted to programs directed at low-income customers, as required by NMSA 1978, Section 62-17-6(A).

17.9.530 NMAC ("Rule 530") imposes certain data filing requirements on investor-owned electric utilities applying for new or modified rates. To the extent the Commission deems Rule 530 applicable to PNM's proposed changes to the EE Rider rates, PNM requests a variance from that Rule so that PNM need not file the schedules and other data in this proceeding. Because PNM is not seeking a change in base rates and due to the specialized nature of the EE Rider, the detailed filing requirements of Rule 530 would serve no useful purpose. For that reason, the Commission granted a similar variance from Rule 530 in PNM's last energy efficiency case, Case No. 20-00087-UT.

**Q. WHAT ARE THE ENERGY EFFICIENCY SAVINGS REQUIREMENTS THAT PNM MUST MEET?**

**A.** Section 62-17-5(G) of the EUEA requires utilities to achieve cumulative energy efficiency savings of five percent of 2020 total retail kilowatt-hour ("kWh") sales to New Mexico customers that have an opportunity to participate in calendar year 2025. The 2025 target may be reduced by the Commission if a utility cannot achieve the target within the 3% to 5% funding level prescribed by Section 62-17-6(A)(1) of the EUEA. PNM's total retail sales in 2020 were 7,898 GWh, making its EUEA cumulative savings requirements by 2025 to be approximately 395 GWh.

**Q. WILL THE PROJECTED ANNUAL SAVINGS UNDER THE 2024 PLAN POSITION PNM TO MEET THE 2025 EUEA SAVINGS REQUIREMENT?**

**A.** Yes. If PNM achieves satisfactory program performance in 2023, as it believes it will, and continues to achieve satisfactory program performance through 2025, PNM will meet its statutorily required savings goal of 395 GWh in 2025.

PNM's current programs have broad application across many customer classes. PNM anticipates that the modifications proposed in the 2024 Plan will maintain the cost-effectiveness of the programs at the portfolio level and their attractiveness to customers in the rate classes to which the EE Rider applies, including low-income customers. The 2024 Plan includes low-cost and no-cost programs to achieve broad participation among all residential customers.

**Q. WHAT DOES PNM PROPOSE THE PROJECTED BASE LEVEL ANNUAL SAVINGS TARGET UNDER THE 2024 PLAN TO BE IN 2026 SINCE THE EUEA SAVINGS REQUIREMENT FOR PROGRAM YEAR 2026 IS NOT DEFINED IN THE EUEA?**

**A.** PNM proposes a base savings level of 80 GWh in 2026. This is consistent with the average annual level of base savings required by the EUEA during the 2021 – 2025 period. As noted previously, this would be subject to modification once the Commission has set the energy savings targets for electric utilities for years 2026 through 2030 as mandated by Section 62-17-5(G) of the EUEA.

## II. SUMMARY OF PNM'S 2024 PLAN

**Q. PLEASE SUMMARIZE THE 2024 PLAN.**

**A.** The 2024 Plan describes the EE and DR programs PNM proposes to implement in calendar year 2024 and calendar years 2025 and 2026, including the participation targets and budgets. PNM proposes to continue the portfolio of ten programs approved by the Commission in Case No. 20-00087-UT, with some program enhancements and modifications to budgets which are also described in the 2024 Plan. The portfolio of programs as a whole in the 2024 Plan passes the UCT for cost-effectiveness. The 2024 Plan complies with the minimum of 3% and no more than 5% of bills program cost funding requirement of Section 62-17-6(A)(1) of the EUEA, based on projected 2023 calendar year bills. It also complies with the $75,000 customer bill impact cap of the EUEA and customers' self-directed program credits or exemptions.

The proposed 2024 Plan has a total 2024 estimated calendar year budget of $34,517,198, with projected annual energy savings of approximately 95 gigawatt-hours ("GWh") and demand savings of about 83 megawatts ("MW"). For 2025, the proposed calendar year budget is estimated at $35,367,236, with projected annual energy savings of approximately 96.7 GWh and demand savings of about 83 MW. The 2026 calendar year includes an estimated budget of $36,479,038, with projected annual energy savings of approximately 99.5 GWh and demand savings of about 83 MW. The 2024 Plan is cost effective, with estimated UCT ratios for the portfolio of 1.60 for calendar year 2024, 1.59 for calendar year 2025 and 1.64 for calendar year 2026. Table 1, Table 2, and Table 3, below, summarize the 2024 Plan for calendar years 2024, 2025, and 2026, respectively.

**Table 1**

| 2024 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT |
|---|---|---|---|---|---|
| Residential Comp. | $ 6,808,220 | 16,433,453 | 142,475,934 | 2,185 | 1.04 |
| Commercial Comp. | $ 10,006,176 | 38,607,755 | 409,242,200 | 7,305 | 2.22 |
| Behavioral Comp. | $ 1,039,052 | 5,743,750 | 13,215,750 | 1,281 | 0.96 |
| Residential Products | $ 4,444,957 | 24,515,684 | 325,077,968 | 1,335 | 2.16 |
| Easy Savings | $ 328,898 | 2,024,750 | 22,616,458 | 242 | 3.38 |
| Energy Smart (MFA) | $ 964,909 | 1,438,245 | 23,227,657 | 373 | 1.61 |
| New Home Const. | $ 575,090 | 650,756 | 9,761,335 | 209 | 1.13 |
| Home Works | $ 784,382 | 2,860,200 | 31,948,434 | 135 | 1.32 |
| Power Saver (LM) | $ 5,445,888 | 1,600,000 | 1,600,000 | 40,000 | 1.18 |
| Peak Saver (LM) | $ 4,119,626 | 1,200,001 | 1,200,001 | 30,000 | 1.17 |
| **Total** | **$ 34,517,198** | **95,074,594** | **980,365,736** | **83,065** | **1.60** |

**Table 2**

| 2025 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT |
|---|---|---|---|---|---|
| Residential Comp. | $ 7,175,099 | 16,159,657 | 140,423,201 | 1,781 | 0.87 |
| Commercial Comp. | $ 10,379,672 | 39,959,026 | 423,565,677 | 7,422 | 2.17 |
| Behavioral Comp. | $ 1,154,423 | 6,327,250 | 15,223,250 | 1,416 | 0.94 |
| Residential Products | $ 4,505,684 | 24,515,684 | 325,077,968 | 1,335 | 2.05 |
| Easy Savings | $ 282,709 | 1,735,500 | 19,385,535 | 207 | 3.29 |
| Energy Smart (MFA) | $ 1,145,223 | 1,704,074 | 27,520,800 | 458 | 1.66 |
| New Home Const. | $ 599,911 | 702,751 | 10,541,268 | 223 | 1.16 |
| Home Works | $ 803,658 | 2,860,200 | 31,948,434 | 135 | 1.23 |
| Power Saver (LM) | $ 5,507,779 | 1,600,000 | 1,600,000 | 40,000 | 1.35 |
| Peak Saver (LM) | $ 3,813,078 | 1,200,001 | 1,200,001 | 30,000 | 1.47 |
| **Total** | **$ 35,367,236** | **96,764,144** | **996,486,134** | **82,976** | **1.59** |

**Table 3**

| 2026 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT |
|---|---|---|---|---|---|
| Residential Comp. | $ 7,891,239 | 18,138,879 | 158,733,847 | 1,846 | 0.91 |
| Commercial Comp. | $ 10,639,693 | 41,157,797 | 436,272,647 | 7,534 | 2.25 |
| Behavioral Comp. | $ 1,026,434 | 5,971,750 | 14,391,750 | 1,371 | 1.26 |
| Residential Products | $ 4,548,682 | 24,515,684 | 325,077,968 | 1,335 | 2.09 |
| Easy Savings | $ 235,256 | 1,446,250 | 16,154,613 | 173 | 3.42 |
| Energy Smart (MFA) | $ 1,320,454 | 1,969,319 | 31,804,505 | 543 | 1.74 |
| New Home Const. | $ 607,016 | 725,768 | 10,886,526 | 233 | 1.24 |
| Home Works | $ 819,907 | 2,860,200 | 31,948,434 | 135 | 1.24 |
| Power Saver (LM) | $ 5,547,244 | 1,600,000 | 1,600,000 | 40,000 | 1.40 |
| Peak Saver (LM) | $ 3,843,112 | 1,200,001 | 1,200,001 | 30,000 | 1.52 |
| **Total** | **$ 36,479,038** | **99,585,648** | **1,028,070,291** | **83,168** | **1.64** |

**Q. PLEASE COMPARE THE 2024 PLAN WITH PNM'S CURRENT PLAN, WHICH WAS APPROVED FOR YEARS 2021 – 2023 IN CASE NO. 20-00087-UT.**

**A.** The 2024 Plan differs from the plan approved in Case No. 20-00087-UT in the following principal respects:

- The total budget for existing EE programs would increase by approximately 17% in 2024, 20% in 2025, and 23% in 2026 over the 2023 spending levels;

- Table 4, Table 5 and Table 6, below, list the existing programs and show the percentage change in budgets for each of years 2024, 2025 and 2026 as compared to the program budget for 2023.

**Table 4**

| 2024 Programs | 2024 Budget | 2023 Budget | 2024 Increase |
|---|---|---|---|
| Residential Comp. | $ 6,808,220 | $ 6,401,076 | 6% |
| Residential Products | $ 4,444,957 | $ 3,818,094 | 16% |
| Commercial Comp. | $ 10,006,176 | $ 9,344,269 | 7% |
| Behavioral Comp. | $ 1,039,052 | $ 1,082,907 | -4% |
| Easy Savings | $ 328,898 | $ 601,759 | -45% |
| Energy Smart (MFA) | $ 964,909 | $ 247,881 | 289% |
| New Home Const. | $ 575,090 | $ 697,681 | -18% |
| Home Works | $ 784,382 | $ 585,524 | 34% |
| Power Saver (LM) | $ 5,445,888 | $ 4,648,499 | 17% |
| Peak Saver (LM) | $ 4,119,626 | $ 2,164,093 | 90% |
| **Total** | **$ 34,517,198** | **$ 29,591,783** | **17%** |

**Table 5**

| 2025 Programs | 2025 Budget | 2023 Budget | 2025 Increase |
|---|---|---|---|
| Residential Comp. | $ 7,175,099 | $ 6,401,076 | 12% |
| Residential Products | $ 4,505,684 | $ 3,818,094 | 18% |
| Commercial Comp. | $ 10,379,672 | $ 9,344,269 | 11% |
| Behavioral Comp. | $ 1,154,423 | 1,082,907 | 7% |
| Easy Savings | $ 282,709 | $ 601,759 | -53% |
| Energy Smart (MFA) | $ 1,145,223 | $ 247,881 | 362% |
| New Home Const. | $ 599,911 | $ 697,681 | -14% |
| Home Works | $ 803,658 | $ 585,524 | 37% |
| Power Saver (LM) | $ 5,507,779 | $ 4,648,499 | 18% |
| Peak Saver (LM) | $ 3,813,078 | $ 2,164,093 | 76% |
| **Total** | **$ 35,367,236** | **$ 29,591,783** | **20%** |

**Table 6**

| 2026 Programs | 2026 Budget | 2023 Budget | 2026 Increase |
|---|---|---|---|
| Residential Comp. | $ 7,891,239 | $ 6,401,076 | 23% |
| Residential Products | $ 4,548,682 | $ 3,818,094 | 19% |
| Commercial Comp. | $ 10,639,693 | $ 9,344,269 | 14% |
| Behavioral Comp. | $ 1,026,434 | $ 1,082,907 | -5% |
| Easy Savings | $ 235,256 | $ 601,759 | -61% |
| Energy Smart (MFA) | $ 1,320,454 | $ 247,881 | 433% |
| New Home Const. | $ 607,016 | $ 697,681 | -13% |
| Home Works | $ 819,907 | $ 585,524 | 40% |
| Power Saver (LM) | $ 5,547,244 | $ 4,648,499 | 19% |
| Peak Saver (LM) | $ 3,843,112 | $ 2,164,093 | 78% |
| **Total** | **$ 36,479,038** | **$ 29,591,783** | **23%** |

**Q. DOES THE 2024 PLAN COMPLY WITH THE FUNDING REQUIREMENTS OF THE EUEA AND THE COMMISSION'S ENERGY EFFICIENCY RULE?**

**A.** The 2024 Plan complies with the 2019 amendments to the EUEA. The EUEA specifies that funding for energy efficiency and load management program costs shall be no less than 3% and no more than 5% of customers' bills but cannot exceed $75,000 for any customer per calendar year.[4] Since PNM is proposing to continue the 2021-2023 portfolio of programs, PNM has derived its 2024 Plan program budgets by updating them to account for modifications and improvements to those programs. The total proposed budgets for the 2024 Plan fall within the range of 3% to 5% of projected 2023 calendar year revenues from the classes of customers that are billed under the Energy Efficiency Rider No. 16 ("Rider

[4] In addition, the Commission's Energy Efficiency rule specifies that the calculation for plan year funding shall exclude customers' plan year self-directed program credits or exemptions.

16"). PNM will update this comparison each year with its reconciliation filing in order to account for updated projected sales and/or rate changes and spending that may occur. Should it become necessary, PNM would modify its program budget in order to maintain compliance with the 3% to 5% requirement.

The calendar year 2024 budget is adjusted for the Rider 16 over-collection in calendar year 2022. The reconciliation of 2022 program costs is being filed concurrently with the 2024 Plan. PNM witness Abraham Casas discusses in his testimony the details of PNM's calculation of the funding amount used in this filing.

**Q. DOES THE 2024 PLAN COMPLY WITH ALL OTHER PROVISIONS OF THE EUEA?**

**A.** Yes. The EUEA requires the Commission to find that the portfolio of programs is cost-effective, as measured by the UCT, before the Commission approves an EE and LM program. The portfolio of programs in the 2024 Plan meets the UCT. The EUEA also requires that energy efficiency programs implemented in 2021 through 2025 achieve savings equivalent to at least 5% of 2020 retail sales by 2025. PNM is projecting that the 2024 Plan will enable PNM to meet its 2025 energy efficiency savings target. Finally, the EUEA requires that at least 5% of program funding be directed towards low-income programs. Under PNM's proposed 2024 Plan, the three-year average is approximately 11% of total program spending for low-income programs years 2024, 2025 and 2026.

**Q. IS THE PROPOSED 2024 PLAN DESIGNED TO PROVIDE EVERY AFFECTED CUSTOMER CLASS WITH THE OPPORTUNITY TO PARTICIPATE AND BENEFIT ECONOMICALLY?**

**A.** Yes, the portfolio of programs in the 2024 Plan is designed to be applicable and accessible to all classes of customers affected by Rider No. 16. The 2024 Plan includes programs that are designed for customers in the residential class as well as the various types of customers in the commercial classes.

**Q. DOES THE 2024 PLAN COMPLY WITH THE RECOMMENDED DECISION AND FINAL ORDER IN CASE NO. 20-00087-UT?**

**A.** Yes, in general. PNM was required to conduct a transmission and distribution ("T & D") avoided cost study and incorporate the results in this application. As noted in PNM witness Phillips direct testimony, PNM's internal review of current actual T & D avoided costs would have resulted in no T & D avoided costs to utilize. Therefore, PNM continues to utilize proxy values of T & D avoided costs.

**Q. HAS PNM SOLICITED DESIGN AND IMPLEMENTATION RECOMMENDATIONS FROM COMMISSION STAFF, THE ATTORNEY GENERAL, THE ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT AND OTHER INTERESTED PARTIES?**

**A.** Yes. PNM invited these and other entities and individuals to form an energy efficiency public advisory group for this purpose. PNM held meetings with the advisory group on February 28, 2023; and April 6, 2023, to solicit recommendations for the proposed 2024

Plan. While not all invitees attended the meetings, the public advisory group provided comments which were carefully considered by PNM. A number of the suggestions were incorporated into the 2024 Plan. PNM believes the attendees of these meetings are in general agreement with the content of the 2024 Plan. Information on the composition of the advisory group can be found in the 2024 Plan, Appendix B.

**Q. WHAT OTHER SOURCES OF INFORMATION DID PNM UTILIZE IN PREPARING THE 2024 PLAN?**

**A.** PNM contracted with Applied Energy Group ("AEG"), which provides a wide range of energy efficiency and demand response related management services to assist clients in designing and implementing programs for their customers. AEG performed both EE and DR potential studies in 2019, with the studies being finalized in early 2020. The EE study was again updated in 2022, which helped guide PNM in preparing the 2024 Plan. PNM also used the New Mexico Technical Resource Manual[5] ("NM TRM") to validate energy savings for various technologies. Much of the research for the 2024 Plan was conducted through interaction with other utilities and through participation in national organizations concerned with energy efficiency, such as E-Source, Consortium for Energy Efficiency ("CEE"), American Council for an Energy Efficient Economy, Southwest Energy Efficiency Project, and Electric Power Research Institute.

[5]New Mexico Technical Resource Manual for the Calculation of Energy Efficiency Savings by Evergreen Economics and EcoMetric Consulting, November 28, 2022

## III. RESIDENTIAL PROGRAMS

**Q. PLEASE IDENTIFY THE RESIDENTIAL ENERGY EFFICIENCY PROGRAMS PNM IS PROPOSING IN THE 2024 PLAN.**

**A.** PNM is proposing to continue all residential EE programs that were approved in Case No. 20-00087-UT, including programs that serve PNM's low-income customers, which I describe in more detail later in my testimony. PNM is proposing to continue the Residential Comprehensive, Residential Products, Residential Home Energy Reports, Home Works, New Home Construction, Energy Smart, and Easy Savings programs. PNM is proposing a total budget for these programs of about $14.5 million in calendar year 2024. The proposed budget for 2025 is about $15.1 million and in 2026 the proposed budget is $16 million.

**Q. PLEASE DESCRIBE THE RESIDENTIAL COMPREHENSIVE PROGRAM.**

**A.** The Residential Comprehensive program is the primary incentive program for residential customers. The program has three components: Home Energy Checkup (including a low-income option), Residential Midstream Cooling, and Refrigerator Recycling. These programs provide energy efficiency options for customers' homes. Home Energy Checkup is an energy assessment program that offers several rebate packages tailored to meet individual customers' needs. The Home Energy Checkup includes a walk-through assessment, additional educational materials, installation of tailored energy efficiency measures, including a varied mix of the following measures: weather stripping, door sweeps, outlet gaskets, big gap filler, LEDs, and advanced power strips. AC diagnostic performance testing and smart thermostat installation are available for additional copays, as well as access to a wide range of appliance rebates such as high efficiency cooling equipment, ENERGY STAR washers and dryers and Wi-Fi connected thermostats. Residential Midstream Cooling provides incentives to distributors and contractors for stocking and installing highly efficient cooling equipment. Discounts are passed through to customers purchasing this equipment. Refrigerator Recycling is designed to encourage retirement of old or unnecessary second refrigerators and freezers. PNM picks up the old equipment for free and recycles about 95% of all the materials. Participants also receive an incentive, currently $75 per unit. A retail component was added to the program as well to encourage customers to recycle their old units while purchasing a new, more efficient one.

**Q. PLEASE DESCRIBE THE RESIDENTIAL PRODUCTS PROGRAM.**

**A.** The Residential Products, formerly Residential Lighting, provides incentives and instant discounts on LED bulbs and other non-lighting measures such as ENERGY STAR appliances, advanced power strips, and room air conditioners purchased at approximately 250 participating retail outlets throughout PNM's service area. However, due to implementation of the federal Energy Independence and Security Act ("EISA"), limited, if any, lighting incentives/rebates will only be offered in the 2024 program year. EISA prescribed minimum efficacy standards beginning in 2007 with several planned phase outs of inefficient lighting technologies. The most recent phase which was due to begin in January 2020 and will now take effect as of January 1, 2024, requires several general service lamps (GSLs) to be approximately 65% more efficient than traditional incandescent bulbs including a "back stop" provision requiring a 45 lumen/watt minimum efficiency standard of GSLs. This most recent EISA standard change reduces lighting savings by approximately half of the previously savings achieved, except for proven halogen replacement in homes. This program is cost effective with a UCT ratio of 2.16 in 2024, a UCT ratio of 2.05 in 2025 and a UCT ratio of 2.09 in 2026.

**Q. PLEASE DESCRIBE THE PNM HOME WORKS PROGRAM.**

**A.** The PNM Home Works program is an energy savings and education program that combine an energy efficiency curriculum for teachers with easy-to-install energy efficiency and water-saving measures for 5th grade and high school students to install at home with their parents. The program has two main goals: energy savings and market transformation through student education. Each participating school hosts an interactive or virtual presentation focused on energy efficiency and conservation delivered by PNM and its implementation contractor. Following the presentation, each student receives a kit of energy efficient measures to be installed in their home. The teacher and student kit materials support state and national educational standards, which allow the program to easily fit into teachers' existing schedules and requirements. Demand has been high for the program and PNM has a waiting list of teachers and schools that wish to participate. About 40% of the cost of delivering the program is the cost of the market transformation or general energy efficiency educational materials, presentations and activities. The purpose of the Market Transformation strategy, which I discuss later in my testimony, is to provide outreach activities that support the goals of the energy efficiency programs and that are needed to increase awareness and understanding of the importance of energy efficiency. Because the general educational component of the PNM Home Works program is important, yet does not directly result in quantifiable energy savings, the 2024 Plan proposes to continue to implement the educational portion of the program through the Market Transformation strategy.

**Q. PLEASE DESCRIBE THE NEW HOME CONSTRUCTION PROGRAM AND ANY MODIFICATIONS TO THIS PROGRAM IN THE 2024 PLAN.**

**A.** The target audience consists of custom, semi-custom, and production home builders and could also include consumers, realtors, trade allies, raters, developers and architects. The goal is to offer a streamlined program that offers participants incentives for highly efficient new single-family residential construction through either a prescriptive or a performance path. PNM is collaborating and cost-sharing with New Mexico Gas Company ("NMGC") on this program for an even more robust program offering to home builders. The program approach offered homebuilders a set prescriptive list of efficient measures to install or a whole home performance path approach for properties exceeding the current building code. The combination of recent building code changes to IECC 2018 and the forthcoming EISA standard changes will have significant impacts on lighting measures beginning in 2024. Therefore, PNM believes higher per home savings would be best achieved by utilizing the performance path solely through an all-electric home pilot. Therefore, PNM is proposing to include an all-electric pilot in the 2024 Plan. PNM will continue to offer a prescriptive measure path to achieve energy savings and continued engagement with the homebuilder community. In 2022, 52 homebuilders participated in conjunction with 7 Home Energy Rating System ("HERS") raters to submit rebates for 528 prescriptive and 874 performance homes. Please see the 2024 Plan for complete details of the program.

## IV. LOW-INCOME PROGRAMS

**Q. HOW DOES THE 2024 PLAN ADDRESS ENERGY EFFICIENCY FOR LOW-INCOME CUSTOMERS?**

**A.** Five of the ten programs in the 2024 Plan are either exclusively for low-income customers or serve a significant number of low-income customers. PNM will continue to fund the Energy Smart program to supplement the weatherization program offered by the New Mexico Mortgage Finance Authority ("MFA") for multifamily and single-family homes. PNM will also continue the low-income Easy Savings kit program, which has been very successful since it began in 2009, and the Home Energy Checkup program, which is available to low-income homeowners and renters. The PNM Home Works program, which provides energy efficiency education and free energy saving kits to fifth grade and high school students, serves a significant number of students from low-income families. Finally, the Multifamily component of the Commercial Comprehensive program includes special options for owners of multifamily residences that serve low-income renters. Approximately 11% of the 2024 Plan budget is projected to be expended on low-income programs over all three program years. Please see the 2024 Plan for complete details of the low-income programs. Table 7, below, shows the low-income program budget amounts and the percent of each program directed to low-income participants in 2024, 2025 and 2026.

**Table 7**

| Low Income Programs | % of Budget Directed to Low Income Participants | 2024 Budget Directed to Low Income Participants | 2025 Budget Directed to Low Income Participants | 2026 Budget Directed to Low Income Participants |
|---|---|---|---|---|
| HEC - LI | 100% | $ 1,864,819 | $ 2,104,354 | $ 2,616,160 |
| Easy Savings | 100% | $ 328,898 | $ 282,709 | $ 235,256 |
| Energy Smart (MFA) | 100% | $ 964,909 | $ 1,145,223 | $ 1,320,454 |
| Home Works | 40% | $ 313,753 | $ 321,463 | $ 327,963 |
| **Total** | | **$ 3,472,379** | **$ 3,853,749** | **$ 4,499,832** |
| % of Total Portfolio Budget | | 10.1% | 10.9% | 12.3% |

**Q. PLEASE DESCRIBE THE ENERGY SMART PROGRAM.**

**A.** The Energy Smart program is implemented by MFA as part of its New Mexico Energy Smart Weatherization Program. The Energy Smart program is funded by several sources including the U.S. Department of Energy, the Low-income Heating Energy Assistance Program ("LIHEAP"), State government, PNM and NMGC. PNM worked with MFA to determine a budget consistent with the funding MFA expects in 2024 from other sources. The program currently offers the following measures for single family and multifamily projects: weatherization, attic insulation, duct sealing, pipe and tank insulation, low-flow showerheads and aerators. As with PNM's other income-based programs, the income eligibility threshold utilized is at or below 200% of the federal poverty level. Beginning in 2021 the replacement of doors, windows, and heat pumps and other shell measures as needed are offered to increase overall savings and to leverage available federal funding.

**Q. PLEASE DESCRIBE THE EASY SAVINGS PROGRAM.**

**A.** The Easy Savings program provides a free kit containing LEDs, advanced power strips, and weatherization measures such as door sweeps and foam tape insulation, in addition to educational materials on saving energy to low-income customers. The program distributes the kits through direct mail. Historically, direct mail has proven to be a successful channel in delivering this program. Customers who receive an enrollment postcard in the mail can request the energy efficiency kit. Customers can order by mail, over the phone, or an online portal.

**Q. PLEASE DESCRIBE THE LOW-INCOME OPTION OF THE HOME ENERGY CHECKUP PROGRAM.**

**A.** As I mentioned earlier in my testimony, the Home Energy Checkup program is available to low-income customers and has special no-cost features. Low-income customers receive all of the benefits of the standard Home Energy Checkup program. There is no cost for the initial assessment and report for income qualified customers. Low-income customers may also qualify to receive an ENERGY STAR refrigerator to replace an older, inefficient model. The home assessor determines if the home's primary refrigerator is eligible for replacement. To be eligible for the low-income benefits, participants must have incomes relative to family size at or below 200% of the federal poverty level. PNM is continuing collaboration with NMGC to provide low-income customers living in Native American communities with all of the benefits of the standard Home Energy Checkup program, including the possibility of qualifying for an ENERGY STAR refrigerator. In 2022 and continuing in 2023, PNM is partnering with Prosperity Works and Energy Works to identify and provide weatherization assistance to selected income qualified communities.

**Q. WHAT OTHER PROGRAMS DIRECTLY BENEFIT PNM'S LOW-INCOME CUSTOMERS?**

**A.** In addition to the programs described above, the PNM Home Works program and the Multifamily component of the Commercial Comprehensive program benefit low-income customers., Many students in PNM's service territory come from low-income families. The energy savings kits and the educational materials provided by the Home Works program benefit the students and their families. In 2022, about 26% of the incentives provided through the Multifamily program were administered to properties that served low-income renters. The improvements to properties participating in the Multifamily program include energy efficiency upgrades to individual rental units and common areas which result in reduced energy consumption for tenants.

## V. COMMERCIAL PROGRAMS AND OTHER INITIATIVES

**Q. PLEASE DESCRIBE THE COMMERCIAL COMPREHENSIVE PROGRAM.**

**A.** The Commercial Comprehensive program is PNM's flagship program for non-residential customers. The program provides incentives for the retrofit or installation of both prescriptive and non-prescriptive measures that decrease demand and save energy. The program is designed to be a "one-stop-shop" for commercial customers interested in improving the efficiency of their existing or planned new facilities. Examples of measures include a prescriptive list of lighting upgrades, VSD's/VFD's, building controls, compressed air and fan systems, and HVAC and refrigeration upgrades, as well as incentives for custom measures. This program also includes a new construction option that offers incentives for buildings constructed to exceed local building code energy requirements and special incentives for small businesses. In addition, the program offers training programs and on-site audits. Enhanced incentives are also available for multi-family projects that serve LI customers. The Commercial Comprehensive program is comprised of six components: Retrofit Rebates, New Construction, Building Tune-Up, Distributor Discount, Multifamily and PNM QuickSaver™ for small business customers. One important aspect of the Commercial Comprehensive program is its reliance on the participation of local energy efficiency vendors, suppliers and contractors who install the energy saving equipment. These businesses are critical "trade allies" and the program would not be successful without their enthusiastic support. Please see the 2024 Plan for complete program details.

**Q. PLEASE DESCRIBE THE MARKET TRANSFORMATION STRATEGY.**

**A.** The Market Transformation ("MT") strategy supports educational activities that further the energy efficiency goals of the EUEA. Energy savings are not directly attributed to the MT strategy; therefore, the MT strategy is not a program subject to the UCT calculation. However, the costs of the MT strategy are included in the calculation of the total 2024 plan portfolio UCT. The goals of the MT strategy are 1) to increase awareness of the importance and benefits of energy efficiency; 2) to encourage behavior changes that result in the adoption of energy efficient measures; and 3) to promote emerging technologies that are not part of existing energy efficiency programs but have the potential to be included in the future. The MT strategy uses various promotional activities and advertising channels to conduct targeted efforts aimed at specific customer segments, including hard-to-reach segments and schools. It focuses on community events and presentations that promote energy efficiency, engaging customers on the topic of energy efficiency through on-line PNM channels and social media, energy efficiency educational presentations at schools as part of the Home Works programs, and a modest level of mass-market advertising to promote energy efficiency in general.

The Certification of Stipulation adopted by the Final Order in Case No. 17-00076-UT concluded that the cost of the Market Transformation strategy was correctly allocated pro rata to each program based on the total cost of each program. That is how MT costs are allocated in PNM's application.

**Q. PLEASE DESCRIBE THE TRADE ALLY INITIATIVE.**

**A.** The Trade Ally ("TA") Initiative offers PNM's trade allies enhanced services, information and incentives, in addition to what is currently provided by third party program implementation contractors. PNM's energy efficiency programs depend on a wide range of trade allies including retail outlets, community agencies that serve PNM's low-income customers, HVAC and lighting contractors and equipment distributors. PNM expects to have over 550 trade allies participate in the 2024 Plan programs (please see a list of current trade allies in Appendix D of the 2024 Plan). Building positive relationships with the trade allies that represent the utility to its customers is important to the success of the energy efficiency programs. The activities include trade ally recognition and rewards for achieving program performance goals; trade ally incentives to drive improved customer service across PNM's service area; technical, marketing and customer service training; and program-related information. Benefits included in the 2024 TA Initiative include co-branded apparel for vendors, special recognition for excellent performance, and an annual awards banquet acknowledging program performance.

## VI. LOAD MANAGEMENT PROGRAMS

**Q. PLEASE DESCRIBE THE PNM DEMAND RESPONSE PROGRAMS.**

**A.** PNM has a well-established base of Demand Response ("DR") resources that the Company has used since 2008. DR is a form of load management. In this filing, PNM uses the terms 'load management' and 'demand response' interchangeably. PNM DR resources consist of 1) Power Saver, an air conditioner ("A/C") cycling program (using switches and thermostats) open to residential and small business customers with central A/C units, and 2) Peak Saver, a commercial and industrial ("C&I") customer curtailment program available for larger business customers. PNM has outsourced the administration of both programs to firms specializing in delivery of DR products and services. Over the years, these DR resources have been integrated into PNM's resource portfolio. PNM power dispatchers call on the programs during the hottest summer days and the demand reduction is counted as a supply resource in PNM's load and resources table. DR provides a unique, demand-side resource that further diversifies PNM's resource portfolio and contributes to the efficient and cost-effective use of supply-side resources.

**Q. HAS PNM UTILIZED THE DEMAND RESPONSE PROGRAMS RECENTLY AS A PEAKING RESOURCE?**

**A.** Yes. The Power Saver and Peak Saver programs are typically dispatched simultaneously in order to achieve the maximum load reduction. The programs were dispatched 3 times in 2022 for a total of 10 hours. In 2021, the programs were dispatched 2 times for a total of 8 hours. Furthermore, in compliance with the Final Order in Case No. 17-00076-UT, PNM addresses in its Annual Reports that the LM measures "avoid or offset" the need for or use of additional peaking units or power purchases, which is also verified by the M&V Report.

**Q. IS DEMAND RESPONSE COST-EFFECTIVE?**

**A.** The current contract terms for calculating capacity combined with the avoided cost of capacity in the program plan approved in Case No. 20-00087-UT results in a cost-effective program. Evaluations by the statewide independent evaluator demonstrate that the actual capacity delivered when measured over an average hour (the average hourly capacity) is lower than calculated by the contract methodology. The independent evaluator evaluated average hourly capacity combined with the avoided cost of capacity results in a program that is not cost-effective under the UCT. The current contracts expire after the 2023 control season.

**Q. DOES PNM UTILIZE THE DEMAND RESPONSE PROGRAMS AS A FIRM CAPACITY RESOURCE?**

**A.** No, due to the parameters of existing programs, mainly voluntary participation, the current capacity provided by the existing programs in not considered a firm resource.

**Q. WHAT STEPS HAS PNM TAKEN TO INCREASE UTILIZATION OF THE DEMAND RESPONSE PROGRAMS AS A FIRM CAPACITY RESOURCE?**

**A.** PNM issued an RFP for DR resources in 2022. The result of the RFP yielded both commercial and residential programs which could provide a firm capacity commitment, while also offering a secondary non-firm voluntary DR option for customers.

**Q. WHAT ARE THE PROPOSED BUDGETS FOR THE DEMAND RESPONSE PROGRAMS AND HOW DO THEY COMPARE TO THE PREVIOUS 2021 PROGRAM PLAN BUDGET(S)?**

**A.** PNM is proposing a total annual budget for the DR programs of about $9.5 million in 2024, $9.3 million in 2025 and $9.4 million in 2026. The Power Saver budget is $5.4 million 2024, $5.5 million in 2025 and $5.5 million in 2026; and the Peak Saver budget is $4.1 million 2024, $3.8 million in 2025, and $3. 8 million in 2026. This represents about a 17% increase compared to the 2022 Program Plan budget for DR.

## VII. OVERALL 2024 PLAN DEVELOPMENT

**Q. HAS PNM EXPLORED COLLABORATION OPPORTUNITIES WITH NEW MEXICO GAS COMPANY?**

**A.** Yes. PNM and NMGC are collaborating in several ways, including cross-promotion of programs and actual sharing of costs in certain situations. Collaboration increases the value of the programs to participants and helps reduce implementation costs. These collaboration efforts are discussed in more detail where my testimony describes the Home Energy Checkup, New Homes Construction, and other low-income programs. PNM and NMGC meet monthly to discuss common program performance and future potential program opportunities shared by our customers. Moreover, PNM, NMGC, Southwestern Public Service Company/Xcel Energy and El Paso Electric Company meet monthly to discuss Energy Efficiency challenges, trends, or program potential within the state of New Mexico.

**Q. WHAT ARE THE UCT RATIOS FOR THE PROGRAMS IN THE 2024 PLAN, BASED ON PNM'S PROJECTED PROGRAM COSTS AND BENEFITS?**

**A.** The UCT ratio is the ratio of the present value of savings and the present value of costs associated with a given program. Any program that has a UCT greater than 1.0 is cost-effective. The UCT costs include all costs borne by the utility to implement the program over a 12-month period. The value of the savings used in the UCT calculation is determined by multiplying the expected energy and demand savings over the useful life of each program by PNM's avoided costs. PNM's avoided costs are shown in the 2024 Plan, Appendix A. PNM Witness, Mr. Phillips describes the development of the avoided costs in his testimony. For the existing programs that will be continued, the energy and demand savings used in the UCT calculation are based on the results of independent M&V analysis. These values and other assumptions used in the UCT calculations are listed in the 2024 Plan, Appendix E. The UCT ratios for each program, based on PNM's projection of annual participation levels, savings and costs for the programs have been provided in Tables 1, 2 and 3 earlier in my testimony.

**Q. WHAT DISCOUNT RATE DID PNM USE TO CALCULATE THE PRESENT VALUE OF COSTS AND BENEFITS AND HOW WAS IT DETERMINED?**

**A.** PNM used a discount rate of 7.2 percent, which is PNM's most recently approved unadjusted weighted average cost of capital ("WACC")[6]. Although the Final Order in Case No. 20-00087-UT (PNM's most recent EE Application) required that, if PNM uses its WACC as the discount rate, it must be adjusted for taxes, the 2019 amendments to the EUEA require otherwise. Section 62-17-5(C) of the EUEA states that "[i]n determining life-cycle costs and benefits of energy efficiency programs, the commission shall not adjust for taxes when selecting a discount rate." PNM has therefore not made a tax adjustment to its WACC that is being used as the discount rate.

**Q. HOW MANY CUSTOMERS ARE EXPECTED TO PARTICIPATE IN THE 2024 PLAN PROGRAMS?**

**A.** Estimates of the anticipated annual participation in each program is shown in Table 8, below.

[6] Final Order adopting Certification of Stipulation in Case No. 16-00276-UT.

**Table 8**

| Programs | Unit Type | 2024 | 2025 | 2026 |
|---|---|---|---|---|
| **Residential Comprehensive** | | **40,198** | **41,438** | **46,933** |
| Res. Comp. - Refrigerator Recycling | Unit | 6,200 | 6,200 | 6,200 |
| Res. Comp. - Home Energy Checkup | Participant | 18,895 | 19,060 | 18,665 |
| Res. Comp. - LI Home Energy Checkup | Participant | 11,985 | 12,940 | 18,650 |
| Res. Comp. - Midstream Cooling | Unit | 3,118 | 3,238 | 3,418 |
| Residential Products | Unit | 309,551 | 309,551 | 309,551 |
| **Commercial Comprehensive** | | **576** | **581** | **587** |
| Comm. Comp. - Retrofit/NC/Mid | Participant | 238 | 240 | 243 |
| Comm. Comp. - QuickSaver | Participant | 248 | 250 | 253 |
| Comm. Comp. - Bldg Tune-Up | Participant | 29 | 29 | 29 |
| Comm. Comp. - Multifamily | Participant | 61 | 62 | 63 |
| Behavioral Comp. | Participant | 219,476 | 219,476 | 219,476 |
| Easy Savings | Participant | 3,500 | 3,000 | 2,500 |
| Energy Smart (MFA) | Participant | 458 | 520 | 582 |
| New Home Const. | Unit | 1,195 | 1,255 | 1,317 |
| Home Works | Participant | 14,000 | 14,000 | 14,000 |

**Q. HOW DID PNM DETERMINE THE PARTICIPATION RATES AND UNIT TARGETS?**

**A.** All programs in the 2024 Plan are programs that were approved by the Commission in previous cases and implemented in previous years. The participation estimates for these programs are based on the most recent participation results, known changes in the market, and discussions with the third-party contractors implementing the programs.

**Q. WHAT ARE THE PROJECTED ANNUAL ENERGY AND DEMAND SAVINGS FROM THE 2024 PLAN?**

**A.** Tables 9, 10 and 11, below, provide the projected annual electric energy and demand savings for each program of the 2024 Plan.[7] Program savings are derived using savings estimates for each measure in the program multiplied by projected participation levels. Specific details on all savings assumptions are shown in the 2024 Plan, Appendix E.

**Table 9**

| 2024 Programs | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings |
|---|---|---|---|
| Residential Comp. | 16,433,453 | 142,475,934 | 2,185 |
| Commercial Comp. | 38,607,755 | 409,242,200 | 7,305 |
| Behavioral Comp. | 5,743,750 | 13,215,750 | 1,281 |
| Residential Products | 24,515,684 | 325,077,968 | 1,335 |
| Easy Savings | 2,024,750 | 22,616,458 | 242 |
| Energy Smart (MFA) | 1,438,245 | 23,227,657 | 373 |
| New Home Const. | 650,756 | 9,761,335 | 209 |
| Home Works | 2,860,200 | 31,948,434 | 135 |
| Power Saver (LM) | 1,600,000 | 1,600,000 | 40,000 |
| Peak Saver (LM) | 1,200,001 | 1,200,001 | 30,000 |
| **Total** | **95,074,594** | **980,365,736** | **83,065** |

[7] The annual savings values reflect annualized savings for all customers that begin participating in PNM's EE programs in a calendar year. For example, if a customer begins participating in an EE program in December 2024, a full year's worth of savings from that participation is attributed to 2024 for purposes of calculating 2024 savings and the UCT. However, the customer's participation will not have a full year's impact on PNM's system load until 2025.

**Table 10**

| 2025 Programs | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings |
|---|---|---|---|
| Residential Comp. | 16,159,657 | 140,423,201 | 1,781 |
| Commercial Comp. | 39,959,026 | 423,565,677 | 7,422 |
| Behavioral Comp. | 6,327,250 | 15,223,250 | 1,416 |
| Residential Products | 24,515,684 | 325,077,968 | 1,335 |
| Easy Savings | 1,735,500 | 19,385,535 | 207 |
| Energy Smart (MFA) | 1,704,074 | 27,520,800 | 458 |
| New Home Const. | 702,751 | 10,541,268 | 223 |
| Home Works | 2,860,200 | 31,948,434 | 135 |
| Power Saver (LM) | 1,600,000 | 1,600,000 | 40,000 |
| Peak Saver (LM) | 1,200,001 | 1,200,001 | 30,000 |
| **Total** | **96,764,144** | **996,486,134** | **82,976** |

Table 11

| 2026 Programs | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings |
|---|---|---|---|
| Residential Comp. | 18,138,879 | 158,733,847 | 1,846 |
| Commercial Comp. | 41,157,797 | 436,272,647 | 7,534 |
| Behavioral Comp. | 5,971,750 | 14,391,750 | 1,371 |
| Residential Products | 24,515,684 | 325,077,968 | 1,335 |
| Easy Savings | 1,446,250 | 16,154,613 | 173 |
| Energy Smart (MFA) | 1,969,319 | 31,804,505 | 543 |
| New Home Const. | 725,768 | 10,886,526 | 233 |
| Home Works | 2,860,200 | 31,948,434 | 135 |
| Power Saver (LM) | 1,600,000 | 1,600,000 | 40,000 |
| Peak Saver (LM) | 1,200,001 | 1,200,001 | 30,000 |
| **Total** | **99,585,648** | **1,028,070,291** | **83,168** |

**Q. HOW WILL MEASUREMENT AND VERIFICATION OF THESE PROGRAMS BE CONDUCTED?**

**A.** M&V will be conducted by an independent program evaluator selected by the Commission. PNM will work closely with the independent evaluator for evaluation of the 2024 Plan programs.

**Q. DID THE 2022 M&V REPORT FIND THAT ANY EXISTING PROGRAM FAILED TO PASS THE UCT?**

**A.** Yes. Although the statutory test for cost-effectiveness is at the total portfolio level, the M&V evaluator also assessed the cost-effectiveness of each individual program. The 2022 report[8] found that the Behavioral Comprehensive, Residential Comprehensive, the Multi-Family program (within the Commercial Comprehensive program), and Energy Smart programs did not pass the UCT. The results are shown in PNM's 2022 annual program report[9]. The 2022 M&V report from the independent evaluator and the 2022 PNM annual report are attached as exhibits B and C to PNM's application in this case. PNM posted the 2022 annual report on the following public website, as required by 17.7.2.14(B) NMAC: https://www.pnm.com/regulatory.

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[8] "Evaluation of 2019 Public Service Company of New Mexico Energy Efficiency & Demand Response Portfolio", Evergreen Economics, April 2020.
[9] "PNM Energy Efficiency Program 2019 Annual Report", PNM, April 15, 2020.

**Q. DOES PNM RECOMMEND CONTINUING ALL INDIVIDUAL ENERGY EFFICIENCY PROGRAMS WITHIN THE PORTFOLIO REGARDLESS OF INDIVIDUAL PROGRAM UCT'S LESS THAN 1.0?**

**A.** Yes. The Energy Efficiency rule, 17.7.2.8(H)(13)(a) NMAC, states, with respect to energy efficiency applications, that the application shall "demonstrate and justify how the estimated monetary program costs will be equal to or greater than the actual monetary program costs." 17.7.2.8(H)(16) NMAC further states: "if the utility cost test is not met, justify why the utility is proposing to implement the program within its portfolio of proposed programs." PNM is proposing that the overall UCT of the proposed portfolio of programs be considered when evaluating the cost-effectiveness of the program plan. This is consistent with NMSA 1978, Section 62-17-5(C), which states that "[b]efore the commission approves an energy efficiency or load management for a public utility, it shall find that the portfolio of programs is cost-effective and designed to provide every affected customer class with the opportunity to participate and benefit economically."

Therefore, to provide the greatest opportunity for each affected customer class customer to participate in energy efficiency programs, PNM recommends that the entire portfolio be approved. Furthermore, several of the programs with low UCTs are directly beneficial to - low-income customers. In addition, these programs provide environmental benefits by avoiding emissions that may be associated with supply-side resources. For all the above reasons, PNM believes it is reasonable to approve the entire portfolio of programs.

**Q. WHAT ARE THE ANTICIPATED PROGRAM COSTS ASSOCIATED WITH THE 2024 PLAN?**

**A.** The projected total program costs for all programs for a full year of implementation are estimated to be $34,517,198 in 2024, $35,367,236 in 2025 and $36,479,038 in 2026, not including profit incentives. The 2024 Plan costs are comprised of internal administrative costs (primarily labor costs), third-party administrative costs, rebates, promotion, and costs associated with M&V of the individual programs. Tables 12, 13, and 14, below, provide a breakdown of the total costs.

**Table 12**

| 2024 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 333,750 | $ 3,230,227 | $ 5,928,840 | $ 169,619 | $ 178,465 | $ 165,274 | $ 10,006,176 |
| Residential Comprehensive | $ 220,481 | $ 2,906,627 | $ 3,341,978 | $ 112,054 | $ 117,897 | $ 109,183 | $ 6,808,220 |
| Behavioral Comprehensive | $ 33,218 | $ 912,379 | $ 42,360 | $ 16,882 | $ 17,763 | $ 16,450 | $ 1,039,052 |
| Residential Products | $ 148,174 | $ 1,468,943 | $ 2,599,925 | $ 75,305 | $ 79,233 | $ 73,376 | $ 4,444,957 |
| Easy Savings Kit | $ 10,876 | $ 144,021 | $ 157,273 | $ 5,527 | $ 5,816 | $ 5,386 | $ 328,898 |
| Energy Smart (MFA) | $ 32,961 | $ 150,000 | $ 731,250 | $ 16,751 | $ 17,625 | $ 16,322 | $ 964,909 |
| New Home Construction | $ 18,918 | $ 291,263 | $ 235,809 | $ 9,615 | $ 10,116 | $ 9,368 | $ 575,090 |
| Home Works | $ 26,794 | $ 201,040 | $ 515,335 | $ 13,617 | $ 14,328 | $ 13,268 | $ 784,382 |
| Power Saver | $ 173,547 | $ 5,005,400 | $ - | $ 88,200 | $ 92,800 | $ 85,941 | $ 5,445,888 |
| Peak Saver | $ 131,282 | $ 3,786,413 | $ - | $ 66,720 | $ 70,200 | $ 65,011 | $ 4,119,626 |
| **TOTALS** | **$ 1,130,002** | **$ 18,096,312** | **$ 13,552,770** | **$ 574,292** | **$ 604,242** | **$ 559,580** | **$ 34,517,198** |

**Table 13**

| 2025 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 346,725 | $ 3,307,753 | $ 6,165,994 | $ 201,312 | $ 184,646 | $ 173,243 | $ 10,379,672 |
| Residential Comprehensive | $ 232,679 | $ 2,990,669 | $ 3,576,486 | $ 135,095 | $ 123,911 | $ 116,259 | $ 7,175,099 |
| Behavioral Comprehensive | $ 36,708 | $ 1,004,789 | $ 54,480 | $ 20,203 | $ 19,718 | $ 18,525 | $ 1,154,423 |
| Residential Products | $ 150,316 | $ 1,513,012 | $ 2,599,925 | $ 87,275 | $ 80,050 | $ 75,106 | $ 4,505,684 |
| Easy Savings Kit | $ 9,360 | $ 123,446 | $ 134,806 | $ 5,435 | $ 4,985 | $ 4,677 | $ 282,709 |
| Energy Smart (MFA) | $ 39,167 | $ 180,938 | $ 861,951 | $ 22,740 | $ 20,858 | $ 19,570 | $ 1,145,223 |
| New Home Construction | $ 19,800 | $ 286,948 | $ 261,228 | $ 11,496 | $ 10,545 | $ 9,893 | $ 599,911 |
| Home Works | $ 27,485 | $ 201,040 | $ 530,805 | $ 15,958 | $ 14,637 | $ 13,733 | $ 803,658 |
| Power Saver | $ 175,761 | $ 5,048,550 | $ - | $ 102,048 | $ 93,600 | $ 87,820 | $ 5,507,779 |
| Peak Saver | $ 121,681 | $ 3,495,150 | $ - | $ 70,649 | $ 64,800 | $ 60,798 | $ 3,813,078 |
| **TOTALS** | **$ 1,159,683** | **$ 18,152,293** | **$ 14,185,675** | **$ 672,212** | **$ 617,749** | **$ 579,624** | **$ 35,367,236** |

**Table 14**

| 2026 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 352,914 | $ 3,373,908 | $ 6,350,974 | $ 194,229 | $ 189,572 | $ 178,098 | $ 10,639,693 |
| Residential Comprehensive | $ 253,789 | $ 3,091,285 | $ 4,142,089 | $ 139,675 | $ 136,326 | $ 128,075 | $ 7,891,239 |
| Behavioral Comprehensive | $ 32,648 | $ 889,706 | $ 52,100 | $ 17,968 | $ 17,537 | $ 16,476 | $ 1,026,434 |
| Residential Products | $ 150,590 | $ 1,558,402 | $ 2,599,925 | $ 82,879 | $ 80,891 | $ 75,995 | $ 4,548,682 |
| Easy Savings Kit | $ 7,733 | $ 102,872 | $ 112,338 | $ 4,256 | $ 4,154 | $ 3,903 | $ 235,256 |
| Energy Smart (MFA) | $ 44,837 | $ 211,875 | $ 992,355 | $ 24,676 | $ 24,085 | $ 22,627 | $ 1,320,454 |
| New Home Construction | $ 19,900 | $ 286,948 | $ 268,484 | $ 10,952 | $ 10,690 | $ 10,043 | $ 607,016 |
| Home Works | $ 27,840 | $ 201,040 | $ 546,700 | $ 15,322 | $ 14,955 | $ 14,050 | $ 819,907 |
| Power Saver | $ 175,739 | $ 5,091,700 | $ - | $ 96,719 | $ 94,400 | $ 88,686 | $ 5,547,244 |
| Peak Saver | $ 121,751 | $ 3,527,513 | $ - | $ 67,007 | $ 65,400 | $ 61,442 | $ 3,843,112 |
| **TOTALS** | **$ 1,187,742** | **$ 18,335,247** | **$ 15,064,964** | **$ 653,683** | **$ 638,009** | **$ 599,393** | **$ 36,479,038** |

**Q. WHAT ARE THE INTERNAL ADMINISTRATIVE COSTS?**

**A.** The internal administrative costs consist primarily of internal labor to research, develop, implement and manage the programs, coordinate with third-party contractors, administer any contracts associated with the specific programs, work with the independent evaluator, and prepare annual compliance filings. This work will continue to be performed by PNM's energy efficiency department staff. Administrative costs also include the costs associated with membership in research organizations such as E-Source, DesignLights Consortium ("DLC"), American Council for an Energy Efficient Economy ("ACEEE") and Consortium for Energy Efficiency ("CEE"). Administrative costs were allocated pro rata to the energy efficiency programs based on the direct costs associated with each program, with some adjustments based on dedicated costs.

**Q. WHAT ARE PNM'S PROMOTIONAL COSTS AND HOW WERE THEY ESTIMATED?**

**A.** About 80% of the total promotional costs for the 2024 Plan are associated with the general promotion activities included in the Market Transformation ("MT") strategy and customer outreach initiatives directed across the portfolio of programs, including the trade ally initiative. All MT costs are allocated across the portfolio of programs on a pro-rata basis. As discussed previously in my testimony, promotional activities of the MT strategy include media communications, school educational activities, and community events. The remaining portion of the promotional budget is for the costs associated with specific promotional activities that are in addition to the promotional activities conducted by third-party contractors. Although program promotion is done by most of the third-party implementation contractors and included in their budgets, PNM is responsible for promotional costs and activities for some programs. PNM plans and executes customer outreach strategy for the Residential Comprehensive program. PNM manages all marketing activity for the Refrigerator Recycling component and assists Itron, Bidgely, AMCG, Franklin Energy and CLEAResult in the development of marketing materials and campaigns for the Power Saver, Home Energy Reports, Easy Savings Kit, Home Energy Checkup and Residential Products and Midstream Cooling programs. While PNM works in conjunction with each third-party contractor to market its respective program, this may also include cross-promotion of other programs in its own marketing materials and customer outreach channels where appropriate. These marketing channels include direct mail, outreach events (including events specifically for low-income customers), bill inserts, call center staff, the PNM website, outdoor advertising, and television and radio spots.

**Q. ARE THE COSTS TO IMPLEMENT THE 2024 PLAN REASONABLE?**

**A.** Yes. The incentive or rebate levels are consistent with industry practice and the program costs are consistent with the EUEA. The internal administrative costs are about three percent (3%) of the total cost and the M&V costs are about two percent (2%) of the total cost. The portfolio of programs has a UCT of greater than 1.0, so the portfolio of programs is therefore cost-effective. All costs associated with the development and implementation of the programs are excluded from PNM's electric cost of service used to determine base rates.

**Q. HOW DOES PNM PROPOSE TO COMPLY WITH THE REQUIREMENT TO INCLUDE LANGUAGE ON CUSTOMER BILLS AND IN CUSTOMER BILL INSERTS EXPLAINING PROGRAM BENEFITS?**

**A.** The Commission's Final Order in Case No. 10-00280-UT approved the following statement to be included in PNM customer bill inserts: "The energy efficiency line on your bill pays for programs that save energy and avoid the cost of new electricity generation." The Commission's Final Order in Case No. 10-00280-UT also approved the line item title on PNM customer bills to read: "Cost-Effective Energy Saving Prog." In subsequent PNM EE/LM proceedings (Case Nos. 14-00310-UT, 16-00096-UT, 17-00076-UT, and 20-00087-UT), this language was recognized as satisfactory.[10] PNM therefore proposes to continue to include this bill insert statement and line item title on customer bills.

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[10] Certification of Stipulation, p. 13, Order Adopting and Approving Certification of Stipulation, Case No. 16-00096-UT, January 11, 2017.

## VIII. PROPOSED PROFIT INCENTIVE

**Q. WHAT ARE THE PRIMARY FINANCIAL IMPLICATIONS FOR A UTILITY OF PROVIDING ENERGY EFFICIENCY PROGRAMS?**

**A.** The traditional electric utility business model seeks to provide adequate and reliable power to meet customer demand. It involves building and maintaining generation plants, transmission lines, transformers, substations, distribution lines and other plants and facilities necessary to accomplish this objective. This involves heavy capital investment, making the traditional electric utility business model "capital intensive." Under traditional regulation, utilities make money by selling the power they generate at rates sufficient to recover their costs and earn a return on the capital invested in the property used to serve customers. Traditional rates are designed in such a manner that the more electricity sold by the utility, the more plants and facilities it builds to meet customer demand, and the greater the profits it earns.

Energy efficiency programs are in direct conflict with this traditional model. The EUEA requires utilities to spend resources on programs that necessitate little or no capital investment and result in selling less of their product, which reduces the revenue they can earn to recover their fixed costs. This, in turn, reduces the overall profitability and profit potential of the traditional business. In short, energy efficiency investments present PNM with three primary financial concerns:

1. energy efficiency program costs that must be recovered;
2. reduced sales that reduce fixed cost recovery and profits; and

3. money spent on energy efficiency programs does not provide an opportunity for a return or profit margin as does the capital investment in utility property that is used to meet customer demand for electricity.

Consequently, in order to incentivize utilities and adequately compensate them for implementing energy efficiency programs and meeting statutory savings goals, all three financial concerns must be appropriately addressed.

**Q. DOES THE EUEA PROVIDE AN APPROPRIATE FRAMEWORK FOR ADDRESSING THESE CONCERNS?**

**A.** Yes. The EUEA addresses all three of these concerns.

- First, the EUEA grants the Commission authority to approve program plans if the portfolio of programs meets the UCT and, therefore, is cost-effective. The EUEA then allows a utility to recover the program costs through base rates, a tariff rider, or a combination of the two, at the utility's option. NMSA 1978, Section 62-17-5(C).
- Second, the EUEA requires the Commission to identify regulatory disincentives to energy efficiency and take steps to remove those disincentives in a manner that balances the interests of customers and investors and the overall public interest. In accordance with the 2019 amendments to the EUEA, the Commission is required to "remove regulatory disincentives through the adoption of a rate adjustment mechanism that ensures that the revenue per customer approved by the commission in a general rate case proceeding is recovered by the public utility without regard

to the quantity of electricity actually sold by the public utility subsequent to the date the rate took effect." NMSA 1978, Section 62-17-5(F).

- Third, the EUEA requires the Commission to provide utilities with "an opportunity to earn a profit on cost-effective energy efficiency and load management resource development that, with satisfactory program performance, is financially more attractive to the utility than supply-side utility resources." NMSA 1978, Section 62-17-5(F). The EUEA also provides that recovery of the profit incentive shall be through base rates, a tariff rider, or a combination of the two, at the utility's option.

**Q. DOES PNM'S APPLICATION ADDRESS ALL THREE FINANCIAL COMPONENTS IN THE EUEA?**

**A.** PNM's Application addresses the first and third financial components, as well as PNM's election to recover program costs and profit incentive through a tariff rider. As to the requirement to address disincentives, PNM currently has an appeal in front of the New Mexico Supreme Court (Case No. S-1-SC-39406) regarding a decoupling mechanism, and PNM therefore will not propose a rate adjustment mechanism to remove disincentives in this application.

**Q. WHY IS THE PROPOSED INCENTIVE AN ESSENTIAL COMPONENT OF PNM'S APPLICATION?**

**A.** PNM has developed and offered cost-effective energy efficiency programs since 2007. PNM has satisfactorily implemented those programs so that it was able to meet the 2014 energy savings required by the EUEA at that time, PNM was able to meet the 2020 savings requirement formerly specified in the EUEA, and PNM expects that it will meet the 2025 energy savings requirements established by the 2019 amendments to the EUEA. Satisfactory performance of these programs has reduced participating customers' bills and has provided and will continue to provide system benefits in terms of avoided fuel and avoided capacity costs to all customers. Yet, as I explained earlier, these savings will result in reduced revenues, reduced additions to rate base and, in turn, reduced shareholder returns. That being the case, approval of a meaningful incentive that fairly balances customer interests, investor interests, and the overall public interest as required by the EUEA, is essential.

**Q. WITH WHAT RATEMAKING STANDARDS MUST PNM'S EE RIDER COMPLY?**

**A.** All rates, including energy efficiency rates, must be "just and reasonable." A rate is "just and reasonable" if it falls within a "zone of reasonableness" that balances the interests of customers and investors. These general ratemaking requirements were confirmed by the New Mexico Supreme Court to be applicable to energy efficiency rates in *Attorney General v. New Mexico Public Regulation Commission,* 2011-NMSC-034, 150 N.M. 174. In that regard, the Supreme Court has said that a profit incentive under the EUEA must be evidence-based, cost-based, and utility-specific. *Attorney General,* 2011-NMSC-034, ¶ 18.

**Q. HOW DOES THE DERIVATION OF A REASONABLE PROFIT INCENTIVE FOR ENERGY EFFICIENCY PROGRAMS DIFFER FROM THE DERIVATION OF A REASONABLE RETURN ON EQUITY?**

**A.** It differs in two regards. The first is that different profitability measures must be used to derive the reasonable profit level due to the practical consideration that energy efficiency programs do not result in a rate base upon which a return may be granted. The New Mexico Supreme Court confirmed the Commission's authority to set profits on energy efficiency measures using techniques other than return on rate base two years later. *New Mexico Attorney General v. New Mexico Public Regulation Commission*, 2013-NMSC-042, ¶¶ 16, 22, 27, 33-34, 309 P.3d 89.

The second difference is that the EUEA requires that utilities be given a chance to earn a reasonable profit incentive for energy efficiency programs that is financially *more attractive* than the reasonable return on equity the utility would earn for investment in supply side resources. The EUEA ties this increased energy efficiency profit incentive to satisfactory performance of the utility's energy efficiency programs. NMSA 1978, Section 62-17-5(F)(3).

**Q. TURNING TO PNM'S PROPOSED INCENTIVE MECHANISM, WHAT IS THE BASIS FOR PNM'S 2024 PLAN INCENTIVE?**

**A.** PNM's incentive is based on PNM meeting the energy savings mandated in the EUEA. The EUEA provides that "[t]his requirement, however, for public utilities providing electricity service, shall not be less than savings of five percent of 2020 total retail kilowatt-hour sales to New Mexico customer classes that have the opportunity to participate in calendar year 2025 as a result of energy efficiency and load management programs implemented in years 2021 through 2025."[11] Based on PNM's actual sales for 2020 of 7,898 GWh, PNM's targeted cumulative energy savings in 2025 is calculated to be 395 GWh (7,898 x 0.05).

**Q. WHAT IS PNM'S BASE LEVEL INCENTIVE AMOUNT FOR THE 2024 CALENDAR YEAR?**

**A.** PNM is proposing a base incentive for 2024 of $2,450,721, equal to 7.1% of PNM's 2024 calendar year budget ($34,517,198). This base incentive is conditioned on PNM achieving energy savings in 2024 that will allow it to meet its EUEA mandated energy savings goal of 395 GWh in 2025. The incentives for the 2025 and 2026 calendar years are discussed later in my testimony.

**Q. HOW DOES PNM DETERMINE IF IT SHOULD BE AWARDED ITS BASE INCENTIVE?**

**A.** The EUEA has specified a target energy savings goal for 2025. PNM's EE and LM programs have been designed and maximized to achieve energy savings annually that will put PNM on a path toward achieving its 2025 cumulative savings goal as specified in the EUEA. In PNM's energy efficiency applications in Case Nos. 16-00096-UT and 17-00076-UT the Commission approved stipulations that adopted target levels of cumulative energy savings for determining PNM's base level savings goals that were similarly designed to achieve the EUEA mandated energy savings, which in those cases was 658 cumulative

[11] NMSA 1978, Section 62-17-5(G).

GWhs in 2020. In PNM's most recent energy efficiency application in Case No. 20-00087-UT, the Commission approved a recommended decision adopting target levels of annual energy savings of 80 GWh, the average annual amount needed to achieve the mandated savings amount set by the EUEA for 2025. Similar to PNM's previous EE cases, its base incentive should be premised on satisfactory performance of programs to achieve the energy savings mandated by the EUEA. If PNM can achieve savings of approximately 49 GWh annually in 2024 and 49 GWh annually in 2025 it will meet its EUEA mandated energy savings and should be awarded its base incentive. In the absence of a current mandated energy savings goal for years beyond 2025,[12] PNM is proposing a standalone annual savings goal of 80 GWh for the 2026 program year. As noted previously in my testimony, PNM will adjust or modify its energy savings goal for 2026 once it is established by the Commission.

**Q. PLEASE EXPLAIN HOW PNM DETERMINED THE SECOND ELEMENT OF THE BASE LEVEL INCENTIVE, THE DOLLAR AMOUNT.**

**A.** The dollar amount of the base level incentive is equal to 7.1% of program costs. This percentage is at or below the level of incentive the Commission has found reasonable for PNM in previous litigated cases. In Case No. 12-00317-UT, the Commission approved an incentive equal to 7.6% of budget. The Commission approved an incentive level of 7.7%

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[12] No later than June 30, 2025, the commission shall adopt, through rulemaking, energy savings targets for electric utilities for years 2026 through 2030 based on cost-effective and achievable energy savings and provide utility incentives based on savings achieved. NMSA 1978 Section 62-17-5 G (in part).

of budget in Case No. 10-00280-UT. In PNM's most recent litigated EE application, Case No. 20-00087-UT, the Commission approved a base incentive of 7.1% of budget.

The Commission approved incentive amounts of 6.8% for 2015 and 7.1% for 2016 in Case No. 14-00310-UT, 7.1% in Case No. 16-00096-UT and 7.1% in Case No. 17-00076-UT. Those cases, however, were resolved based on stipulations in which PNM agreed to lower incentive amounts than the Commission had historically approved as part of the overall give and take of the settlement. It would be reasonable for the Commission to approve a base level incentive in this case that is at least as high as the incentives approved in PNM's last fully litigated energy efficiency cases because PNM has consistently met or exceeded its savings goals, its 5% low-income program funding goal, and all other requirements of the EUEA. PNM projects that it will accomplish the same in 2024.

The base incentive that PNM has proposed in this case is less than or equal to that which PNM has been granted in litigated cases because it includes a sliding scale mechanism that affords the Company the opportunity to earn a higher incentive if it is able to achieve savings in excess of its 2024 target. The base incentive and sliding scale mechanism are very similar to those approved by the Commission for plan years 2020, 2021, 2022, and 2023.

**Q. PLEASE DESCRIBE PNM'S PROPOSED SLIDING SCALE MECHANISM.**

**A.** PNM should be awarded its base incentive in 2024 if it achieves annual energy savings of 49 GWh, with no additional incentive up to 80 GWh of annual energy savings. In addition to this base incentive equal to 7.1% of program costs, or $2,450,721 PNM will earn additional incentive based on a sliding scale that will be triggered if PNM is able to achieve annual savings in excess of 80 GWh in 2024. PNM Exhibit AC-5 of PNM Witness Abraham Casas' Testimony shows how the incentive increases in a series of steps, a "sliding scale", to provide increased incentive for higher levels of annual savings achieved. Similar to the incentive mechanism proposed in PNM's most recent EE application, Case No. 20-00087-UT, the sliding scale includes three "steps" of additional incentive. The first step would provide an additional 0.125% of program cost for each additional GWh of energy savings of 81 through 85 GWh. The second step would provide an additional 0.175% of program cost for each additional GWh of energy savings of 86 through 90 GWh, and the third step would provide 0.225% of program cost for each additional GWh above 90 GWh up to the maximum. The sliding scale is capped at 10.73% of program costs, or $3,703,695, which PNM would earn if it is able to achieve annual savings of 100 GWh or more in 2024. This cap is equal to the maximum incentive provided by the EE Rule, 17.7.2.8(L) NMAC, PNM's pre-tax weighted average cost of capital ("WACC") multiplied by program costs.[13]

**Q. WHAT ARE THE BENEFITS OF THE SLIDING SCALE MECHANISM?**

**A.** The sliding scale provides an incentive for PNM to achieve energy efficiency savings above the "satisfactory" level required by the EUEA, which is program performance that puts PNM on a path to achieve 395 GWh of energy savings in 2025. It incentivizes PNM

[13] In Case No. 16-00096-UT, the Commission determined that the appropriate WACC for setting the 17.7.2.8(L) NMAC cap is the pre-tax WACC. Certification of Stipulation, December 21, 2016, pp. 66-67.

to achieve savings it may need in future years so that it will be better positioned to meet its EUEA savings requirement.

**Q. WHAT INCENTIVE MECHANISM DOES PNM PROPOSE FOR THE 2025 AND 2026 PROGRAM YEARS?**

**A.** For 2025, PNM is proposing the same base level profit incentive of 7.1% of program costs for minimum annual energy savings of 49 GWh and the same sliding scale mechanism for achieving annual savings in excess of 80 GWh as is proposed for 2024. For 2026, PNM has assumed a target of 80 GWh of energy savings because the goal has not been established yet by the Commission. PNM's proposed incentive for 2026 includes a base level of 7.1% of program costs for minimum annual energy savings of 80 GWh and the same sliding scale mechanism for achieving annual energy savings in excess of 80 GWh as is proposed for 2024 and 2025.

**Q. IS PNM'S INCENTIVE MECHANISM CONSISTENT WITH THE COMMISSION'S ENERGY EFFICIENCY RULE?**

**A.** Yes. The Commission's energy efficiency rule requires that a utility's proposed incentive:

i. be based on the utility's costs;

ii. be based on satisfactory performance of measures and programs;

iii. be supported by written testimony and exhibits; and

iv. shall not exceed the product (expressed in dollars) of:

v. its weighted cost of capital (expressed as a percent), and

vi. its approved annual program costs.[14]

Because PNM's proposed incentive is based on a percentage of program costs, it is cost-based. It is also based on satisfactory performance of measures and programs in that the base level incentive for 2024 and 2025 is tied to the satisfactory progress toward achieving the EUEA savings goal in 2025 (with a proxy goal for 2026), while the sliding scale mechanism provides an incentive for PNM to achieve savings above the satisfactory level. PNM will not recover any incentive amount in excess of the EE Rule limit, which is equal to PNM's WACC multiplied by program costs.

**Q. IS THE INCENTIVE MECHANISM CONSISTENT WITH WHAT OTHER REGULATORY COMMISSIONS HAVE APPROVED?**

**A.** Yes. According to a recent report issued by the American Council for an Energy-Efficient Economy, 29 states have adopted some form of performance-based incentive mechanism ("PIM").[15] The report describes the prevalent types of incentives such as shared savings, multi-factor and return on equity and summarize the various incentive mechanisms approved in several of those states. The report states that the majority of states with PIMs have incentives based on shared savings or a multi-factor mechanism. Of the states discussed in this report, the states with mechanisms similar to PNM have maximum incentives that range from 3% to 15% of budget or savings. PNM's proposed maximum

[14] 17.7.2.8(L) NMAC.
[15] "Snapshot of Energy Efficiency Performance Incentives for Electric Utilities" ACEEE Report, December 11, 2018, available at: https://www.aceee.org/sites/default/files/pims-121118.pdf

incentive would equal 10.73% of budget and is reasonable based on a comparison with incentives approved in other states.

**Q. WILL THERE BE A RECONCILIATION OR TRUE-UP OF THE PROFIT INCENTIVE AMOUNT BASED ON ACTUAL COSTS, REVENUES AND SAVINGS?**

**A.** Yes. Because PNM's incentive amount depends on the savings it actually achieves and its actual program costs, the incentive amount will be recalculated at the end of the year and trued-up against the actual revenues received under the incentive element of the EE Rider. PNM witness Abraham Casas describes the Rider reconciliation/true-up in his testimony.

## IX. PROPOSED REVISIONS TO THE EE RIDER

**Q. WHAT REVISIONS TO PNM'S RIDER NO. 16, THE EE RIDER, WILL RESULT FROM PNM'S PROPOSED 2024 PLAN?**

**A.** As discussed by Mr. Casas, PNM is updating Section IV(C) of the EE Rider for the 2024 Plan costs and the profit incentive. The EE Rider proposed for 2024 does not include true-up collections under the current plan and incentive, which will be fully collected by year end 2023, and will not be continued into 2024.

**Q. ARE PNM'S 2024 ENERGY EFFICIENCY PLAN, PROFIT INCENTIVE AND PROPOSED REVISIONS TO RIDER NO. 16 JUST AND REASONABLE AND IN THE PUBLIC INTEREST?**

**A.** Yes. PNM's 2024 Plan is just and reasonable and in the public interest because it modifies current programs to improve cost effectiveness and administrative efficiency. It is consistent with the statutory requirements of the EUEA regarding the annual expenditure amount and the UCT cost-effectiveness test; and it implements a straight-forward profit incentive mechanism that complies with the EUEA and the EE Rule. It is also consistent with Commission orders in other efficiency cases.

Revised Rider No. 16 is just and reasonable because it will recover the costs of the EUEA as provided by the EUEA and the EE Rule and ensures through the reconciliation process that only actual program costs and the authorized profit incentive are passed through to customers. Additionally, the sliding scale method for setting the profit incentive provides a verifiable, utility-specific and cost-based incentive that is directly tied to PNM's success in implementing energy efficiency programs and that is consistent with the EUEA, the EE Rule and Commission precedents. It will reward PNM for achieving energy efficiency savings in excess of the savings required to achieve the 2025 savings target.

**Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

**A.** Yes, it does.

*GCG#530752*

Resume

# PNM Exhibit SKJ-1

Is contained in the following 1 page.

# SHARON K. JAMES

## EDUCATIONAL AND PROFESSIONAL SUMMARY

**Name:** Sharon K. James

**Address:** Public Service Company of New Mexico
414 Silver Ave SW
Albuquerque, NM 87102

**Position:** Program Manager, Energy Efficiency
Reporting and Budget

**Education:** Bachelor of Arts in Organizational Behavior,
College of Santa Fe, Albuquerque, NM campus

**Employment:** Public Service Company of New Mexico, Albuquerque, NM since 1994

- Positions held within the Company include:
  - Program Manager, Energy Efficiency Reporting and Budget, Energy Efficiency
  - Senior Energy Efficiency Program Developer, Energy Efficiency
  - Marketing Service Representative, Marketing
  - Administrator III

*GCG#530727*

2024 Energy Efficiency and Load Management Program Plan

# PNM Exhibit SKJ-2

Is contained in the following 64 pages.

# 2024

# ENERGY EFFICIENCY AND

# LOAD MANAGEMENT

# PROGRAM PLAN

NMPRC CASE NO. 23-00___-UT

APRIL 17, 2023

# *Table of Contents*

# 1 EXECUTIVE SUMMARY

PNM began offering Energy Efficiency (EE) and Load Management (LM)[1] programs to residential and commercial customers in October 2007, with the approval of the New Mexico Public Regulation Commission (NMPRC) in Case No. 07-00053-UT. The NMPRC approved subsequent EE programs in Case No. 08-00204-UT in May 2009, in Case No. 10-00280-UT in June 2011, in Case No. 12-00317-UT in November 2013, in Case No. 14-00310-UT in April 2015, in Case No. 16-00096-UT in January 2017, in Case No. 17-00076-UT in January 2018, and in Case No. 20-00087-UT in October 2020. Table 1-1 summarizes EE and LM program performance from 2008 through 2022. Detailed analyses of the most recent year's (2022) performance are available in PNM's annual EE and LM program report and measurement and verification report, which are filed concurrently with the 2024 Energy Efficiency and Load Management Program Plan (2024 Plan) and are available at www.pnm.com/regulatory.

[1] Load Management is also referred to as Demand Response (DR), and in this filing, PNM uses the terms 'load management' and 'demand response' interchangeably.

**Table 1-1**

| Year | Portfolio Benefit Cost Ratio** | Incremental Annual Energy Savings* | Peak Demand Reduction* | Dispatchable Capacity (DR) | Total Program Expenses ($M) |
|---|---|---|---|---|---|
| 2008 | 2.71 | 35.2GWh | 7.5 MW | 47 MW | $8.0 |
| 2009 | 1.56 | 39.9 GWh | 6.3 MW | 53 MW | $12.0 |
| 2010 | 2.2 | 58.8 GWh | 9.9 MW | 67 MW | $16.6 |
| 2011 | 1.78 | 57.6 GWh | 9.7 MW | 57 MW | $16.6 |
| 2012 | 2.85 | 79.3 GWh | 13.6 MW | 57 MW | $17.3 |
| 2013 | 1.91 | 75.6 GWh | 11.8 MW | 62 MW | $18.1 |
| 2014 | 1.74 | 74.8 GWh | 12.0 MW | 61 MW | $21.7 |
| 2015 | 1.79 | 79.3 GWh | 12.1 MW | 57 MW | $24.3 |
| 2016 | 1.75 | 82.0 GWh | 13.0 MW | 57 MW | $25.6 |
| 2017 | 1.74 | 74.4 GWh | 11.9 MW | 60 MW | $25.8 |
| 2018 | 1.67 | 70.8 GWh | 12.5 MW | 57 MW | $23.5 |
| 2019 | 1.93 | 78.2 GWh | 13.7 MW | 44 MW | $24.0 |
| 2020 | 2.32 | 87.1 GWh | 15.0 MW | 44 MW | $26.0 |
| 2021 | 1.48 | 107.1 GWh | 18.8 MW | 51.6 MW | $29.5 |
| 2022 | 1.77 | 96.1 GWh | 13.9 MW | 51.7 MW | $30.9 |

* Savings at the customer meter. Savings at the generator include an additional 8% system losses.

** Utility Cost Test applied beginning in 2015; Total Resource Cost applied in prior years.

The 2024 Plan describes PNM's portfolio of EE and LM programs, and also presents updated participation targets and budgets for the EE and LM programs currently in effect, that were approved by the NMPRC in Case No. 20-00087-UT. PNM is filing the 2024 Plan pursuant to the Efficient Use of Energy Act, NMSA 1978 §§ 62-17-1 to -11 (2005, as amended through 2020), (EUEA or Act) and the NMPRC's Energy Efficiency Rule, 17.7.2 NMAC (Rule). The 2024 Plan includes proposed budgets and savings for calendar years 2024, 2025 and 2026.

PNM is proposing to continue all of its existing EE and LM programs, with the modifications described in this Plan. All programs proposed in the 2024 Plan were selected based on the criteria detailed below, including that the portfolio of programs pass the Utility Cost Test (UCT). PNM also carefully considered public comments and suggestions, as described in Section 3, especially from the members of the public advisory group, concerning the reasonableness of program changes. PNM developed the portfolio of programs to appeal to various segments of residential customers, including low-income customers. The 2024 Plan includes low-cost and no-cost programs to achieve broad participation among all residential customers. In addition, every commercial or industrial customer who pays the energy efficiency rider is eligible to participate in the programs for non-residential customers. The proposed 2024 Plan has a total projected 12-month budget of $34,517,198 for calendar year 2024 with projected energy savings of approximately 95.1 gigawatt-hours (GWh). Tables 1-2, 1-3, and 1-4 show the projected annual budgets, energy and demand savings, participation targets and the UCT ratios for each program and the total portfolio.

**Table 1-2**

| 2024 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT | Participation /Units |
|---|---|---|---|---|---|---|
| Residential Comp. | $ 6,808,220 | 16,433,453 | 142,475,934 | 2,185 | 1.04 | 40,198 |
| Commercial Comp. | $ 10,006,176 | 38,607,755 | 409,242,200 | 7,305 | 2.22 | 576 |
| Behavioral Comp. | $ 1,039,052 | 5,743,750 | 13,215,750 | 1,281 | 0.96 | 219,456 |
| Residential Products | $ 4,444,957 | 24,515,684 | 325,077,968 | 1,335 | 2.16 | 309,551 |
| Easy Savings | $ 328,898 | 2,024,750 | 22,616,458 | 242 | 3.38 | 3,500 |
| Energy Smart (MFA) | $ 964,909 | 1,438,245 | 23,227,657 | 373 | 1.61 | 458 |
| New Home Const. | $ 575,090 | 650,756 | 9,761,335 | 209 | 1.13 | 1,195 |
| Home Works | $ 784,382 | 2,860,200 | 31,948,434 | 135 | 1.32 | 14,000 |
| Power Saver (LM) | $ 5,445,888 | 1,600,000 | 1,600,000 | 40,000 | 1.18 | |
| Peak Saver (LM) | $ 4,119,626 | 1,200,001 | 1,200,001 | 30,000 | 1.17 | |
| **Total** | **$ 34,517,198** | **95,074,594** | **980,365,736** | **83,065** | **1.60** | |

**Table 1-3**

| 2025 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT | Participation /Units |
|---|---|---|---|---|---|---|
| Residential Comp. | $ 7,175,099 | 16,159,657 | 140,423,201 | 1,781 | 0.87 | 41,438 |
| Commercial Comp. | $ 10,379,672 | 39,959,026 | 423,565,677 | 7,422 | 2.17 | 581 |
| Behavioral Comp. | $ 1,154,423 | 6,327,250 | 15,223,250 | 1,416 | 0.94 | 219,456 |
| Residential Products | $ 4,505,684 | 24,515,684 | 325,077,968 | 1,335 | 2.05 | 309,551 |
| Easy Savings | $ 282,709 | 1,735,500 | 19,385,535 | 207 | 3.29 | 3,000 |
| Energy Smart (MFA) | $ 1,145,223 | 1,704,074 | 27,520,800 | 458 | 1.66 | 520 |
| New Home Const. | $ 599,911 | 702,751 | 10,541,268 | 223 | 1.16 | 1,255 |
| Home Works | $ 803,658 | 2,860,200 | 31,948,434 | 135 | 1.23 | 14,000 |
| Power Saver (LM) | $ 5,507,779 | 1,600,000 | 1,600,000 | 40,000 | 1.35 | |
| Peak Saver (LM) | $ 3,813,078 | 1,200,001 | 1,200,001 | 30,000 | 1.47 | |
| **Total** | **$ 35,367,236** | **96,764,144** | **996,486,134** | **82,976** | **1.59** | |

**Table 1-4**

| 2026 Programs | Budget | Annual kWh Savings | Lifetime kWh Savings | Annual kW Savings | UCT | Participation /Units |
|---|---|---|---|---|---|---|
| Residential Comp. | $ 7,891,239 | 18,138,879 | 158,733,847 | 1,846 | 0.91 | 46,933 |
| Commercial Comp. | $ 10,639,693 | 41,157,797 | 436,272,647 | 7,534 | 2.25 | 587 |
| Behavioral Comp. | $ 1,026,434 | 5,971,750 | 14,391,750 | 1,371 | 1.26 | 219,456 |
| Residential Products | $ 4,548,682 | 24,515,684 | 325,077,968 | 1,335 | 2.09 | 309,551 |
| Easy Savings | $ 235,256 | 1,446,250 | 16,154,613 | 173 | 3.42 | 2,500 |
| Energy Smart (MFA) | $ 1,320,454 | 1,969,319 | 31,804,505 | 543 | 1.74 | 582 |
| New Home Const. | $ 607,016 | 725,768 | 10,886,526 | 233 | 1.24 | 1,317 |
| Home Works | $ 819,907 | 2,860,200 | 31,948,434 | 135 | 1.24 | 14,000 |
| Power Saver (LM) | $ 5,547,244 | 1,600,000 | 1,600,000 | 40,000 | 1.40 | |
| Peak Saver (LM) | $ 3,843,112 | 1,200,001 | 1,200,001 | 30,000 | 1.52 | |
| **Total** | **$ 36,479,038** | **99,585,648** | **1,028,070,291** | **83,168** | **1.64** | |

## 1.1 SUMMARY OF CHANGES FROM PREVIOUS PLAN

PNM is not proposing new programs in the 2024 Plan and has evaluated existing programs and explored strategies and tactics to increase program effectiveness. Therefore, PNM is proposing the following additions and modifications in the 2024 Plan:

- The total first year budget for the 2024 Plan is $34,517,198. This annual budget and the 2025 and 2026 budget targets comply with the EUEA of no less than 3% and no more than 5% funding requirement.

- The total 2024 budget for the energy efficiency portfolio has increased from the 2023 Program budget by approximately 20%, due to continued supply chain issues, cost increases due to inflation, and enhancements to existing programs.

- PNM issued a request for proposals (RFP) for residential and commercial demand response and load management programs and met with the EE public advisory group on February 28, 2023 and April 6, 2023, to discuss the responses to the RFP and the feasibility of implementing new programs. Based on the responses to the RFP and consultation with stakeholders, PNM has determined that implementing new residential and commercial demand response and load management programs is in the public interest and plans to propose the demand response EE programs in the 2024 EE application.
- In addition to serving single family customers, PNM will continue to expand the Energy Smart weatherization program offering to eligible multifamily properties in PNM's service area.
- PNM will incorporate an all-electric pilot beginning in 2024 which will solely utilize a performance path approach in the New Home Construction Program, in addition to, the existing prescriptive path which will help to mitigate EISA lighting standards and building code changes.

- LM program terms are being modified to provide a firm capacity resource and improve cost-effectiveness. Cost effectiveness will be improved by aligning the payment price to the capacity realized on an hourly basis as opposed to a fifteen minute maximum.
- Results from an updated potential study performed in 2022, along with other industry research, will be utilized when planning further residential program offerings.

# 2 PROGRAM GOALS

## 2.1 LEAST-COST RESOURCE PLANNING

PNM EE and LM programs benefit the PNM system, participating customers, non-participating customers, the environment and the New Mexico economy. The programs were identified as a key resource in the PNM 2020 Integrated Resource Plan (2020 IRP)[2]. The 2020 IRP examined many different portfolios of options that could be implemented to meet expected growth in the demand for electricity from 2020 to 2039. EE and LM programs were consistently found to be cost-effective alternatives for meeting system needs when compared with traditional supply-side resources. The most cost-effective resource portfolio is defined as "those supply-side resources and demand-side resources that minimize the net present value of revenue requirements proposed by the utility to meet electric system demand during the planning period consistent with reliability and risk considerations, as defined in the IRP Rule."[3] PNM is currently preparing its 2023 Integrated Resource Plan, the 2024 Energy Efficiency Plan will once again be utilized as a key resource. The 2024-2026 Plan includes a revised estimate of avoided costs which were used to calculate cost-effectiveness of the EE programs.

## 2.2 REQUIREMENTS OF THE EFFICIENT USE OF ENERGY ACT

Projected growth of PNM's EE and LM programs will allow PNM to achieve the minimum energy saving goals at the budget levels specified in the EUEA. The Act required that PNM achieve cumulative savings of at least 411 GWh in 2014, equivalent to five percent (5%) of PNM's retail sales in 2005, which PNM met.[4] In 2020 PNM is required to achieve cumulative savings of 658 GWH, or 8% of 2005 retail sales and has exceeded that goal. The next compliance year is 2025, when PNM is required to achieve an estimated cumulative savings of 395 GWH, or 5% of 2020 retail sales. In 2021 and 2022, PNM achieved annual savings of 203.3 GWH.

New programs are developed according to the specifications included in the Act and the Rule, which include passing the UCT standard at a portfolio level, and meeting or exceeding the EUEA goals. As of year-end 2022, PNM's approved EE programs are achieving cumulative annual net energy savings of about 750 GWh since 2008. (Net savings are determined by applying reductions to gross savings accounting for free-rider impacts and the effective useful life [EUL] of the programs, as determined by the independent evaluator).

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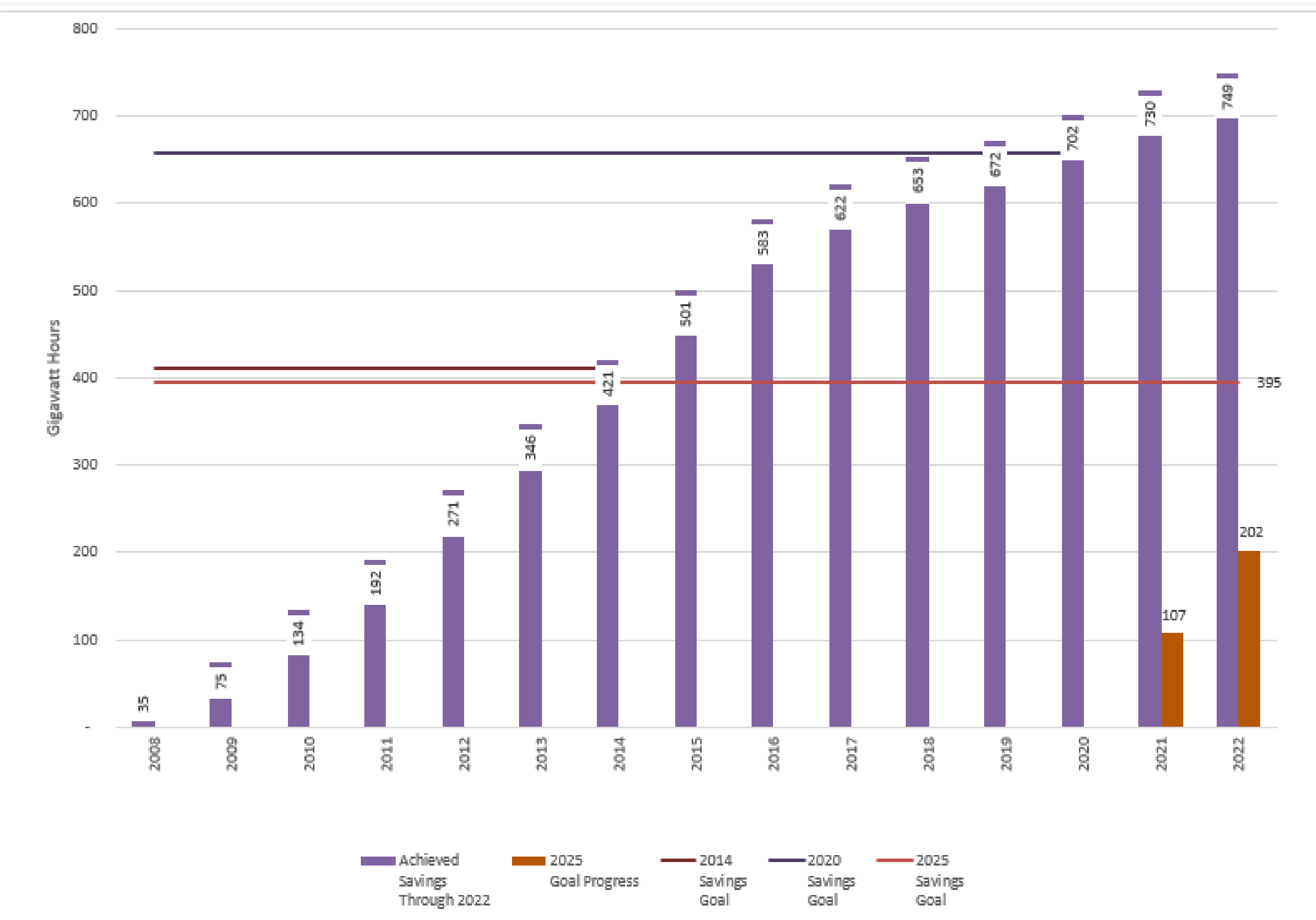
[2] "PNM 2020-2039 Integrated Resource Plan" July 2020. Also found at http://www.pnm.com/regulatory https://www.pnmforwardtogether.com/assets/uploads/PNM-2020-IRP-EXECUTIVE-SUMMARY-NEW-COVER.pdf

[3] Ibid, page 82

[4] "PNM Energy Efficiency Program 2015 Annual Report", April 15, 2016.

For cost-effectiveness analysis and for determining the cumulative savings that contribute to meeting the EUEA goals, PNM calculates the average EUL of the portfolio, this value is determined by dividing the total lifetime savings by the annual savings, resulting in an average estimate of how long measures will continue to provide savings. The average portfolio EUL for the 2022 Program was 13.1 years. The cumulative savings for 2022 are the sum of all annual savings for the nine years from 2014 through 2022. Beginning in 2022, the 2013 annual savings will no longer contribute to cumulative savings. Based on the annual savings achieved through 2022, PNM programs must achieve an average of 49 GWh of annual savings in years 2024 and 2025 to achieve the 2025 minimum savings goal of 395 GWh. Figure 2-1 shows the annual cumulative savings achieved through 2022.

**Figure 2-1**



## 2.3 INCREASED ADOPTION OF ENERGY EFFICIENCY TECHNOLOGIES

In addition to meeting the requirements of the Act, PNM's EE programs encourage lasting structural and behavioral changes in the New Mexico economy through the process of market transformation. This is accomplished by promoting the purchase of energy efficient products and services, increasing customer awareness of energy efficiency measures, providing incentives to change behaviors, and removing market barriers. Over time, distributors will stock more efficient equipment, contractors will promote more efficient equipment to their customers, and customers will become more inclined to purchase efficient equipment. The programs included in the 2024 Plan address the market transformation objectives and strategy by continuing initiatives launched in 2017, including continuing to work with organizations such as Design Lights Consortium to incorporate the latest in efficient lighting technology into our Commercial Comprehensive portfolio, along with the continuous fine tuning of program design and delivery elements in the other PNM EE programs including, but not limited to:

- Implementing multi-channel promotional campaigns that increase customer awareness of EE products and their benefits
- Educating the vendor community of retailers and installation contractors who provide EE products and services, to build awareness, encourage participation and promote consistency in business operations and customer service within PNM's service area
- Partnering with community-based organizations to educate customers
- Using rebates to shift the focus from the initial cost of installing measures to the long-term savings in operating costs
- Simplifying rebates for customers by offering multiple rebate channels, such as online rebate submittal, instant in-store discounts, and mail-in and electronic rebate forms as applicable
- Increasing awareness of low-income programs by expanding the Energy Smart program to include additional measures for deeper energy savings, and continuing to monitor and adjust the other low-income programs to encourage broad participation across PNM's service area
- Implementing educational programs for different customer segments about the benefits of the EE programs

# 3 PROGRAM SELECTION

## 3.1 PROGRAM RESEARCH

In 2020, and updated in 2022, Applied Energy Group (AEG) completed an energy efficiency potential study (AEG Potential Study), which identified categories of energy efficient equipment and the estimated technical, economic and market potential for adoption of that equipment in the state. The updated potential study will be used as a reference for future program design and analysis and in preparing the 2024 plan. PNM also completed an updated residential appliance and socket saturation survey in 2021 to be utilized in future program design.

Much of the research for the 2024 Plan was done in conjunction with other electric utilities and through participation in national organizations concerned about energy efficiency such as E Source, Consortium for Energy Efficiency (CEE), American Council for an Energy-Efficient Economy (ACEEE), Southwest Energy Efficiency Project (SWEEP) and Electric Power Research Institute (EPRI).

PNM also solicited input regarding existing and new programs from a public advisory stakeholder group. A list of those invited to the advisory group meetings is provided in Appendix B. The public advisory group met on February 28, 2023 and again on April 6, 2023 to discuss the development of the 2024 Plan. Individual members of the public advisory group provided comments and information at other times during the Plan development process.

## 3.2 SELECTION CRITERIA

The following criteria were considered when evaluating and considering modifications to existing programs:

A. Cost effectiveness – The Act establishes the Utility Cost Test (UCT) as the standard to be used in determining the cost-effectiveness of energy efficiency or load management programs. The UCT, as defined in the Act, "means a standard that is met if the monetary costs that are borne by the public utility and that are incurred to develop, acquire and operate energy efficiency or load management resources on a life-cycle basis are less than the avoided monetary costs associated with developing, acquiring and operating the associated supply-side resources."[5]

   1. Costs are identified by the following categories: PNM program administration costs, promotion, third-party implementation, participant rebates/incentives, market transformation, and measurement and verification.

[5] NMSA 1978 § 62-17-4(K)

2. Benefits include avoided costs to the utility for energy demand and reductions in $CO_2$ emissions. PNM's EE avoided costs are provided in Appendix A.

3. Not all programs in the 2024 Plan are cost-effective because they do not individually have a UCT greater than 1.0. However, the overall portfolio of programs does have a UCT greater than 1.0.

B. System benefits – programs should deliver system benefits through demand and energy savings or the ability to dispatch load or shift it to off-peak times.

The programs selected for the 2024 Plan provide significant energy and demand savings as shown in Table 4-2 below.

C. Broad participation potential – programs should provide the opportunity for broad participation among eligible customer classes targeting residential, commercial, industrial and low-income customers.

The 2024 Plan includes programs for residential customers, low-income customers, homebuilders, commercial and industrial customers.

D. Energy and demand savings – collectively, the proposed programs will contribute to meeting the 2025 savings requirements as set forth in the Act.

E. Non-energy benefits – programs should create significant non-energy benefits, including lower bills for customers, increased consumer awareness and adoption of energy efficient technologies, removal or minimization of market barriers to adoption of energy efficiency products and technologies, and environmental benefits through the reduction in emissions and water use associated with the production of electricity. Programs in the 2024 Plan provide significant non-energy benefits including:

1. Lower bills for those who participate. Energy savings for the measures in each program are shown in Table 4-2. These savings will result in lower bills for those who participate.

2. Increased awareness and adoption of technologies. The programs include substantial promotional efforts designed to increase customer awareness and understanding of energy efficiency. The participation goals, shown in Table 4-1, will ensure increased adoption of measures.

3. Water use and $CO_2$ reduction. The programs result in significant water savings and reduction in greenhouse gases that would not have occurred absent the programs. The estimated reductions are described in Section 4.2.2.

F. Implementation – Programs should have a proven track record in other utility markets and a defined target market within PNM service areas that ensures straightforward program implementation.

Programs are implemented and managed by PNM staff and third-party contractors who are experienced with specific programs and technologies, and who leverage the existing market experience by implementing programs that attract customers and encourage them to save additional money and energy. Table 3-4 lists the parties responsible for program implementation.

G. Measurement and verification (M&V) – Each program implemented should have a defined method for measuring and verifying savings to determine the contribution to overall energy efficiency goals.

PNM has worked closely with independent M&V evaluators since 2008 and will continue to work with the state-appointed evaluator when they examine the 2024 Plan programs. Section 4.4 provides a description of the important elements of program M&V.

H. Performance risk of the technologies – None of the products promoted by any of the programs should rely on unproven technologies.

Each program contained in the 2024 Plan is based on proven measures that have been implemented successfully by other utilities.

## 3.3 PROGRAM BUDGETS AND COST-EFFECTIVENESS

### 3.3.1 UCT MODEL

PNM has developed a spreadsheet model for performing the UCT calculation. The input assumptions and UCT results are shown in Appendix E – Technical Manual. Inputs to the UCT model include measure life, per-unit energy and capacity savings, forecasted participation rates, rebate costs, administration costs and M&V costs. These inputs are based on independent measurement and verification reports for past program years, New Mexico Technical Resources Manual (TRM), research on programs at other utilities, and standards set by ENERGY STAR, Consortium for Energy Efficiency (CEE) and other energy efficiency organizations.

Several factors were considered in estimating portfolio participation targets, including past program performance, the potential participation rates identified in past potential studies, participation targets identified in responses to RFPs issued by PNM, and third-party contractor estimates. PNM also considered participation rates at other utilities and the cost impact to participants of installing efficiency measures.

### 3.3.2 PROGRAM BENEFITS

Program benefits are determined by multiplying the annual program energy and demand savings by the annual avoided costs for energy and demand, over the useful life of the program, and taking the net present value of the sum. The avoided costs used in the UCT model are provided in Appendix A.

### 3.3.3 PROGRAM COSTS

Tables 3-1, 3-2, and 3-3 show the estimated annual costs to implement the 2024 Plan programs (for 12 months of implementation). The total 2024 Plan budget amount of $34,517,198 for calendar year 2024 is based on 3.94% of projected 2023 revenues adjusted for an over-collection of program costs in 2022 (see Section 4.3 below). Likewise, the $35,367,236 budget for 2025 is based on 4.04% of projected revenue for 2023. Finally, the $36,479,038 budget for 2026 is based on 4.17% of projected revenue for 2023. Costs are presented in six categories which are described in detail following the table.

**Table 3-1**

| 2024 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 333,750 | $ 3,230,227 | $ 5,928,840 | $ 169,619 | $ 178,465 | $ 165,274 | $ 10,006,176 |
| Residential Comprehensive | $ 220,481 | $ 2,906,627 | $ 3,341,978 | $ 112,054 | $ 117,897 | $ 109,183 | $ 6,808,220 |
| Behavioral Comprehensive | $ 33,218 | $ 912,379 | $ 42,360 | $ 16,882 | $ 17,763 | $ 16,450 | $ 1,039,052 |
| Residential Products | $ 148,174 | $ 1,468,943 | $ 2,599,925 | $ 75,305 | $ 79,233 | $ 73,376 | $ 4,444,957 |
| Easy Savings Kit | $ 10,876 | $ 144,021 | $ 157,273 | $ 5,527 | $ 5,816 | $ 5,386 | $ 328,898 |
| Energy Smart (MFA) | $ 32,961 | $ 150,000 | $ 731,250 | $ 16,751 | $ 17,625 | $ 16,322 | $ 964,909 |
| New Home Construction | $ 18,918 | $ 291,263 | $ 235,809 | $ 9,615 | $ 10,116 | $ 9,368 | $ 575,090 |
| Home Works | $ 26,794 | $ 201,040 | $ 515,335 | $ 13,617 | $ 14,328 | $ 13,268 | $ 784,382 |
| Power Saver | $ 173,547 | $ 5,005,400 | $ - | $ 88,200 | $ 92,800 | $ 85,941 | $ 5,445,888 |
| Peak Saver | $ 131,282 | $ 3,786,413 | $ - | $ 66,720 | $ 70,200 | $ 65,011 | $ 4,119,626 |
| **TOTALS** | **$ 1,130,002** | **$ 18,096,312** | **$ 13,552,770** | **$ 574,292** | **$ 604,242** | **$ 559,580** | **$ 34,517,198** |

**Table 3-2**

| 2025 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 346,725 | $ 3,307,753 | $ 6,165,994 | $ 201,312 | $ 184,646 | $ 173,243 | $ 10,379,672 |
| Residential Comprehensive | $ 232,679 | $ 2,990,669 | $ 3,576,486 | $ 135,095 | $ 123,911 | $ 116,259 | $ 7,175,099 |
| Behavioral Comprehensive | $ 36,708 | $ 1,004,789 | $ 54,480 | $ 20,203 | $ 19,718 | $ 18,525 | $ 1,154,423 |
| Residential Products | $ 150,316 | $ 1,513,012 | $ 2,599,925 | $ 87,275 | $ 80,050 | $ 75,106 | $ 4,505,684 |
| Easy Savings Kit | $ 9,360 | $ 123,446 | $ 134,806 | $ 5,435 | $ 4,985 | $ 4,677 | $ 282,709 |
| Energy Smart (MFA) | $ 39,167 | $ 180,938 | $ 861,951 | $ 22,740 | $ 20,858 | $ 19,570 | $ 1,145,223 |
| New Home Construction | $ 19,800 | $ 286,948 | $ 261,228 | $ 11,496 | $ 10,545 | $ 9,893 | $ 599,911 |
| Home Works | $ 27,485 | $ 201,040 | $ 530,805 | $ 15,958 | $ 14,637 | $ 13,733 | $ 803,658 |
| Power Saver | $ 175,761 | $ 5,048,550 | $ - | $ 102,048 | $ 93,600 | $ 87,820 | $ 5,507,779 |
| Peak Saver | $ 121,681 | $ 3,495,150 | $ - | $ 70,649 | $ 64,800 | $ 60,798 | $ 3,813,078 |
| **TOTALS** | **$ 1,159,683** | **$ 18,152,293** | **$ 14,185,675** | **$ 672,212** | **$ 617,749** | **$ 579,624** | **$ 35,367,236** |

**Table 2-3**

| 2026 Program | Admin | Third Party | Rebates | Promotion | M&V | Market Transformation | Total |
|---|---|---|---|---|---|---|---|
| Commercial Comprehensive | $ 352,914 | $ 3,373,908 | $ 6,350,974 | $ 194,229 | $ 189,572 | $ 178,098 | $ 10,639,693 |
| Residential Comprehensive | $ 253,789 | $ 3,091,285 | $ 4,142,089 | $ 139,675 | $ 136,326 | $ 128,075 | $ 7,891,239 |
| Behavioral Comprehensive | $ 32,648 | $ 889,706 | $ 52,100 | $ 17,968 | $ 17,537 | $ 16,476 | $ 1,026,434 |
| Residential Products | $ 150,590 | $ 1,558,402 | $ 2,599,925 | $ 82,879 | $ 80,891 | $ 75,995 | $ 4,548,682 |
| Easy Savings Kit | $ 7,733 | $ 102,872 | $ 112,338 | $ 4,256 | $ 4,154 | $ 3,903 | $ 235,256 |
| Energy Smart (MFA) | $ 44,837 | $ 211,875 | $ 992,355 | $ 24,676 | $ 24,085 | $ 22,627 | $ 1,320,454 |
| New Home Construction | $ 19,900 | $ 286,948 | $ 268,484 | $ 10,952 | $ 10,690 | $ 10,043 | $ 607,016 |
| Home Works | $ 27,840 | $ 201,040 | $ 546,700 | $ 15,322 | $ 14,955 | $ 14,050 | $ 819,907 |
| Power Saver | $ 175,739 | $ 5,091,700 | $ - | $ 96,719 | $ 94,400 | $ 88,686 | $ 5,547,244 |
| Peak Saver | $ 121,751 | $ 3,527,513 | $ - | $ 67,007 | $ 65,400 | $ 61,442 | $ 3,843,112 |
| **TOTALS** | **$ 1,187,742** | **$ 18,335,247** | **$ 15,064,964** | **$ 653,683** | **$ 638,009** | **$ 599,393** | **$ 36,479,038** |

## THIRD PARTY IMPLEMENTATION

PNM is the administrator for its entire portfolio of EE and LM programs, but has engaged third-party contractors with proven expertise to implement the programs because of the many advantages that this approach provides, including:

- *Selecting contractors through an RFP process allows PNM to determine the most qualified contractor and best proposal for program implementation.*
- *Proven expertise and experience in delivering similar programs by the selected contractor reduces the risk associated with implementing a program and achieving participation and savings goals.*
- *Program scale can be adjusted up or down quickly using contractor personnel.*
- *Contracts can be designed to limit PNM and customer risk by including provisions to pay for performance achieved.*

Third-party implementation costs are the costs paid by PNM to the third-party contractors. These costs can include contractor labor, development of promotional material, marketing, customer outreach, development of program processes and customer enrollment procedures, trade ally recruitment and other program specific costs. Table 3-4 lists each program and the contractor responsible for implementation.

**Table 3-4**

| Program | Primary Implementer | Program Type | | | |
|---|---|---|---|---|---|
| | | Commercial | Residential | Low Income | Load Management |
| Commercial Comprehensive | DNV-GL | X | | | |
| Comm. Comp. - Multifamily | DNV-GL | X | X | X | |
| Res. Comp. - Refrigerator Recycling | ARCA | X | X | | |
| Res. Comp. - Home Energy Checkup | Franklin Energy Services | | X | X | |
| Res. Comp. - Midstream Cooling | CLEAResult | | X | | |
| Residential Products | CLEAResult | | X | | |
| New Home Construction | ICF | X | X | | |
| PNM Home Works | NEF | | X | X | |
| Energy Smart (MFA) | NM MFA | | | X | |
| Easy Savings Kit | AM Conservation Group | | | X | |
| Behavioral Comp. | Bidgely and Strategic Energy Group | X | X | | |
| Power Saver | Itron | X | X | | X |
| Peak Saver | Itron | X | | | X |

## CUSTOMER INCENTIVES (REBATES)

One of the barriers to energy efficiency deployment is that, although high efficiency options are cost-effective on a life-cycle basis, initial costs may be higher than they are for less efficient options. Customer incentives or rebates are designed to help overcome this barrier. Rebates provided in the 2024 Plan are designed to provide between 25% and 50% of the incremental cost of purchasing the energy efficiency measure over the standard non-energy efficient option. This range is typical of EE programs offered in the industry. Exceptions to this are the programs that target low-income customers and other hard-to-reach customer segments, such as small-business customers. The low-income programs are offered at no cost to income-qualified participants, and the small-business component of the Commercial Comprehensive program provides higher incentives to encourage greater participation. In addition to using the general guideline of 25% to 50% of incremental cost, rebate amounts are set for each measure in a program based on a market assessment of what it will take to achieve the participation targets for the program. For some programs, such as the Home Energy Checkup component of the Residential Comprehensive program, the rebates are determined in part on past participation rates at a given rebate level and the need to increase participation.

## INTERNAL ADMINISTRATION

The primary internal administrative cost is the labor associated with program management and administration, including program development, tracking, reporting and the time needed to oversee and interact with third-party contractors and stakeholders. Additional costs include incidental costs, such as travel and membership fees for energy efficiency organizations. Internal administrative costs are proportionally allocated to the energy efficiency programs based on the direct costs associated with each program with some adjustments for known dedicated costs. Direct costs are the costs specific to individual programs such as third-party costs, rebates, and promotional costs. Administrative costs represent less than five percent of the total 2024 Plan costs.

### MEASUREMENT AND VERIFICATION

The budget for independent M&V of the programs is estimated to be about two percent of the total program budget, based on the current contract approved by the NMPRC. The EE portfolio M&V is discussed in more detail in Section 4.4.

## 3.4 PROMOTION

Effective promotion and marketing are critical to the success of the EE programs. PNM oversees planning for program marketing across its EE portfolio, and continuously monitors each program's promotional plans. The day-to-day management of marketing depends on each program's needs. Where third-party contractors are responsible for marketing the programs they administer, their promotional costs are recorded in the third-party expense category. In some cases, where contractors do not have the necessary marketing capabilities, PNM directly manages marketing for these programs. PNM also produces its own marketing materials to use in a variety of customer outreach channels where appropriate. These marketing channels include program marketing materials (such as case studies, bill inserts or brochures), direct mail, email, outreach events (including events focusing on low-income customers), customer communications with call center staff, the PNM website, social media, digital advertising, outdoor advertising, and television and radio commercials.

To increase customer awareness and participation for the coming years, the marketing plan has expanded to include a microsite that ties directly to the core message for the campaign: Check with PNM before making an appliance purchase. Throughout 2022, the primary brand campaign directing customers to visit CheckWithPNM.com[6] was very successful with over 60,000 unique views to the site, which directs customers to all PNM energy efficiency programs from a single landing page.

Additionally, to make communications more equitable and increase program awareness on a larger scale, PNM has pivoted to produce dual language bill inserts to ensure both English and Spanish speaking customers are aware of the EE offerings. Spanish is available in most of PNM's EE programs through one or more of the following channels: online rebate applications, online appointment scheduling, call center representatives and installation contractors, and marketing collateral.

[6] https://www.checkwithpnm.com/

## TRADE ALLY NETWORK STRATEGY

As of 2023, over 550 businesses, or trade allies, will actively participate in PNM's EE programs by delivering program services and incentives to customers (see Appendix D for a list of current EE trade ally businesses). By consolidating synergies where appropriate and consolidating the trade ally network across almost all of its EE programs, PNM is able to support the many businesses that drive energy efficiency implementation in its service area. This trade ally network strategy offers services and incentives in addition to those already offered by third party program implementation contractors, including market research, public recognition and sales training. Other utilities have shown that such efforts result in increased trade ally engagement with programs and improved program outcomes, including increased customer participation and energy savings.

# 4 2024 PROGRAM PLAN SUMMARY

## 4.1 SUMMARY TABLES

The tables in this section present the key performance measures and assumptions for each program in the 2024 Plan. Table 4-1 shows the customer participation and unit targets forecasted for each program.

**Table 4-1**

| Programs | Unit Type | 2024 | 2025 | 2026 |
|---|---|---|---|---|
| **Residential Comprehensive** | | **40,198** | **41,438** | **46,933** |
| Res. Comp. - Refrigerator Recycling | Unit | 6,200 | 6,200 | 6,200 |
| Res. Comp. - Home Energy Checkup | Participant | 18,895 | 19,060 | 18,665 |
| Res. Comp. - LI Home Energy Checkup | Participant | 11,985 | 12,940 | 18,650 |
| Res. Comp. - Midstream Cooling | Unit | 3,118 | 3,238 | 3,418 |
| Residential Products | Unit | 309,551 | 309,551 | 309,551 |
| **Commercial Comprehensive** | | **576** | **581** | **587** |
| Comm. Comp. - Retrofit/NC/Mid | Participant | 238 | 240 | 243 |
| Comm. Comp. - QuickSaver | Participant | 248 | 250 | 253 |
| Comm. Comp. - Bldg Tune-Up | Participant | 29 | 29 | 29 |
| Comm. Comp. - Multifamily | Participant | 61 | 62 | 63 |
| **Behavioral Comprehensive** | | **219,476** | **219,476** | **219,476** |
| Behavioral - Residential | Participant | 219456 | 219456 | 219456 |
| Behavioral - Commercial | Participant | 20 | 20 | 20 |
| Easy Savings | Participant | 3,500 | 3,000 | 2,500 |
| Energy Smart (MFA) | Participant | 458 | 520 | 582 |
| New Home Construction | Unit | 1,195 | 1,255 | 1,317 |
| Home Works | Participant | 14,000 | 14,000 | 14,000 |

Table 4-2 shows the effective useful life (EUL), energy and demand savings, and average rebate cost per unit for each program.

**Table 4-2**

| Programs | EUL | Per Unit Net kWh Savings | Per Unit Net kW Savings | Per Unit Average Rebate Amount |
|---|---|---|---|---|
| Refrigerator Recycling | 5 | 1089 | 0.26 | $82 |
| Home Energy Checkup (Mkt) | 9 | 322 | 0.01 | $44 |
| Home Energy Checkup (LI) | 9 | 385 | 0.01 | $96 |
| Residential Midstream Cooling | 15 | 836 | 0.37 | $294 |
| Residential Products | 13 | 116 | 0.01 | $8 |
| Retrofit/NC/Mid | 11 | 137448 | 26.21 | $14,062 |
| QuickSaver | 11 | 29182 | 7.10 | $5,947 |
| Bldg Tune-Up | 11 | 21978 | 3.13 | $4,650 |
| Multifamily | 11 | 81627 | 5.10 | $18,508 |
| Easy Savings | 11 | 579 | 0.07 | $45 |
| Energy Smart (MFA) | 16 | 3267 | 0.88 | $1,653 |
| New Home Const. | 15 | 756 | 0.24 | $203 |
| Behavioral Res | 1 | 9 | 0.00 | $0 |
| Behavioral Com | 3 | 206567 | 39.25 | $2,482 |
| Home Works | 11 | 204 | 0.01 | $38 |

Tables 4-3, 4-4, and 4-5 show the net present value (NPV) of program costs, the NPV of program benefits, and the ratio of benefits to costs, which is the UCT for each program. NPV Costs are different from program budgets because they are discounted for the time value of money. Additional detail on the UCT calculations for each program is in Appendix E.

**Table 4-3**

| 2024 Programs | NPV Benefits | NPV Costs | 2024 UCT |
|---|---|---|---|
| Residential Comp. | $ 7,066,016 | $6,808,220 | 1.04 |
| Refrig. Recycl. | $ 1,273,225 | $1,472,559 | 0.86 |
| HEC - Mkt | $ 1,677,749 | $1,781,148 | 0.94 |
| HEC - LI | $ 1,760,812 | $1,864,819 | 0.94 |
| Midstream Cooling | $ 2,187,960 | $1,689,694 | 1.29 |
| Residential Products | $ 9,582,248 | $4,444,957 | 2.16 |
| Commercial Comp. | $ 22,220,562 | $10,006,176 | 2.22 |
| Easy Savings | $ 1,110,471 | $328,898 | 3.38 |
| Energy Smart (MFA) | $ 1,552,895 | $964,909 | 1.61 |
| New Home Const. | $ 649,856 | $575,090 | 1.13 |
| Behavioral (Residential) | $ 146,327 | $664,664 | 0.22 |
| Behavioral (Commercial) | $ 635,949 | $374,388 | 1.70 |
| Home Works | $ 1,032,552 | $784,382 | 1.32 |
| Power Saver (LM) | $ 6,440,751 | $5,445,888 | 1.18 |
| Peak Saver (LM) | $ 4,830,563 | $4,119,626 | 1.17 |
| Total | $ 55,101,920 | $ 34,517,198 | 1.60 |

**Table 4-4**

| 2025 Programs | NPV Benefits | NPV Costs | 2025 UCT |
|---|---|---|---|
| Residential Comp. | $ 6,252,560 | $7,175,099 | 0.87 |
| Refrig. Recycl. | $ 1,218,454 | $1,476,674 | 0.83 |
| HEC - Mkt | $ 1,238,628 | $1,797,207 | 0.69 |
| HEC - LI | $ 1,232,845 | $2,104,354 | 0.59 |
| Midstream Cooling | $ 2,292,335 | $1,796,864 | 1.28 |
| Residential Products | $ 9,227,669 | $4,505,684 | 2.05 |
| Commercial Comp. | $ 22,548,983 | $10,379,672 | 2.17 |
| Easy Savings | $ 929,824 | $282,709 | 3.29 |
| Energy Smart (MFA) | $ 1,900,469 | $1,145,223 | 1.66 |
| New Home Const. | $ 695,954 | $599,911 | 1.16 |
| Behavioral (Residential) | $ 144,003 | $665,559 | 0.22 |
| Behavioral (Commercial) | $ 809,223 | $488,864 | 1.66 |
| Home Works | $ 985,256 | $803,658 | 1.23 |
| Power Saver (LM) | $ 7,453,713 | $5,507,779 | 1.35 |
| Peak Saver (LM) | $ 5,590,285 | $3,813,078 | 1.47 |
| Total | $ 56,267,641 | $ 35,367,236 | 1.59 |

**Table 4-5**

| 2026 Programs | NPV Benefits | NPV Costs | 2026 UCT |
|---|---|---|---|
| Residential Comp. | $ 7,175,954 | $7,891,239 | 0.91 |
| Refrig. Recycl. | $ 1,236,588 | $1,474,597 | 0.84 |
| HEC - Mkt | $ 1,296,454 | $1,936,854 | 0.67 |
| HEC - LI | $ 1,786,573 | $2,616,160 | 0.68 |
| Midstream Cooling | $ 2,518,798 | $1,863,630 | 1.35 |
| Residential Products | $ 9,489,210 | $4,548,682 | 2.09 |
| Commercial Comp. | $ 23,911,886 | $10,639,693 | 2.25 |
| Easy Savings | $ 803,856 | $235,256 | 3.42 |
| Energy Smart (MFA) | $ 2,298,789 | $1,320,454 | 1.74 |
| New Home Const. | $ 754,645 | $607,016 | 1.24 |
| Behavioral (Residential) | $ 172,527 | $665,559 | 0.26 |
| Behavioral (Commercial) | $ 814,424 | $360,875 | 2.26 |
| Home Works | $ 1,020,279 | $819,907 | 1.24 |
| Power Saver (LM) | $ 7,767,317 | $5,547,244 | 1.40 |
| Peak Saver (LM) | $ 5,825,488 | $3,843,112 | 1.52 |
| Total | $ 59,696,836 | $ 36,479,038 | 1.64 |

## 4.2 NON-ENERGY BENEFITS

### 4.2.1 ECONOMIC BENEFITS

The PNM Energy Efficiency Program has a positive economic impact on New Mexico through the creation of new jobs associated with delivering efficiency products, services and incentives to customers. As determined by the independent M&V evaluation of the programs, most projects would not have been completed without the program incentives. For every dollar spent in EE programs, a portion of it remains within the state as wages and payment for local equipment and services. As this money gets re-spent within the state, it increases its overall benefit through a multiplier effect. The incentive levels in the 2024 Plan are designed to cover between 25% and 50% of the incremental cost of performing retrofits and encourage investments that would otherwise not be made. Although PNM is not aware of specific studies that quantify additional economic benefits due to funding energy efficiency improvements in New Mexico, one conservative approach to estimating the increased investment caused by the rebate payments would be to assume that the rebates cause spending on retrofits valued at twice the rebate level, assuming the rebates cover about half of the incremental cost. Based on the estimated annual average of customer incentives totaling approximately $14,200,000, this would result in about $28,400,000 in investment in energy efficiency improvements that would otherwise not have been made.

The number of direct jobs created by the existing PNM Energy Efficiency Program is shown in Table 4-6. These jobs are full-time positions created by the third-party contractors to implement the programs. The Commercial Comprehensive program, for example, directly employs nine people locally. In addition to the jobs shown in Table 4-6, many additional jobs are being supported in the trade ally and contractor community to install the measures associated with PNM's EE programs. According to a national study completed in 2022, there are over 4,000 energy efficiency-related jobs in PNM's service area.[7]

**Table 4-6**

| Program | Direct Energy Efficiency Jobs |
|---|---|
| Residential Comp. Refrigerator Recycling | 6 |
| Residential Comp. Home Energy Checkup | 4 |
| Residential Comp. Midstream Cooling | 2 |
| Residential Products | 3 |
| Commercial Comp. | 10 |
| Home Works | 1 |
| Energy Smart (MFA) | 1 |
| New Home Const. | 2 |
| Power Saver (LM) | 9 |
| Peak Saver (LM) | 3 |
| **Total** | **41** |

### 4.2.2 EMISSIONS REDUCTIONS

The energy savings attributed to the proposed 2024 Plan, if approved and implemented, would result in significant reductions of various environmental emissions and in water needed for the generation of electricity. The cumulative $CO_2$ reduction is estimated to save 360,000 metric tons for the planning years 2024, 2025, and 2026. The cumulative water reduction is estimated at about 138,800,000 gallons for the

[7] https://e4thefuture.org/wp-content/uploads/2022/12/EE-Jobs-in-America_All-States_2022.pdf.

planning years 2024, 2025, and in 2026, assuming the 2022 PNM average generation portfolio production values.

## 4.3 TARIFF RIDER AND CUSTOMER BILL IMPACT

PNM Rate Rider No. 16 (Rider) recovers the program costs and approved profit incentive associated with the PNM's EE and LM programs. Beginning in January 2023, the program cost element of the Rider is set to 3.177% percent of bills and the profit incentive element set at 0.219% percent[8]. PNM is filing a reconciliation of 2022 program costs and profit incentive concurrently with the 2024 Plan on April 15, 2023. The reconciliation of program costs shows an over collection in 2022 compared to actual 2022 program costs. The 2024 Plan budget has been adjusted to reflect the under-spent amount using the method prescribed by 17.7.2.8(E) NMAC. The reconciliation filing also includes a proposed adjustment to the Rider to account for under-collection of profit incentive costs in 2022. In 2024 the total program cost element is set to 3.707% of bills and the base level profit incentive element is set to 0.246% of bills totaling 3.952% in cost elements.

## 4.4 MEASUREMENT AND VERIFICATION (M&V)

The Act requires that M&V be performed by an independent program evaluator that, pursuant to the Rule, is approved by the NMPRC. The independent evaluator prepares a report that documents the total portfolio and individual program-level expenditures, measured and verified savings, and cost-effectiveness of all the EE and LM programs plus self-direct programs. The report includes deemed savings assumptions and all other assumptions determined by the evaluator. Objectives of the M&V process include verifying that measures were installed and documentation matches rebate applications; and that measures are operating properly within program quality standards and expected to generate the predicted savings. In addition to providing measured and verified information regarding PNM's programs, the M&V report also provides guidance for how PNM can assess its own program metrics, and informs future program design and budget allocation decisions.

PNM will work closely with Ecometric as the evaluator approved by the NMPRC for evaluation of the 2024 Plan programs.

## 4.5 REPORTING

[8] Advice Notice 585, Effective May 31, 2022.

PNM will make annual filings, currently required on April 15 of each year, that will provide program evaluation information, as required by 17.7.2.14 NMAC, and tariff rider collections. The filings will also include the M&V reports completed by the independent evaluator. Concurrently with filing the annual report, PNM will request any needed reconciliation of the tariff Rider to reflect actual participation levels and actual expenditures made in implementation of the programs. Annual reports are available through the PNM web site at: www.pnm.com/regulatory.

# 5 PROGRAM DESCRIPTIONS

Continuing programs and enhancements are described in the following sections:

*5.1 – Commercial Programs*

*5.2 – Residential Programs*

*5.3 – Low-Income Programs*

5.4 – *Behavioral Programs*

*5.5 – Load Management Programs*

*5.6 – Market Transformation Program*

## 5.1 COMMERCIAL PROGRAMS

### 5.1.1 CONTINUING PROGRAMS – APPROVED IN CASE NO. 20-00087-UT

#### COMMERCIAL COMPREHENSIVE

The Commercial Comprehensive program is PNM's flagship program for non-residential customers. The program provides incentives for the retrofit or installation of both prescriptive and non-prescriptive measures that decrease demand and save energy. The program is designed to be a "one-stop-shop" for commercial customers interested in improving the efficiency of their existing or planned new facilities. Examples of measures include a prescriptive list of lighting upgrades, building controls, compressed air and fan systems, and HVAC and refrigeration upgrades, as well as incentives for custom measures. This program also includes a new construction option that offers incentives for buildings constructed to exceed local building code energy requirements and special incentives for small businesses. In addition, the program offers training programs and on-site audits.

One important aspect of the Commercial Comprehensive program is its reliance on the participation of local energy efficiency vendors, suppliers and contractors who install the energy saving equipment. These businesses are critical "trade allies" and the program would not be successful without their enthusiastic support. PNM conducts several training sessions each year for participating trade allies in which the program processes are reviewed, and technical training is provided on new efficiency approaches.

The Commercial Comprehensive program is implemented for PNM by DNV-GL. In collaboration with DNV-GL, PNM continuously monitors market conditions and changes in the status of commercial and industrial technologies in order to keep the list of eligible upgrades current and the rebates appropriate. For example, PNM regularly consults the DesignLights Consortium[9] web site to search for new energy efficient lighting technologies that could be added to the program. The DesignLights Consortium is a non-profit membership organization that promotes quality, performance, and energy efficient commercial sector lighting solutions.

The Commercial Comprehensive program has six components: Retrofit Rebates, New Construction, Building Tune-Up, Distributor Discount, Multifamily and PNM QuickSaver™ for small business customers. Each of these is described in detail below. Complete program details, including the customer application and a list of all rebates, is available on the PNM web site.[10]

## RETROFIT REBATES

The Retrofit Rebate is the largest component of the Commercial Comprehensive program in terms of total savings. The Retrofit Rebate component offers two options for a PNM business customer: 1) a pre-set menu of rebates for installing qualifying equipment in new and existing buildings; and 2) custom rebates for reducing energy use with a system improvement that is not included on the pre-set menu. Custom rebates are based on the estimated first-year energy savings. Complete program details including a list of all rebates are available on the PNM web site.[11]

## NEW CONSTRUCTION

Customers that build new facilities or make major renovations of existing buildings can receive an incentive if they install equipment or systems that result in surpassing existing building code requirements and save additional energy. Savings are determined by following American Society of Heating, and the latest Refrigerating and Air-Conditioning Engineers' (ASHRAE) Standards and must be validated using a standard modeling tool, such as DOE-2, BLAST, EnergyPlus or eQUEST, capable of hourly calculations and modeling multiple thermal zones. The tool used must be approved by PNM staff.

The whole-building New Construction component provides an incentive based on the amount of annual energy saved due to constructing the building to standards at least 10% better than local building code,

[9] https://www.designlights.org/

[10] https://www.pnm.com/bizrebates

[11] https://www.pnm.com/bizrebates

which is currently the ASHRAE 90.1 2016 – IECC 2018 standard. There are two levels of incentives available based on the following conditions:

- Surpass ASHRAE 90.1 2016 on a new building by 10 percent and receive an incentive based on first-year kilowatt-hours saved.
- Surpass ASHRAE 90.1 2016 on a new building by 20 percent and receive a higher incentive based on first-year kilowatt-hours saved.

## BUILDING TUNE-UP

Building tune-up refers to the process of bringing a building's mechanical and electrical systems, including building controls, to peak performance. Existing systems are analyzed, parameters are adjusted and equipment repaired as necessary. Low-cost operational improvements that deliver high energy savings are also identified. For more complex systems, a building analysis may be performed. In return for the building analysis, the customer is required to install all identified energy efficient measures that have a two-year payback or less and cost less than $5,000. After system improvements are identified and prior to any system modifications, a baseline of electricity consumption is estimated. PNM pays a rebate based on the one-year annualized rate of energy savings. For more complicated buildings, the program also provides a rebate for a portion of the study expenses.

The Building Tune-Up component of the Commercial Comprehensive program differs from the Retrofit Rebate component in that the primary goal is to identify low-cost operational improvements that deliver energy savings. Existing mechanical and electrical systems and building controls will be adjusted, typically with minimum capital cost. To the extent a building tune-up incorporates prescriptive elements included in the Retrofit Rebate component, the customer will generally receive rebates through the Retrofit Rebate component.

## DISTRIBUTOR (MIDSTREAM) INCENTIVES

In 2015, PNM expanded program outreach through "midstream" marketing for HVAC measures that are also available through the Retrofit Rebate component. In 2019, commercial cooking measures were added to the program. Midstream refers to providing incentives at the distribution level rather than, or in addition to, the customer. As pointed out in a SWEEP report[12], deeper market penetration of certain energy efficient products is possible if this approach is used. Without midstream incentives, distributors tend to stock basic equipment that is less expensive to install. Energy efficient alternatives are generally more expensive and must be "special ordered." Therefore, if a customer's piece of equipment fails and it must be replaced under time constraints, the energy efficient alternative is often not installed. Moreover,

[12] Upstream Utility Incentive Programs: Experience and Lessons Learned, Maureen Quaid and Howard Geller, May 2014. Available at http://swenergy.org/publications/documents/Upstream_Utility_Incentive_Programs_05-2014.pdf.

the midstream model allows for incentives to be paid to the counter sales staff. This further motivates sales staff to promote efficient equipment. Also, midstream incentives show the point-of-sale discount on the quotation or invoice which will further motivate contractors and customers to select the energy efficient choice. The current list of equipment included in Distributor Incentives is based on an assessment of technologies that are not readily available or stocked in the high efficiency option. The program currently provides incentives for HVAC equipment and vending machine controls. Additional items will be considered for 2024 based on market conditions. The program will also work to recruit additional distributors throughout PNM's service area.

## MULTIFAMILY

The Multifamily program targets a unique and hard-to-reach customer segment. The target audience consists of owners of multifamily (apartment) dwellings, who are eligible to receive rebates and direct-install measures for energy efficiency upgrades in common areas and residential housing units. For the purpose of this program, PNM defines multifamily dwellings as those that include five or more residential housing units. The goal is to offer a program that is streamlined and offers a simple approach to participation, and that will make their buildings more energy efficient. Making recommended, cost-effective energy efficiency upgrades, including lighting retrofits, appliance upgrades, and direct installation of smaller measures, is a good investment for the property owner and will also benefit tenants and property owners with lower utility bills, increased comfort, and improved security. The program is administered by DNV-GL, a third-party implementer. DNV-GL manages all components of the program, including marketing, outreach, and rebate processing. A central part of the program delivery includes utilizing a primary point of contact or liaison either employed by or contracted with the implementer to assist the property manager throughout the entire project.

The program has special incentives available to multifamily participants with a majority of low-income tenants, defined as being at or below 200% of the federal poverty level. These properties are typically operated by a recognized low-income housing provider including, but not limited to, government entities, nonprofit agencies, and private-market Section 8 providers.

Energy savings are achieved through both prescriptive and custom measures. Projects that include custom measures that are not included in the prescriptive list can receive rebates provided that building system analysis shows them to be cost-effective. The program will soon add new construction to the performance incentive path for multifamily properties that include up to three floors, in addition to trade ally performance incentives to encourage contractor engagement, deeper achieved energy savings, and for quality assurance purposes. PNM will continuously monitor participation in the program and make modifications to the measure list and rebate amounts as needed to achieve participation and budget goals. Complete program details including a list of all rebates are available on the PNM website.[13]

## PNM QUICKSAVER

The PNM QuickSaver component provides special incentives for PNM small-business customers who are considered a hard-to-reach segment because of their limited access to capital and other barriers to participation. Beginning In 2015, the upper threshold for eligibility in QuickSaver was increased from business accounts with peak demand of 100 kW to those with 200 kW in 2016 to reach even more small business customers and has maintained this level since. Qualifying businesses contact an approved PNM QuickSaver contractor to schedule an energy efficiency evaluation. The PNM QuickSaver-approved contractor then provides an on-site evaluation and a written proposal for the energy efficiency equipment upgrades for which the facility qualifies. Using this information, a contract between the customer and the contractor is drafted with the costs and final project completion payment clearly defined. The contractor handles all of the project paperwork. PNM QuickSaver covers on average about 65% of the project cost, which makes improved efficiency more affordable and attractive to the hard-to-reach small business customer. PNM pays the rebate to the contractor and, for many projects, utility savings will pay back out-of-pocket costs incurred by the business participant in less than one year.

Fewer energy savings measures are available under the QuickSaver component as compared to the Retrofit or New Construction components. However, QuickSaver focuses on measures that are the most common and cost-effective measures for the typical small business such as refrigeration components, lighting fixtures and lamps, and lighting control upgrades. These measures are also ones that can be installed quickly and provide immediate electric cost savings to participating small business owners. Many of the retrofits that have been done have focused on lighting, but contractors are also promoting more refrigeration and controls retrofits. In addition, PNM's third-party contractor is providing analytics to support targeted marketing of the program to increase participation and engagement of eligible customers.

## REFRIGERATOR RECYCLING

The Refrigerator Recycling program is primarily a residential program but is also available to commercial customers. Please see the residential Refrigerator Recycling program description for more detail.

## SELF-DIRECT

[13] https://www.pnm.com/bizrebates

This program allows large customers (with energy usage greater than 7 million kWh per year) to receive credits for qualifying incremental expenditures made towards energy efficiency measures at the customers' facilities. Credits for approved self-direct programs may be used to offset up to seventy percent of the energy efficiency tariff Rider until the credit is exhausted. Qualifying customers apply for the credit through submitting a proposed EE project they intend to implement at their facility. The PNM Self-Direct program manager reviews the application. If the project meets the program requirements the application is approved and the customer's electric bill is credited. Projects must not utilize funding from any other PNM EE program in order to be eligible.

## 5.2 RESIDENTIAL PROGRAMS

### 5.2.1 CONTINUING PROGRAMS – APPROVED IN CASE NO. 20-00087-UT

#### RESIDENTIAL COMPREHENSIVE

The Residential Comprehensive program is the primary incentive program for residential customers. The program has three components; Home Energy Checkup (including a low-income option), Residential Midstream Cooling, and Refrigerator Recycling. All of these programs provide energy efficiency options for customers' homes and have similar offers and benefits. For example, cooling options are available through Home Energy Checkup and Residential Midstream Cooling and customers recycling their refrigerators may also wish to take advantage of rebates on new appliances. PNM will continue to monitor the market for efficient appliances and HVAC equipment and make additions and modifications to the rebates to reflect market conditions and achieve budget and savings targets. Complete program details including customer applications and a list of all rebates is available on the PNM web site[14].

#### HOME ENERGY CHECKUP

Home Energy Checkup, managed by Franklin Energy Services, provides PNM residential customers, including low-income customers, the opportunity to participate in a Home Energy Checkup to save money and energy by choosing between two individually priced direct installation packages. The Home Energy Checkup applies a one-stop-shop approach at no charge to the customer that includes a walk-through assessment and informative discussion between the program participant and energy specialist explaining the assessment results, while also providing additional educational materials including conservation tips, ENERGY STAR appliance rebate eligibility, weatherization eligibility, and information about other energy efficiency programs available to participants. Once the assessment has been completed and the results and educational materials have been presented, the specialist installs applicable energy efficiency measures, from the direct installation package provided. Each package contains a varied mix of the

[14] https://www.checkwithpnm.com/

following measures: weather stripping, door sweeps, outlet gaskets, big gap filler, LEDs, and advanced power strips. Weatherization upgrades, AC diagnostic performance testing and smart thermostat installation are available for additional copays. Other low-cost measures may also be introduced if they are cost-effective, can be delivered within the program budget and help achieve the program savings goals. Franklin Energy Services' duties include recruitment and training of contractors, energy specialists and retailers (trade allies), rebate fulfillment, marketing and advertising, data tracking, reporting, and quality assurance. PNM is collaborating and cost-sharing with the New Mexico Gas Company (NMGC) and Prosperity Works on this program for an even more robust program offering to customers, including tribal customers.

Income qualified customers do not pay a copay for weatherization or the installation of smart thermostats that market rate customer pay and may also qualify to receive an ENERGY STAR refrigerator to replace an older, inefficient model. For income-qualified participants, the energy specialist determines if the home's primary refrigerator is eligible for replacement.

Rebates are also provided for the purchase of ENERGY STAR appliances, heat pump water heaters, replacement of existing and working HVAC units with more efficient units and adding insulation for homes with refrigerated air-conditioning. The program identifies customers who may qualify for additional incentives on advanced evaporative cooling.

To encourage even greater energy and cost savings, participants also receive tailored combinations of rebate applications for ENERGY STAR qualified appliances and HVAC replacement to higher efficiency equipment as applicable. Appliances and HVAC equipment that qualify for rebates currently include the following:

- *Standard size refrigerator*
- *Freezer*
- *Clothes washer*
- *Clothes dryer*
- *Air Purifier*
- *Insulation Rebates*
- *Dishwasher*
- *Smart Thermostat*
- *Air Conditioning Tune-Up*
- *HVAC Early Replacement*
- *HVAC Replacement with CEE Tier I*
- *HVAC Replacement with CEE Tier 2*
- *HVAC Replacement with CEE Tier 3*
- *Heat Pump Water Heater*

To offer a more robust program and deeper savings, customers will also receive a breakdown of weatherization upgrades available to them for an additional co-pay. Upgrades will include a range of comprehensive envelope measures and smart thermostats delivered by local contractors. The assessment will include a blower door test. Scheduling for upgrades is managed by the implementer.

As with the other programs in the portfolio, PNM will continue to monitor and evaluate the market for high-efficiency appliances and other efficient measures that could be included as rebate options, provided they are cost-effective and can be provided within the program budget.

## RESIDENTIAL MIDSTREAM COOLING

The Residential Midstream Cooling program, formerly the Residential Cooling and Pool Pump program, offers distributors and contractors incentives to stock highly efficient cooling equipment so it is readily available for a broader customer reach. The program also offers contractors incentives to install highly efficient units. Qualifying equipment includes CEE Tier one, two and advanced tier refrigerated air conditioning equipment, ducted and non-ducted heat pumps, heat pump water heaters, smart thermostats and any additional measures that pass cost effectiveness analysis. Discounts are passed through to customers having this equipment installed.

Refrigerated AC tune-ups are also offered to customers free of charge through this program when the ambient temperature reaches 55 degrees Fahrenheit or above. The tune-ups help systems maintain optimal performance to save customers more energy and money on their utility bills. Advanced evaporative and other cooling equipment incentives are now offered through the Residential Products program discussed later in the Plan.

## REFRIGERATOR RECYCLING

The Refrigerator Recycling component is designed to encourage retirement of old or unnecessary second refrigerators and freezers. A refrigerator manufactured before 1995 can use up to three times more energy than a newer model. By retiring and not replacing an extra working unit, a PNM residential customer can save up to $175 a year in electricity costs. This program is also available to PNM business customers, although only residential size and type refrigerators and freezers are accepted. The program provides a rebate for each unit that is recycled. The rebate amount is currently $75 per refrigerator or freezer.

PNM is contracted with ARCA, Inc. to implement the program, which includes picking up old units and transporting them to the local recycling facility. Approximately 95% of each refrigerator or freezer is recycled. The unit must be in working condition and be between 10 and 30 cubic feet in size. There is a limit of two refrigerators and/or freezers per household, and more than two refrigerators and/or freezers for business customers with PNM program manager approval. PNM is increasing marketing efforts going forward to maintain adequate participation and cost effectiveness in this legacy program.

## RESIDENTIAL PRODUCTS

Beginning in 2021, the Residential Products program, formerly the Residential Lighting program, incorporated additional retail products such as advanced power strips, evaporative cooling equipment and room air conditioners and other measures, in addition to, the current residential lighting discounts. PNM will continue to expand the program with additional cost-effective products as advised by results of a residential appliance and socket saturation survey conducted in 2020 and current market conditions. Incorporating additional offerings has provided customers with a more comprehensive program of discounted products at the point of sale and will also assist in offsetting reduced lighting savings in the future due to the forthcoming EISA standard changes.

A list of retailers that offer discounts is available at https://www.pnm.com/instantdiscounts. The list of participating retailers is also shown in Appendix D.

The residential lighting market has been undergoing transformative change over the last few years and change is expected to continue as LEDs become more affordable and new halogen incandescent bulbs continue to claim market share. The Energy Independence and Security Act of 2007 (EISA) prescribed minimum efficacy standards (lumens per watt) for regular duty light bulbs and required the phase-out of inefficient lighting technologies beginning in 2012 with the elimination of the 100 watt (W) incandescent bulb and then the 75W, 60W and 40W bulbs, respectively, in subsequent years; although certain specialty bulbs are exempt, including candelabra bulbs, reflectors, and three-way bulbs.

A second phase of the EISA was due to begin in January of 2020 requiring general service lamps (GSL) to be approximately 65% more efficient than the traditional incandescent bulbs by including a “back stop” provision requiring a 45 lumen/watt minimum efficiency standard on sales of GSLs.[15] However, in 2019 the U.S. Department of Energy rolled back this phase and standards were not put in place as initially required but will now take full effect beginning in 2024 except for proven halogen replacement in homes.

Despite the major lighting market change driven by EISA as a whole, there may still be a continued need for some specialty LED and/or lighting fixture promotions not impacted by the EISA standard changes. Independent M&V will determine impacts on the free-rider rates or net energy savings. PNM will continue to make necessary modifications to the non-lighting measure mix incentivized to help mitigate any negative impacts to cost effectiveness due to changes in EISA standards.

## PNM HOME WORKS (AND ENERGY INNOVATION)

PNM Home Works and Energy Innovation are an energy savings and education program that combines energy efficiency curriculum for teachers with easy-to-install energy efficiency and water-saving measures

[15] https://www.energystar.gov/sites/default/files/asset/document/3.%20%20Claire%20Miziolek_NEEP%20-%20Plenary.pdf

for students to install at home with their parents. The program has two main goals: energy savings and market transformation through student education.

PNM contracted with National Energy Foundation (NEF) to implement this program which consists of general program oversight, student and teacher presentations, web design, kit production, warehousing and distribution, marketing, program tracking, data tabulation, and reporting. This program is designed to generate immediate and long-term savings by sending energy savings measures and interactive hands-on education home with motivated students. The 2024 Plan program will continue to have two presentations and kits designed for 5th grade students and high school students. Each student will receive educational materials designed to build knowledge and demonstrate simple ways to save by changing habits in conjunction with easy-to-install measures. The teacher and student kit materials support state and national educational standards, which allow the program to easily fit into teachers' existing schedules and requirements. The total cost of providing the program, including all presentation time and materials is about $88 per kit.

The program begins with an interactive presentation at a school assembly or similar event teaching the importance of using water and energy efficiently, followed by hands-on, creative problem solving. Next, participating students take home an activity kit that includes high efficiency water, lighting, and weatherization measures. With the help of their parents or caregivers, the students install the measures at home and complete a home survey. The high school presentation includes a special emphasis on sustainability and on the unique energy usage footprint of a high school-aged student in the home. The high school kits contain a Tier two advanced power strip. The NEF staff tabulates all the responses, including home survey information, teacher responses, student input and parent responses, and generates a program summary report. Teachers receive a small mini grant to purchase supplies and materials for their classrooms. The amount of the mini grant is calculated based on the completed percentage of Home Energy Worksheets (HEWS) returned by each teacher. PNM will target approximately, 8,500 5th grade students and 5,500 high school students each year across the service area.

The educational and energy awareness training is a crucial part of the PNM Home Works program but is not directly linked to specific energy savings. Rather, the education builds awareness of the importance of energy efficiency in general and supports the goals of the 2024 Plan in general. Therefore, PNM funds the general energy efficiency educational materials and presentations activities of the program, about 35-40% of the program cost, through the Market Transformation (MT) program, which is described in the MT section of the 2024 Plan below.

## NEW HOME CONSTRUCTION

ICF International is the third-party implementer managing this turnkey program which includes marketing and outreach, builder and HERS rater outreach and training, quality assurance, data tracking and reporting, and rebate processing. PNM is collaborating and cost-sharing with the New Mexico Gas Company (NMGC) on this program for an even more robust program offering to home builders.

The target audience consists of custom, semi-custom, and production home builders and includes consumers, realtors, trade allies, raters, developers and architects. The goal is to offer a streamlined program that offers participants incentives for highly efficient new single-family residential construction through either a prescriptive or a performance path.

The combined prescriptive and performance program approach has proven less stringent than the previous ENERGY STAR-only approach because homebuilders could choose to install a list of efficient prescriptive measures that meet or exceed efficiency goals or choose a whole home performance path approach for properties exceeding the (previous) IECC 2009 building code while continuing to encourage home builders to participate in ENERGY STAR®, Zero Energy Ready Homes (ZERH) and Build Green NM initiatives.

With the EISA Lighting Backstop taking effect in this program on January 1st, 2024, the New Home Construction Program will lose the ability to claim savings on LED lighting. These savings currently account for approximately half of the total kWh savings for performance homes. ICF analyzed the impact of the LED savings due to EISA changes on all 2018 IECC homes submitted in PY2022 and determined that 99% of all performance homes submitted would fail to meet the 10% above code threshold, and only 10% of submitted homes would qualify for the 5% above code threshold.

With these considerations, PNM believes higher per home savings would be best achieved by utilizing the performance path solely through an all-electric home pilot. Therefore, PNM is proposing to include an all-electric pilot in the 2024 Plan. PNM will continue to offer a prescriptive measure path to achieve energy savings and continued engagement with the homebuilder community. Builders will have the option to use a rater to submit the home via the performance path or self-submit through the prescriptive path.

The interest in all-electric homes is beginning to grow with New Mexico builders, and the addition of an all-electric homes pilot in this program will accelerate the adoption of technologies like heat pump water heaters and air source heat pumps in new homes. The proposed 2024 participation goal is 1,195 homes.

Currently, the average savings per newly constructed home is approximately 1,158 kWh, however, the removal of lighting as a measure is anticipated to decrease the average savings per home to 750 kWh. The initial prescriptive incentive path as listed below in Table 5-1 requires that home builders install at least two measures to qualify. PNM will monitor market conditions and will adjust the incentive amounts as needed to meet program performance goals while maintaining cost-effectiveness of the program.

**Table 5--1**

| PNM Prescriptive Incentives | 2024-2026 |
|---|---|
| **Air Conditioning** | |
| 16 SEER (from 15 SEER) | $25 per ton |
| 17 SEER (from 15 SEER) | $50 per ton |
| 18 SEER (from 15 SEER) | $70 per ton |
| **ENERGY STAR Air Source Heat Pump** | |
| ENERGY STAR® ASHP: HVAC Split System (Seer 16+≥ 10.0 HSPF) | $170 per ton |
| ENERGY STAR® ASHP: HVAC Split System (Seer 18+≥ 10.0 HSPF) | $167 per ton |
| ENERGY STAR® ASHP: HVAC Split System (Seer 20+≥ 10.0 HSPF) | $200 per ton |
| ENERGY STAR® ASHP: HVAC Mini Split, ducted/ductless System (Seer 16+≥ 10.0 HSPF) | $170 per ton |
| ENERGY STAR® ASHP: HVAC Mini Split, ducted/ductless System (Seer 16+≥ 10.0 HSPF) | $167 per ton |
| ENERGY STAR® ASHP: HVAC Mini Split, ducted/ductless System (Seer 16+≥ 10.0 HSPF) | $200 per ton |
| **Water Heating: Heat Pump > 2.0 UEF** | $700 per unit |
| **Radiant Barrier: 100% Radiant Barrier (from None)** | $60 per home |
| **ENERGY STAR® Certified Smart Thermostat** | $50 per unit |
| **ENERGY STAR Appliance** | |
| **Refrigerator: ENERGY STAR® Refrigerator (from Standard Refrigerator)** | $15 per unit |
| **Washing Machine: ENERGY STAR® Washing Machine (from Standard Washing Machine)** | $75 per unit |
| **Dryer: ENERGY STAR® Electric Dryer (from Standard Electric Dryer)** | $25 per unit |
| **Solar Attic Fan** | $50 per unit |

### MULTIFAMILY

The Multifamily program is described in detail in the previous Commercial section and has also been added as a component to the current NM MFA administered Energy Smart program. The ultimate participant in the program is the property owner rather than the residents. However, the residents benefit directly from the program, especially if they have PNM electric accounts. Therefore, the Multifamily program benefits both commercial and residential customers.

## 5.3 LOW INCOME PROGRAMS

### 5.3.1 CONTINUING PROGRAMS – APPROVED IN CASE NO. 20-00087-UT

## EASY SAVINGS KIT

The Easy Savings Kit program provides free LED lightbulbs (both standard and specialty bulbs), LED nightlights, advanced power strip, weatherization measures and educational materials on saving energy to low-income PNM customers. This program currently targets low-income PNM customers through direct mail and email.

Customers who receive the enrollment postcard in the mail or via email can request the energy efficiency kit. Customers can order by mail, over the phone, or online at the program website printed on the enrollment card.

The targeted population customers have the flexibility to choose a pre-packaged “Quickpick” kit or a “KitPick” configuration by mail, phone or online. The KitPick option gives customers the flexibility to choose from a menu of energy saving measures. Informative educational materials, conservation tips and installation instructions are also included in each kit. The addition of the KitPick kit option creates a customized experience for the customer and allows PNM to quickly add additional efficient measures that could be included, provided they are cost-effective and can be provided within the program budget. Kits are also distributed by non-profit agencies throughout PNM’s service area. For those customers that prefer the conventional utility provided kit, that option is still available with the addition of an advanced power strip.

## ENERGY SMART – MFA

The Energy Smart program provides funding to the New Mexico Energy$mart weatherization program implemented by New Mexico Mortgage Finance Authority (MFA). PNM funding is used by MFA to supplement federal and state funding they receive to administer the low-income weatherization program. In recent years, the program has focused on installation of LED bulbs, weatherization, and replacement of older inefficient refrigerators with ENERGY STAR qualified models. In 2017, the program was expanded to include a number of additional items for PNM customers who have electric space heating, electric water heating or refrigerated air-conditioning. These additional options include: attic and wall insulation, duct and air sealing, hot water heater pipe and tank insulation, programmable thermostats, low-flow showerheads and aerators, and door and window replacement. The expanded offerings allowed federal funding to be leveraged to assist more homeowners and multifamily residents who are at or below 200% of the federal poverty level. PNM will continue to evaluate opportunities for additional efficient measures that could be included, provided they are cost-effective and can be provided within the program budget.

## HOME ENERGY CHECKUP (LOW-INCOME)

This program is a component of the Home Energy Checkup program described in the Residential Programs section above. The program is the same as the Home Energy Checkup program with the exception that the copay for the smart thermostat and weatherization measures, which include installation, are waived and a free replacement refrigerator may be available through the program if eligibility criteria are met.

To be eligible, participants must have incomes relative to family size at or below 200% of the federal poverty level. A program participant's refrigerator must meet the following criteria to be eligible for replacement:

- Be in working condition.
- Be the primary refrigerator used in the home.
- Be at least 10-30 cubic feet to qualify for replacement.
- Be at least ten years old, or 12 years or older if it is ENERGY STAR.
- Consumption must be at least twice that of the efficient model being installed or have an observed physical condition causing excessive consumption such as poor door seal and an inability to cool.

PNM actively seeks out ways to collaborate in the community. PNM is collaborating with New Mexico Gas Company (NMGC) to offer Home Energy Checkup to income qualified residential customers living in Native American communities. For several years in a row PNM has partnered with Prosperity Works and Energy Works to offer income qualified Home Energy Checkups and will continue to look for more opportunities to collaborate with community organizations.

#### PNM HOME WORKS (LOW INCOME)

The PNM Home Works program is described in detail in the previous Residential section. Although it is not a low-income program specifically, because so many students are from low-income families, this program benefits many low-income PNM customers. PNM estimates that at least 40% of students are from families with annual income below 200% of the federal poverty level.

#### MULTIFAMILY (LOW INCOME)

The Multifamily program is described in detail in the previous Commercial section and has been added as a component to the NM MFA administered Energy Smart weatherization program. Behavioral-Based Energy Efficiency Programs

## 5.4 BEHAVIORAL PROGRAMS

### 5.4.1 CONTINUING PROGRAMS – APPROVED IN CASE NO. 20-00087-UT

#### 5.4.1.1 BEHAVIORAL COMPREHENSIVE

In Case No. 17-00076-UT, PNM was ordered to issue an RFP for a behavioral-based energy efficiency program. Through an RFP committee process in the fall of 2019, PNM chose two vendors to offer two separate programs, a residential behavioral home energy reports (HER) and commercial behavioral strategic energy management (SEM) program. These programs were presented and discussed at a public advisory stakeholder meeting on February 20, 2020, and the determination was made that these programs are in the interest of customers and were proposed and approved in the 2021 – 2023 program plan filing.

The SEM program approach emphasized the importance of equipping and enabling plant management and staff to impact energy consumption through behavioral and operational change and structured planning of commercial and industrial facility upgrades and process improvements. The projected participation goal (pre-COVID-19) included up to 45 customers' sites grouped into cohorts to encourage collaborative and interactive learning to identify and act upon savings opportunities within these customer sites. Customer recruitment efforts included: webinars, Lunch & Learns, Email newsletters, PNM Key Account Manager outreach, SEM program webpage information, Case Studies, and Trade Ally cross-promotion. Customers targeted included: government, healthcare, education, manufacturing, retail, aviation, water utilities and tribal segments.

While the program is offered at no cost to participants, personnel commitments from the participant is required. Due to staffing and labor challenges recognized during COVID-19, participant resources were limited and as a result only five participants were enrolled during the initial three-year deployment. While participating customers did recognize energy saving through their participation, the savings achieved was much lower than anticipated due to the factors mentioned above. Also as a result of these factors, the program approach was forced to be more of a direct one-on-one customer engagement versus the original intended cohort model. Going forward however, PNM is planning to recruit customers through the cohort approach and will offer customers milestone and performance incentives for more sustained participation and greater energy savings.

In addition to a commercial SEM program, PNM also launched a behavioral-based residential Home Energy Report program in 2021. This program is delivered through a combination of customizable and personalized home energy reports (both paper and digital), a customer survey to enhance and further customize future report content, a customer web portal with specific and personalized insights and cross-promotion of other relevant energy efficiency rebate programs, and an online marketplace offering discounts on energy efficient measures. The treatment group consists of approximately 70% of PNM residential customers, with the remaining 30% in the control group.

This platform can function with either non- AMI or AMI enabled metering, however, with the existing non-AMI structure, customers can still receive information about their consumption through higher- level end use disaggregation.

Program ramp-up took longer than anticipated due to attrition and other mitigating factors such as COVID-19. This program achieved lower than anticipated energy savings however, is ranked in the top three in customer satisfaction with PNM customers in learning more about their usage and ways to save energy and money on their bills. The total 2024 annual budget for this program is approximately $660,000. The projected annual energy savings equals just over 2 GWh in 2024.

## 5.5 LOAD MANAGEMENT PROGRAMS

### CONTINUING PROGRAMS – APPROVED IN CASE NO. 20-00087-UT

The load management programs provide PNM with a demand-side resource that can be used to meet peak demand requirements for up to 100 hours per year, June 1 through September 30, 1pm to 8pm, Monday through Friday, excluding holidays and weekends. PNM has successfully dispatched the load management resource for peak reduction during each summer season beginning in 2008. Table 5-2 below lists the dates and times in which PNM utilized load management in 2022.

**Table 5-2**

| Date | Start Time (MDT) | End Time (MDT) | Duration (Hr) |
|---|---|---|---|
| 6/10/2022 | 3:00 PM | 7:00 PM | 4 |
| 7/11/2022 | 3:00 PM | 7:00 PM | 4 |
| 9/2/2022 | 5:00 PM | 7:00 PM | 2 |

### PEAK SAVER

The PNM Peak Saver program targets non-essential electric loads that can be reduced during periods of peak system demand and is available to commercial and industrial customers with peak loads of 150 kW or greater. Participating customers receive an incentive based on their level of load reduction at the end of each control season.

PNM selected a new third-party contractor, Itron, to manage and market this program. Itron is responsible for building and operating a direct load control system that provides PNM with the ability to achieve contracted load reductions through control of end-use equipment at participating businesses. Itron's responsibilities include marketing, installing load control equipment, data collection and analyses required for validating the contract capacity.

### ENHANCEMENTS AND GROWTH

The Peak Saver program will retain the same program elements that are currently available to existing customers. Itron has a strong technology offering via their proprietary IntellSOURCE platform that could be used in the future to help integrate distributed energy resources, including: controllable load, batteries, smart inverters, and electric vehicles. Itron intends to automate as many participant sites as possible within IntellSOURCE. Itron has Program capabilities that have the potential to grow the resource over time.

### POWER SAVER

The PNM Power Saver program is the load management program for residential customers and small commercial customers who are not served by the Peak Saver program. This program cycles non-critical loads, such as refrigerated air conditioning units, on and off during summer peak hours. Thermostats that are participating in the program will be set to a warmer temperature during an event. Participating customers receive a modest incentive at the end of each control season. PNM retained its third-party contractor, Itron, to manage this program. Itron is responsible for marketing the program to customers, installing load control equipment, data collection and analyses required for validation of the contract capacity.

### ENHANCEMENTS AND GROWTH

The Power Saver program will now offer a firm capacity commitment of 20MW. Also, the Peak Saver program has a contract firm capacity of 15MW. There are penalty provisions that will keep PNM whole if Itron is unable to deliver the minimum (firm) capacity commitments. Appendix C has additional detail.

The Power Saver program will retain the same program elements that are currently available to customers. The existing switch network, representing about 40 MW of reliable capacity, will be maintained and a new, attractive Wi-Fi thermostat option will be marketed to customers who have previously dropped out and offered as an option to new participants. Customers with existing thermostats are also allowed to participate under the bring-your-own-thermostat ("BYOT") option. Wi-Fi enables a more enhanced customer experience by interactively engaging the customer via any internet connected device (such as a mobile phone or computer). Participants will have the option of a thermostat installed at no charge or enrolling in the program using their own qualifying thermostat. In either case, Itron will initiate control events through interacting with the thermostats through the participants' home Wi-Fi networks. The thermostat option provides the additional benefits of potential energy savings through using verifiable set-back strategies and providing a higher level of customer satisfaction. PNM and Itron anticipate that new participants will be attracted to the thermostat option and that some participants that have previously left the program will reenroll, thereby increasing the resource over time.

## 5.6 MARKET TRANSFORMATION

### OVERVIEW AND DESCRIPTION

The goals of the Market Transformation (MT) strategy are to 1) achieve a measurable increase in awareness of the importance of energy efficiency; 2) encourage behavior changes that result in the adoption of energy efficient measures; and 3) promote emerging technologies that are not part of existing EE programs but have the potential to be included in programs in the future. MT uses mass-market advertising channels and conducts targeted efforts aimed at specific customer segments, including hard-to-reach segments and schools. In addition to current awareness-building activities that are ongoing. MT costs are allocated on a pro rata basis across the portfolio.

## 2024 PLAN PROGRAM SCOPE

In prior years, PNM's MT strategy has focused on EE promotional events including community events and presentations, engaging customers on energy efficiency through on-line PNM channels and tools, funding the educational component of the PNM Home Works and Energy Innovation school kit program, and supporting a modest level of mass market advertising to promote energy efficiency and highlight selected program offers, and any potential studies or residential saturation surveys to assist in designing attractive and cost effective programs. PNM will continue to use Market Transformation funding to provide these awareness building services as well as fund updates to the energy efficiency potential study, residential appliance and socket saturation surveys, and continuing funding for other educational efforts. Although it is outside the scope of the EUEA requirements, PNM is providing web links to state and federal websites for information on additional tax credits and incentives available. PNM is providing this information as a courtesy and is not responsible for the validation and maintenance of the content on state and federal websites. Third-party implementers also reference state and federal government links when training participating trade allies who work with PNM customers.

PNM will continue funding the general energy efficiency educational activity that is currently part of the PNM Home Works and Energy Innovation program with Market Transformation funding. While PNM has received very positive feedback from teachers and students on the education component of the program, the training by itself is not directly linked to energy savings. Rather, the education builds awareness of the importance of energy efficiency in general and supports the goals of the 2024 Plan.

## ONGOING RESEARCH AND DEVELOPMENT

PNM understands that its energy efficiency plans and programs will need to continue being responsive to evolving markets and technologies. PNM will maintain an active research and program design effort throughout the next planning cycle and for the foreseeable future. While specific initiatives may be modified over time to reflect the changing needs of the energy efficiency portfolio, the anticipated initiatives that may be developed over the next year or two include:

- Continued collaboration with New Mexico Gas Company and other community organizations and public entities where appropriate to encourage robust and comprehensive program offerings with maximum customer appeal.
- Continued expansion of outreach/education-based initiatives either through Market Transformation or within specific programs.

- Increasing incentive budgets in programs with higher energy savings and participation potential and lower market saturation.
- Continued monitoring of any potential new program design concepts being developed or offered in similar utility programs.
- Expansion of direct marketing for efficiency programs – finding customers that need efficiency improvements and that are most likely to participate in programs is becoming more difficult.

# 6 APPENDICES

## 6.1 APPENDIX A – AVOIDED COSTS

The benefits of energy efficiency and load management are evaluated over the life of the programs in the UCT model using PNM avoided costs and a discount rate of 7.20%. Avoided costs are the costs that PNM would not incur as a result of lower energy consumption and demand resulting from implementation of energy efficiency and load management measures. Energy efficiency avoided cost forecasts were developed by the staff of the PNM Planning and Resources department and are shown in Table 6-1 below.

**Table 6--1**

| Avoided Energy and Capacity Costs EE and DR | EE Total Capacity MW ($/kW-yr) | EE Energy (incl CO2) ($/kWh) | DR MW ($/kW-yr) | Avoided Energy Cost (DR) $/kWh |
|---|---|---|---|---|
| 2024 | $166.19 | $0.051 | $9.07 | $0.000 |
| 2025 | $167.89 | $0.026 | $147.14 | $0.000 |
| 2026 | $223.60 | $0.026 | $194.28 | $0.000 |
| 2027 | $232.96 | $0.026 | $194.29 | $0.000 |
| 2028 | $220.60 | $0.027 | $193.76 | $0.000 |
| 2029 | $199.24 | $0.028 | $194.29 | $0.000 |
| 2030 | $173.00 | $0.027 | $194.29 | $0.000 |
| 2031 | $263.22 | $0.034 | $213.21 | $0.000 |
| 2032 | $261.10 | $0.032 | $229.08 | $0.000 |
| 2033 | $252.75 | $0.037 | $229.91 | $0.000 |
| 2034 | $252.15 | $0.038 | $221.18 | $0.000 |
| 2035 | $255.48 | $0.034 | $215.97 | $0.000 |
| 2036 | $254.64 | $0.037 | $215.48 | $0.000 |
| 2037 | $256.39 | $0.035 | $218.51 | $0.000 |
| 2038 | $255.52 | $0.034 | $219.27 | $0.000 |
| 2039 | $242.41 | $0.034 | $219.45 | $0.000 |
| 2040 | $302.52 | $0.046 | $294.91 | $0.000 |
| 2041 | $184.30 | $0.053 | $135.98 | $0.000 |
| 2042 | $175.46 | $0.043 | $106.60 | $0.000 |

## 6.2 APPENDIX B – PUBLIC ADVISORY GROUP MEMBERS

Table 6-2 lists the organizations that have been invited to participate in the energy efficiency advisory group and who receive regular updates on the status and progress of PNM's energy efficiency efforts.

**Table 6--2**

| Name | Organization |
|---|---|
| Aaron Gould | Western Resource Advocates (WRA) |
| Allison McIntire | Xcel Energy |
| Amanda Evans | Santa Fe Community College |
| Camilla Fiebelman | Sierra Club |
| Cara Lynch | Coalition for Clean Affordable Energy (CCAE) |
| Cassandra Valencia | New Mexico Gas Gompany |
| Chuck Noble | Retired Coalition for Clean Affordable Energy (CCAE) |
| Christopher Dunn | NM Public Regulation Commission Staff |
| Cissy McAndrew | Southwest NM Green Chamber of Commerce |
| Crystal Enoch | El Paso Electric |
| Cydney Beadles | Western Resource Advocates (WRA) |
| Dana Howard | NM Energy, Minerals & Natural Resources Dept. |
| Dave Nelson | American Association of Retired Persons (AARP) |
| Ed Rilkoff | NM Public Regulation Commission Staff |
| Eli LaSalle | NM Public Regulation Commission Staff |
| Gideon Elliot | NM Attorney General |
| Jeremy Lovelady | SPS - Xcel Energy |
| Jim Folkman | Foundation for Building/Green Building Foundation |
| Joan Brown | Interfaith Power & Light |
| Justin Brant | Southwest Energy Efficiency Project |
| Kelly Gould | NM Area |
| Ken Baker | Walmart |
| Ken Walsh | Excel Energy |
| Keven Gedko | NM Attorney General |
| Kurt Albershardt | Southwest Energy Generators (Silver City) |
| Michael Pascucci | Xcel Energy |
| Michael Kenney | Coalition for Clean Affordable Energy (CCAE) |
| Ona Porter | Prosperity Works |
| Pat Cardona | American Association of Retired Persons (AARP) |
| Peter Gould | NM Area |
| Rick D. Chamberlain | Behrens, Wheeler & Chamberlain |
| Rick Rennie | Downtown Improvement District |
| Robb Hirsch | Santa Fe Green Chamber of Commerce |
| Robert Mang | Smart Home Project |
| Steve Casey | NM Gas Company |
| Tammy Fiebelkorn | Southwest Energy Efficiency Project |
| Tom Singer | Western Environmental Law Center |
| Wayne Hofeldt | Retired So. Cal Edison |

## 6.3 APPENDIX C – LOAD MANAGEMENT CONTRACT TERMS

**Table 6-3**

| Implementer | ITRON | |
|---|---|---|
| Program | **Power Saver** | **Peak Saver** |
| Contract Term | Three 3-year terms; requires PRC re-approval for each 3-year term. | Three 3-year terms; requires PRC re-approval for each 3-year term. |
| Contract Effective Date | January 1, 2024 | January 1, 2024 |
| Contract Start Date | January 1, 2024 or date of PRC approval, whichever is later | January 1, 2024 or date of PRC approval, whichever is later |
| Projected Total Contract Cost | $42.12M over 9 years | $29.46M over 9 years |
| Contract Pricing | All-inclusive pay-for-performance pricing. Payment per MW of delivered capacity. | All-inclusive pay-for-performance pricing. Payment per MW of delivered capacity. |
| Basis of Capacity Payments | 12 monthly payments based on installed monthly capacity for that month. | 12 monthly payments based on installed monthly capacity for that month. |
| Customer Incentives (paid to participants) | Incentives for residential and small commercial customers are approximately $31.25/kWyr new installation and annual incentives. | Large customers are paid for approximately $45.00/kWyr of available capacity. |
| Minimum Contract Capacity | 20 MW | 15 MW |
| Maximum Contract Capacity | 40 MW | 30 MW |
| Control Season (for dispatch) | June 1st - September 30 | January - December |
| Control Times | 1:00 PM – HE 9:00 PM M-F (excluding holidays) | 1:00 PM – HE 9:00 PM M-F (excluding holidays) |
| Dispatch Limits | Maximum of 100 hours per control season. Maximum 4 hours per day. Capacity is temperature dependent. | Maximum of 100 hours per control season. Maximum 4 hours per day. Capacity is temperature dependent. |
| Minimum Response Time | 10 minutes | 10 minutes |
| Method of Event Activation | Web-based application | Web-based application and direct customer notification for non Auto-DR sites. |
| Verification of Actual Capacity | Regression analysis of sample population based on prior day non-event kWh usage when compared to event-day kWh use. This reduction will be applied to overall population based on device type. | A baseline of energy use on non-event days will be compared to the energy use on an event day. |
| Penalty for Not Meeting Minimum Contract Capacity | Schedule of liquidated damages applied to the capacity deficit per year. | Schedule of liquidated damages applied to the capacity deficit per year. |
| Early Termination Costs | There are no "early termination" costs. | There are no "early termination" costs. |
| Target Customers | Residential and small commercial less than 150 kW peak demand plus apartment complexes. | Commercial customers with a demand greater than 150 kW per month. |
| Target Loads | Central refrigerated AC units. Potentially, electric water heating, pool pumps, and other small commercial loads may be considered in future. | Building management systems, industrial pumping loads, battery storage capacity, and other systems, including other motor loads. |
| Technology Employed | 1) Pager or radio controlled switches installed on exterior AC units. Controlled through web-based activation system. AC compressor is cycled, fans remain on.<br>2) Wi-Fi thermostats controlled through web application at time of dispatch. | Some sites will enable direct-load control, others will employ direct communication with the customer where sensitive loads cannot be third-party controlled, and others will use Web systems when controlling building load such as thermostats. |
| Local Office | Local office to manage recruiting, installation and maintenance using local staffing and contractors. Regional call center to respond to customer inquiries and initiate dispatch events | Local office to manage recruiting, installation and maintenance using local staffing and contractors. Regional call center to respond to customer inquiries and initiate dispatch events |
| Marketing Plan | Multi-channel approach including direct mail, bill inserts, radio, print, web and co-marketing. All materials approved by PNM. | Direct customer contact, and utilizing PNM account managers. All materials approved by PNM. |

## 6.4 APPENDIX D – TRADE ALLY BUSINESS LIST

**Trade Ally Businesses Supporting PNM Residential and Commercial Programs**

| Name | Area Served | | | |
|---|---|---|---|---|
| | Central | Northern | South Central | Southwest |
| A.B. Plumbing Inc. | X | X | | |
| Absolute Mechanical | X | X | | |
| Aire Mechanical Inc. | X | | | |
| Aztec Mechanical, Inc. | X | | | |
| Comfort Solutions of New Mexico LLC | X | X | | |
| Daniels Heating & Air Conditioning LLC | X | | | |
| Desert Suns Heating & Cooling Inc. | X | | | |
| Four Winds Mechanical HTC/AC Inc. | X | | | |
| Mechanical Control Solutions LLC | X | X | X | X |
| Morrison Supply Co | X | X | | |
| Norman S Wright Co | X | X | | |
| RE Michel Co LLC | X | X | | |
| Sigler Inc. | X | | | |
| TLC Plumbing & Utility Inc. | X | X | X | X |

**Trade Ally Businesses Supporting PNM Commercial Programs**

| Name | Area Served | | | |
|---|---|---|---|---|
| | Central | Northern | South Central | Southwest |
| 3B Builders Inc. | X | | | |
| 3B Electrical LLC | X | | | |
| A-1 Electric Inc. | X | X | | |
| Abraxas Electric LLC | X | X | X | X |
| Albuquerque Plumbing, Heating & Cooling | X | X | X | X |
| Alderete Electric Service Corp. | X | | | |
| Allied Electric Inc. | | X | | |
| ARCA Recycling, Inc. | X | X | X | X |
| AZ Insulation & Energy Solutions dba Tru Lite | X | X | X | X |
| Aztec Mechanical, Inc. | X | | | |
| B&D Industries Inc. | X | X | X | X |
| Benchmark Group Inc. | X | | | |
| Bernard TME LLC | X | X | X | X |

| | | | | |
|---|---|---|---|---|
| Beyond Electric | X | | | |
| BP Enterprises LLC dba Batteries Plus #1049 | X | X | X | X |
| Bridgers & Paxton Consulting Engineers | X | X | X | X |
| Bright Ideas Inc. dba The Lamp shop | X | X | X | X |
| Building Energy Solutions and Technology, dba Bes-Tech Inc. | X | X | X | X |
| Bulldog Energy Solutions Inc. | X | X | X | X |
| Burque Electric Co | X | X | | |
| Carlile Electrical and Mechanical LLC | X | X | X | X |
| CB Power LLC | X | X | X | X |
| Colorado Lighting, Inc. dba CLI Services | X | X | X | X |
| Conti Energy Control LLC | X | X | X | X |
| Corbins Electric | X | X | X | X |
| Corrales Electric Inc. | X | X | | |
| DAC Electric | X | X | | |
| Dalkia Energy Solutions | X | X | X | X |
| Dekker/Perich Sabatini | X | X | X | X |
| Del Electric LLC | X | X | | |
| DRB Electric Inc. | X | X | X | X |
| E.R.M. electric LLC | | | X | |
| ECOterra Energy Consulting | X | | | |
| EEA consulting Engineers | X | X | X | X |
| Electro Data LLC | X | X | X | X |
| Energy Design Service Systems | X | | | |
| Energy Management Collaborative LLC | X | | | |
| EnergyWorks LLC | X | X | X | X |
| EnerNet Solutions, LLC | X | X | X | X |
| Engie Insight Services dba Engie Impact | X | X | X | X |
| Engineering Economics | X | X | X | X |
| Enterprise Builders Corp | X | X | X | X |
| Escudo Resturant Solutions, LLC dba Chef Link | X | X | X | X |
| Facility Solutions Group | X | X | X | X |
| Financial Energy Management Inc. | X | X | X | X |
| Fout Electric, LLC | X | X | | |
| Frank's Electric | X | X | X | |
| Goodmen Electrical Services | X | X | X | X |
| Graybar Electric Company, Inc | X | | | |
| Green Insight LLC | X | X | X | X |
| Green Rebates LLC | X | X | X | X |
| Greenleaf Energy Solutions | X | X | X | X |
| HD Supply Facilities Maintenance | X | X | X | X |
| HEI Inc. | X | | | |

| | | | | |
|---|---|---|---|---|
| High Desert Lighting & Electric LLC | X | X | X | X |
| ICAST | X | X | X | X |
| Illumetek | X | X | X | X |
| J & C Ortiz Electric LLC | X | X | | |
| Jesse Arias Electrical Contractor | X | | | |
| Johnson Controls | X | X | X | X |
| L & K Electric | | X | | |
| LaMay LLC | | | X | |
| Leidos Engineering LLC | X | X | X | X |
| M Squared Electric LLC | | | | X |
| McDade-Woodcock Inc | X | X | X | X |
| Mechanical Systems Inc. | X | X | X | X |
| Mag Energy | X | X | X | X |
| Mora Electric LLC | X | X | X | X |
| Mountain Vector Energy | X | X | X | X |
| New Generation Electric, LLC | X | X | | |
| New Line Technology Inc. | X | X | | |
| Nex Rev | X | X | X | X |
| Norman S Wright Co | X | X | X | X |
| Nowlin Mechanical | X | X | X | X |
| Omega Contractors | X | X | X | X |
| Optima Technology dba Bid Energy | X | X | X | X |
| Phaze One Electric | X | X | | |
| Prime Electric Inc. | X | | | |
| Pumps & Service | X | | | |
| Randy's Electric Co Inc. | X | X | | |
| RE Michel Co LLC | X | X | X | X |
| Reliable Electric LLC | X | X | | |
| Reliable Relamping | X | X | X | X |
| RKL Sales Corporation | X | | X | |
| ROI Energy Investments LLC | X | X | X | X |
| ROI Energy LLC | X | X | X | X |
| Royal Pacific, LTD | X | | | |
| Russel Sigler Inc. | X | | | |
| S.E. Electric & Commercial Maintenance LLC | X | | | |
| Schneider Electric Inc | X | X | | |
| SourceOne Solutions | X | X | X | X |
| SRS Electric | X | X | | |
| Standard Restaurant Supply | X | X | X | X |
| Stone Electric and Power LLC | | | | X |
| Strategic Lighting | X | X | | |

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|---|---|---|---|---|
| Strongbuilt LLC | X | X | X | X |
| Summit Electric Supply | X | X | X | X |
| Sustainable Building Solutions LLC | X | X | | |
| Sustainable Engineering LLC | X | X | X | X |
| Texal Energy LLC | X | X | X | X |
| Thompson Construction | X | | | |
| TLC Company | X | X | X | X |
| Tofel Dent Construction | X | X | X | X |
| Trane SW | X | X | X | X |
| Travers Mechanical | X | | | |
| U.S. Electrical Corp | X | X | X | X |
| United Refrigeration Inc | X | X | X | X |
| Voss Lighting | X | | | |
| Wesco Energy Solutions | X | X | | |
| Wizer Electric LLC | X | X | X | X |
| Yearout Energy Services Company | X | X | X | X |
| Yearout Service LLC | X | | | |

**Trade Ally Businesses Supporting PNM Residential Programs**

| | Area Served | | | |
|---|---|---|---|---|
| Name | Central | Northern | South Central | Southwest |
| #1 Plumbing And Air | X | | | |
| 1 of a King Heating, A/C and Plumbing | X | | | |
| 1-Call Mechanical, LLC | X | | | |
| 3Js Plumbing & Heating | X | | | |
| 5 Star Services Plumbing, Heating & Cooling | X | | | |
| 505 M & C | X | | | |
| A-Gee Whiz Mechanical | X | | | |
| A & G Heating and Air Conditioning, Inc. | X | | | |
| A & G Mechanical, Inc. | X | | | |
| A & J Services | X | | | |
| A And G Heating And Air Conditioning, Inc. | X | | | |
| AAG, Inc. | | X | | |
| A B Honest 1 Plumbing, Heating & Cooling, LLC | X | | | |
| A.B. Plumbing | X | | | |
| A.I.O. Trades | X | | | |
| A1 Pool Supply | X | | | |
| Action Plumbing Heating & Cooling | X | | | |
| AAA Master Services | X | | | |
| Abel Plumbing & Heating | X | | | |
| Able Service Pro's LLC | X | | | |

| | | | | |
|---|---|---|---|---|
| Abq Temperature Management LLC | X | | | |
| Absolute Mechanical | X | X | | |
| AC&R Heating, Cooling and Plumbing Inc. | X | | | |
| Academy | X | | | |
| Acetech, LLC | X | X | | |
| Active Refrigeration's A/C & Htg Inc. | X | | | |
| Advanced Refrigeration & HVAC | X | | | |
| Affordable Service, Inc. | X | | | |
| Air Comforting Experts, LLC | | X | | |
| Air Conditioning & Heating Service Co. | | X | | |
| Air Conditioning Systems, Inc. | X | | | |
| Air One Cooling And Heating, LLC | X | | | |
| Air Pro, Inc. | X | | | |
| Air Care New Mexico | X | X | | |
| Air Service of NM, LLC | X | | | |
| Albuquerque Plumbing Heating And Cooling | X | | | |
| Albuquerque Winair | X | | | |
| All Temperature Systems | X | | | |
| Alpine Air | X | | | |
| Amazon.Com | X | X | X | X |
| AMI Mechanical Corp | X | | | |
| Ancae Heating, Air Conditioning & Plumbing | X | | | |
| Anderson Air Corps | X | | | |
| Anderson Refrigeration Inc. | | | | X |
| Aranda's Plumbing, Heating And Supply, Inc. | | X | | |
| Arch Design | X | | | |
| Atar, Inc. | X | | | |
| Axiom Home Services | X | | | |
| B Carlson | X | X | | |
| Backyardpoolsuperstore.Com | | | | |
| Baker Distributing | X | | | |
| Barrera's Mechanical | X | | | |
| Bel Air Conditioning and Heating Systems, LLC | | X | | |
| Bentley Plumbing And Heating | | | X | |
| Best Choice Builders, LLC | X | | | |
| Black Bear Mechanical, LLC | X | | | |
| Blazin Zia Mechanical | X | | | |
| Blue Water Pools Inc. | X | | | |
| Bopat Mechanical | X | | | |
| Bosque Heating Cooling and Plumbing LLC | X | | | |
| Brent's HVAC And Plumbing | X | | | |

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|---|---|---|---|---|
| Brothers Electro Mechanical, Inc. | X | | | |
| Bryan Andrade | X | | | |
| Budget Climate Control | X | | | |
| Budget Climate Control | X | | | |
| Builders Mechanical, Inc. | X | | | |
| C&L Total Service, LLC | X | | | |
| Cait Co. Drain Works | | X | | |
| Carlile Electrical & Mechanical | X | | | |
| Cartwright's Plumbing & Roto Rooter | | X | | |
| Central NM Housing Corporation | X | | | |
| Chant Associates | X | | | |
| Clean Air Mechanical Inc. | X | | | |
| Climate Heating & Air Conditioning | | | | X |
| Comfort Doctor Heating & Cooling | | X | | |
| Comfort Solutions of New Mexico | X | | | |
| Comfort Zone Heating and Air Cooling | X | | | |
| Controlled Comfort | X | | | |
| Copperstone Plumbing & Piping Systems | X | | | |
| Corrales Air LLC | X | | | |
| Courtesy Plumbing Heating & Air Conditioning Inc. | X | | | |
| CR Refrigeration, LLC | X | | | |
| Cross Unlimited, LLC | | | | X |
| Cummings Construction, LLC | X | | | |
| Cunningham Distributing, Inc. | X | | | |
| Custom Plumbing & Heating LTD Co. | X | | | |
| D&L Plumbing and Heating | X | | | |
| Dahl Of Santa Fe | | X | | |
| Daniels Heating and Air Conditioning LLC | X | | | |
| David Holdren Heating | X | | | |
| Davis the Plumber | X | | | |
| Day & Night Plumbing Heating & Cooling Inc. | X | | | |
| Daylight Electric and Appliance | | | X | |
| Delta Mechanical | X | | | |
| Desert Mountain Plumbing And Heating Inc. | | X | | |
| Desert Pools And Spas | X | | | |
| Desert Suns Heating & Cooling | X | | | |
| Desert Valley Plumbing, Heating, & Cooling LLC | X | | | |
| DJ'S Plumbing & Mechanical, LLC | X | | | |
| Doc Savage Supply | X | | | |
| Doctor Plumbing | X | | | |
| Donner Plumbing & Heating Inc. | X | | | |

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|---|---|---|---|---|
| Dub-L-EE LLC | X | | | |
| Duke City Heating And Cooling, LLC | X | | | |
| Durano Construction | X | | | |
| Eagle Eye Mechanical | | X | | |
| Ebay.Com | X | X | X | X |
| EcoAir | X | | | |
| Elevated Mechanical Services | X | | | |
| Em Plumbing Heating Mechanical | X | | | |
| Enchanted Hills Heating & Cooling | X | | | |
| Enchantment Refrigeration, LLC | | X | | |
| Energy Works, LLC | | | | X |
| Exceptional Services | X | | | |
| Ferguson | X | | | |
| First Rate Plumbing, Heating & Cooling, Inc. | X | | | |
| FLM Enterprises | X | | | |
| FM Mechanical | X | | | |
| Four Seasons Plumbing & Heating | | X | | |
| Four Star Mechanical Services Inc. | x | x | | |
| Frigid Mechanical | X | | | |
| G C Services, Inc. | X | | | |
| Gardner Plumbing | X | | | |
| Garley Heating & Cooling | X | | | |
| Garrity Insulation, Inc. | X | | | |
| Gimmesum HVAC | X | | | |
| Golden Sun Solar | | X | | |
| Goodman | X | | | |
| Gorman Industries | X | | | |
| Gustave Larson | X | | | |
| H.E.L.P., Inc. | X | | | |
| Harder Electrical & Mechanical Services | X | | | |
| Harper Heating And Air Conditioning | X | | | |
| Hart Heating & Air Conditioning, Inc. | X | | | |
| Hausermann Mechanical LLC | X | | | |
| Hercules Industries | X | | | |
| Hessinger's Plumbing, Heating & Air | X | | | |
| High Desert Air Conditioning And Heating | | X | | |
| Home Service Contractors, Inc. | | | | X |
| HomeRun Plumbing Heating Cooling | X | | | |
| Hubbell Electro-Mechanical | | X | | |
| Husky Refrigeration HVAC & Mechanical | | X | | |
| IAB Mechanical | X | | | |

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|---|---|---|---|---|
| Image Electric and Mechanical | X | | | |
| Industrial Commercial Contracting | X | | | |
| Innovative Plumbing Systems | X | | | |
| Insight Mechanical | | X | | |
| Inyopools.Com | X | X | X | X |
| ISHC | X | | | |
| J.C. Heating and Cooling | X | | | |
| JAC Heating & Cooling | X | | | |
| James Plumbing & Heating | | X | | |
| Jerome's Mechanical | | X | | |
| JLC Professional Plumbing & Heating, LLC | X | | | |
| John's HVAC | X | | | |
| Johnstone Supply Co | X | | | |
| Johnstone Supply Co | | X | | |
| Jones Mechanical, LLC | X | | | |
| JP Plumbery, LLC | X | | | |
| J&S Plumbing and Heating | | | | X |
| Just Sprinklers | X | | | |
| Kokopelli Pool & Spa LLC | | X | | |
| KSM | X | | | |
| Lane Plumbing Company, Inc. | | | | X |
| LC Heating & Cooling, LLC | X | | | |
| Lee-Sure Pools, Inc. | X | | | |
| Left-Handed Mechanical & Electrical | | X | | |
| Lennox Parts Plus | X | | | |
| Leonard’s Plumbing And Heating | | | X | |
| Leslie’s Pool Supplies | X | | | |
| Leslie’s Pool Supplies #036 | X | | | |
| Leslie’s Pool Supplies #764 | X | | | |
| Leslie’s Pool Supplies #868 | | | | |
| Limitless Pool And Spa | X | | | |
| Lobo Tech, LLC | | X | | |
| Lobo Mechanical | X | | | |
| Macias Heating & Cooling | | | | X |
| Magic Mobile Homes, Inc. | X | | | |
| Magnoliapools.Com | X | X | X | X |
| Marathon Mechanical Services | X | | | |
| Master Homecrafters, Inc. | X | | | |
| Mat's Mechanical | X | | | |
| McKee Service Company | X | | | |
| Mechanical Concepts Ltd Co | X | | | |

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|---|---|---|---|---|
| Mechanical Control Solutions | X | | | |
| Mechanical Systems | X | | | |
| Medlin Mechanical | | X | | |
| Mel Muller Repair | X | | | |
| Metal Craft Company | | | | |
| MGP Mechanical | X | | | |
| MGS Refrigeration, Heating, & Cooling | | | | X |
| Mi Casa Heating LLC | | X | | |
| Miller's Insulation | X | X | | |
| MMA Mechanical | X | | | |
| Modern Creations Construction | X | | | |
| Moore Quality Air, LLC | X | | | |
| Morrison Supply Co | | | | X |
| Morrison Supply Santa Fe | | X | | |
| MPC Enterprises | | | | X |
| N Demand Test & Balance LLC | X | | | |
| N&J's Plumbing and HVAC | | | X | |
| Nativo Development Corporation | | X | | |
| Natures Creations Inc. | | X | | |
| New Mexico Pools & Spas | X | | | |
| Nowlin Mechanical | X | | | |
| NRG-Efficient | X | | | |
| Omni Mechanical Services | X | | | |
| Ortega Quality Mechanical | X | | | |
| Ortega's H.P.C.E. | X | | | |
| Otero Plumbing & Heating, Inc. | | | | X |
| Paul’s Plumbing & Heating, Inc. | | X | | |
| PDR Of Northern New Mexico, Inc. | | X | | |
| Pearl Mechanical LLC | X | | | |
| Perfection Pools & Plumbing | X | | | |
| Perkins Mechanical, LLP | | X | | |
| Perry Supply Co | X | X | | |
| PHC Systems | | | X | |
| Pinos Altos Plumbing Corp | | | | X |
| Plumbing Heating Cooling Systems | | | X | |
| Pool And Spa Doctor Inc. | | X | | |
| Pool Supply Unlimited | X | | | |
| Pool Works | X | | | |
| Poolcleaningparts.Com | X | X | X | X |
| Poolplaza.Com | X | X | X | X |
| Pools Plus | X | | | |

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|---|---|---|---|---|
| Poolsupply4Less | X | X | X | X |
| Poolsupplyunlimited.Com | X | X | X | X |
| Poolsupplyworld.Com | X | X | X | X |
| Poper Construction LLC | X | | | |
| Porky's of Alamogordo | | | | X |
| Precision Service LLC | X | | | |
| Preferred Plumbing, Heating, & Cooling, LLC | X | | | |
| Presidio Mechanical | X | | | |
| Priority Plumbing and Heating Inc. | X | | | |
| Pro-Tech Air Conditioning & Heating | | X | | |
| R & R Heating & Air | X | | | |
| Ray Sego Insulation, Inc. | X | x | | |
| Redline Mechanical | X | | | |
| Reliable Tech Heating, Cooling & Plumbing LLC. | | X | | |
| Reliant Services | X | | | |
| Rich Duran Plumbing & Heating Inc. | | X | | |
| Rick's Heating & Plumbing | | | | |
| Rio Grande Food Project | X | | | |
| RMS Services | X | | | |
| Roadrunner Air Conditioning, Heating & Refrigeration | | X | | |
| RS Heating & Cooling | X | | | |
| RT Biery LC | X | | | |
| Salazar Heating Cooling & Plumbing | | X | | |
| Salvation Army | | X | | |
| Salvation Army | | X | | |
| Santa Fe Habitat for Humanity | | X | | |
| Santa Fe Winnelson | | X | | |
| SCP | X | | | |
| S.E. Electric & Commercial Maintenance, LLC | X | | | |
| Signature Heating and Cooling | X | | | |
| Simmons Plumbing Company | X | | | |
| Southwest Heating & Cooling | | | | X |
| Southwest Service Company | X | | | |
| Southwestern Regional Housing Comm. Dev. Corp | | | | X |
| Sr. Construction | X | | | |
| St. Francis Newman Center | | | | X |
| STM Air Conditioning And Heating | | X | | |
| Stockton Mechanical | | X | | |
| Storm Electric | X | | | |
| Strongbuilt Solar and Air | X | | | |
| Sun State Mechanical, Inc. | X | | | |

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|---|---|---|---|---|
| Sunshine Plumbing & Heating, Inc. | X | | | |
| Tarango Heating & Cooling | X | | | |
| Techwest, Inc. | X | X | X | X |
| Territorial Plumbing, Heating and Electric LLC | | X | | X |
| The Storehouse | X | | | |
| Thompson Heating And Air Conditioning, Inc. | X | | | |
| Top Tier Service Inc. | | X | | |
| Total Comfort Heating & Cooling, Inc. | X | | | |
| Town & Country Plumbing, Heating, Cooling, LLC | X | | | |
| Townsend Pool Specialists | X | | | |
| Tru Air Systems | X | | | |
| United Refrigeration | X | | | |
| Universal Plumbing & Heating | | X | | |
| Unlimited Plumbing, LLC | X | | | |
| UV Plumbing LLC | X | | | |
| Valiant Mechanical & Electrical | X | | | |
| Vica Heating & A/C | X | | | |
| Viking Air | X | | | |
| Wagner Mechanical | X | | | |
| Watts Eastside Pools | X | | | |
| Weir Plumbing, Heating and Cooling | X | | | |
| Williams Mechanical – Alb. | X | | | |
| Winnelson- Alamogordo | | | | X |
| www.Webpoolsupply.Com | X | X | X | X |
| Wolff Heating, Cooling, and Plumbing | X | | | |
| Wong Mechanical | X | | | |

**Trade Ally Businesses Supporting Retail Rebate Programs**

| Retailer | Location |
|---|---|
| Dollar Tree | Alamogordo |
| Dollar Tree | Alamogordo |
| Home Depot | Alamogordo |
| Lowe's | Alamogordo |
| Samon's | Alamogordo |
| Walgreens | Alamogordo |
| Walmart | Alamogordo |
| Walmart | Alamogordo |
| Baillio's | Albuquerque |
| Batteries Plus Bulbs | Albuquerque |
| Best Buy | Albuquerque |

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|---|---|
| Best Buy | Albuquerque |
| Conn's Home Plus | Albuquerque |
| Costco | Albuquerque |
| Costco | Albuquerque |
| Costco | Albuquerque |
| Do It Best - Raks | Albuquerque |
| Dollar Tree | Albuquerque |
| Dollar Tree | Albuquerque |
| Dollar Tree | Albuquerque |
| Dollar Tree | Albuquerque |
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| Habitat for Humanity (HFH) | Albuquerque |
| Home Depot | Albuquerque |
| Home Depot | Albuquerque |
| Home Depot | Albuquerque |
| Home Depot | Albuquerque |
| Lowe's | Albuquerque |
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| Lowe's | Albuquerque |
| Salvation Army | Albuquerque |
| Salvation Army | Albuquerque |
| Samon's | Albuquerque |
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| Samon's | Albuquerque |
| Samon's | Albuquerque |
| Sam's Club | Albuquerque |
| Sam's Club | Albuquerque |
| Sam's Club | Albuquerque |
| Smith's Food and Drug | Albuquerque |
| Smith's Food and Drug | Albuquerque |
| Smith's Food and Drug | Albuquerque |
| Smith's Food and Drug | Albuquerque |
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| Smith's Food and Drug | Albuquerque |
| St. Vincent de Paul | Albuquerque |
| Target | Albuquerque |
| Target | Albuquerque |
| Target | Albuquerque |
| Target | Albuquerque |
| Target | Albuquerque |
| The Lamp Shop | Albuquerque |
| True Value | Albuquerque |
| Walgreens | Albuquerque |
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| Walmart | Albuquerque |
| Family Dollar | Algodones |
| Ace Hardware | Belen |
| Dollar Tree | Belen |
| Family Dollar | Belen |
| Family Dollar | Belen |
| St. Vincent de Paul | Belen |
| Walgreens | Belen |
| Walmart | Belen |
| Family Dollar | Bernalillo |
| Walgreens | Bernalillo |
| Walmart | Bernalillo |
| Samon's | Bosque Farms |
| Family Dollar | Clayton |
| Dollar Tree | Deming |
| Family Dollar | Deming |
| True Value | Deming |
| Walgreens | Deming |
| Walmart | Deming |
| Do It Best - BTU Do It Center! | Las Vegas |
| Dollar Tree | Las Vegas |
| Family Dollar | Las Vegas |

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|---|---|
| Walgreens | Las Vegas |
| Walmart | Las Vegas |
| Family Dollar | Lordsburg |
| Ace Hardware | Los Lunas |
| Do It Best - Raks | Los Lunas |
| Dollar Tree | Los Lunas |
| Dollar Tree | Los Lunas |
| Family Dollar | Los Lunas |
| Family Dollar | Los Lunas |
| Family Dollar | Los Lunas |
| Home Depot | Los Lunas |
| Lowe's | Los Lunas |
| Smith's Food and Drug | Los Lunas |
| St. Vincent de Paul | Los Lunas |
| Walgreens | Los Lunas |
| Walgreens | Los Lunas |
| Walmart | Los Lunas |
| Walgreens | Los Ranchos |
| Family Dollar | Peralta |
| Family Dollar | Pojoaque |
| Dollar Tree | Rio Rancho |
| Dollar Tree | Rio Rancho |
| Dollar Tree | Rio Rancho |
| Home Depot | Rio Rancho |
| Lowe's | Rio Rancho |
| Smith's Food and Drug | Rio Rancho |
| Target | Rio Rancho |
| True Value | Rio Rancho |
| Walgreens | Rio Rancho |
| Walgreens | Rio Rancho |
| Walgreens | Rio Rancho |
| Walgreens | Rio Rancho |
| Walmart | Rio Rancho |
| Walmart | Rio Rancho |
| Walgreens | Ruidiso |
| Dollar Tree | Ruidoso |
| Family Dollar | Ruidoso |
| Family Dollar | Ruidoso |
| Walmart | Ruidoso Downs |

| | |
|---|---|
| Ace Hardware | Santa Fe |
| Batteries Plus Bulbs | Santa Fe |
| Best Buy | Santa Fe |
| Dollar Tree | Santa Fe |
| Dollar Tree | Santa Fe |
| Dollar Tree | Santa Fe |
| Family Dollar | Santa Fe |
| Habitat for Humanity (HFH) | Santa Fe |
| Home Depot | Santa Fe |
| Lowe's | Santa Fe |
| Ray of Light | Santa Fe |
| Salvation Army | Santa Fe |
| Sam's Club | Santa Fe |
| Smith's Food and Drug | Santa Fe |
| Smith's Food and Drug | Santa Fe |
| Target | Santa Fe |
| True Value | Santa Fe |
| Walgreens | Santa Fe |
| Walgreens | Santa Fe |
| Walgreens | Santa Fe |
| Walgreens | Santa Fe |
| Walmart | Santa Fe |
| Walmart | Santa Fe |
| Dollar Tree | Silver City |
| Family Dollar | Silver City |
| True Value | Silver City |
| Walgreens | Silver City |
| Walmart | Silver City |
| Family Dollar | Tularosa |

## 6.5 APPENDIX E – TECHNICAL MANUAL

The following page shows the UCT calculations for the various programs. These graphs are extracted from the PNM UCT model.

| 2024 | kWh | kW | Lifetime kWh | EUL | LI% | Total Cost | 2024 UCT | kWh & $CO_2$ NPV Factor | kW NPV Factor |
|---|---|---|---|---|---|---|---|---|---|
| Residential Comp. | 16,433,453 | 2,185 | 142,475,934 | 9 | 28.7% | 6,808,220 | 1.038 | $ 0.2152 | $ 1,440 |
| Refrig. Recycl. | 3,706,738 | 871 | 18,237,152 | 5 | 0.0% | $ 1,472,559 | 0.865 | $ 0.1381 | $ 874 |
| HEC - Mkt | 6,426,373 | 205 | 57,516,041 | 9 | 0.0% | $ 1,781,148 | 0.942 | $ 0.2152 | $ 1,440 |
| HEC - LI | 4,572,134 | 336 | 40,920,601 | 9 | 100.0% | $ 1,864,819 | 0.944 | $ 0.2152 | $ 1,440 |
| Midstream Cooling | 1,728,208 | 773 | 25,802,140 | 15 | 0.0% | $ 1,689,694 | 1.295 | $ 0.3129 | $ 2,131 |
| Residential Products | 24,515,684 | 1,335 | 325,077,968 | 13 | 0.0% | $ 4,444,957 | 2.156 | $ 0.2858 | $ 1,930 |
| Commercial Comp. | 38,607,755 | 7,305 | 409,242,200 | 11 | 0.0% | $ 10,006,176 | 2.221 | $ 0.2538 | $ 1,701 |
| Easy Savings | 2,024,750 | 242 | 22,616,458 | 11 | 100.0% | $ 328,898 | 3.376 | $ 0.2538 | $ 1,701 |
| Energy Smart (MFA) | 1,438,245 | 373 | 23,227,657 | 16 | 100.0% | $ 964,909 | 1.609 | $ 0.3250 | $ 2,216 |
| New Home Const. | 650,756 | 209 | 9,761,335 | 15 | 0.0% | $ 575,090 | 1.130 | $ 0.3129 | $ 2,131 |
| Behavioral (Residential) | 2,007,750 | 571 | 2,007,750 | 1 | 0.0% | $ 664,664 | 0.220 | $ 0.0257 | $ 166 |
| Behavioral (Commercial) | 3,736,000 | 710 | 11,208,000 | 3 | 0.0% | $ 374,388 | 1.699 | $ 0.0719 | $ 517 |
| Home Works | 2,860,200 | 135 | 31,948,434 | 11 | 40.0% | $ 784,382 | 1.316 | $ 0.2538 | $ 1,701 |
| Power Saver (LM) | 1,600,000 | 40,000 | 1,600,000 | 7 | 0.0% | $ 5,445,888 | 1.183 | $ - | $ 161 |
| Peak Saver (LM) | 1,200,001 | 30,000 | 1,200,001 | 7 | 0.0% | $ 4,119,626 | 1.173 | $ - | $ 161 |
| Total | 95,074,594 | 83,065 | 980,365,736 | | | $ 34,517,198 | 1.60 | | |

| 2024 Programs | NPV Benefits | NPV Costs | 2024 UCT |
|---|---|---|---|
| Residential Comp. | $ 7,066,016 | $6,808,220 | 1.04 |
| Refrig. Recycl. | $ 1,273,225 | $1,472,559 | 0.86 |
| HEC - Mkt | $ 1,677,749 | $1,781,148 | 0.94 |
| HEC - LI | $ 1,760,812 | $1,864,819 | 0.94 |
| Midstream Cooling | $ 2,187,960 | $1,689,694 | 1.29 |
| Residential Products | $ 9,582,248 | $4,444,957 | 2.16 |
| Commercial Comp. | $ 22,220,562 | $10,006,176 | 2.22 |
| Easy Savings | $ 1,110,471 | $328,898 | 3.38 |
| Energy Smart (MFA) | $ 1,552,895 | $964,909 | 1.61 |
| New Home Const. | $ 649,856 | $575,090 | 1.13 |
| Behavioral (Residential) | $ 146,327 | $664,664 | 0.22 |
| Behavioral (Commercial) | $ 635,949 | $374,388 | 1.70 |
| Home Works | $ 1,032,552 | $784,382 | 1.32 |
| Power Saver (LM) | $ 6,440,751 | $5,445,888 | 1.18 |
| Peak Saver (LM) | $ 4,830,563 | $4,119,626 | 1.17 |
| Total | $ 55,101,920 | $ 34,517,198 | 1.60 |

| 2025 | kWh | kW | Lifetime kWh | EUL | LI% | Total Cost | kWh & $CO_2$ NPV Factor | kW NPV Factor |
|---|---|---|---|---|---|---|---|---|
| Residential Comp. | 16,159,657 | 1,781 | 140,423,201 | 9 | 31.6% | 7,175,099 | $ 0.1976 | $ 1,510 |
| Refrig. Recycl. | 3,706,738 | 871 | 18,237,152 | 5 | 0.0% | $ 1,476,674 | $ 0.1150 | $ 909 |
| HEC - Mkt | 5,705,993 | 74 | 51,068,638 | 9 | 0.0% | $ 1,797,207 | $ 0.1976 | $ 1,510 |
| HEC - LI | 4,952,206 | 32 | 44,322,244 | 9 | 100.0% | $ 2,104,354 | $ 0.1976 | $ 1,510 |
| Midstream Cooling | 1,794,720 | 803 | 26,795,166 | 15 | 0.0% | $ 1,796,864 | $ 0.2942 | $ 2,197 |
| Residential Products | 24,515,684 | 1,335 | 325,077,968 | 13 | 0.0% | $ 4,505,684 | $ 0.2674 | $ 2,002 |
| Commercial Comp. | 39,959,026 | 7,422 | 423,565,677 | 11 | 0.0% | $ 10,379,672 | $ 0.2351 | $ 1,773 |
| Easy Savings | 1,735,500 | 207 | 19,385,535 | 11 | 100.0% | $ 282,709 | $ 0.2351 | $ 1,773 |
| Energy Smart (MFA) | 1,704,074 | 458 | 27,520,800 | 16 | 100.0% | $ 1,145,223 | $ 0.3102 | $ 2,304 |
| New Home Const. | 702,751 | 223 | 10,541,268 | 15 | 0.0% | $ 599,911 | $ 0.2942 | $ 2,197 |
| Behavioral (Residential) | 1,879,250 | 571 | 1,879,250 | 1 | 0.0% | $ 665,559 | $ 0.0257 | $ 168 |
| Behavioral (Commercial) | 4,448,000 | 845 | 13,344,000 | 3 | 0.0% | $ 488,864 | $ 0.0719 | $ 579 |
| Home Works | 2,860,200 | 135 | 31,948,434 | 11 | 40.0% | $ 803,658 | $ 0.2351 | $ 1,773 |
| Power Saver (LM) | 1,600,000 | 40,000 | 1,600,000 | 6 | 0.0% | $ 5,507,779 | $ - | $ 186 |
| Peak Saver (LM) | 1,200,001 | 30,000 | 1,200,001 | 6 | 0.0% | $ 3,813,078 | $ - | $ 186 |
| Total | 96,764,144 | 82,976 | 996,486,134 | | | $ 35,367,236 | | |

| 2025 Programs | NPV Benefits | NPV Costs | 2025 UCT |
|---|---|---|---|
| Residential Comp. | $ 6,252,560 | $7,175,099 | 0.87 |
| Refrig. Recycl. | $ 1,218,454 | $1,476,674 | 0.83 |
| HEC - Mkt | $ 1,238,628 | $1,797,207 | 0.69 |
| HEC - LI | $ 1,232,845 | $2,104,354 | 0.59 |
| Midstream Cooling | $ 2,292,335 | $1,796,864 | 1.28 |
| Residential Products | $ 9,227,669 | $4,505,684 | 2.05 |
| Commercial Comp. | $ 22,548,983 | $10,379,672 | 2.17 |
| Easy Savings | $ 929,824 | $282,709 | 3.29 |
| Energy Smart (MFA) | $ 1,900,469 | $1,145,223 | 1.66 |
| New Home Const. | $ 695,954 | $599,911 | 1.16 |
| Behavioral (Residential) | $ 144,003 | $665,559 | 0.22 |
| Behavioral (Commercial) | $ 809,223 | $488,864 | 1.66 |
| Home Works | $ 985,256 | $803,658 | 1.23 |
| Power Saver (LM) | $ 7,453,713 | $5,507,779 | 1.35 |
| Peak Saver (LM) | $ 5,590,285 | $3,813,078 | 1.47 |
| Total | $ 56,267,641 | $ 35,367,236 | 1.59 |

| 2026 | kWh | kW | Lifetime kWh | EUL | LI% | Total Cost | kWh & $CO_2$ NPV Factor | kW NPV Factor |
|---|---|---|---|---|---|---|---|---|
| Residential Comp. | 18,138,879 | 1,846 | 158,733,847 | 9 | 38.6% | 7,891,239 | $ 0.2061 | $ 1,584 |
| Refrig. Recycl. | 3,706,738 | 871 | 18,237,152 | 5 | 0.0% | $ 1,474,597 | $ 0.1160 | $ 926 |
| HEC - Mkt | 5,687,214 | 79 | 50,900,569 | 9 | 0.0% | $ 1,936,854 | $ 0.2061 | $ 1,584 |
| HEC - LI | 6,850,438 | 49 | 61,311,420 | 9 | 100.0% | $ 2,616,160 | $ 0.2061 | $ 1,584 |
| Midstream Cooling | 1,894,488 | 848 | 28,284,706 | 15 | 0.0% | $ 1,863,630 | $ 0.3051 | $ 2,290 |
| Residential Products | 24,515,684 | 1,335 | 325,077,968 | 13 | 0.0% | $ 4,548,682 | $ 0.2740 | $ 2,077 |
| Commercial Comp. | 41,157,797 | 7,534 | 436,272,647 | 11 | 0.0% | $ 10,639,693 | $ 0.2429 | $ 1,847 |
| Easy Savings | 1,446,250 | 173 | 16,154,613 | 11 | 100.0% | $ 235,256 | $ 0.2429 | $ 1,847 |
| Energy Smart (MFA) | 1,969,319 | 543 | 31,804,505 | 16 | 100.0% | $ 1,320,454 | $ 0.3239 | $ 2,355 |
| New Home Const. | 725,768 | 233 | 10,886,526 | 15 | 0.0% | $ 607,016 | $ 0.3051 | $ 2,290 |
| Behavioral (Residential) | 1,761,750 | 571 | 1,761,750 | 1 | 0.0% | $ 665,559 | $ 0.0255 | $ 224 |
| Behavioral (Commercial) | 4,210,000 | 800 | 12,630,000 | 3 | 0.0% | $ 360,875 | $ 0.0732 | $ 633 |
| Home Works | 2,860,200 | 135 | 31,948,434 | 11 | 40.0% | $ 819,907 | $ 0.2429 | $ 1,847 |
| Power Saver (LM) | 1,600,000 | 40,000 | 1,600,000 | 5 | 0.0% | $ 5,547,244 | $ - | $ 194 |
| Peak Saver (LM) | 1,200,001 | 30,000 | 1,200,001 | 5 | 0.0% | $ 3,843,112 | $ - | $ 194 |
| Total | 99,585,648 | 83,168 | 1,028,070,291 | | | $ 36,479,038 | | |

| 2026 Programs | NPV Benefits | NPV Costs | 2026 UCT |
|---|---|---|---|
| Residential Comp. | $ 7,175,954 | $7,891,239 | 0.91 |
| Refrig. Recycl. | $ 1,236,588 | $1,474,597 | 0.84 |
| HEC - Mkt | $ 1,296,454 | $1,936,854 | 0.67 |
| HEC - LI | $ 1,786,573 | $2,616,160 | 0.68 |
| Midstream Cooling | $ 2,518,798 | $1,863,630 | 1.35 |
| Residential Products | $ 9,489,210 | $4,548,682 | 2.09 |
| Commercial Comp. | $ 23,911,886 | $10,639,693 | 2.25 |
| Easy Savings | $ 803,856 | $235,256 | 3.42 |
| Energy Smart (MFA) | $ 2,298,789 | $1,320,454 | 1.74 |
| New Home Const. | $ 754,645 | $607,016 | 1.24 |
| Behavioral (Residential) | $ 172,527 | $665,559 | 0.26 |
| Behavioral (Commercial) | $ 814,424 | $360,875 | 2.26 |
| Home Works | $ 1,020,279 | $819,907 | 1.24 |
| Power Saver (LM) | $ 7,767,317 | $5,547,244 | 1.40 |
| Peak Saver (LM) | $ 5,825,488 | $3,843,112 | 1.52 |
| Total | $ 59,696,836 | $ 36,479,038 | 1.64 |

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | **Case No. 23-00XXX-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

## SELF AFFIRMATION

**SHARON K. JAMES, Program Manager, Energy Efficiency Reporting and Budget for Public Service Company of New Mexico,** upon being duly sworn according to law, under oath, deposes and states: I have read the foregoing **Direct Testimony of Sharon K. James** and it is true and correct based on my personal knowledge and belief.

SIGNED this 17th day of April, 2023.

/s/ Sharon K. James
**SHARON K. JAMES**

GCG#530738

**<u>BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION</u>**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE** | **)** | **Case No. 23-00___-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO** | **)** | |
| **Applicant.** | **)** | |

**DIRECT TESTIMONY**

**OF**

**NICHOLAS L. PHILLIPS**

**April 17, 2023**

**DIRECT TESTIMONY OF**
**NICHOLAS L. PHILLIPS**
**CASE NO. 23-00___-UT**

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**DIRECT TESTIMONY OF**
**NICHOLAS L. PHILLIPS**
**CASE NO. 23-00___-UT**

## I. INTRODUCTION

**Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.**

**A.** My name is Nicholas L. Phillips. I am the Director of Integrated Resource Planning for Public Service Company of New Mexico ("PNM" or "Company"). My business address is Public Service Company of New Mexico, 414 Silver Ave SW, Albuquerque, NM 87102.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.**

**A.** My educational background and relevant employment experience are summarized in PNM Exhibit NLP-1 attached to my testimony.

**Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES AS DIRECTOR OF INTEGRATED RESOURCE PLANNING.**

**A.** I direct PNM's Integrated Resource Planning team. The Integrated Resource Planning team is responsible for developing PNM's resource plans and the regulatory filings to support those resource plans, including the annual renewable energy portfolio procurement plan and the triennial Integrated Resource Plan ("IRP"). The Integrated Resource Planning team is also responsible for performing resource planning analysis to support abandonment and retirement decisions as well as resource additions and acquisitions, all of which require New Mexico Public Regulation Commission ("NMPRC" or "Commission") approval.

**Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN COMMISSION PROCEEDINGS?**

**A.** Yes. Cases in which I have testified before the Commission are identified in PNM Exhibit NLP-1.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

**A.** The purpose of my testimony is to:

1. Present the avoided capacity costs that PNM used in determining the cost effectiveness of its energy efficiency and demand response programs, and explain the methodology PNM used to calculate the avoided capacity costs; and
2. Present the avoided energy costs that PNM used in determining the cost effectiveness of its energy efficiency programs, and explain the methodology PNM used to calculate the avoided energy costs; and
3. Discuss the avoided transmission and distribution costs study PNM performed as required by the NMPRC's acceptance of the Recommended Decision in Case No. 20-00087-UT at Decretal Paragraph I.
4. Demonstrate that the 2024 Electric Energy Efficiency and Load Management Program Plan ("2024 Plan") is consistent with PNM's 2020 IRP and upcoming 2023 IRP.

**Q. WHAT ARE AVOIDED COSTS AND HOW WERE THEY USED IN DEVELOPING THE 2024 PLAN?**

**A.** Avoided costs are marginal fixed and variable costs that could be avoided by employing an alternative supply-side or demand-side resource. I discuss in detail the specific components of avoided costs later in my testimony. In the context of load management programs, avoided cost is the cost an electric utility would otherwise incur to generate electricity without the decrease in the electric load the utility must serve attributable to implementation of energy efficiency and demand response programs. The cost savings (i.e., avoided costs) are created by customers consuming less energy and requiring less power and generating capacity than would otherwise be consumed or required without PNM's energy efficiency and demand response programs. These cost savings can then be compared with the costs of implementing the energy efficiency and demand response programs. PNM calculates these avoided costs to determine cost-effectiveness of energy efficiency and demand response programs when energy efficiency plans are filed with the Commission. Cost effectiveness is demonstrated by the Utility Cost Test ("UCT") pursuant to the Efficient Use of Energy Act ("EUEA")[1].

**Q. HOW ARE THE ENERGY EFFICIENCY AVOIDED COSTS USED IN DETERMINING THE COST-EFFECTIVENESS OF ENERGY EFFICIENCY PROGRAMS?**

**A.** The avoided costs from energy efficiency and demand response programs are used to determine the benefit portion of the cost-benefit ratio of the proposed portfolio of programs by analyzing each program measure over its respective effective useful life. For example, installing high-efficiency lighting delivers savings over a period of several years. The cost-

[1] NMSA 1978, §§ 62-17-1 to 11 (2005, as amended through 2020).

benefit analysis for the 2024 Plan is described in further detail by PNM witness Sharon James.

**Q. HOW ARE THE ENERGY EFFICIENCY AVOIDED COSTS CALCULATED AND HOW ARE THEY REPORTED FOR THIS FILING?**

**A.** The avoided cost valuation is done with PNM's capacity expansion planning software, EnCompass®. Using the EnCompass results, PNM compiles the costs of scenarios that are differentiated only by the presence of PNM's energy efficiency and demand response programs. When comparing system costs without demand-side programs to system costs with demand-side programs, the integrated system will likely have a different set of optimal generation resources and will dispatch those generation resources differently. Generally, the displaced load from the suite of demand-side programs can avoid the need to generate electricity and possibly invest in new capacity. Given that different programs have different lifespans, a system analysis is needed to reflect the differing values for load reductions across years, and for different times and conditions within the year.

## II. AVOIDED CAPACITY VALUE

**Q. WHAT IS THE VALUE OF AVOIDED CAPACITY THAT PNM USED IN PREPARING THE 2024 PLAN?**

**A.** The value of avoided capacity due to energy efficiency measures and demand response programs in PNM's 2024 Plan, expressed in $/kW per year, is presented in PNM Table NLP-1. The table provides annual, nominal avoided capacity values for 2023 through 2042.

Note that the 2041-2042 avoided cost values for energy efficiency reflect phasing out of earlier programs; at the time we performed the analysis PNM did not have estimates for incremental energy efficiency potential in 2041-2042. Consequently, there is no new energy efficiency assumed in those years which understates the avoided costs for those years. However, those years are not utilized in the UCT calculation discussed by PNM Witness James.

**PNM Table NLP-1**

| | **Energy Efficiency** Avoided Generation Capacity Cost $/kW-year firm capacity (nominal) | **Demand Response** Avoided Generation Capacity Cost $/kW-year firm capacity (nominal) |
|---|---|---|
| 2023 | 0.00 | 4.11 |
| 2024 | 147.07 | 9.07 |
| 2025 | 142.28 | 147.14 |
| 2026 | 184.79 | 194.28 |
| 2027 | 192.53 | 194.29 |
| 2028 | 182.32 | 193.76 |
| 2029 | 164.66 | 194.29 |
| 2030 | 142.97 | 194.29 |
| 2031 | 217.54 | 213.21 |
| 2032 | 215.79 | 229.08 |
| 2033 | 208.88 | 229.91 |
| 2034 | 208.39 | 221.18 |
| 2035 | 211.14 | 215.97 |
| 2036 | 210.45 | 215.48 |
| 2037 | 211.89 | 218.51 |
| 2038 | 211.18 | 219.27 |
| 2039 | 200.34 | 219.45 |
| 2040 | 250.02 | 294.91 |
| 2041 | 152.31 | 135.98 |
| 2042 | 145.01 | 106.60 |
| **Levelized*** | **195.02** | **178.99** |

* Levelized costs are for informational purposes only and not utilized in the UCT

**Q. WHAT UTILITY AVOIDED FIXED COSTS ARE INCLUDED IN THE AVOIDED CAPACITY COST CALCULATION?**

**A.** Capital costs, fixed operations and maintenance ("O&M") costs, fixed costs associated with Energy Storage Agreements ("ESA"s), and any associated transmission network upgrade and interconnection costs that are avoided by generation resource deferrals are included in the avoided capacity cost calculations for both energy efficiency and demand response. Additionally, transmission and distribution related investment deferral values are included for energy efficiency related avoided capacity costs. However, these values are not applicable to demand response avoided costs. Implicit in the way the calculations are performed, the avoided capacity costs include avoided planning reserves and demand related losses. This results from the model requirement that generation located at distances electrically remote from the load must provide capacity as well as energy greater than the load in order to cover the transmission and distribution losses. Demand side load reductions do not incur that penalty.

**Q. HOW DID PNM DETERMINE THE ENERGY EFFICIENCY TRANSMISSION AND DISTRIBUTION DEFERRAL COSTS?**

**A.** Generally speaking, there are two accepted methods for analyzing marginal costs for transmission and distribution that could be deferred or avoided as a result of reductions in expected future load. The first method is an analysis of historic embedded costs ("Historic Cost") approach; and the second is a System Planning approach.

The Historic Cost approach relies on the general assumption that transmission investments are driven by demand growth and, in particular for distribution costs, what should be classified as customer- vs demand-related. The reality is that investments are made for a variety of reasons and investments unrelated to load growth would need to be removed from the calculus. Some examples of non-demand related transmission investments would be:

1. Those related to remote siting of generation units;
2. Those related to system interconnections and pool requirements;
3. Those related with large loads of individual customers; and
4. Replacement of existing facilities without adding capacity to serve additional load.

A similar process is followed for analyzing historic distribution costs in that a review of projects should remove investments unrelated to load growth with the additional caveat that customer-related costs of load growth related projects should also be removed.

On the other hand, the System planning approach seeks to identify changes to future investment plans, timing of investments, etc. associated with a load forecast that assumes no incremental energy efficiency reductions on the system compared to one that does assume reductions in the load associated with incremental energy efficiency on the system. This can become difficult to assess as transmission and distribution investment plans are highly dependent upon the specific location of loads on the system.

Due to the large expenses and complications involved, PNM did not conduct a System Planning study to analyze potential deferral or avoided values of transmission and distribution investments for the 2024 Plan; instead, PNM focused on the Historic Cost approach.

**Q. PLEASE DESCRIBE THE HISTORIC COST ANALYSIS PERFORMED BY PNM?**

**A.** PNM first pulled historic capital expenditures functionalized into transmission and distribution investments along with functionalized retirement of transmission and distribution plant. PNM's transmission and distribution departments then reviewed the historic cost data to identify which projects, if any, were associated with load growth. Upon review, PNM was unable to identify any projects that were undertaken specifically due to load growth on the system. To the contrary, most of the investments in the last five years and projected to be undertaken in the next five years are to replace aging infrastructure or provide for interconnection of new generation facilities. Some additional capacity will result from aging infrastructure projects and transmission upgrades needed for new generation.

**Q. CAN YOU PLEASE EXPLAIN YOUR LAST STATEMENT IN MORE DETAIL?**

**A.** In recent history, aside from some specific large customer growth, PNM's load has been flat or declining. Furthermore, PNM has been met with resistance in expanding its distribution system on overloaded feeders. As a result, PNM generally has been deferring investments and instead, operating its system at or near equipment ratings. (The more common practice is to add additional equipment/circuits when normal operation of equipment exceeds 80% loads, as this provides room for contingency operations.) Therefore, the bulk of investments on PNM's system in recent years and projected in the next five years are related to replacing aging equipment or are focused on new large individual customer loads or new generation resources. Consequently, PNM does not identify any transmission and distribution costs that could be avoided or deferred, at least in the near term.

**Q. WHAT DOES PNM PROPOSE TO USE FOR DEFERRED OR AVOIDED TRANSMISSION AND DISTRIBUTION COSTS IN THIS FILING?**

**A.** PNM will continue to use the proxy costs included in its 2020 EE Plan for now. In theory there should be an avoided or deferred transmission and distribution cost component as energy efficiency measures do create permanent reductions in customer demands. Once PNM has replaced the aging infrastructure on its system and addressed the necessary investments to both return the transmission and distribution systems to more traditional equipment loads and modernized equipment in line with current standards and our grid mod plan, PNM will revisit the calculus of deferred or avoided transmission and distribution costs.

**Q. HOW DID PNM DETERMINE THE VALUE OF AVOIDED CAPACITY FOR THE 2024 PLAN?**

**A.** Fundamentally, the avoided costs represent a point at which the system is indifferent, from a cost perspective, between supplying capacity and energy to serve the load or incurring a cost to reduce the load that must be served. PNM's energy efficiency and demand response programs can reduce the need for incremental investments in PNM's system that would otherwise be required to reliably serve load. For the 2024 Plan, PNM has calculated the avoided capacity cost for energy efficiency and demand response separately and is presenting the values on a nominal basis. The value of the avoided capacity cost is based on the additional fixed costs associated with supply-side resources and infrastructure that PNM would need to incur if energy efficiency and load management programs were removed from PNM's energy supply portfolio. In other words, the capacity value of these programs is the revenue requirement associated with capital and fixed expenditures, including any fixed portion of ESAs, that would have otherwise been necessary (without the presence of energy efficiency and demand response programs) to support the addition of resources and infrastructure.[2]

**Q. WHY DIDN'T PNM USE THE COST OF AN ALTERNATIVE RESOURCE AS A PROXY VALUE FOR AVOIDED COST?**

**A.** PNM does not believe a proxy would accurately reflect the contribution of the energy efficiency programs. No single supply-side resource would match precisely the avoided investments and operating costs provided by energy efficiency programs in any one year, let alone over the life spans of the programs or the proxy. A system analysis gives the full assessment of the programs' avoided cost.

**Q. HOW ARE THE AVOIDED CAPACITY VALUES FOR PNM'S ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS USED IN THE UTILITY COST TEST?**

[2] PNM notes that the cost of capacity can sometimes differ from accounting classifications for fixed costs. Building a solar facility will entail nearly all fixed costs. A contract to take all the energy from that same solar facility will be accounted for as a variable cost. Part of the calculation is to correctly assign these cost categories between capacity and energy.

**A.** As described in more detail by PNM Witness James, the cost effectiveness of energy efficiency and demand response programs is calculated using the UCT. The generation capacity cost avoided by these programs is included as a benefit in the UCT calculation.

## III. AVOIDED ENERGY VALUE

**Q. WHAT VALUE OF AVOIDED ENERGY DID PNM USE IN THE 2024 PLAN?**

**A.** The value of avoided energy due to each of the energy efficiency measures in the 2024 Plan, expressed in $/MWh per year, is presented in PNM Table NLP-2. The table provides annual avoided energy values for 2024 through 2042. Note that the 2041-2042 avoided cost values for energy efficiency reflect phasing out of earlier programs; at the time we performed the analysis PNM did not have estimates for incremental energy efficiency potential in 2041-2042. Consequently, there is no new energy efficiency in those years, which understates the avoided costs for those years. However, those years are not utilized in the UCT calculation discussed by PNM Witness James.

**PNM Table NLP-2**

| Energy Efficiency Avoided Generation Energy Cost $/MWh (nominal) | |
|---|---|
| 2023 | 0.00 |
| 2024 | 50.53 |
| 2025 | 25.65 |
| 2026 | 25.51 |
| 2027 | 25.80 |
| 2028 | 27.13 |
| 2029 | 27.83 |
| 2030 | 26.73 |
| 2031 | 34.47 |
| 2032 | 32.37 |
| 2033 | 36.74 |
| 2034 | 37.98 |
| 2035 | 34.44 |
| 2036 | 36.83 |
| 2037 | 35.00 |
| 2038 | 34.14 |
| 2039 | 34.35 |
| 2040 | 45.51 |
| 2041 | 53.36 |
| 2042 | 43.01 |
| **Levelized*** | **34.51** |

* Levelized costs are for informational purposes only and not utilized in the UCT

**Q. WHAT UTILITY AVOIDED VARIABLE COSTS ARE INCLUDED IN THE AVOIDED ENERGY COST CALCULATION?**

**A.** Generation variable costs such as fuel, variable operations and maintenance costs, including those associated with renewable Power Purchase Agreements ("PPA"s) and any variable portion of ESAs, and avoided carbon emission costs are included in the avoided energy cost. In addition, the avoided energy costs also include implied avoided transmission and distribution energy losses and lower operating reserve costs (these costs are implicit in the way the calculations are performed).

**Q. HOW DID PNM DETERMINE THE AVOIDED ENERGY VALUE?**

**A.** PNM used a portfolio comparison to determine the avoided energy value associated with the 2024 Plan. Avoided energy value is created by avoiding the generation variable costs described above when generating electricity to meet system energy requirements. PNM prepared a variable cost analysis of its portfolio of resources with and without the incremental impact of the energy efficiency resource then compared the difference in variable costs between the two portfolios – the difference then represents the avoided energy cost associated with the energy efficiency resource. The resulting avoided energy values that were used in the UCT calculations for the 2024 Plan are shown in PNM Table NLP-2.

## IV. CONSISTENCY WITH PNM'S UPCOMING 2023 IRP

**Q. WILL PNM CONTINUE TO EVALUATE DEMAND SIDE ALTERNATIVES TO SUPPLY SIDE RESOURCES IN ITS 2023 IRP?**

**A.** Yes. PNM will continue to evaluate demand side resources as an alternative to supply side resources in its 2023 IRP. PNM will continue to consider both the regulatory requirements associated with the EUEA and the energy savings and spending requirements contained therein, as well as evaluating PNM's avoided cost methodology to ensure PNM is capturing the appropriate costs and benefits to reducing supply-side alternatives.

**Q. IS THE 2024 PLAN CONSISTENT WITH PNM'S ACCEPTED 2020 IRP AND UPCOMING 2023 IRP?**

**A.** Yes. Both the accepted 2020 IRP and the upcoming 2023 IRP assume that PNM will continue to propose cost effective energy efficiency and demand response programs and that they will be approved by the Commission; the 2024 Plan is consistent with that assumption.

**Q. WHAT NATURAL GAS AND CARBON PRICING WAS UTILIZED IN THE DETERMINATION OF THE AVOIDED COSTS?**

**A.** PNM Table NLP-3 provides a summary of the delivered gas and carbon prices used in the avoided cost analysis.

**PNM Table NLP-3**

| | **Natural Gas Price** Delivered to Southern NM $/MMBtu | **Natural Gas Price** Delivered to Northern NM $/MMBtu | **Natural Gas Price** Delivered to ABQ $/MMBtu | **Carbon Price** Emissions $/ton |
|---|---|---|---|---|
| 2023 | 3.32 | 5.24 | 5.81 | 0.00 |
| 2024 | 3.94 | 4.86 | 5.43 | 0.00 |
| 2025 | 4.06 | 4.81 | 5.38 | 0.00 |
| 2026 | 4.04 | 4.69 | 5.26 | 0.00 |
| 2027 | 3.92 | 4.59 | 5.16 | 0.00 |
| 2028 | 4.01 | 4.66 | 5.23 | 11.82 |
| 2029 | 4.10 | 4.76 | 5.32 | 13.25 |
| 2030 | 4.21 | 4.87 | 5.43 | 14.82 |
| 2031 | 4.37 | 4.98 | 5.54 | 16.61 |
| 2032 | 4.48 | 5.09 | 5.66 | 18.61 |
| 2033 | 4.59 | 5.21 | 5.78 | 20.84 |
| 2034 | 4.70 | 5.33 | 5.90 | 23.33 |
| 2035 | 4.82 | 5.46 | 6.03 | 26.14 |
| 2036 | 4.94 | 5.59 | 6.16 | 29.28 |
| 2037 | 5.06 | 5.72 | 6.29 | 32.81 |
| 2038 | 5.19 | 5.85 | 6.42 | 36.74 |
| 2039 | 5.32 | 5.99 | 6.56 | 41.14 |

**Q. DO YOU HAVE ANY OBSERVATIONS REGARDING THE AVOIDED CAPACITY AND ENERGY COSTS?**

**A.** Yes. PNM’s proposed portfolio of demand side resources is expected to provide an economic benefit to the system and meet the savings goals required by the EUEA through 2025 and beyond. The 2023 avoided capacity costs are significantly greater than in previous years, indicating that energy efficiency and demand response programs are increasingly valuable. Near-term resource costs have increased; recent bids in response to Requests for Proposals (RFP) reflect cost increases due to supply chain constraints and higher commodity prices. While technology prices generally decrease over time in real terms, relatively high inflation expectations, particularly for labor (which heavily influence O&M cost estimates), somewhat counteract this decline. The full impacts of the Inflation

Reduction Act (IRA) may also further influence future resource costs and PPA/ESA prices – while some tax credit benefits are assumed to be reflected in the RFP bids that formed the baseline for estimating renewable and storage costs, the IRA was very new when the RFP bids were submitted and was likely still being digested by developers. It is possible that the full value of tax benefits as laid out in the IRA could further reduce costs once these benefits are fully reflected in future RFP bids.

Similarly, avoided energy costs are somewhat higher than in previous years, mostly due to higher prices for natural gas and renewable PPAs. In the future, avoided energy costs may decrease as further impacts of the IRA are incorporated into energy and capacity costs. Additionally, as increases to the renewable portfolio standard (RPS) target and specific carbon emission requirements (as set forth in the Energy Transition Act) significantly decrease carbon emissions over time, these environmental conditions can reasonably be expected to a) reduce the value of the environmental benefits associated with energy efficiency (i.e., decreased natural gas usage and carbon emissions reduces the value of avoiding these costs), and b) increase the need for new resources that will be required to meet state RPS and carbon emission regulations, regardless of load or economically driven resource planning decisions (these resource costs cannot be avoided). Finally, curtailment of renewable resources can in some instances increase the costs to the system due to the must-take nature of the resources and forgone environmental attributes used to meet the RPS, which now must be bundled with energy in order to comply with the Renewable Energy Act as amended by the Energy Transition Act. Collectively, all these factors create an environment that could lead to sustained low and potentially decreasing avoided energy costs.

We are entering a new world that will require a re-evaluation of PNM's system, including how and why costs are incurred, in order to best determine not only demand side resources, but all of PNM's resources, and how those costs are recovered from customers as PNM transitions towards a carbon-free system. Future regulatory filings, including PNM's upcoming 2023 IRP, will further examine this transition.

## V. CONCLUSION

**Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

**A.** PNM's energy efficiency and demand response programs as proposed in the 2024 Plan will reduce energy production and the need for additional generation capacity. The costs associated with the avoided energy and capacity represent utility costs that would be incurred if the 2024 Plan and future plans are not approved and implemented. The value of the avoided energy and capacity is a benefit, on a portfolio level, in the UCT cost effectiveness assessment.

**Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

**A.** Yes.

*GCG#530753*

Educational Background and Employment Summary

# PNM Exhibit NLP-1

Is contained in the following 2 pages.

**Nicholas L. Phillips**
**EDUCATIONAL AND PROFESSIONAL SUMMARY**

**Address:** Public Service Company of New Mexico 414 Silver Avenue, SW, MS-0915, Albuquerque, New Mexico 87102

**Position:** Director, Integrated Resource Planning, June 2019 to present

**Education:** Bachelor of Science in Electrical Engineering, Washington University in St.Louis/University of Missouri - St. Louis Joint EngineeringProgram

Master of Engineering in Electrical Engineering, Electric Power and Energy Systems, Iowa State University of Science and Technology

Master of Science in Computational Finance and Risk Management, University of Washington Seattle

**Employment:** Employed by Public Service Company of New Mexico since 2019.

Principal with Brubaker & Associates, Inc. ("BAI"), a consulting firm specializing in public utility regulation, energy and economics.

**Professional Affiliations:** Member of the Institute of Electrical and Electronic Engineers ("IEEE") Power Engineering Society

**Testimony/Affidavits Presented Before:**
Kansas Public Service Commission
Michigan Public Service Commission
Missouri Public Service Commission
Wisconsin Public Service Commission
Wyoming Public Service Commission
California Public Utilities Commission
Nevada Public Utilities Commission
Idaho Public Utilities Commission
Federal Energy Regulatory Commission
New Mexico Public Regulation Commission

**NMPRC Testimony:**

| | |
|---|---|
| Case No. 13-00390-UT | PNM's SJGS Units 1 and 4 Abandonment |
| Case No. 15-00261-UT | PNM's 2015 General Rate Case |
| Case No. 15-00312-UT | PNM's AMI Application |
| Case No. 16-00276-UT | PNM's 2016 General Rate Case |
| Case No. 17-00044-UT | SPS Application for Wind CCN & PPA |
| Case No. 19-00018-UT | PNM's SJGS Units 2 and 3 Abandonment |
| Case No. 19-00195-UT | PNM's SJGS Replacement Resources Application |
| Case No. 20-00087-UT | PNM's Energy Efficiency 2021 Plan Application |
| Case No. 20-00124-UT | PNM's 2021 Renewable Energy Plan |
| Case No. 20-00182-UT | PNM's SJGS Replacement Resources Compliance Application |

| | |
|---|---|
| Case No. 20-00218-UT | PNM's Demand Response Application |
| Case No. 21-00031-UT | Application for Facebook PPA and ESA 3 |
| Case No. 21-00083-UT | Palo Verde Abandonment and Replacement |
| Case No. 22-00143-UT | PNM's 2023 RPS Application |

*GCG#528279v2*

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | **Case No. 23-00XXX-UT** |
| **Applicant.** | ) | |

**SELF AFFIRMATION**

**NICHOLAS L. PHILLIPS, Director, Integrated Resource Planning, at Public Service Company of New Mexico,** upon penalty of perjury under the laws of the State of New Mexico, affirm and state: I have read the foregoing **Direct Testimony of Nicholas L. Phillips** and it is true and correct based on my personal knowledge and belief.

DATED this 17th day of April, 2023.

/s/ Nicholas L. Phillips
**NICHOLAS L. PHILLIPS**

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | **)** | **Case No. 23-00___-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | **)** | |
| **Applicant.** | **)** | |

**DIRECT TESTIMONY**

**OF**

**ABRAHAM CASAS**

**April 17, 2023**

**DIRECT TESTIMONY OF**
**ABRAHAM CASAS**
**CASE NO. 23-00______-UT**

**Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

**A.** My name is Abraham Casas. I am a Senior Pricing Analyst for Public Service Company of New Mexico ("PNM" or "Company"). My business address is 414 Silver Ave SW, Albuquerque, NM 87102.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL QUALIFICATIONS.**

**A.** I graduated from New Mexico State University with a bachelor's degree in Economics in 2016, and a Master of Arts degree in Economics in 2018. I was hired by PNM as a Pricing Analyst in March of 2019. Please see PNM Exhibit AC-1 for a statement of qualifications.

**Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION ("NMPRC" OR "COMMISSION")?**

**A.** Yes. A listing of cases in which I have testified or filed testimony is included in PNM Exhibit AC-1.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?**

**A.** The purpose of this testimony is

i. To describe and support PNM's Advice Notice No. 604 and the 29th Revised Energy Efficiency ("EE") Rider No. 16 ("Revised Rider"), filed concurrently herewith, through which PNM proposes to adjust the Rider No. 16 rate in accordance with the Efficient Use of Energy Act[1] ("EUEA"), 17.7.2.13 NMAC and PNM's 2024 Energy Efficiency and Load Management Program Plan ("2024 Plan") addressed by PNM witness Sharon K. James.

ii. To describe the mechanics of PNM's proposed Profit Incentive addressed in the testimony of PNM Witness James.

iii. To provide customer bill impacts of the Revised Rider.

**Q. HAVE YOU PREPARED ANY EXHIBITS?**

**A.** Yes. Attached to my testimony are:

PNM Exhibit AC-1: Statement of Qualifications.

PNM Exhibit AC-2: Program Costs and Rate Elements.

PNM Exhibit AC-3: A copy of the proposed Energy Efficiency Tariff Rider No. 16 effective for year 2024.

PNM Exhibit AC-4: Impact of proposed Rider by Customer Class.

PNM Exhibit AC-5: Proposed Energy Efficiency Plan Profit Incentive.

PNM Exhibit AC-6: Rider Impacts for Selected Customer Classes.

**Q. PLEASE DESCRIBE THE RATE ELEMENTS INCLUDED IN PNM'S CURRENT RIDER NO. 16.**

**A.** At the time of the filing of this application the EE Rider ("Current EE Rider") includes a 2023 Program Cost rate element that is assessed as a percentage charge (3.177%) on PNM

[1] NMSA 1978, §§ 62-17-1 to 11 (2005, as amended through 2020).

customers' monthly bills and was designed to recover approximately $29,591,738 in 2023 program costs on an annual basis. In addition, the current EE Rider has a 2023 Base Profit Incentive rate element (0.219% of bills), which is designed to recover an estimated $2,101,013. The Current EE Rider elements were approved by the Commission in PNM's last EE program application in Case No. 20-00087-UT. PNM filed its Advice Notice No. 585 with its annual EE reconciliation filing on April 15, 2022, which provided reconciliation of the 2021 profit incentive in an EE Rider rate that was effective through the remainder of 2022, as well as the Current EE Rider rate that became effective with the first billing cycle of 2023. Therefore, the total Current EE Rider rate, inclusive of these rate elements, is 3.396% of customers' bills before taxes and franchise fees.

**Q. PLEASE DESCRIBE THE EE RIDER CHANGES PROPOSED IN THIS FILING.**

**A.** In accordance with the amendments made to the EUEA in 2019, PNM is required to fund EE programs at a range of no less than 3% and no more than 5% of customer bills or $75,000 per customer per calendar year, whichever is less, for customer classes with the opportunity to participate in energy efficiency programs. Thus, PNM is requesting Commission approval of a Revised Rider designed to recover program costs of the 2024 Plan based on a program budget of $34,517,198 for calendar year 2024, $35,367,236 for calendar year 2025, and $36,479,038 for calendar year 2026, determined in compliance with the amendments to the EUEA and based on the rates in PNM's most recently approved rate case filing in Case No. 16-00276-UT.

PNM is also requesting a Base Profit Incentive of $2,450,721 for calendar year 2024, $2,511,074 for calendar year 2025, and $2,590,012 for calendar year 2026, representing 7.10% of the respective annual budget amounts.

**Q. HOW DID PNM PROJECT REVENUES TO DETERMINE THE PLAN YEAR BUDGETS?**

**A.** PNM used forecasted 2023 Energy Efficiency revenues and forecasted billing determinants to project revenues to determine plan year budgets for 2024, 2025, and 2026.

**Q. PLEASE EXPLAIN THE DERIVATION OF THE PROGRAM COST ELEMENT OF THE REVISED RIDER RATE.**

**A.** As shown on PNM Exhibit AC-2 pages 1 through 3, the Revised Rider is estimated to recover $34,517,198 in program costs in 2024, $35,367,236 in program costs in 2025, and $36,479,038 in 2026, through the rider rate elements.

A copy of the proposed Energy Efficiency Tariff Rider No. 16 effective for year 2024 is included as PNM Exhibit AC-3. In addition to the changed rate elements, the proposed tariff includes several non-substantiative language modifications. PNM will modify the Rider No. 16 rate with its reconciliation filing each April to include the rate for the subsequent year, in addition to the reconciliation rate.

**Q. WHAT ARE THE IMPACTS OF THE PROPOSED RIDER RATE ON THE ELIGIBLE CUSTOMER CLASSES?**

**A.** The allocation of program costs to the various customer classes is shown on PNM Exhibit AC-4 pages 1 through 3. For 2024, the impacts for an average customer range from $0.42 to $284.96 per bill. For 2025, the impacts for an average customer range from $0.50 to $343.06 per bill. For 2026, the impacts for an average customer range from $0.59 to $414.21 per bill.

**Q. PLEASE EXPLAIN THE DERIVATION OF THE PROFIT INCENTIVE ELEMENT OF THE REVISED RIDER RATE.**

**A.** As more fully explained by PNM witness James, PNM is proposing base Profit Incentives of $2,450,721, $2,511,074, and $2,590,012 in program years 2024, 2025, and 2026 respectively. The base profit incentive for each year is 7.10% of the requested Plan annual budgets. As shown on PNM Exhibit AC-2 pages 1 through 3, this amount will be collected through rider rate elements of 0.246%, 0.252%, and 0.260% of customer bills in 2024, 2025, and 2026, respectively. As discussed later in my testimony, these base incentive amounts may be increased after measurement and verification if actual annual energy savings achieved by PNM exceed 80 GWh in a program year.

**Q. WHAT IS THE TOTAL REVISED RIDER RATE THAT WILL BE APPLIED TO CUSTOMER BILLS IN 2024?**

**A.** The total Revised Rider rate requested to be approved in this case for calendar year 2024 is 3.952% of customer bills before taxes and franchise fees. Table 1 below compares the Current EE Rider rate elements with those proposed in this case for calendar year 2024.

| Table 1. Energy Efficiency 2024 Plan Rider No. 16 – 2024 Rate Elements | | | | |
|---|---|---|---|---|
| | | | | |
| Rate Rider Element | Current Amount | Current Rate Rider Element | Proposed Amount | Proposed Rate Rider Element |
| Approved 2023 Program Plan Costs | $29,591,738 | 3.177% | | |
| Approved 2023 Incentive | $2,101,013 | 0.219% | | |
| Total (Current) | $31,692,751 | 3.396% | | |
| Proposed 2024 Program Costs | | | $34,517,198, | 3.707% |
| Proposed 2024 Profit Incentive | | | $2,450,721 | 0.246% |
| Total (Proposed) | | | $36,967,919 | 3.952% |

**Q. WHAT IS THE TOTAL REVISED RIDER RATE THAT WILL BE APPLIED TO CUSTOMER BILLS IN 2025?**

**A.** The total Revised Rider rate requested to be approved in this case for calendar year 2025 is 4.058% of customer bills before taxes and franchise fees. Table 2 below compares the Current EE Rider rate elements with those proposed in this case for calendar year 2025.

| Table 2. Energy Efficiency 2024 Plan Rider No. 16 – 2025 Rate Elements | | | | |
|---|---|---|---|---|
| | | | | |
| Rate Rider Element | Current Amount | Current Rate Rider Element | Proposed Amount | Proposed Rate Rider Element |
| Approved 2023 Program Plan Costs | $29,591,738 | 3.177% | | |
| Approved 2023 Incentive | $2,101,013 | 0.219% | | |
| Total (Current) | $31,692,751 | 3.396% | | |
| Proposed 2025 Program Costs | | | $35,367,236 | 3.805% |
| Proposed 2025 Profit Incentive | | | $2,511,074 | 0.252% |

| | | | | |
|---|---|---|---|---|
| Total (Proposed) | | | $37,878,310 | 4.058% |

**Q. WHAT IS THE TOTAL REVISED RIDER RATE THAT WILL BE APPLIED TO CUSTOMER BILLS IN 2026?**

**A.** The total Revised Rider rate requested to be approved in this case for calendar year 2026 is 4.191% of customer bills before taxes and franchise fees. Table 3 below compares the Current EE Rider rate elements with those proposed in this case for calendar year 2026.

| Table 3. Energy Efficiency 2024 Plan Rider No. 16 – 2026 Rate Elements | | | | |
|---|---|---|---|---|
| | | | | |
| Rate Rider Element | Current Amount | Current Rate Rider Element | Proposed Amount | Proposed Rate Rider Element |
| Approved 2023 Program Plan Costs | $29,591,738 | 3.177% | | |
| Approved 2023 Incentive | $2,101.013 | 0.219% | | |
| Total (Current) | $31,692,751 | 3.396% | | |
| Proposed 2026 Program Costs | | | $36,479,038 | 3.931% |
| Proposed 2026 Profit Incentive | | | $2,590,012 | 0.260% |
| Total (Proposed) | | | $39,069,050 | 4.191% |

**Q. WHAT MECHANISM IS PNM PROPOSING FOR THE CALCULATION OF THE EE PROFIT INCENTIVE?**

**A.** PNM Exhibit AC-5 page 1, shows the operation of the Profit Incentive mechanism requested by PNM in this case, including the base level incentive and the proposed adjustment based on actual measured and verified energy savings. As explained by PNM witness James, the Profit Incentive will increase by a sliding scale ranging from 0.125% to 0.225% of the annual Plan program costs for each annual GWh of savings PNM achieves in excess of 80. This approach is the same as PNM proposed in its 2021 EE Program Plan in Case No. 20-00087-UT, and awards increasing incentives in a tiered format as PNM achieves greater levels of energy savings.

**Q. HOW WILL PNM PERFORM THE RECONCILIATION/TRUE-UP OF THE INCENTIVE BASED ON ACTUAL PERFORMANCE OF THE 2024, 2025, AND 2026 PLANS?**

**A.** In its 2024, 2025, and 2026 Annual Reports, PNM will calculate the energy savings resulting from the implementation of the 2024 Plan based on the Measurement and Verification ("M&V") report. Based on this annual savings, PNM will apply the sliding scale percentage shown in PNM Exhibit AC-5. For example, if PNM achieves 84 GWh of annual Energy Savings, actual program costs would be multiplied by 7.600% to arrive at the total Incentive. For each GWh of actual annual savings above 80 GWh, PNM will multiply the actual program costs by the incentive as a percentage of total program costs and will add that amount to the base incentive amount (7.10% of actual program costs), up to a Profit Incentive percentage equal to PNM's pre-tax weighted average cost of capital ("WACC"), the limit provided in the EE Rule.

Mathematically, for each program year's annual energy savings in excess of 80 GWh the calculation of the additional Profit Incentive will be as follows:

$$API = [M\&V\ AGWh] * [Total\ Incentive\ Rate] * APC$$

Where:

$API$ =Additional Profit Incentive

*M&V AGWh*= Annual Measured and Verified Energy Savings (GWh)

*Total Incentive Rate*= PNM Exhibit AC-5 Column C value corresponding to M&V AGWH

*APC*= Actual Program Costs of Plan ($)

PNM will recover the additional Profit Incentive amount, if any, through the reconciliation of the EE Rider rate in the following plan year.

**Q. IS PNM PROPOSING A CARRYING CHARGE ON OVER- AND UNDER-COLLECTIONS OF PROGRAM COSTS?**

**A.** Yes. As previously approved by the Commission, PNM proposes to continue assessing a symmetrical carrying charge on any under- or over-collection of program costs. PNM proposes to continue using the customer deposit interest rate that is set by the Commission early each year. The rate for 2023 is 3.94% per annum.

**Q. HAVE YOU CALCULATED THE IMPACT OF THE REVISED RIDER RATE ON CUSTOMER BILLS AT DIFFERENT KWH USAGE LEVELS?**

**A.** Yes. PNM Exhibit AC-4 pages 1 through 3 show the impact of the Revised Rider rate at the average usage level of each customer class subject to the EE Rider as projected for each plan year. PNM Exhibit AC-6 pages 1 through 3 shows the projected impact of the revised EE Rider Rate for Residential and Small Power customers.

For 2024, projected bill impacts for rate Schedule 1A – Residential customers the bill increase ranges from $0.04 to $1.72 per month depending on usage; for Schedule 2A - Small Power customers the range of increase is from $0.09 to $11.29 per month.

For 2025, projected bill impacts for rate Schedule 1A – Residential customers, the bill increase ranges from $0.05 to $2.04 per month depending on usage; Schedule 2A - Small Power customers the range of increase is from $0.10 to $13.42 per month.

For 2026, projected bill impacts for rate Schedule 1A – Residential customers the bill increase ranges from $0.06 to $2.45 per month depending on usage; Schedule 2A - Small Power customers the range of increase is from $0.13 to $16.13 per month.

Rate Schedule 1A – Residential and Rate Schedule 2A - Small Power classes comprise over 99% of all PNM customers that are subject to the EE Rider.

**Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

**A.** Yes, it does.

*GCG#530741*

Statement of Qualifications

# PNM Exhibit AC-1

Is contained in the following 1 page.

**Abraham Casas: Educational and Professional Summary**

**Current Position:**

Senior Pricing Analyst, Strategic Marketing and Product Management. Public Service Company of New Mexico (PNM)

**Education:**

Master of Arts, Economics – 2018

Bachelor's in Business Administration, Economics – 2016

**Experience:**

Pricing Analyst, Public Service Company of New Mexico (4/2019 – Present)

Project Manager, B and D Industries. (8/2016 - 8/2017)

**Testimony:**

Before the New Mexico Public Regulation Commission

- NMPRC Case No. 17-00076-UT. In support of PNM's 2019, 2020, and 2021 Energy Efficiency ("EE") Profit Incentive

- NMPRC Case No. 22-00276-UT. In support of PNM's 2022 Rio Rancho Underground Rider.

- NMPRC Case No. 22-00270-UT. In support of PNM's 2024 Rate Change.

Program Costs and Rate Elements

# PNM Exhibit AC-2

Is contained in the following 3 pages.

PNM

# 2024 Energy Efficiency Plan - Program Costs and Rate Elements

| Line N0. | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2024 Program Costs | $ 34,517,198 | | **2024 EE Rate Component** | | |
| 2 | 2024 Base Profit Incentive | 7.10% | | Program Cost Rate Element | 3.707% | *($34,517,198 - ∑(G)) / ∑(D)* |
| 3 | 2024 Base Profit Incentive | $ 2,450,721 | | Incentive Rate Element | 0.246% | *(∑(H) / ∑(E))* |
| 4 | | | | Total | 3.952% | |
| 5 | | | | | | |

| Line N0. | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) | (I) |
|---|---|---|---|---|---|---|---|---|---|
| 7 | | | | *(B) - (C)* | *(B)* | *(D) x 3.707%* | *$75k/ capped customer* | *(E) x 0.246%* | *(F) + (G) + (H)* |
| 8 | **Customer Class** | **Revenue ($)** | **Capped ($)** | **Net Revenue for Program Costs ($)** | **Revenue for Incentive ($)** | **Program Costs From Uncapped($)** | **Program Costs From Capped ($)** | **Energy Efficiency Incentive Recovery ($)** | **Total Revenue ($)** |
| 9 | 1A/1B - Residential | $ 450,586,604 | $ - | $ 450,586,604 | $ 450,586,604 | $ 16,701,618 | $ - | $ 1,107,806 | $ 17,809,424 |
| 10 | 2A/2B - Small Power | $ 114,149,838 | $ - | $ 114,149,838 | $ 114,149,838 | $ 4,231,122 | $ - | $ 280,647 | $ 4,511,769 |
| 11 | 3B - General Power | $ 160,126,079 | $ - | $ 160,126,079 | $ 160,126,079 | $ 5,935,295 | $ - | $ 393,684 | $ 6,328,979 |
| 12 | 3C - General Power (Low Load Factor) | $ 24,568,156 | $ - | $ 24,568,156 | $ 24,568,156 | $ 910,653 | $ - | $ 60,403 | $ 971,056 |
| 13 | 4B - Large Power | $ 101,388,153 | $ - | $ 101,388,153 | $ 101,388,153 | $ 3,758,093 | $ - | $ 249,272 | $ 4,007,364 |
| 14 | 5B - Large Service for Customers >=8,000kW | $ 5,093,930 | $ 5,093,930 | $ - | $ 5,093,930 | $ - | $ 75,000 | $ 12,524 | $ 87,524 |
| 15 | 11B - Wtr/Swg Pumping | $ 66,243,770 | $ - | $ 66,243,770 | $ 66,243,770 | $ 2,455,417 | $ - | $ 162,866 | $ 2,618,283 |
| 16 | 15B - Universities 115 kV | $ 4,911,905 | $ 4,911,905 | $ - | $ 4,911,905 | $ - | $ 75,000 | $ 12,076 | $ 87,076 |
| 17 | 30B - Manufacturing (30 MW) | $ 57,715,733 | $ 57,715,733 | $ - | $ 57,715,733 | $ - | $ 75,000 | $ 141,899 | $ 216,899 |
| 18 | 35B - Large Power >=3,000kW | $ 12,016,597 | $ 12,016,597 | $ - | $ 12,016,597 | $ - | $ 300,000 | $ 29,544 | $ 329,544 |
| 19 | **Customer Rate Class Totals** | **$ 996,800,767** | **$ 79,738,166** | **$ 917,062,601** | **$ 996,800,767** | **$ 33,992,198** | **$ 525,000** | **$ 2,450,721** | **$ 36,967,919** |

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# 2025 Energy Efficiency Plan - Program Costs and Rate Elements

| Line N0. | | | | | |
|---|---|---|---|---|---|
| 1 | 2025 Program Costs | $ 35,367,236 | **2025 EE Rate Component** | | |
| 2 | 2025 Base Profit Incentive | 7.10% | Program Cost Rate Element | 3.805% | *($35,367,236 - ∑(G)) / ∑(D)* |
| 3 | 2025 Base Profit Incentive | $ 2,511,074 | Incentive Rate Element | 0.252% | *(∑(H) / ∑(E))* |
| 4 | | | Total | 4.058% | |
| 5 | | | | | |

| Line N0. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6 | *(A)* | *(B)* | *(C)* | *(D)* | *(E)* | *(F)* | *(G)* | *(H)* | *(I)* |
| 7 | | | | *(B) - (C)* | *(B) or 0* | *(D) x 3.805%* | *$75k/ capped customer* | *(E) x 0.252%* | *(F) + (G) + (H)* |
| 8 | **Customer Class** | **Revenue ($)** | **Capped ($)** | **Net Revenue for Program Costs ($)** | **Revenue for Incentive ($)** | **Program Costs From Uncapped($)** | **Program Costs From Capped ($)** | **Energy Efficiency Incentive Recovery ($)** | **Total Revenue ($)** |
| 9 | 1A/1B - Residential | $ 447,343,690 | $ - | $ 447,343,690 | $ 447,343,690 | $ 17,022,881 | $ - | $ 1,128,582 | $ 18,151,463 |
| 10 | 2A/2B - Small Power | $ 114,685,632 | $ - | $ 114,685,632 | $ 114,685,632 | $ 4,364,161 | $ - | $ 289,335 | $ 4,653,496 |
| 11 | 3B - General Power | $ 159,970,895 | $ - | $ 159,970,895 | $ 159,970,895 | $ 6,087,412 | $ - | $ 403,583 | $ 6,490,995 |
| 12 | 3C - General Power (Low Load Factor) | $ 24,406,009 | $ - | $ 24,406,009 | $ 24,406,009 | $ 928,728 | $ - | $ 61,573 | $ 990,301 |
| 13 | 4B - Large Power | $ 102,891,457 | $ - | $ 102,891,457 | $ 102,891,457 | $ 3,915,354 | $ - | $ 259,580 | $ 4,174,934 |
| 14 | 5B - Large Service for Customers >=8,000kW | $ 5,096,138 | $ 5,096,138 | $ - | $ 5,096,138 | $ - | $ 75,000 | $ 12,857 | $ 87,857 |
| 15 | 11B - Wtr/Swg Pumping | $ 66,320,228 | $ - | $ 66,320,228 | $ 66,320,228 | $ 2,523,700 | $ - | $ 167,316 | $ 2,691,016 |
| 16 | 15B - Universities 115 kV | $ 4,893,855 | $ 4,893,855 | $ - | $ 4,893,855 | $ - | $ 75,000 | $ 12,346 | $ 87,346 |
| 17 | 30B - Manufacturing (30 MW) | $ 57,715,733 | $ 57,715,733 | $ - | $ 57,715,733 | $ - | $ 75,000 | $ 145,608 | $ 220,608 |
| 18 | 35B - Large Power >=3,000kW | $ 12,007,241 | $ 12,007,241 | $ - | $ 12,007,241 | $ - | $ 300,000 | $ 30,293 | $ 330,293 |
| 19 | **Customer Rate Class Totals** | **$ 995,330,879** | **$ 79,712,968** | **$ 915,617,911** | **$ 995,330,879** | **$ 34,842,236** | **$ 525,000** | **$ 2,511,074** | **$ 37,878,310** |

PNM

# 2026 Energy Efficiency Plan - Program Costs and Rate Elements

| Line N0. | | | | | |
|---|---|---|---|---|---|
| 1 | 2026 Program Costs | $ 36,479,038 | **2026 EE Rate Component** | | |
| 2 | 2026 Base Profit Incentive | 7.10% | Program Cost Rate Element | 3.931% | *($36,479,038 - ∑(G)) / ∑(D)* |
| 3 | 2026 Base Profit Incentive | $ 2,590,012 | Incentive Rate Element | 0.260% | *(∑(H) / ∑(E))* |
| 4 | | | Total | 4.191% | |
| 5 | | | | | |

| Line N0. | (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) | (I) |
|---|---|---|---|---|---|---|---|---|---|
| 7 | | | | *(B) - (C)* | *(B) or 0* | *(D) x 3.931%* | *$75k/ capped customer* | *(E) x 0.260%* | *(F) + (G) + (H)* |
| 8 | **Customer Class** | **Revenue ($)** | **Capped ($)** | **Net Revenue for Program Costs ($)** | **Revenue for Incentive ($)** | **Program Costs From Uncapped($)** | **Program Costs From Capped ($)** | **Energy Efficiency Incentive Recovery ($)** | **Total Revenue ($)** |
| 9 | 1A/1B - Residential | $ 445,288,950 | $ - | $ 445,288,950 | $ 445,288,950 | $ 17,502,614 | $ - | $ 1,159,769 | $ 18,662,382 |
| 10 | 2A/2B - Small Power | $ 115,226,247 | $ - | $ 115,226,247 | $ 115,226,247 | $ 4,529,105 | $ - | $ 300,110 | $ 4,829,216 |
| 11 | 3B - General Power | $ 159,738,793 | $ - | $ 159,738,793 | $ 159,738,793 | $ 6,278,724 | $ - | $ 416,045 | $ 6,694,769 |
| 12 | 3C - General Power (Low Load Factor) | $ 24,233,289 | $ - | $ 24,233,289 | $ 24,233,289 | $ 952,518 | $ - | $ 63,116 | $ 1,015,635 |
| 13 | 4B - Large Power | $ 103,597,068 | $ - | $ 103,597,068 | $ 103,597,068 | $ 4,072,006 | $ - | $ 269,822 | $ 4,341,828 |
| 14 | 5B - Large Service for Customers >=8,000kW | $ 5,096,138 | $ 5,096,138 | $ - | $ 5,096,138 | $ - | $ 75,000 | $ 13,273 | $ 88,273 |
| 15 | 11B - Wtr/Swg Pumping | $ 66,632,503 | $ - | $ 66,632,503 | $ 66,632,503 | $ 2,619,070 | $ - | $ 173,546 | $ 2,792,616 |
| 16 | 15B - Universities 115 kV | $ 4,889,652 | $ 4,889,652 | $ - | $ 4,889,652 | $ - | $ 75,000 | $ 12,735 | $ 87,735 |
| 17 | 30B - Manufacturing (30 MW) | $ 57,715,733 | $ 57,715,733 | $ - | $ 57,715,733 | $ - | $ 75,000 | $ 150,322 | $ 225,322 |
| 18 | 35B - Large Power >=3,000kW | $ 12,007,241 | $ 12,007,241 | $ - | $ 12,007,241 | $ - | $ 300,000 | $ 31,273 | $ 331,273 |
| 19 | **Customer Rate Class Totals** | **$ 994,425,614** | **$ 79,708,765** | **$ 914,716,849** | **$ 994,425,614** | **$ 35,954,038** | **$ 525,000** | **$ 2,590,012** | **$ 39,069,050** |

Copy of the proposed Energy Efficiency Tariff Rider No. 16 effective for year 2024

# PNM Exhibit AC-3

Is contained in the following 4 pages.

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**ELECTRIC SERVICES**

**29th REVISED RIDER NO. 16**
**CANCELING 28th REVISED RIDER NO. 16**

ENERGY EFFICIENCY RIDER



DESCRIPTION: This Energy Efficiency Surcharge is a mechanism for recovery of costs associated with energy efficiency programs approved by the New Mexico Public Regulation Commission. The surcharge may also include the costs associated with removal of disincentives to, and a provision of incentives for, expenditures on energy efficiency and load management measures.

APPLICABILITY: This Rider shall be applicable to all PNM retail customers receiving electric service, with an opportunity to participate in the energy efficiency programs approved by the Commission, except the following: 6, 10A/10B, 20, 33B, and 36B.

APPLICATION: The energy efficiency surcharge shall be added to each customer's bill. The surcharge shall be calculated by multiplying the total charges other than franchise fees and taxes by the surcharge rate approved by the Commission. The Program Plan Costs amount of the energy efficiency surcharge shall not exceed $75,000 per year.

RATES, TERMS AND PROCEDURES:

I. Purpose

This Rider establishes detailed procedures which will permit the Company to recover from its customers Rider No. 16 Amounts as determined and ordered by the Commission to be administered through this mechanism. This mechanism is specific as to Amounts pertaining to Affected Customer Classes.

II. Definitions

The following definitions shall apply to this Rider:

1. Affected Customer Classes: Customer classes subject to Rider No. 16.

2. Amortization Period: The Amortization Period for program costs approved by the Commission will comply with the period specified in the respective Commission Order for each Rider No. 16 Amount.

3. Annual Projected Sales Revenues: Revenues for the Company projected for the Amortization Period, which includes Revenue, excluding franchise fees and taxes, for Affected Customer Class.

4. Billing Cycle: A period of time employed by the Company's billing system and used by the Company to render bills for service to customers. The Company employs twenty-one (21)

Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy & Case Management

GCG#

**PUBLIC SERVICE COMPANY OF NEW MEXICO**
**ELECTRIC SERVICES**

**29th REVISED RIDER NO. 16**
**CANCELING 28th REVISED RIDER NO. 16**

ENERGY EFFICIENCY RIDER



billing cycles, which constitute a billing month and may or may not coincide with a calendar month.

5. M&V Report: The annual monitoring and verification report of the independent evaluator for the prior calendar year.

6. Rider No. 16 Amounts: The dollar amounts of Rider No. 16, shall be approved by the Commission, and will be collected from Electric Service Customers within the Affected Customer Classes. A separate pool of dollar amounts will be set up for each identified component of this rider identifying the dollars to be recovered compared to the actual Dollars recovered for each rider component.

7. Reconciliation Amounts: Consists of Rider No. 16 Amounts that were under-recovered/credited or over-recovered/credited during their respective amortization terms.

8. Electric Service Customer: A customer receiving electric service directly from the Company within the Company's New Mexico service territory.

III. Methodology for Developing and Administering the Rider No. 16 Amounts

1. Effective Date: The date specified by the Commission to begin billing this rate.

2. Rider No. 16 Amounts: The amounts to be collected are approved by the Commission. This mechanism is designed to accommodate only those amounts ordered for collection on a percentage of bill basis whereby the billing factors will be derived using Annual Projected Sales Revenue associated with Electric Service Customers within Affected Customer Classes adjusted for anticipated savings from the energy efficiency programs approved by the Commission.

3. Reconciliation Amounts: Reconciliation Amounts will be summed with and absorbed into existing Rider No. 16 Amounts by pool and will assume that respective amount’s collection conditions and terms. This transaction will be specifically noted and identified in the next subsequent Energy Efficiency Surcharge Factor filing.

IV. Calculation of the Energy Efficiency Surcharge Factors

For purposes of determining the Energy Efficiency Surcharge Factors, each of the Rider No. 16 Amounts, is fully amortized (paid) over their respective periods commencing with the first Billing Cycle of the month following approval of any of the Rider No. 16 Amounts or any alternative effective



/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy & Case Management

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date as determined by the Commission. The total combined Energy Efficiency Surcharge Factor is 3.952 % of Affected Customer Classes bills in 2024. The total Factor is determined as follows: x x

(A) Each Energy Efficiency Surcharge Factor for Customers is determined by dividing the annual recovery amounts by the combined total Annual Projected Sales Revenue for Affected Customer Classes;

(B) Reconciliation Amounts incapable of generating a factor out to five (5) decimal places are summed with and absorbed into existing Rider No. 16 Amounts and their disposition is recognized within the existing factor.

(C) The total combined Energy Efficiency Surcharge Factor is comprised of the following elements for bills beginning with the first billing cycle for January 2024: x

| Rate Element | Amount to be Recovered | Element Rate | |
|---|---|---|---|
| 1) 2024 Total Program Costs | $34,517,198 | 3.707% | x |
| 2) 2022 Budget Reconciliation | $ 649,373 | | x |
| 3) 2024 Net Program Budget (1 + 2) | $35,166,571 | | x |
| 4) 2024 Base Level Incentive (1 x 7.1%) | $ 2,450,721 | 0.246% | x |
| Total (1 + 4) | $36,967,919 | 3.952% | x |

The recovery period will be as specified in the Commission's Final Order approving PNM's energy efficiency plan. x x

The profit incentive may increase in accordance with the methodology approved by the NMPRC based on actual energy savings as verified by the M&V Report.

V. Annual Reconciliation Filings

The Company shall file with the Commission an annual report on its energy efficiency programs. The initial report was due on April 1, 2009, and covered the period from the effective date of Rider No. 16 through December 31, 2008. Subsequent reports shall be filed as required by Commission rule or order. These reports will contain: x

1. Energy Efficiency Surcharge Factor Report: Schedules shall contain sufficient information describing:

   a. A Summary of the Energy Efficiency Surcharge Factors;
   b. Calculation of each Energy Efficiency Surcharge Factor, for each package of programs

Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy & Case Management

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ENERGY EFFICIENCY RIDER



and Incentive/Disincentive Adder Revenues and by each Affected Customer Class;

c. Calculation of the Energy Efficiency Surcharge Factor to be applied for the subsequent 12 months;
d. A Summary of Annual Projected Sales Revenue, less anticipated savings;
e. A Summary consisting of the beginning balance of each Rider No. 16 Amount, the sum total of the annual transactions, and the ending balance; and
f. A detail listing of expenditures and collections for each Rider No. 16 Amount, for each package of programs and Incentive/Disincentive Adder Revenues, by Affected Customer Class.

2. M&V Report: The M&V Report shall be submitted with the annual reconciliation filing as a separate document.

3. Amounts Not Generating a Factor: If the sum of all Rider No. 16 Amounts have been depleted to the extent that an annual factor cannot be calculated out to five (5) decimals, the residual amount will be held by the Company until:

   a. Additional Rider No. 16 Amounts occur and these amounts can be combined with these existing amounts to create an annual factor; or
   b. The disposition of this amount is determined in conjunction with a subsequent proceeding before the Commission.

4. Other Annual Reconciliation Filings Content: The Annual Reconciliation Filings shall contain sufficient information describing:

   a. Any material change in Rider No. 16 Amounts and explanations of the sources of those changes;
   b. Any material difference in respective annual projected kWhs and anticipated savings, and the reasons for any proposed difference; and
   c. The addition/deletion of and to any individual Rider No. 16 Amounts due to accounting adjustments, the M&V Report or other reasons, including a true-up of the Incentive/Disincentive calculation for M & V and performance results.

Advice Notice No. 604

/s/ Mark Fenton
Mark Fenton
Executive Director, Regulatory Policy & Case Management

GCG#

Impact of proposed Rider by Customer Class

# PNM Exhibit AC-4

Is contained in the following 3 pages.

# 2024 Energy Efficiency Rider - Impact of Proposed Rider by Customer Class

| | | (A) | (B) | (C) | (D) | (E) | (F) | (G) |
|---|---|---|---|---|---|---|---|---|
| | | | | | *(B) / (A) x (C) / 12* | | *(B) / (A) x (E) / 12* | *(F) - (D)* |
| Line No. | **Customer Class** | **2024 Average Number of Customers** | **2024 Revenues ($)** | **Current Energy Efficiency Rate ($/kWh)** | **Current Average Monthly Energy Efficiency Charge ($)** | **Proposed 2024 Energy Efficiency Rate ($/kWh)** | **Proposed 2024 Average Monthly Energy Efficiency Charge ($)** | **Proposed 2024 Change in Monthly Average Energy Efficiency Rider Charge ($)** |
| 1 | 1A/1B - Residential | 491,896 | 450,586,604 | 3.396% | $2.59 | 3.952% | $3.02 | $0.42 |
| 2 | 2A/2B - Small Power | 55,343 | 114,149,838 | 3.396% | $5.84 | 3.952% | $6.79 | $0.96 |
| 3 | 3B - General Power | 3,327 | 160,126,079 | 3.396% | $136.20 | 3.952% | $158.51 | $22.32 |
| 4 | 3C - General Power (Low Load Factor) | 824 | 24,568,156 | 3.396% | $84.43 | 3.952% | $98.27 | $13.84 |
| 5 | 4B - Large Power | 165 | 101,388,153 | 3.396% | $1,738.96 | 3.952% | $2,023.92 | $284.96 |
| 6 | 5B - Large Service for Customers >=8,000kW | 1 | 5,093,930 | 3.396% | $6,250.00 | 3.952% | $6,250.00 | $0.00 |
| 7 | 11B - Wtr/Swg Pumping | 151 | 66,243,770 | 3.396% | $1,241.44 | 3.952% | $1,444.87 | $203.43 |
| 8 | 15B - Universities 115 kV | 1 | 4,911,905 | 3.396% | $6,250.00 | 3.952% | $6,250.00 | $0.00 |
| 9 | 30B - Manufacturing (30 MW) | 1 | 57,715,733 | 3.396% | $6,250.00 | 3.952% | $6,250.00 | $0.00 |
| 10 | 35B - Large Power >=3,000kW | 4 | 12,016,597 | 3.396% | $6,044.49 | 3.952% | $6,250.00 | $205.51 |

# 2025 Energy Efficiency Rider - Impact of Proposed Rider by Customer Class

| Line No. | Customer Class | 2025 Average Number of Customers | 2025 Revenues ($) | Current Energy Efficiency Rate ($/kWh) | Current Average Monthly Energy Efficiency Charge ($) | Proposed 2025 Energy Efficiency Rate ($/kWh) | Proposed 2025 Average Monthly Energy Efficiency Charge ($) | Proposed 2025 Change in Monthly Average Energy Efficiency Rider Charge ($) |
|---|---|---|---|---|---|---|---|---|
| | | (A) | (B) | (C) | (D) | (E) | (F) | (G) |
| | | | | | *(B) / (A) x (C) / 12* | | *(B) / (A) x (E) / 12* | *(F) - (D)* |
| 1 | 1A/1B - Residential | 497,505 | 447,343,690 | 3.396% | $2.54 | 4.058% | $3.04 | $0.50 |
| 2 | 2A/2B - Small Power | 55,950 | 114,685,632 | 3.396% | $5.80 | 4.058% | $6.93 | $1.13 |
| 3 | 3B - General Power | 3,343 | 159,970,895 | 3.396% | $135.41 | 4.058% | $161.79 | $26.38 |
| 4 | 3C - General Power (Low Load Factor) | 824 | 24,406,009 | 3.396% | $83.87 | 4.058% | $100.21 | $16.34 |
| 5 | 4B - Large Power | 165 | 102,891,457 | 3.396% | $1,760.90 | 4.058% | $2,103.96 | $343.06 |
| 6 | 5B - Large Service for Customers >=8,000kW | 1 | 5,096,138 | 3.396% | $6,250.00 | 4.058% | $6,250.00 | $0.00 |
| 7 | 11B - Wtr/Swg Pumping | 151 | 66,320,228 | 3.396% | $1,242.87 | 4.058% | $1,485.01 | $242.14 |
| 8 | 15B - Universities 115 kV | 1 | 4,893,855 | 3.396% | $6,250.00 | 4.058% | $6,250.00 | $0.00 |
| 9 | 30B - Manufacturing (30 MW) | 1 | 57,715,733 | 3.396% | $6,250.00 | 4.058% | $6,250.00 | $0.00 |
| 10 | 35B - Large Power >=3,000kW | 4 | 12,007,241 | 3.396% | $6,039.78 | 4.058% | $6,250.00 | $210.22 |

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# 2026 Energy Efficiency Rider - Impact of Proposed Rider by Customer Class

| | | (A) | (B) | (C) | (D) | (E) | (F) | (G) |
|---|---|---|---|---|---|---|---|---|
| | | | | | *(B) / (A) x (C) / 12* | | *(B) / (A) x (E) / 12* | *(F) - (D)* |
| Line No. | **Customer Class** | **2026 Average Number of Customers** | **2026 Revenues ($)** | **Current Energy Efficiency Rate ($/kWh)** | **Current Average Monthly Energy Efficiency Charge ($)** | **Proposed 2026 Energy Efficiency Rate ($/kWh)** | **Proposed 2026 Average Monthly Energy Efficiency Charge ($)** | **Proposed 2026Change in Monthly Average Energy Efficiency Rider Charge ($)** |
| 1 | 1A/1B - Residential | 501,339 | 445,288,950 | 3.396% | $2.51 | 4.191% | $3.10 | $0.59 |
| 2 | 2A/2B - Small Power | 56,388 | 115,226,247 | 3.396% | $5.78 | 4.191% | $7.14 | $1.35 |
| 3 | 3B - General Power | 3,354 | 159,738,793 | 3.396% | $134.78 | 4.191% | $166.34 | $31.56 |
| 4 | 3C - General Power (Low Load Factor) | 824 | 24,233,289 | 3.396% | $83.28 | 4.191% | $102.78 | $19.50 |
| 5 | 4B - Large Power | 166 | 103,597,068 | 3.396% | $1,769.23 | 4.191% | $2,183.45 | $414.21 |
| 6 | 5B - Large Service for Customers >=8,000kW | 1 | 5,096,138 | 3.396% | $6,250.00 | 4.191% | $6,250.00 | $0.00 |
| 7 | 11B - Wtr/Swg Pumping | 151 | 66,632,503 | 3.396% | $1,248.73 | 4.191% | $1,541.08 | $292.35 |
| 8 | 15B - Universities 115 kV | 1 | 4,889,652 | 3.396% | $6,250.00 | 4.191% | $6,250.00 | $0.00 |
| 9 | 30B - Manufacturing (30 MW) | 1 | 57,715,733 | 3.396% | $6,250.00 | 4.191% | $6,250.00 | $0.00 |
| 10 | 35B - Large Power >=3,000kW | 4 | 12,007,241 | 3.396% | $6,039.78 | 4.191% | $6,250.00 | $210.22 |

Proposed Energy Efficiency Plan Profit Incentive

# PNM Exhibit AC-5

Is contained in the following 1 page.

## Calculation of PNM's Proposed 2021, 2022, and 2023 EE Plan Profit Incentive

| Line | Program Year | 2024 | 2025 | 2026 |
|---|---|---|---|---|
| 1 | **Program Costs** | $ 34,517,198 | $ 35,367,236 | $ 36,479,038 |
| 2 | **Base Profit Incentive (%)** | 7.10% | 7.10% | 7.10% |
| 3 | **Base Profit Incentive (L1 x L2) ($)** | $ 2,450,721 | $ 2,511,074 | $ 2,590,012 |
| 4 | | | | |

| Line | (A) | (B) | (C) | (D) | (E) | (F) | |
|---|---|---|---|---|---|---|---|
| 6 | | | *L2 + (B)* | *L1 x (C)* | *L1 x (C)* | *L1 x (C)* | **WACC** 10.73% |
| 7 | | | | | | | |
| 8 | **Annual Energy Savings (GWh)** | **Sliding Scale Increment (%)** | **Incentive as a Percentage of Total Program Costs (%)** | **2024 Total Potential Incentive ($)** | **2025 Total Potential Incentive ($)** | **2026 Total Potential Incentive ($)** | **Sliding Scale** |
| 9 | 80 | 0.000% | 7.100% | $ 2,450,721 | $ 2,511,074 | $ 2,590,012 | 0.000% |
| 10 | 81 | 0.125% | 7.225% | $ 2,493,868 | $ 2,555,283 | $ 2,635,610 | 0.125% |
| 11 | 82 | 0.250% | 7.350% | $ 2,537,014 | $ 2,599,492 | $ 2,681,209 | 0.125% |
| 12 | 83 | 0.375% | 7.475% | $ 2,580,161 | $ 2,643,701 | $ 2,726,808 | 0.125% |
| 13 | 84 | 0.500% | 7.600% | $ 2,623,307 | $ 2,687,910 | $ 2,772,407 | 0.125% |
| 14 | 85 | 0.625% | 7.725% | $ 2,666,454 | $ 2,732,119 | $ 2,818,006 | 0.125% |
| 15 | 86 | 0.800% | 7.900% | $ 2,726,859 | $ 2,794,012 | $ 2,881,844 | 0.175% |
| 16 | 87 | 0.975% | 8.075% | $ 2,787,264 | $ 2,855,904 | $ 2,945,682 | 0.175% |
| 17 | 88 | 1.150% | 8.250% | $ 2,847,669 | $ 2,917,797 | $ 3,009,521 | 0.175% |
| 18 | 89 | 1.325% | 8.425% | $ 2,908,074 | $ 2,979,690 | $ 3,073,359 | 0.175% |
| 19 | 90 | 1.500% | 8.600% | $ 2,968,479 | $ 3,041,582 | $ 3,137,197 | 0.175% |
| 20 | 91 | 1.725% | 8.825% | $ 3,046,143 | $ 3,121,159 | $ 3,219,275 | 0.225% |
| 21 | 92 | 1.950% | 9.050% | $ 3,123,806 | $ 3,200,735 | $ 3,301,353 | 0.225% |
| 22 | 93 | 2.175% | 9.275% | $ 3,201,470 | $ 3,280,311 | $ 3,383,431 | 0.225% |
| 23 | 94 | 2.400% | 9.500% | $ 3,279,134 | $ 3,359,887 | $ 3,465,509 | 0.225% |
| 24 | 95 | 2.625% | 9.725% | $ 3,356,798 | $ 3,439,464 | $ 3,547,586 | 0.225% |
| 25 | 96 | 2.850% | 9.950% | $ 3,434,461 | $ 3,519,040 | $ 3,629,664 | 0.225% |
| 26 | 97 | 3.075% | 10.175% | $ 3,512,125 | $ 3,598,616 | $ 3,711,742 | 0.225% |
| 27 | 98 | 3.300% | 10.400% | $ 3,589,789 | $ 3,678,193 | $ 3,793,820 | 0.225% |
| 28 | 99 | 3.525% | 10.625% | $ 3,667,452 | $ 3,757,769 | $ 3,875,898 | 0.225% |
| 29 | 100 | 3.750% | 10.730% | $ 3,703,695 | $ 3,794,904 | $ 3,914,201 | 0.225% |

Rider Impacts for Selected Customer Classes

# PNM Exhibit AC-6

Is contained in the following 3 pages.

# PNM
## 2024 Plan Energy Efficiency Rider No. 16
## Rider Impacts Calculation for Selected Rate Classes

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | PNM<br>Residential Schedule 1A | | | | |
| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2024 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
| 1 | 0 | $7.11 | 3.396% | $0.24 | 3.952% | $0.28 | $0.04 |
| 2 | 50 | $12.88 | 3.396% | $0.44 | 3.952% | $0.51 | $0.07 |
| 3 | 100 | $18.65 | 3.396% | $0.63 | 3.952% | $0.74 | $0.11 |
| 4 | 150 | $24.43 | 3.396% | $0.83 | 3.952% | $0.97 | $0.14 |
| 5 | 200 | $30.20 | 3.396% | $1.03 | 3.952% | $1.19 | $0.16 |
| 6 | 250 | $35.97 | 3.396% | $1.22 | 3.952% | $1.42 | $0.20 |
| 7 | 300 | $41.74 | 3.396% | $1.42 | 3.952% | $1.65 | $0.23 |
| 8 | 400 | $53.29 | 3.396% | $1.81 | 3.952% | $2.11 | $0.30 |
| 9 | 500 | $66.50 | 3.396% | $2.26 | 3.952% | $2.63 | $0.37 |
| 10 | 600 | $81.38 | 3.396% | $2.76 | 3.952% | $3.22 | $0.46 |
| 11 | 750 | $103.70 | 3.396% | $3.52 | 3.952% | $4.10 | $0.58 |
| 12 | 800 | $111.14 | 3.396% | $3.77 | 3.952% | $4.39 | $0.62 |
| 13 | 900 | $126.01 | 3.396% | $4.28 | 3.952% | $4.98 | $0.70 |
| 14 | 1,000 | $142.63 | 3.396% | $4.84 | 3.952% | $5.64 | $0.80 |
| 15 | 1,200 | $175.87 | 3.396% | $5.97 | 3.952% | $6.95 | $0.98 |
| 16 | 1,600 | $242.33 | 3.396% | $8.23 | 3.952% | $9.58 | $1.35 |
| 17 | 2,000 | $308.80 | 3.396% | $10.49 | 3.952% | $12.21 | $1.72 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | PNM<br>Small Power Schedule 2A | | | | |
| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2024 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
| 18 | 0 | $15.77 | 3.396% | $0.54 | 3.952% | $0.62 | $0.09 |
| 19 | 500 | $82.85 | 3.396% | $2.81 | 3.952% | $3.27 | $0.46 |
| 20 | 1,000 | $149.93 | 3.396% | $5.09 | 3.952% | $5.93 | $0.83 |
| 21 | 1,500 | $217.01 | 3.396% | $7.37 | 3.952% | $8.58 | $1.21 |
| 22 | 2,000 | $284.09 | 3.396% | $9.65 | 3.952% | $11.23 | $1.58 |
| 23 | 3,000 | $418.25 | 3.396% | $14.20 | 3.952% | $16.53 | $2.33 |
| 24 | 4,000 | $552.41 | 3.396% | $18.76 | 3.952% | $21.83 | $3.07 |
| 25 | 5,000 | $686.58 | 3.396% | $23.32 | 3.952% | $27.14 | $3.82 |
| 26 | 7,000 | $954.90 | 3.396% | $32.43 | 3.952% | $37.74 | $5.31 |
| 27 | 9,000 | $1,223.22 | 3.396% | $41.54 | 3.952% | $48.35 | $6.81 |
| 28 | 12,000 | $1,625.70 | 3.396% | $55.21 | 3.952% | $64.26 | $9.05 |
| 29 | 15,000 | $2,028.19 | 3.396% | $68.88 | 3.952% | $80.16 | $11.29 |

PNM
2025 Plan Energy Efficiency Rider No. 16
Rider Impacts Calculation for Selected Rate Classes

PNM
Residential Schedule 1A

| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2025 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
|---|---|---|---|---|---|---|---|
| 1 | 0 | $7.11 | 3.396% | $0.24 | 4.058% | $0.29 | $0.05 |
| 2 | 50 | $12.88 | 3.396% | $0.44 | 4.058% | $0.52 | $0.08 |
| 3 | 100 | $18.65 | 3.396% | $0.63 | 4.058% | $0.76 | $0.13 |
| 4 | 150 | $24.43 | 3.396% | $0.83 | 4.058% | $0.99 | $0.16 |
| 5 | 200 | $30.20 | 3.396% | $1.03 | 4.058% | $1.23 | $0.20 |
| 6 | 250 | $35.97 | 3.396% | $1.22 | 4.058% | $1.46 | $0.24 |
| 7 | 300 | $41.74 | 3.396% | $1.42 | 4.058% | $1.69 | $0.27 |
| 8 | 400 | $53.29 | 3.396% | $1.81 | 4.058% | $2.16 | $0.35 |
| 9 | 500 | $66.50 | 3.396% | $2.26 | 4.058% | $2.70 | $0.44 |
| 10 | 600 | $81.38 | 3.396% | $2.76 | 4.058% | $3.30 | $0.54 |
| 11 | 750 | $103.70 | 3.396% | $3.52 | 4.058% | $4.21 | $0.69 |
| 12 | 800 | $111.14 | 3.396% | $3.77 | 4.058% | $4.51 | $0.74 |
| 13 | 900 | $126.01 | 3.396% | $4.28 | 4.058% | $5.11 | $0.83 |
| 14 | 1,000 | $142.63 | 3.396% | $4.84 | 4.058% | $5.79 | $0.95 |
| 15 | 1,200 | $175.87 | 3.396% | $5.97 | 4.058% | $7.14 | $1.17 |
| 16 | 1,600 | $242.33 | 3.396% | $8.23 | 4.058% | $9.83 | $1.60 |
| 17 | 2,000 | $308.80 | 3.396% | $10.49 | 4.058% | $12.53 | $2.04 |

PNM
Small Power Schedule 2A

| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2025 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
|---|---|---|---|---|---|---|---|
| 18 | 0 | $15.77 | 3.396% | $0.54 | 4.058% | $0.64 | $0.10 |
| 19 | 500 | $82.85 | 3.396% | $2.81 | 4.058% | $3.36 | $0.55 |
| 20 | 1,000 | $149.93 | 3.396% | $5.09 | 4.058% | $6.08 | $0.99 |
| 21 | 1,500 | $217.01 | 3.396% | $7.37 | 4.058% | $8.81 | $1.44 |
| 22 | 2,000 | $284.09 | 3.396% | $9.65 | 4.058% | $11.53 | $1.88 |
| 23 | 3,000 | $418.25 | 3.396% | $14.20 | 4.058% | $16.97 | $2.77 |
| 24 | 4,000 | $552.41 | 3.396% | $18.76 | 4.058% | $22.41 | $3.65 |
| 25 | 5,000 | $686.58 | 3.396% | $23.32 | 4.058% | $27.86 | $4.54 |
| 26 | 7,000 | $954.90 | 3.396% | $32.43 | 4.058% | $38.75 | $6.32 |
| 27 | 9,000 | $1,223.22 | 3.396% | $41.54 | 4.058% | $49.63 | $8.09 |
| 28 | 12,000 | $1,625.70 | 3.396% | $55.21 | 4.058% | $65.96 | $10.76 |
| 29 | 15,000 | $2,028.19 | 3.396% | $68.88 | 4.058% | $82.30 | $13.42 |

PNM
2026 Plan Energy Efficiency Rider No. 16
Rider Impacts Calculation for Selected Rate Classes

PNM
Residential Schedule 1A

| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2026 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
|---|---|---|---|---|---|---|---|
| 1 | 0 | $7.11 | 3.396% | $0.24 | 4.191% | $0.30 | $0.06 |
| 2 | 50 | $12.88 | 3.396% | $0.44 | 4.191% | $0.54 | $0.10 |
| 3 | 100 | $18.65 | 3.396% | $0.63 | 4.191% | $0.78 | $0.15 |
| 4 | 150 | $24.43 | 3.396% | $0.83 | 4.191% | $1.02 | $0.19 |
| 5 | 200 | $30.20 | 3.396% | $1.03 | 4.191% | $1.27 | $0.24 |
| 6 | 250 | $35.97 | 3.396% | $1.22 | 4.191% | $1.51 | $0.29 |
| 7 | 300 | $41.74 | 3.396% | $1.42 | 4.191% | $1.75 | $0.33 |
| 8 | 400 | $53.29 | 3.396% | $1.81 | 4.191% | $2.23 | $0.42 |
| 9 | 500 | $66.50 | 3.396% | $2.26 | 4.191% | $2.79 | $0.53 |
| 10 | 600 | $81.38 | 3.396% | $2.76 | 4.191% | $3.41 | $0.65 |
| 11 | 750 | $103.70 | 3.396% | $3.52 | 4.191% | $4.35 | $0.83 |
| 12 | 800 | $111.14 | 3.396% | $3.77 | 4.191% | $4.66 | $0.89 |
| 13 | 900 | $126.01 | 3.396% | $4.28 | 4.191% | $5.28 | $1.00 |
| 14 | 1,000 | $142.63 | 3.396% | $4.84 | 4.191% | $5.98 | $1.14 |
| 15 | 1,200 | $175.87 | 3.396% | $5.97 | 4.191% | $7.37 | $1.40 |
| 16 | 1,600 | $242.33 | 3.396% | $8.23 | 4.191% | $10.16 | $1.93 |
| 17 | 2,000 | $308.80 | 3.396% | $10.49 | 4.191% | $12.94 | $2.45 |

PNM
Small Power Schedule 2A

| Line No. | Usage (kWh) | Bill ($) | Current EE Rider Rate ($/kWh) | Current Monthly EE Rider Charge ($) | Proposed 2026 EE Total Rider Rate ($/kWh) | Proposed Monthly EE Rider Charge ($) | Proposed Change in EE Monthly EE Charge ($) |
|---|---|---|---|---|---|---|---|
| 18 | 0 | $15.77 | 3.396% | $0.54 | 4.191% | $0.66 | $0.13 |
| 19 | 500 | $82.85 | 3.396% | $2.81 | 4.191% | $3.47 | $0.66 |
| 20 | 1,000 | $149.93 | 3.396% | $5.09 | 4.191% | $6.28 | $1.19 |
| 21 | 1,500 | $217.01 | 3.396% | $7.37 | 4.191% | $9.10 | $1.73 |
| 22 | 2,000 | $284.09 | 3.396% | $9.65 | 4.191% | $11.91 | $2.26 |
| 23 | 3,000 | $418.25 | 3.396% | $14.20 | 4.191% | $17.53 | $3.33 |
| 24 | 4,000 | $552.41 | 3.396% | $18.76 | 4.191% | $23.15 | $4.39 |
| 25 | 5,000 | $686.58 | 3.396% | $23.32 | 4.191% | $28.77 | $5.46 |
| 26 | 7,000 | $954.90 | 3.396% | $32.43 | 4.191% | $40.02 | $7.59 |
| 27 | 9,000 | $1,223.22 | 3.396% | $41.54 | 4.191% | $51.27 | $9.73 |
| 28 | 12,000 | $1,625.70 | 3.396% | $55.21 | 4.191% | $68.13 | $12.93 |
| 29 | 15,000 | $2,028.19 | 3.396% | $68.88 | 4.191% | $85.00 | $16.13 |

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | **Case No. 23-00XXX-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

**SELF AFFIRMATION**

**ABRAHAM CASAS, Senior Pricing Analyst, Public Service Company of New Mexico,** upon penalty of perjury under the laws of the State of New Mexico, affirm and state: I have read the foregoing **Direct Testimony of Abraham Casas.** and it is true and accurate based on my own personal knowledge and belief.

Dated this 17th day of April, 2023.

/s/ Abraham Casas
**ABRAHAM CASAS**

*GCG # 530742*

**BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION**

| | | |
|---|---|---|
| **IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR APPROVAL OF ITS 2024 ELECTRIC ENERGY EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE AND REVISED RIDER NO. 16 PURSUANT TO THE NEW MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF ENERGY ACT AND ENERGY EFFICIENCY RULE,** | ) | **Case No. 23-00___-UT** |
| **PUBLIC SERVICE COMPANY OF NEW MEXICO,** | ) | |
| **Applicant.** | ) | |

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the **Application of Public Service Company of New Mexico for Approval of 2024 Electric Energy Efficiency and Load Management Program Plan, Profit Incentive, and Revisions to Tariff Rider No. 16** was emailed to parties listed below on April 17, 2023.

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Dated this 17th day of April, 2023.

By: /s/Steven Schwebke
Steven Schwebke, Senior Project Manager
PNM Regulatory Policy & Case Management
Public Service Company of New Mexico