

**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. 23-00138-UT**

**DIRECT TESTIMONY**

**ON BEHALF OF THE OFFICE OF THE ATTORNEY GENERAL**

**KENJI TAKAHASHI**

**SEPTEMBER 18, 2023**

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1 **1. INTRODUCTION AND PURPOSE OF TESTIMONY**

2 Q **Please state your name and occupation.**

3 A My name is Kenji Takahashi. I am a Senior Associate at Synapse Energy  
4 Economics, Inc. (“Synapse”). My business address is 485 Massachusetts Avenue,  
5 Suite 3, Cambridge, Massachusetts 02139.

6 Q **Please describe Synapse Energy Economics.**

7 A Synapse is a research and consulting firm specializing in energy and  
8 environmental issues, including electric generation, transmission and distribution  
9 system reliability, ratemaking and rate design, electric industry restructuring and  
10 market power, electricity market prices, stranded costs, efficiency, renewable  
11 energy, environmental quality, and nuclear power.

12 Synapse’s clients include state consumer advocates, public utilities commission  
13 staff, attorneys general, environmental organizations, federal government  
14 agencies, and utilities.

15 Q **Please summarize your work experience and educational background.**

16 A Since joining Synapse in 2004, I have worked on decarbonization planning,  
17 programs, and technologies across the energy sector, with a particular focus on  
18 the energy, economic, and environmental impacts of building decarbonization  
19 measures—including energy efficiency, demand response and other distributed  
20 energy resources (DERs).

21

1 Over the past 19 years, I have assessed the design, impact, and potential of energy  
2 efficiency, demand response, and distributed energy resources policies and  
3 programs in over 40 jurisdictions across North America for a variety of clients.  
4 These include environmental groups; municipal, state, and provincial  
5 governments; and federal agencies such as U.S. Environmental Protection Agency  
6 and U.S. Department of Energy. I assessed numerous energy efficiency and  
7 demand response potential studies and conducted a meta-analysis of potential  
8 studies on behalf of U.S. EPA. I was also the lead author of the best practice  
9 reports on energy efficiency programs on behalf of Ontario Energy Board and  
10 Prince Edward Island Regulatory and Appeals Commission. Further in 2019, I led  
11 the analysis of energy efficiency and demand response potential as part of  
12 solutions to mitigate the expected rate impacts from the Muskrat Falls Project on  
13 behalf of the Newfoundland and Labrador Public Utilities Board.

14 I hold a Master's in Urban Affairs and Public Policy with a concentration in  
15 Energy and Environmental Policy from the Biden School of Public Policy and  
16 Administration at the University of Delaware. I also recently completed the  
17 Massachusetts Institute of Technology's online program "Sustainable  
18 Infrastructure Systems: Planning and Operations."

19 A copy of my current resume is attached as OAG Exhibit KT-1.

20 **Q On whose behalf are you testifying in this case?**

21 **A** I am testifying on behalf of the New Mexico Office of Attorney General  
22 ("NMAG").

1 Q **Have you previously testified in regulatory proceedings in New Mexico?**

2 A Yes. I testified on behalf of the NMAG in NMPRC Case No. 22-00232-UT, the  
3 Application of New Mexico Gas Company, Inc. for Approval of its 2023–2025  
4 Energy Efficiency Program.

5 Q **Have other expert witnesses from Synapse previously testified in regulatory  
6 proceedings in New Mexico on behalf of the NMAG?**

7 A Yes. Jennifer Kallay also testified in NMPRC Case No. 22-00232-UT.  
8 Additionally, I have included a list of other Synapse experts who testified in other  
9 matters before the NMPRC on behalf of the NMAG.

Case No	Date Filed	Name of Expert	Matter
Case No. 21-00269-UT	5/11/2022	Courtney Lane	Application of El Paso Electric Company for Approval of a Grid Modernization Project to Implement an Advanced Metering System Project
Case No. 21-00178-UT	10/11/2022	Courtney Lane	Application of Southwestern Public Service Company for Authorization to Implement Grid Modernization Components
Case No. 22-00232-UT	11/30/2022	Jennifer Kallay	Application of New Mexico Gas Company, Inc. for Approval of its 2023–2025 Energy Efficiency Program
Case No. 22-00093-UT	1/9/2023	Devi Glick	Application for Approval of El Paso Electric Company's 2022 Renewable Energy Act Plan pursuant to the Renewable Energy Act and 17.9.572 NMAC, and Sixth Rate Revised Rate No. RPS Cost Rider
Case Nos. 19-00099-UT and 19-00348-UT	1/23/2023	Devi Glick	In the matter of El Paso Electric Company's Amended Application for Approval of its Amended 2019 Renewable Energy Act Plan and 2020 Renewable Energy Act Plan pursuant to the Renewable Energy Act and 17.9.572 NMAC, and Third Revised Rate no.38 - RPS Cost Rider.
Case No. 22-00058-UT	1/27/2023	Courtney Lane	Application of Public Service Company of New Mexico for Authorization to Implement Grid Modernization Components

10

11 Q **Have you testified on a similar topic before a state or provincial commission  
12 in other jurisdictions?**

13 A Yes. I have testified regarding energy efficiency and demand response program  
14 assessments before the New Jersey Board of Public Utilities, the Maryland Public

1 Service Commission, the Massachusetts Department of Public Utilities, the Nova  
2 Scotia Utility and Review Board, and the Ontario Energy Board.

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

4 **A** NMAG retained Synapse to review the Public Service Company of New Mexico  
5 (“PNM” or “Company”) Application for approval of its 2024–2026 Energy  
6 Efficiency and Load Management Plan (“2024–2026 EE and LM Plan”) and  
7 provide recommendations to the New Mexico Public Regulation Commission  
8 (“NMPRC” or “Commission”). To this end, I reviewed the 2024–2026 EE and  
9 LM Plan and assessed whether it is in the interest of the residential and small  
10 business customers of PNM and in the public interest of the state of New Mexico.  
11 The purpose of my testimony is to provide a summary of key findings from my  
12 review of the 2024–2026 EE and LM Plan and recommendations for  
13 improvement.

14 **Q How is this testimony structured?**

15 **A** Section 2 summarizes key findings and recommendations.

16 Section 3 provides an overview of PNM’s proposed 2024–2026 EE and LM Plan.

17 Section 4 reviews cost-effectiveness.

18 Section 5 addresses federal incentives.

19 Section 6 discusses electrification.

20 Section 7 concerns low-income and Justice40 energy efficiency investments.

21 Section 8 discusses demand response.



1 Q **What documents did you rely upon for your findings and recommendations?**

2 A The sources for this testimony are the 2024–2026 EE and LM Plan, the *Efficient*  
3 *Use of Energy Act* 62-17 Sections 1 through 11, PNM’s 2022 Energy Efficiency  
4 Potential Study, PNM’s 2020 Energy Efficiency and Demand Response Potential  
5 Studies, PNM’s responses to discovery requests, Synapse testimony in NMPRC  
6 Case No. 22-00232-UT, the Hearing Examiners’ recommended decisions  
7 concerning PNM’s demand response programs in Case No. 19-00195-UT and  
8 Case No. 20-00182-UT, the Application of New Mexico Gas Company, Inc. for  
9 Approval of its 2023–2025 Energy Efficiency Program, and my personal  
10 knowledge and experience with energy efficiency and demand response programs  
11 in other jurisdictions.

12 I have submitted additional discovery to PNM, and I note topic areas throughout  
13 this testimony on which I have asked the Company additional questions. NMAG  
14 hopes to be granted leave to supplement this testimony based on the Company’s  
15 responses.

16 **2. KEY FINDINGS AND RECOMMENDATIONS**

17 Q **What are your primary findings concerning PNM’s 2024–2026 EE and LM**  
18 **Plan?**

19 A My primary findings are as follows:

- 20 1. PNM’s utility cost test (“UCT”) is missing some costs and benefits, in  
21 particular utility performance incentive costs, avoided costs of complying  
22 with the Renewable Portfolio Standard, avoided credit and collection  
23 costs, reduced risk, and increased reliability. The likely net impact of  
24 excluding these costs and benefits is that PNM is underestimating the

1 benefits of the proposed EE and LM Plan. This also means that it is likely  
2 that the EE and LM Plan is excluding some of the energy efficiency and  
3 demand response measures that would be cost-effective if those missing  
4 costs and benefits were included.

5 2. PNM’s plan does not assess whether its programs are designed to provide  
6 every affected customer class with the opportunity to participate and  
7 benefit economically.

8 3. Despite the fact that PNM was required by the Commission in Case 20-  
9 00087-UT to conduct a transmission and distribution (“T&D”) avoided  
10 cost study and update the proxy value for this benefit in the Company’s  
11 UCT calculation PNM did not conduct the study and proposes to continue  
12 using a proxy value for the avoided T&D costs.

13 4. The 2024–2026 EE and LM Plan does not account for new federal  
14 incentives which will materialize during the three-year period.

15 5. The proposed All-Electric New Homes pilot program would promote  
16 electrification measures and avoid building homes using fossil-fuel-based  
17 appliances. This would help the state reduce greenhouse gas emissions  
18 from the building sector and meet the state’s greenhouse gas reduction  
19 target established by Governor Michelle Lujan Grisham’s Executive Order  
20 2019-003 in 2019. However, this pilot does not provide sufficient support  
21 for heat pumps, in particular cold-climate heat pumps. Further, the  
22 proposed pilot would target only new construction homes and would not  
23 support any customers who are considering replacing their existing fossil  
24 combustion appliances (e.g., gas or propane furnace) to energy-efficient  
25 electric appliances (e.g., heat pumps).

- 1           6. The backlog in PNM’s Energy Smart Mortgage Finance Authority  
2            (“MFA”) program is substantial and indicates that some of the state’s most  
3            vulnerable customers are paying to support the energy efficiency programs  
4            and not being served. This backlog is not acceptable and needs to be  
5            addressed.
- 6           7. No information is available on the extent to which the plan encourages  
7            participation by customers in Justice40 communities; these are  
8            communities the federal government has prioritized for federal funding.
- 9           8. PNM lacks plans for additional demand response programs despite (a) a  
10          Commission Order in Case No. 19-00195-UT that directed it to procure 24  
11          MW of load reductions through new demand response programs and (b)  
12          recent demand response potential studies including PNM’s own study  
13          prepared by Applied Energy Group in 2020, which found more demand  
14          response potential from new demand response measures and technologies.  
15          Instead of complying with the Order, PNM has stated that it will propose  
16          demand response in its Integrated Resource Plan (“IRP”), which will delay  
17          review and implementation.

18    **Q     What recommendations do you make regarding your findings on the 2024–**  
19    **2026 EE and LM Plan?**

20    **A     My recommendations concerning PNM’s EE and LM Plan include the following:**

- 21           1. I recommend PNM include missing costs and benefits in its UCT benefit-  
22            cost calculation.
- 23           2. I recommend PNM begin to collect participant cost and benefit data to  
24            assess whether its programs are designed to provide every affected

1 customer class with the opportunity to participate and benefit  
2 economically. I also recommend that the Commission modify its cost-  
3 effectiveness testing framework to support achievement of state climate  
4 goals and to address the *Efficient Use of Energy Act's* (“EUEA”) requirements that the portfolio of programs be “designed to provide every  
5 affected customer class with the opportunity to participate and benefit  
6 economically.”  
7

8 3. I recommend that PNM should conduct a study to update the proxy values  
9 it is using for avoided T&D costs. I also recommend PNM use a period of  
10 at least 10 years for gathering historical T&D investments and estimating  
11 avoided T&D costs.

12 4. Regarding federal incentives available from the *Inflation Reduction Act*  
13 (“IRA”), I recommend:

- 14       ▪ PNM develop a robust marketing strategy and materials to educate  
15       its customers on available federal incentives from the IRA and  
16       encourage them to take advantage of the funding.
- 17       ▪ PNM establish a stakeholder working group to discuss (a)  
18       coordination with the state, customers, and trade allies on  
19       implementation of federal incentives and (b) modification of utility  
20       incentives or program designs to take advantage of the federal  
21       incentives.
- 22       ▪ PNM file an updated version of this plan with adjustments to  
23       participation, incentives, and incentive budgets to incorporate new  
24       federal incentives.

- 1           5. I recommend that PNM’s 2024–2026 EE and LM plan should do more to  
2           support electrification as follows:
- 3                   ▪ Within the proposed All Electric New Homes Pilot, PNM should  
4                   offer additional bonus incentives for cold-climate heat pumps to  
5                   encourage the adoption of this new technology in the region.
  - 6                   ▪ PNM should monitor and track the following metrics for the  
7                   performance of heat pumps in the All-Electric New Homes Pilot:  
8                   hourly kW loads, heating capability, seasonal electric  
9                   consumption, and the efficiency of heat pumps in terms of  
10                  coefficient of performance (“COP”). Further, I recommend PNM  
11                  conduct a participation survey on the following: the program  
12                  incentive levels, motivations to participate in the pilot program,  
13                  satisfaction with the installation, and operation of the installed  
14                  measures including air-source heat pumps (“ASHP”).
  - 15                  ▪ PNM should implement an electrification pilot program targeting  
16                  retrofits for low-income customers. I further recommend that PNM  
17                  offer two types of assistance in this low-income electrification  
18                  pilot program: (a) financial incentives in terms of rebates or/and  
19                  zero-interest financing; (b) technical assistance (e.g., turnkey  
20                  solution that takes care of the entire process from contractor  
21                  selection to measure installation).
- 22           6. Following the New Mexico Gas Company’s recent agreement with the  
23           Office of the Attorney General and MFA in Case No. 22-00232-UT, I  
24           recommend that PNM update its Energy Smart MFA program by: (a)  
25           adjusting the spending per customer to allocate some funds to address pre-

1 weatherization barriers and (b) not applying cost-effectiveness  
2 requirements to individual measures.

3 7. I recommend that PNM identify Justice40 communities and provide  
4 baselines and targets for Justice40 communities in its 2024–2026 EE and  
5 LM Plan. PNM should list the Justice40 communities in its 2024–2026 EE  
6 and LM Plan. PNM should report 2023 actual performance on spending,  
7 savings, and benefits for Justice40 communities in its 2023 Annual  
8 Report. PNM should use that baseline to develop spending, savings, and  
9 benefits targets for 2024, 2025, and 2026 and incorporate these targets into  
10 its 2024–2026 EE and LM Plan.

11 8. I recommend that PNM propose new, incremental demand response  
12 efforts prior to the IRP. I recommend that PNM begin to fulfill its  
13 obligation to provide 24 MW of new, incremental demand response by  
14 proposing new and/or pilot programs to capitalize on emerging  
15 opportunities for electric vehicles, batteries, and heat pump water heaters.  
16 Other jurisdictions in this region have implemented programs focused on  
17 these newer technologies and PNM should leverage the designs of these  
18 programs.

19 **3. 2024–2026 EE AND LM PLAN OVERVIEW**

20 **Q Please summarize PNM’s 2024–2026 EE and LM Plan budgets.**

21 **A** PNM proposes annual budgets of \$34.5 million, \$35.4 million, and \$36.5 million  
22 for the 2024–2026 EE and LM Plan, for a total of \$106.4 million over the three  
23 years of the plan. The budget equates to 4.01 percent of customer bills in 2024,  
24 4.11 percent in 2025, and 4.24 percent in 2026, and complies with the minimum

1           of 3 percent and no more than 5 percent program funding requirement of Section  
2           62-17-13 6(A) of the EUEA.

3           Table 1 below summarizes the budgets proposed in 2023 as compared to the  
4           proposed budgets for 2024–2026 by program and in total. PNM’s budget  
5           represents 17 percent, 20 percent, and 23 percent increases over the 2023 budget  
6           of \$29.6 million, respectively. PNM proposes to continue all of its existing energy  
7           efficiency and demand response<sup>1</sup> programs that were approved in Case No. 20-  
8           00087-UT, with some changes to the incentive levels and expected customer  
9           interest in the various measures and the addition of three new program  
10          components.<sup>2</sup> PNM allocates the additional budget between many of the  
11          programs.

12          The highest budget increases support the two demand response programs (Power  
13          Saver and Peak Saver). The Company allocates between 26 and 28 percent of the  
14          total budget to these two programs (or \$9.4 to \$9.6 million), depending on the  
15          year. Its plan allocates 10 percent of the total budget to low-income customers in  
16          2024, up from roughly a 6 percent allocation in 2023.<sup>3</sup> This proportion continues  
17          to rise to 12 percent by 2026. The Energy Smart MFA program investment is  
18          expected to more than quadruple from 2023 to 2026. In addition, the plan added  
19          an All-Electric New Construction pilot for residential customers to the New

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<sup>1</sup> While the plan is called an “Energy Efficiency and Load Management Plan,” I refer to load management as demand response throughout.

<sup>2</sup> In response to Interrogatory OAG 2-6, PNM stated, “In general, the measures will remain the same within programs. PNM continuously fine tunes measure mix and incentive levels due to factors including, but not limited to: market transformation, seasonality, implementer recommendations, market demand, equipment availability, and promotional campaigns to increase participation and cost effectiveness to meet goals set forth in the EUEA. New program components in this plan include: adding milestone and performance-based incentives to the Strategic Energy Management (SEM) program; the all-electric pilot in the New Home Construction program; and renter kits and increased weatherization measures in the Low-Income Home Energy Checkup program.”

<sup>3</sup> I estimated this by applying the methodology the Company used for 2024–2026 (as shown in Table 7 on page 21 of Sharon K. James’ Direct Testimony) to 2023.

1 Home Construction program with an incentive budget ranging from \$55,350 in  
2 2024 to \$73,800 in 2025 and 2026.<sup>4</sup>

3 **Table 1. Budget by program and in total, \$ millions**

<b>Budget (\$ millions)</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>
Residential Comp.	\$ 6.4	\$ 6.8	\$ 7.2	\$ 7.9
Refrig. Recycl.	\$ 1.3	\$ 1.5	\$ 1.5	\$ 1.5
HEC - Mkt	\$ 1.1	\$ 1.8	\$ 1.8	\$ 1.9
HEC - LI	\$ 0.8	\$ 1.9	\$ 2.1	\$ 2.6
Cooling & Midstream	\$ 3.2	\$ 1.7	\$ 1.8	\$ 1.9
Residential Lighting/Retail Products	\$ 3.8	\$ 4.4	\$ 4.5	\$ 4.5
Commercial Comp.	\$ 9.3	\$ 10.0	\$ 10.4	\$ 10.6
Easy Savings	\$ 0.6	\$ 0.3	\$ 0.3	\$ 0.2
Energy Smart (MFA)	\$ 0.2	\$ 1.0	\$ 1.1	\$ 1.3
New Home Const.	\$ 0.7	\$ 0.6	\$ 0.6	\$ 0.6
Behavioral (SEM)	\$ 0.6	\$ 0.7	\$ 0.7	\$ 0.7
Behavioral (Residential)	\$ 0.5	\$ 0.4	\$ 0.5	\$ 0.4
Home Works	\$ 0.6	\$ 0.8	\$ 0.8	\$ 0.8
Power Saver (LM)	\$ 4.6	\$ 5.4	\$ 5.5	\$ 5.5
Peak Saver (LM)	\$ 2.2	\$ 4.1	\$ 3.8	\$ 3.8
<b>Total</b>	<b>\$ 29.6</b>	<b>\$ 34.5</b>	<b>\$ 35.4</b>	<b>\$ 36.5</b>
<b>LI Total</b>	<b>\$ 1.91</b>	<b>\$ 3.47</b>	<b>\$ 3.85</b>	<b>\$ 4.50</b>
<b>LI % of Total</b>	<b>6%</b>	<b>10%</b>	<b>11%</b>	<b>12%</b>

4  
5 *Source: PNM Exhibit RFP CCAE 1-1.xlsx*

6 **Q Please summarize PNM’s 2024–2026 EE and LM Plan annual savings.**

7 **A** PNM’s proposed investment in energy efficiency from 2024–2026 is projected to  
8 produce cumulative savings that exceed its five-year cumulative savings

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<sup>4</sup> PNM’s response to Interrogatory OAG 2-1 stated, “The estimated incentive amount per all-electric home is approximately \$1,845. Other costs related to the pilot are embedded within the overall New Home Construction budget as detailed in the triennial plan available at <https://www.pnm.com/regulatory> under the heading ‘Electric Energy Efficiency Programs’. The estimate of all-electric homes is 30 in 2024, 40 in 2025, and 40 in 2026.” To estimate the budget for this program effort, I multiplied the incentive per home by the number of homes in each year.



1 requirements of 395 GWh by 2025.<sup>5</sup> Annual energy efficiency and demand  
2 response savings are lower in 2024–2026 as compared to 2023. Table 2 below  
3 summarizes the annual savings proposed in 2023 as compared to the annual  
4 savings proposed for 2024–2026 by program and in total.

5 **Table 2. Annual savings by program and in total**

<b>Savings (Annual MWh)</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>
Residential Comp.	10,897	16,433	16,160	18,139
Refrig. Recycl.	5,283	3,707	3,707	3,707
HEC - Mkt	1,192	6,426	5,706	5,687
HEC - LI	596	4,572	4,952	6,850
Cooling & Midstream	3,826	1,728	1,795	1,894
Residential Lighting/Retail Products	34,014	24,516	24,516	24,516
Commercial Comp.	40,511	38,608	39,959	41,158
Easy Savings	1,729	2,025	1,736	1,446
Energy Smart (MFA)	360	1,438	1,704	1,969
New Home Const.	669	651	703	726
Behavioral (SEM)	9,833	2,008	1,879	1,762
Behavioral (Residential)	12,836	3,736	4,448	4,210
Home Works	1,928	2,860	2,860	2,860
Power Saver (LM)	2,050	1,600	1,600	1,600
Peak Saver (LM)	1,000	1,200	1,200	1,200
<b>Total</b>	<b>115,827</b>	<b>95,075</b>	<b>96,764</b>	<b>99,586</b>

<b>Savings (Annual MW)</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>
Power Saver (LM)	55	40	40	40
Peak Saver (LM)	25	30	30	30
<b>Total</b>	<b>80</b>	<b>70</b>	<b>70</b>	<b>70</b>

8 *Source: PNM Exhibit RFP CCAE I-1.xlsx*

9 **Q Please summarize PNM’s 2024–2026 EE and LM Plan lifetime savings.**

10 **A** While annual energy efficiency savings are lower in 2024–2026 as compared to  
11 2023, the lifetime savings have increased. The programs are supporting more

<sup>5</sup> Direct Testimony of Sharon K. James, page 45.

1 comprehensive measures with deeper savings opportunities and longer measure  
2 lives as evidenced by the increase in lifetime savings. Table 3 below summarizes  
3 the lifetime savings proposed in 2023 as compared to the lifetime savings  
4 proposed for 2024–2026 by program and in total.

5 **Table 3. Lifetime savings by program and in total, MWh**

Savings (Lifetime MWh)	2023	2024	2025	2026
Residential Comp.	93,957	142,476	140,423	158,734
Refrig. Recycl.	25,727	18,237	18,237	18,237
HEC - Mkt	10,670	57,516	51,069	50,901
HEC - LI	5,334	40,921	44,322	61,311
Cooling & Midstream	52,226	25,802	26,795	28,285
Residential Lighting/Retail Products	304,428	325,078	325,078	325,078
Commercial Comp.	353,167	409,242	423,566	436,273
Easy Savings	18,155	22,616	19,386	16,155
Energy Smart (MFA)	5,735	23,228	27,521	31,805
New Home Const.	9,967	9,761	10,541	10,887
Behavioral (SEM)	29,498	2,008	1,879	1,762
Behavioral (Residential)	12,836	11,208	13,344	12,630
Home Works	21,596	31,948	31,948	31,948
Power Saver (LM)	2,050	1,600	1,600	1,600
Peak Saver (LM)	1,000	1,200	1,200	1,200
<b>Total</b>	<b>852,387</b>	<b>980,366</b>	<b>996,486</b>	<b>1,028,070</b>

6  
7 *Source: PNM Exhibit RFP CCAE 1-1.xlsx*

8 **Q Please summarize the cost-effectiveness of PNM’s 2024–2026 EE and LM**  
9 **Plan.**

10 **A** The EUEA requires utilities to use the UCT to evaluate the costs and benefits of  
11 their energy efficiency and demand response portfolios. The portfolio must be  
12 cost-effective from the utility system perspective with a UCT of 1.0 or greater. <sup>6</sup>  
13 PNM’s portfolio is cost-effective under the UTC, with benefit-cost ratios of 1.60,

<sup>6</sup> [NM Stat § 62-17-5 \(2021\)](#). Section C.

1 1.59, and 1.64 for 2024, 2025, and 2026 respectively. Portfolio cost-effectiveness  
 2 is projected to improve after 2023 and most programs are cost-effective with the  
 3 exception of the Residential Comprehensive program. Table 4 below summarizes  
 4 the UCT benefit-cost ratios proposed in 2023 as compared to the proposed UCT  
 5 benefit-cost ratios for 2024–2026 by program and in total.

6 **Table 4. Utility Cost Test benefit-cost ratios by program and in total**

UCT BCR Ratio	2023	2024	2025	2026
Residential Comp.	0.92	1.04	0.87	0.91
Refrig. Recycl.	0.98	0.86	0.83	0.84
HEC - Mkt	0.31	0.94	0.69	0.67
HEC - LI	0.21	0.94	0.59	0.68
Cooling & Midstream	1.41	1.29	1.28	1.35
Residential Lighting/Retail Products	2.38	2.16	2.05	2.09
Commercial Comp.	1.46	2.22	2.17	2.25
Easy Savings	1.15	3.38	3.29	3.42
Energy Smart (MFA)	0.62	1.61	1.66	1.74
New Home Const.	0.70	1.13	1.16	1.24
Behavioral (SEM)	2.23	0.22	0.22	0.26
Behavioral (Residential)	0.70	1.70	1.66	2.26
Home Works	0.83	1.32	1.23	1.24
Power Saver (LM)	1.67	1.18	1.35	1.40
Peak Saver (LM)	1.64	1.17	1.47	1.52
<b>Total</b>	<b>1.48</b>	<b>1.60</b>	<b>1.59</b>	<b>1.64</b>

7  
 8 *Source: PNM Exhibit RFP CCAE 1-1.xlsx Cost-Effectiveness*

9 **4. COST-EFFECTIVENESS**

10 **Q What costs and benefits does PNM include in the UCT?**

11 **A** PNM includes the following costs in the UCT: utility costs associated with  
 12 administration, third-party implementation, rebates, promotion, measurement and  
 13 verification (M&V), and market transformation.<sup>7</sup> PNM includes the following

<sup>7</sup> Direct Testimony of Sharon K. James, Tables 12-14, pages 36 and 37.

1           benefits in the UCT: avoided energy and capacity costs.<sup>8</sup> PNM stated that it  
2           included a proxy value for avoided T&D costs, which is a component of the  
3           avoided capacity costs.<sup>9</sup>

4    **Q     Do these costs and benefits represent all the costs and benefits that should be**  
5           **included in the UCT?**

6    **A**No. PNM is missing costs and benefits that should be included in the UCT.  
7           Synapse made the same finding in Case No. 22-00232-UT (the Application of  
8           New Mexico Gas Company, Inc. for Approval of its 2023–2025 Energy  
9           Efficiency Program). Multiple utilities in New Mexico are not accurately  
10          calculating cost-effectiveness for energy efficiency programs.

11   **Q     What costs are missing from PNM’s calculation of the UCT?**

12   **A**Please refer to Table 4 on page 23 of the *National Standard Practice Manual for*  
13          *Assessing Cost-Effectiveness of Energy Efficiency Resources* which is replicated  
14          as Table 5 below for ease of reference.<sup>10</sup> Table 5 provides a list of electric utility  
15          system costs and benefits that should be included when calculating the UCT as  
16          they are impacts to the electric utility system. For costs, PNM appears to include  
17          all costs except for Utility Performance Incentives, which are the performance  
18          incentives that PNM receives for achieving its energy efficiency targets.<sup>11</sup>

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<sup>8</sup> PNM 2024-2026 EE and LM Plan. 6.1 Appendix A – Avoided Costs. Page 44.

<sup>9</sup> Direct Testimony of Sharon K. James, pages 26-27.

<sup>10</sup> National Efficiency Screening Project. 2017. *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*. Edition 1. The Available at: [https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM\\_May-2017\\_final.pdf](https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf).

<sup>11</sup> As is appropriate, PNM does not include participant costs associated with the energy efficiency programs in the UCT.

1

**Table 5. Example electric utility system impacts to include in cost-effectiveness tests**

Scope	Costs	Benefits
Utility System	<ul style="list-style-type: none"><li>• Measure Costs (utility portion)</li><li>• Other Financial or Technical Support</li><li>• Program Administration</li><li>• Marketing and Outreach</li><li>• Evaluation, Measurement and Verification</li><li>• Utility Performance Incentives</li></ul>	<ul style="list-style-type: none"><li>• Avoided Energy Costs</li><li>• Avoided Generating Capacity Costs</li><li>• Avoided T&amp;D Costs</li><li>• Avoided T&amp;D Line Losses</li><li>• Avoided Ancillary Services</li><li>• Wholesale Price Suppression Effects</li><li>• Avoided Costs of Complying with Renewable Portfolio Standard</li><li>• Avoided Environmental Compliance Costs</li><li>• Avoided Credit and Collection Costs</li><li>• Reduced Risk</li><li>• Increased Reliability</li></ul>

2

*Note: This table is presented for illustrative purposes and is not meant to be an exhaustive list.*

3

**Q What benefits are missing from PNM’s calculation of the UCT?**

4

**A** Referencing Table 5, PNM includes the avoided cost of energy and capacity, including avoided T&D costs. However, I assert that the value of avoided T&D costs is underestimated, which I discuss in more detail below. Further, PNM does not include the following types of avoided costs: avoided costs of complying with the Renewable Portfolio Standard, avoided credit and collection costs, reduced risk, increased reliability, and potentially other benefits. I do not know if avoided ancillary service costs are included in the avoided costs and have asked PNM a question to confirm it.

12

Further, the EUEA specifically states “In determining life-cycle costs and benefits for energy efficiency and load management programs directed to low-income customers, the commission shall either quantify or assign a reasonable value to: (1) reductions in working capital; (2) reduced collection costs; (3) lower bad-debt expense; (4) improved customer service effectiveness; and (5) other appropriate

13

14

15

16

1 factors as utility system economic benefits.”<sup>12</sup> I reviewed the Company’s benefit-  
2 cost model and could not find evidence that PNM includes non-energy benefits  
3 for low-income customers in the UCT results. The EUEA requires that the PNM  
4 include non-energy benefits specific to low-income customers in UCT results.

5 **Q Should PNM account for these costs and benefits in its UCT calculations and**  
6 **results?**

7 Yes. By including some, but not all, of the costs and benefits in its analysis, PNM  
8 rendered its cost-effectiveness test results inaccurate. As more benefits are  
9 missing than costs, PNM is likely understating the benefits of energy efficiency  
10 and demand response resources included in the proposed EE and LM Plan. This  
11 also means that it is likely that the EE and LM Plan is excluding some of the  
12 energy efficiency and demand response measures that would be cost-effective if  
13 those missing benefits were included.

14 **Q How should PNM update its UCT results to account for these costs and**  
15 **benefits?**

16 **A** PNM should evaluate the missing costs and benefits I identified above and  
17 determine appropriate values. PNM should begin such efforts as soon as  
18 reasonably practicable.

19 **Q Is the UCT the only EUEA requirement the Commission needs to consider**  
20 **before approving an energy efficiency program for a utility such as PNM?**

21 **A** No. In addition to screening for cost-effectiveness using the UCT, the EUEA  
22 requires that the portfolio of programs be “designed to provide every affected

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<sup>12</sup> NMSA § 62-17-5.C.

1 customer class with the opportunity to participate and benefit economically.”<sup>13</sup>  
2 The EUEA makes no statement as to how the Commission or utilities should  
3 assess whether the energy efficiency and demand response programs meet such  
4 design requirements.

5 **Q How can the Commission assess whether energy efficiency and demand**  
6 **response programs are designed to provide every affected customer class**  
7 **with the opportunity to benefit economically?**

8 **A** There are multiple ways the Commission can make this assessment, and there are  
9 various tests and tools that could meaningfully contribute to the development of  
10 the Company’s programs. At a minimum, it is important to recognize that the  
11 UCT results alone do not provide sufficient information to assess whether  
12 customers can benefit economically.

13 To start, the Commission should direct the Company to begin collecting data  
14 related to customer participation. Such data includes the participant’s costs to  
15 install and operate energy efficiency and demand response equipment, as well as  
16 benefits from participation such as lower energy bills, lower water bills, and  
17 improved productivity.

18 Participant costs can be calculated based on the incremental or total cost of the  
19 measure, less the financial incentives. For example, in the case of some energy  
20 efficiency or electrification measures, the new technology replaces a less efficient,  
21 or fossil-fuel-based option that the host customer would have obtained in the  
22 absence of the energy efficiency program or intervention. Here, the incremental  
23 cost of the measure is the difference in costs between the energy efficiency

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<sup>13</sup> NMSA § 62-17-5.C.

1 measure and the baseline option. In other cases, the incremental cost may be the  
2 total cost of the energy efficiency measure. For all energy efficiency measures,  
3 any financial incentive provided to the host customer should be subtracted from  
4 the incremental energy efficiency measure costs for use in cost-effectiveness tests.

5 With respect to participant benefits, I recommend the collection of the savings in  
6 water, other fuels (such as natural gas, propane, or oil), and in maintenance costs  
7 associated with efficiency measures. These data can be used to evaluate the  
8 programs using additional cost-effectiveness tests, such as the Participant Cost  
9 Test (PCT) and the Total Resource Cost (TRC) test.<sup>14</sup> When combined with the  
10 UCT, such tests can be used to measure the economic impacts of the Company's  
11 programs and subsequently improve them.

12 **Q Are there other ways PNM could assess program design consistent with the**  
13 **EUEA's requirements?**

14 **A** Yes. Ideally, the Commission should undertake a separate investigation to design  
15 a New-Mexico-specific cost-effectiveness test, following the guidance in the  
16 *National Standard Practice Manual for Benefit-Cost Analysis of Distributed*  
17 *Energy Resources* (NSPM for DERs). The NSPM for DERs includes a framework  
18 based on a set of core principles that a jurisdiction can use to develop and apply  
19 cost-effectiveness tests to distributed energy resources, including energy  
20 efficiency. The NSPM for DERs framework supports cost-effectiveness practices  
21 that align with a jurisdiction's policy goals and objectives. For example, New  
22 Mexico stakeholders could collectively design a single fuel-agnostic cost-  
23 effectiveness test that combines the EUEA's requirements and state climate goals

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<sup>14</sup> The Participant Cost Test estimates the impact of energy efficiency programs on the participating customer, while the Total Resource Cost test combines both the participant and utility system impacts.



1 and ensure customers can benefit economically while reducing greenhouse gas  
2 emissions.<sup>15</sup> I recommend that the Commission modify its cost-effectiveness  
3 testing framework to support achievement of state climate goals and to address  
4 the EUEA’s requirement that the portfolio of programs be “designed to provide  
5 every affected customer class with the opportunity to participate and benefit  
6 economically.’

7 **Q What other benefits can come from a New-Mexico-specific cost-effectiveness**  
8 **test?**

9 **A** Interrogatory CCAE 1-3 states that PNM does not target electrification measures  
10 to customers that use propane. Inclusion of fossil fuel savings (including, but not  
11 limited to propane) in cost-effectiveness modeling could make PNM more likely  
12 to pursue these savings.

13 **Q Why is it important for PNM to pursue fossil fuel savings?**

14 First, New Mexico Governor Michelle Lujan Grisham issued Executive Order  
15 2019-003 “Executive Order on Addressing Climate Change and Energy Waste  
16 Prevention” in January 2019. This Executive Order established a statewide  
17 greenhouse gas emission reduction target of at least 45 percent by 2030, based on  
18 2005 levels.<sup>16</sup> PNM’s energy efficiency plan should align with and assist with  
19 achieving these targets. Fuel-switching from fossil fuels to electricity is necessary  
20 to achieve New Mexico’s climate goals.

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<sup>15</sup> National Energy Screening Project. 2020. *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*. Available at [www.nationalenergyscreeningproject.org/national-standard-practice-manual](http://www.nationalenergyscreeningproject.org/national-standard-practice-manual).

<sup>16</sup> EO 2019-003. Available at: [https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO\\_2019-003.pdf](https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO_2019-003.pdf).

1           Second, including fossil fuel savings in the cost-effectiveness test will help PNM  
2           fully recognize and ensure that its customers participate and benefit economically.  
3           Customers who use fossil fuels for major end uses (e.g., space heating) will have  
4           more opportunities to participate and benefit economically from program efforts  
5           that are targeted to reduce this use.

6    **Q     Do you have any concerns with the way PNM currently calculates the**  
7           **benefits it includes in the UCT?**

8    **A     Yes, I have multiple concerns. To summarize:**

- 9           • Despite the fact that PNM is required by the Commission’s directive in Case  
10           20-00087-UT<sup>17</sup> to “conduct a transmission and distribution (“T&D”) avoided  
11           cost study and incorporate the results in this application,”<sup>18</sup> PNM did not  
12           conduct the study and proposes to continue using a proxy value for the  
13           avoided T&D costs.
- 14           • PNM’s rationale for not conducting this study is flawed.
- 15           • The methodology PNM used to evaluate T&D avoided costs is flawed.
- 16           • The proxy T&D value PNM is currently using and proposing to continue  
17           using for the proposed plan is likely too low.

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<sup>17</sup> New Mexico Public Regulation Commission. Recommended Decision, September 17, 2020, in Case No. 20-00087-UT.

<sup>18</sup> Direct Testimony of Sharon K. James, page 14.

1    **Q     What avoided T&D costs is PNM proposing to use?**

2    **A**Witness Phillips mentioned in his testimony that “PNM will continue to use the  
3           proxy costs included in its 2020 EE Plan for now.”<sup>19</sup> Appendix B to PNM’s  
4           proposed EE and LM Plan includes PNM’s avoided costs used in the 2020 energy  
5           efficiency plan, Case No. 20-00087-UT. According to Appendix B, the proxy  
6           avoided T&D costs range from just \$5 per kW-year to \$6.5 per kW-year. I have  
7           asked PNM to confirm if these are the values the Company is proposing to use for  
8           the proposed EE and LM Plan.

9    **Q     Why rationale does PNM provide for not conducting the T&D avoided cost**  
10       **study?**

11   **A**Witness Phillips mentioned two main reasons why PNM did not conduct the T&D  
12       avoided cost study. First, Witness Phillips argues that “PNM generally has been  
13       deferring investments and instead, operating its system at or near equipment  
14       ratings”<sup>20</sup> partly due to two main factors: (a) “PNM’s load has been flat or  
15       declining”<sup>21</sup> and (b) “PNM has been met with resistance in expanding its  
16       distribution system on overloaded feeders.”<sup>22</sup> Second, Witness Phillips claims that  
17       while PNM reviewed historical investments over the past five years and projected  
18       investments over the next five years, PNM did not find any projects related to  
19       load growth—the type of investments that would be avoided or deferred by  
20       energy efficiency measures.

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<sup>19</sup> Direct Testimony of Nicholas L. Phillips, page 10, line 6.

<sup>20</sup> Direct Testimony of Nicholas L. Phillips, page 9, lines 17-18.

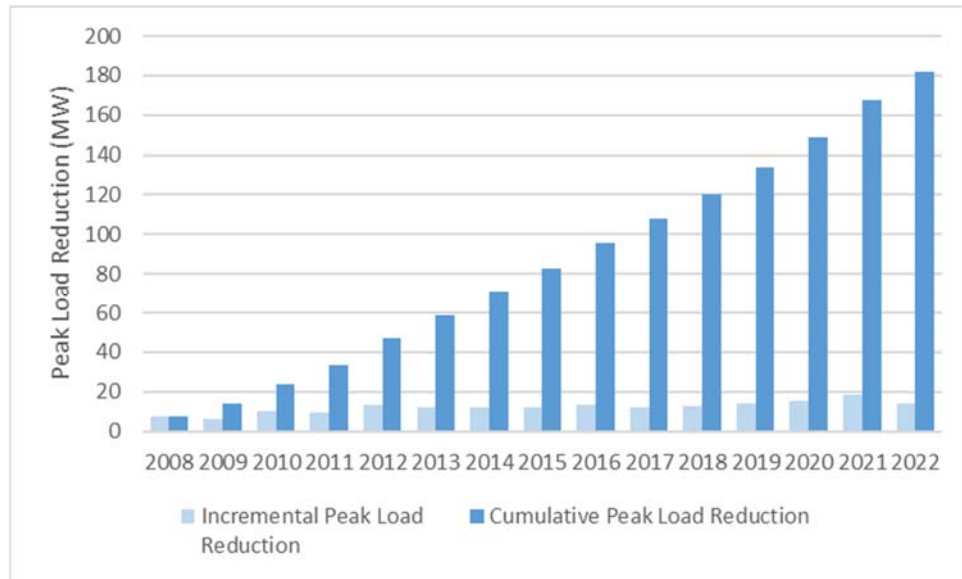
<sup>21</sup> Direct Testimony of Nicholas L. Phillips, page 9, lines 15-16.

<sup>22</sup> Direct Testimony of Nicholas L. Phillips, page 9, lines 16-17.

1 Q Why do you think PNM’s rationale for not conducting a T&D avoided cost  
2 study is flawed?

3 A Witness Phillip fails to recognize that part of the reason why demand has been  
4 “flat or declining” is due to energy efficiency efforts in the state. PNM’s EE and  
5 LM Plan shows that PNM has reduced its peak load from 6 MW to 19 MW on an  
6 annual basis through its energy efficiency since 2008.<sup>23</sup> The total cumulative peak  
7 load reductions due to PNM’s energy efficiency programs is approximately 180  
8 MW from 2008 to 2022 as shown in Figure 1. Most of these historical energy  
9 efficiency investments will keep electric loads low beyond 2022.

10 **Figure 1. Annual incremental and cumulative peak load reduction through PNM’s**  
11 **energy efficiency programs since 2008**



12

13 PNM has been able to defer T&D investments in part due to these historical  
14 energy efficiency investments. Without these investments, today’s load would be  
15 much higher, and PNM may have had to upgrade some of its T&D systems. These

<sup>23</sup> PNM 2024-2026 EE and LM Plan. Table 1-1. Page 4.

1 historical energy efficiency investments have deferred some T&D investment  
2 costs. The fact that there have not been T&D investments in the past does not  
3 mean there are no T&D deferral values. The absence of T&D investments in the  
4 past indicates that there should be T&D deferral values from historical energy  
5 efficiency investments. This principle should also apply to the proposed energy  
6 efficiency programs in PNM's current EE and LM Plan as they would help keep  
7 peak loads low and in turn would help defer or avoid future T&D investments.

8 **Q Please explain how PNM evaluated T&D avoided costs and how this**  
9 **methodology is flawed.**

10 **A** Witness Phillips discusses PNM's assessment of historical T&D capital  
11 expenditures on pages 7 to 9 of his testimony. He introduces an approach called  
12 the embedded costs approach that he used to examine avoided T&D costs. As he  
13 discussed, this approach estimates T&D avoided costs by focusing on costs  
14 related to load growth. This is an industry-standard approach for estimating  
15 avoided T&D for energy efficiency programs. His description of this approach is  
16 generally sound, but he made one critical error in his analysis of T&D avoided  
17 costs. He uses historical T&D investments over the past 5 years for examining  
18 avoided T&D costs and did not make any change to this timeframe, despite  
19 Witness Phillips' claim that "PNM was unable to identify any projects that were  
20 undertaken specifically due to load growth on the system."<sup>24</sup>

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<sup>24</sup> Direct Testimony of Nicholas L. Phillips, page 9, lines 7-8.

1 Q **Please explain in detail why PNM’s approach to rely on just five years of**  
2 **historical T&D investment data is not appropriate.**

3 A Once a utility makes large investments in its T&D facilities, it may not need to  
4 make new investments for many years as the new facilities provide sufficient  
5 capacity until the load grows significantly. Thus, if a utility needs to know the  
6 value of deferring T&D investments, the utility has to use a long-term time  
7 horizon (e.g., 10 years) so that it can include meaningful historical T&D  
8 investments that can be related to load growth.

9 Q **What timeframe do you recommend PNM use for historical T&D**  
10 **investments for its analysis of avoided T&D costs?**

11 A I recommend PNM use a period of at least 10 years for gathering historical T&D  
12 investments and estimating avoided T&D costs. This recommendation reflects a  
13 recommendation by a 2011 study titled “Deployment of Distributed Generation  
14 for Grid Support and Distribution System Infrastructure” prepared for the New  
15 York State Energy Research and Development Authority (NYSERDA).<sup>25,26</sup> A  
16 2022 U.S. Environmental Protection guidance document titled “Quantifying the  
17 Multiple Benefits of Energy Efficiency and Renewable Energy: A Guide for State  
18 and Local Governments” also supports the use of this methodology.<sup>27</sup>

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<sup>25</sup> Pace Energy and Climate Center and Synapse Energy Economics. 2011. Deployment of Distributed Generation for Grid Support and Distribution System Infrastructure. Available at: <file:///C:/Users/ktakahashi/Downloads/Deployment-of-Distributed-Generation-for-Grid-Support.pdf>.

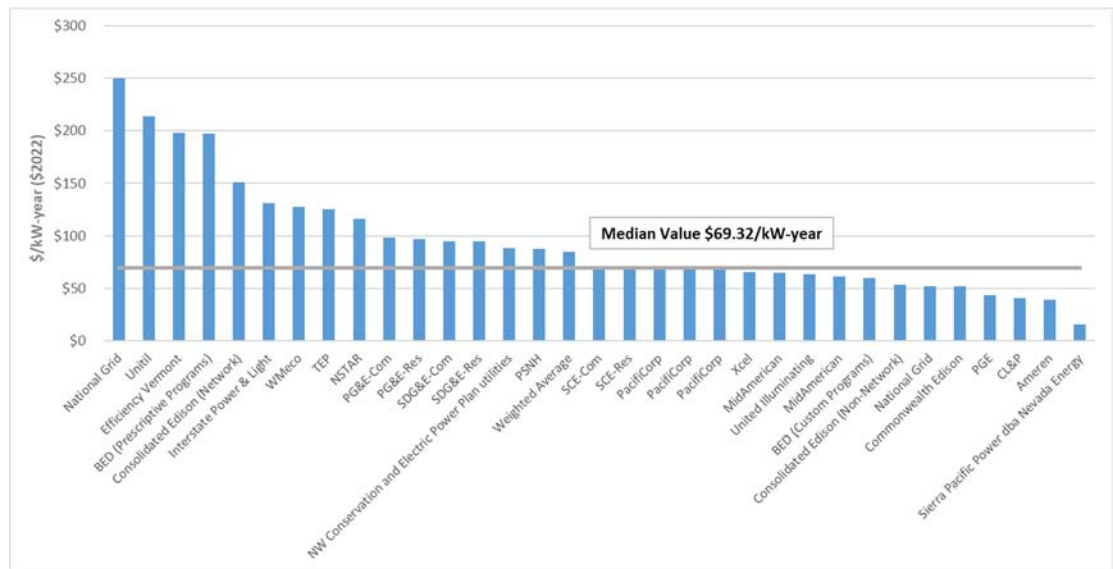
<sup>26</sup> Page 9 of the study states: “utilities use long-term historical trends (more than 10 years) and sometimes planned T&D costs to estimate future avoided T&D costs. This approach often looks at load-related investment (as opposed to customer-related) and estimates system-wide (e.g., utility service territory) average avoided T&D costs.”

<sup>27</sup> U.S. EPA. 2022. Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy: A Guide for State and Local Governments. Available at: [https://www.epa.gov/system/files/documents/2022-07/MBG\\_2-3\\_ElectricitySystemBenefits\\_0.pdf](https://www.epa.gov/system/files/documents/2022-07/MBG_2-3_ElectricitySystemBenefits_0.pdf).

1 Q Why do you think the current proxy T&D values are too low?

2 A As I mentioned above, the current proxy T&D values range from \$5 to \$6.5 per  
 3 kW-year. Figure 2 below illustrates a range of avoided T&D costs in current use  
 4 by utilities (excluding four utilities that show zero T&D values in the survey).<sup>28,29</sup>  
 5 Avoided T&D costs range from about \$15 to as high as \$250 per kW-year.<sup>30</sup>  
 6 PNM’s proxy T&D values are lower than the avoided T&D costs in use in all  
 7 these jurisdictions.

8 **Figure 2. Survey of transmission and distribution avoided costs**



9  
 10 Source: Mendota Group. 2014. *Benchmarking Transmission and Distribution Costs Avoided by*  
 11 *Energy Efficiency Investments.*

<sup>28</sup> Mendota Group. 2014. *Benchmarking Transmission and Distribution Costs Avoided by Energy Efficiency Investments.* Available at: <https://mendotagroup.com/wp-content/uploads/2018/01/PSCo-Benchmarking-Avoided-TD-Costs.pdf>.

<sup>29</sup> One of the four utilities that has zero T&D value in the survey is Wisconsin’s Focus on Energy. However, Focus on Energy is currently using a high T&D value of approximately \$65/kW-year. See Evaluation Working Group. 2021. *Request for Comment and Memorandum Avoided T&D.* Available at: <https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=403255>.

<sup>30</sup> The costs are adjusted to 2022-dollar value, using implicit price deflator indexes for GDP, available from the Federal Reserve Bank, available at: <https://fred.stlouisfed.org/series/GDPDEF>.

1 Q What do you recommend PNM should do regarding avoided T&D costs?

2 A I strongly recommend that PNM conduct an avoided T&D cost study to comply  
3 with the Commission's directive.

4 **5. FEDERAL INCENTIVES**

5 Q Are there new federal incentives for energy efficiency measures in PNM's  
6 plan that are available in the 2024–2026 timeframe?

7 A Yes. The IRA, *Infrastructure Investment and Jobs Act* ("IIJA"), and *Bipartisan*  
8 *Infrastructure Law* ("BIL") together allocate tens of billions of dollars for energy  
9 efficiency implementation, including substantial incentives for implementing  
10 energy efficiency measures.<sup>31</sup>

11 Per the IRA, customers can currently receive tax credits under Section 25C of the  
12 tax code for home improvements. Both ASHPs and heat pump water heaters are  
13 eligible for up to \$2,000 of federal tax credits. Electric panel upgrades are also  
14 eligible for \$600 in tax credits.<sup>32</sup> These tax credits can only offset taxes that a  
15 customer owes come year end.

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<sup>31</sup> See Nadel, Steven, *How Utility Energy Efficiency Programs Can Use New Federal Funding*, ACEEE (2023) [https://www.aceee.org/sites/default/files/pdfs/home\\_energy\\_upgrade\\_incentives\\_2-1-23\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_2-1-23_1.pdf); ACEEE Home Energy Upgrade Incentives (2023) [https://www.aceee.org/sites/default/files/pdfs/how\\_utility\\_energy\\_efficiency\\_programs\\_can\\_use\\_new\\_federal\\_funding\\_-\\_encrypt\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/how_utility_energy_efficiency_programs_can_use_new_federal_funding_-_encrypt_1.pdf).

<sup>32</sup> Rewiring America. "25C Residential Energy Efficiency Tax Credit and 25D Residential Clean Energy Tax Credit." Available at: <https://www.rewiringamerica.org/ira-fact-sheets>.



1 Geothermal heat pumps are also currently eligible for up to a 30 percent tax credit  
2 under Section 25D of the tax code, meaning households can receive the tax credit  
3 regardless of whether the taxpayers owe taxes to the federal government.<sup>33</sup>

4 The Home Electrification Rebates Program is a new \$4.5 billion dollar program  
5 under the IRA, which will provide point-of-sale discounts to low- and moderate-  
6 income customers who make qualifying appliance purchases.<sup>34</sup> State energy  
7 offices will administer the program and likely launch it in 2024. Eligible  
8 appliances include heat pumps for space heating, heat pump water heaters, clothes  
9 dryers, and induction stoves. This program offers a \$14,000 maximum customer  
10 rebate per household depending on the measures and household income.<sup>35</sup>

11 The Home Efficiency Rebates Program under the IRA will also be administered  
12 by state energy offices and provides rebates for whole-home retrofit packages.<sup>36</sup>  
13 Rebates will be available for all income levels and residents of multifamily  
14 buildings. The rebate amounts will be based on reductions in home energy use.  
15 Incentives for most households are \$2,000 for 20 percent energy savings and  
16 \$4,000 for 35 percent energy savings, but these are doubled for households with  
17 income below 80 percent of the area median income.<sup>37</sup>

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<sup>33</sup> U.S. EPA. 2022. “Geothermal Heat Pumps Tax Credit.” Available at:  
[https://www.energystar.gov/about/federal\\_tax\\_credits/geothermal\\_heat\\_pumps](https://www.energystar.gov/about/federal_tax_credits/geothermal_heat_pumps).

<sup>34</sup> DOE has renamed from its original name in IRA: High-Efficiency Electric Home Rebate.

<sup>35</sup> Nadel, Steven, How Utility Energy Efficiency Programs Can Use New Federal Funding, ACEEE (2023)  
[https://www.aceee.org/sites/default/files/pdfs/home\\_energy\\_upgrade\\_incentives\\_2-1-23\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_2-1-23_1.pdf).

<sup>36</sup> DOE has renamed from its original name in IRA: Home Energy Performance-Based Whole-House  
(HOMES) Rebates.

<sup>37</sup> Nadel, Steven, How Utility Energy Efficiency Programs Can Use New Federal Funding, ACEEE (2023)  
[https://www.aceee.org/sites/default/files/pdfs/home\\_energy\\_upgrade\\_incentives\\_2-1-23\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_2-1-23_1.pdf).

1 Q **Did PNM consider the new federal incentives—either rebates or tax credits—**  
2 **in the 2024–2026 EE and LM Plan?**

3 A No. PNM did not adjust participation, incentives, or outreach to reflect the new  
4 federal incentives.<sup>38</sup>

5 Q **Should PNM factor the new federal incentives into its 2024–2026 EE and LM**  
6 **Plan?**

7 A Yes. As discussed above, the federal government is providing tens of billions of  
8 dollars for the implementation of energy efficiency measures nationwide. Federal  
9 tax credits under IRA are already available in 2023, and the funds for rebates will  
10 be available to states at some point in 2024.<sup>39</sup> PNM and the state of New Mexico  
11 more broadly will have access to substantial funds available to accomplish energy  
12 efficiency objectives by helping customers install measures that are included in  
13 PNM’s 2024–2026 EE and LM Plan. These funds can offset ratepayer costs and  
14 increase participation and savings. Because tax credits are already available to  
15 customers for some measures, PNM should currently be planning for increased  
16 uptake of those measures, increasing awareness of the federal incentives, and  
17 assisting customers with utilization of these tax credits. As the rebate funding  
18 becomes available, PNM will likely need to update the expected participation and  
19 incentives in its 2024–2026 EE and LM Plan to account for the federal incentives.

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<sup>38</sup> PNM Response to Interrogatory CCAE 1-7; PNM Response to Interrogatory OAG 1-32.

<sup>39</sup> Nadel, Steven, How Utility Energy Efficiency Programs Can Use New Federal Funding, ACEEE (2023)  
[https://www.aceee.org/sites/default/files/pdfs/home\\_energy\\_upgrade\\_incentives\\_2-1-23\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_2-1-23_1.pdf).

1 Q **How should PNM proceed in the immediate term?**

2 A PNM already provides some information about federal and state incentives  
3 through the Home Energy Checkup program, as well as through some trade ally  
4 and homebuilder training. PNM is also starting to engage in discussions with New  
5 Mexico Gas Company and New Mexico Energy, Minerals, and Natural Resources  
6 Department (EMNRD) staff to discuss collaboration strategies related to IRA  
7 resources.<sup>40</sup>

8 PNM should develop a robust marketing strategy and materials to educate its  
9 customers on available federal incentives from the IRA and encourage them to  
10 take advantage of the funding. With this information in hand, consumers can  
11 better plan for retrofits for their homes and buildings which makes them more  
12 likely to use the funds in a future year. PNM should also continue to educate its  
13 trade ally network and contractors about federal funding opportunities to drive  
14 increased participation in energy efficiency programs.

15 PNM should establish a stakeholder working group to discuss (a) coordination  
16 with the state, customers, and trade allies on implementation of federal incentives  
17 and (b) modification of utility incentives or program designs to take advantage of  
18 the federal incentives. This collaboration will ensure that program implementation  
19 does not become overcomplicated and that programs and incentives available in  
20 New Mexico are well designed and aligned.<sup>41</sup>

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<sup>40</sup> PNM Response to Interrogatory OAG 2-14.

<sup>41</sup> Nadel, Steven. 2023. How Utility Energy Efficiency Programs Can Use New Federal Funding. Prepared for the American Council for an Energy-Efficient Economy. Available at: [https://www.aceee.org/sites/default/files/pdfs/home\\_energy\\_upgrade\\_incentives\\_2-1-23\\_1.pdf](https://www.aceee.org/sites/default/files/pdfs/home_energy_upgrade_incentives_2-1-23_1.pdf).

1 Q **How should PNM proceed over the longer term?**

2 A Once there is a launch date for the federal rebates and after collaboration with  
3 other stakeholders occurs, PNM should file an updated 2024–2026 EE and LM  
4 Plan that fully accounts for federal incentives.

5 **6. ELECTRIFICATION**

6 Q **Please briefly summarize PNM’s proposed “All-Electric New Homes” pilot  
7 program.**

8 A According to PNM, about half of the electricity savings from high performance,  
9 new construction homes came from LED lighting. However, new construction  
10 projects cannot claim savings through LED lighting anymore due to changes in  
11 federal lighting standards. Thus, PNM has proposed to offer an All-Electric New  
12 Homes pilot program within the existing New Home Construction program to  
13 continue offering customers options to significantly reduce energy savings.<sup>42</sup> This  
14 pilot program adds a performance incentive option for all-electric homes, while  
15 keeping the existing prescriptive incentive structure as another option. More  
16 specifically, PNM proposes a performance incentive of \$0.45 per kWh saved  
17 while keeping the existing prescriptive incentive amounts for various appliances  
18 including air-conditioning, ASHPs, heat pump water heaters, and Energy Star  
19 appliances. Assuming an average savings of 4,100 kWh, PNM estimates that a  
20 program participant would receive \$1,845 with the performance path.<sup>43</sup>

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<sup>42</sup> PNM 2024-2026 EE and LM Plan. pages 34 to 36.

<sup>43</sup> Interrogatory CCAE 1-19; PNM 2024-2026 EE and LM Plan. page 36.

1    **Q     Do you support this proposal?**

2    **A     Yes, I generally support PNM’s All-Electric New Homes pilot program.**

3    **Q     Please explain why you support this pilot program.**

4    **A     Building electrification including all-electric home and building measures is one**  
5            **crucial strategy to help the state reduce greenhouse gas emissions from the**  
6            **building sector and meet the state’s greenhouse gas reduction target. This is**  
7            **because electrification can reduce a substantial amount of fossil fuel consumption**  
8            **as greenhouse gas emissions from the grid are expected to decline to zero by 2045**  
9            **due to the state’s Renewable Portfolio Standard.<sup>44</sup> Energy-efficient appliances**  
10           **such as heat pumps would use cleaner electricity over time and reduce greenhouse**  
11           **gas emissions substantially while other conventional heating systems such as**  
12           **natural gas furnaces will not be able to reduce emissions much from today’s**  
13           **levels. For example, a 2022 study conducted by the Southwest Energy Efficiency**  
14           **Partnership (SWEET) estimated that heat pumps for space heating installed today**  
15           **in New Mexico are expected to reduce emissions relative to gas by approximately**  
16           **60 percent over the life of the heat pumps.<sup>45</sup>**

17   **Q     Are there any modifications you recommend for this pilot program?**

18   **A     Yes. The proposed incentives for heat pumps do not include bonus incentives for**  
19           **cold-climate ASHPs (“ccASHP”), which are a relatively new type of heat pump**  
20           **that can produce heat under cold climate conditions very efficiently while**

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<sup>44</sup> S.B. 489 of 2019. Available at <https://www.nmlegis.gov/Sessions/19%20Regular/bills/senate/SB0489.pdf>.

<sup>45</sup> SWEET. 2022. Benefits of heat pumps for Southwest homes. Table 8 on page 22 and Table 9 on page 23. Available at: <https://swenergy.org/pubs/southwest-heat-pump-study-2022>.

1           maintaining a high heating capacity.<sup>46</sup> While a recent study found that the total  
2           installed costs for ccASHPs are not so different from the costs of non-ccASHPs,<sup>47</sup>  
3           ccASHPs are still new to the state of New Mexico. Further, ccASHPs are  
4           necessary to support the full heating loads heating in cold climate regions in the  
5           state (including Albuquerque), without any backup or supplemental heating  
6           systems (e.g., existing gas furnaces, electric resistance heaters). Thus, I  
7           recommend that PNM offer additional bonus incentives for ccASHPs to  
8           encourage the adoption of this new technology in the region. Xcel Energy,  
9           Colorado currently offers \$2,200 for ccASHPs and \$1,700 for other, efficient heat  
10          pumps.<sup>48</sup> Based on this example, I recommend that PNM also offers a bonus  
11          incentive of \$500 for ccASHPs.

12    **Q       Do you have any recommendations for how to evaluate this pilot program?**

13    **A**Yes. I believe that this pilot program offers a great opportunity to evaluate the  
14          performance of ASHPs, in particular ccASHPs, during the winter season as part  
15          of an M&V study of the proposed All-Electric Homes pilot program. More  
16          specifically, I recommend that PNM monitor and track the following metrics for  
17          ccASHPs and non-ccASHPs: hourly kW loads, heating capability, seasonal  
18          electric consumption, and the efficiency of heat pumps in terms of COP. Further, I  
19          recommend PNM conduct a participation survey on the program incentive levels,

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<sup>46</sup> The most widely adopted definition of ccASHPs is the ccASHP specification developed by the Northeast Energy Efficiency Partnership (NEEP). See NEEP's definition of ccASHP at: <https://neep.org/heating-electrification/ccashp-specification-product-list>.

<sup>47</sup> Navigant. 2018. Ductless Mini-Split Heat Pump Cost Study (RES 28): Final Report. Prepared for the Electric Program Administrators of Massachusetts Part of the Residential Evaluation Program Area. Available at: [https://ma-eeac.org/wp-content/uploads/RES28\\_Assembled\\_Report\\_2018-10-05.pdf](https://ma-eeac.org/wp-content/uploads/RES28_Assembled_Report_2018-10-05.pdf).

<sup>48</sup> Xcel Energy Colorado, "Heat Pump Rebates," Available at: <https://co.my.xcelenergy.com/s/residential/heating-cooling/heat-pumps>.

1 motivations to participate in the pilot program, satisfaction with the installation,  
2 and operation of the installed measures including ASHPs.

3 **Q Do you have any other recommendation regarding PNM's electrification**  
4 **pilot program?**

5 **A** Yes. The proposed All-Electric Homes pilot would target only new construction  
6 homes and would not support any customers who are considering replacing their  
7 existing fossil fuel combustion appliances (e.g., gas or propane furnace) to  
8 energy-efficient electric appliances (e.g., heat pumps). I recommend that PNM  
9 also implement an electrification pilot program targeting existing residential  
10 customers, with a focus on low-income customers. I further recommend that PNM  
11 offer two types of assistance in this low-income electrification pilot program: (a)  
12 financial incentives in terms of rebates or/and zero or low-interest financing; (b)  
13 technical assistance (e.g., turnkey solution that takes care of the entire process  
14 from contractor selection to measure installation).

15 **Q Why do you recommend a low-income electrification pilot program?**

16 **A** Low-income customers are expected to face many more barriers to building  
17 electrification than other customers because they often lack access to funding and  
18 information about energy savings opportunities. Thus, this pilot program can help  
19 assess and find ways to assist low-income customers with their electrification  
20 efforts. More specifically, with this pilot program PNM would be able to find  
21 ways to assist low-income customers with accessing IRA rebates, in particular the  
22 Home Electrification Rebates Program and the Home Efficiency Rebates Program  
23 that I mentioned above under the Federal Incentive section of my testimony.  
24 These IRA programs would provide a substantial rebate for low-income  
25 customers. However, customers may not be aware of the programs. Thus, PNM

1 could help educate customers about the benefit of the IRA incentive program.  
2 Further, customers may not be able to provide an upfront payment to contractors  
3 if such rebates are not paid in advance of their projects or if the rebates are not  
4 large enough to cover the cost of the projects. In addition to assisting customers  
5 find contractors, PNM could offer zero-or low-interest financing or additional  
6 financial incentives to such low-income customers.

7 Finally, even though this is an electrification pilot and does not reduce electricity  
8 consumption, it would help low-income customers reduce their energy bills in the  
9 long term because the prices of propane are very high, and the prices of natural  
10 gas are expected to increase in the future as more customers electrify their end  
11 uses and leave the gas system to meet the state’s greenhouse gas reduction  
12 mandate.<sup>49</sup> Essentially, this pilot program would provide low-income customers  
13 additional “opportunities to participate and benefit economically” through energy  
14 efficiency programs, which is one of the EUEA regulatory requirements for  
15 energy efficiency programs.

16 **Q Are you aware of any utilities that offer financing for energy efficiency**  
17 **projects?**

18 **A** Yes. A 2020 report titled “Energy Efficiency Program Financing: Size of the  
19 Markets” by the American Council for an Energy-Efficient Economy (“ACEEE”)  
20 indicated that there were over 50 energy efficiency financing programs operated  
21 by numerous utilities across the county in 2018 to 2019.<sup>50</sup> Of those, Mass Save  
22 Heat Loan program in Massachusetts, operated by all investor-owned utilities and

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<sup>49</sup> Direct testimony of Kenji Takahashi, Case No. 22-00232-UT. Pages 17 to 18.

<sup>50</sup> ACEEE. 2020. *Energy Efficiency Program Financing: Size of the Markets*. Available at:  
[https://www.aceee.org/sites/default/files/pdfs/energy\\_efficiency\\_financing\\_-\\_the\\_size\\_of\\_the\\_markets.pdf](https://www.aceee.org/sites/default/files/pdfs/energy_efficiency_financing_-_the_size_of_the_markets.pdf).



1           one third-party efficiency program administrator in the state, is one of the largest  
2           utility energy efficiency loan programs in the nation. Mass Save Heat Loan  
3           currently offers zero-interest loans up to \$50,000 for energy-efficient home  
4           upgrades that include heat pumps and up to \$25,000 for projects that do not  
5           include heat pumps, with terms up to 7 years.<sup>51</sup> In New Mexico, Roosevelt  
6           County Electric Cooperative offers a low-interest rate loan of up to \$25,000 for  
7           the installation of high efficiency heat pumps and insulation.<sup>52</sup> In Arizona,  
8           Sulphur Springs Valley EC offers a zero-interest loan of up to \$20,000 for  
9           building envelope and a 7 percent interest loan of up to \$10,000 for heat pumps.<sup>53</sup>  
10          In these utility loan programs, utilities use their energy efficiency program funds  
11          to buydown interests rates, provide credit enhancements, or capitalize loans.<sup>54</sup>

12    **7. LOW-INCOME AND JUSTICE40 INVESTMENTS**

13    **Q     How much does PNM propose to invest in low-income customers in its 2024–**  
14          **2026 EE and LM Plan?**

15    **A**PNM proposes that 11 percent of its budget support low-income customers on  
16          average across the three years of the plan.<sup>55</sup> This meets Commission Rule  
17          17.7.2.8(K) NMAC, which requires that no less than 5 percent of a utility’s  
18          energy efficiency budget be directed towards measures and programs for low-  
19          income customers.

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<sup>51</sup> Mass Save. “Mass Save HEAT Loan.” Available at: <https://www.masssave.com/residential/rebates-and-incentives/heat-loan-program> and <https://www.myheatloan.com/landingpage>.

<sup>52</sup> Roosevelt County Electric Cooperative. “Energy Efficiency Info.” Available at: <https://rcec.coop/3-interest-erc-loan-program>.

<sup>53</sup> Sulphur Springs Valley Electric Cooperative. “Sulphur Springs Valley EC - Residential Energy Efficiency Loan Program.” Available at: <https://www.energybot.com/incentives/arizona/sulphur-springs-valley-ec-residential-energy-efficiency-loan-program-2095.html>.

<sup>54</sup> ACEEE. 2020. Page 4.

<sup>55</sup> Direct Testimony of Sharon K. James, page 13.

1 Q **Does this investment lead to sufficient low-income customer participation in**  
2 **programs?**

3 A Not necessarily. PNM’s response to Interrogatory OAG 2-9 states that 40 percent  
4 of residential customers are considered low-income based on census data. PNM’s  
5 response to Interrogatory CCAE 2-3 states that the Energy Smart MFA program  
6 has a waitlist of 640 customers. As PNM’s plan estimates that 458 customers can  
7 be served by this program in 2024, this backlog is roughly 18 months.<sup>56</sup> There are  
8 low-income customers who are not being served by current programs.

9 Q **How can your concerns with the low-income programs be addressed?**

10 A A June 30, 2023, report titled “Report on Income Qualified Program” filed in  
11 Case No. 22-00232-UT outlines updates to the low-income programs  
12 implemented by MFA in New Mexico Gas Company’s service territory that are  
13 relevant to low-income programs in PNM’s service territory. For example,  
14 “NMGC has agreed that, in order to assist MFA in reducing the waiting list, MFA  
15 does not need to ensure that each individual measure under NMGC’s Income  
16 Qualified program provided to natural gas customers in NMGC’s service territory  
17 satisfies the Utility Cost Test (“UCT”).” For consistency, I request that PNM’s  
18 Energy Smart MFA program be planned and implemented in the same way. This  
19 will allow MFA to spend more money per kWh saved and allow its service  
20 providers to install necessary health and safety measures along with those that  
21 reduce electricity. I then recommend that PNM adjust the spending per customer  
22 to allocate some funds to address pre-weatherization barriers. Lastly, I  
23 recommend that PNM increase the number of low-income customers it plans to

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<sup>56</sup> I calculated this by dividing 640 by 458.

1           serve to account for the availability of federal incentives and the reduction in pre-  
2           weatherization barriers.

3    **Q       What is the federal government’s Justice40 Initiative?**

4    **A**The Federal Government has a goal that 40 percent of the benefits of energy  
5           efficiency programs flow to disadvantaged communities.<sup>57</sup> Federal agencies are  
6           using the Climate and Economic Justice Screening Tool to identify disadvantaged  
7           communities and ensuring that programs are designed and implemented to ensure  
8           benefits flow to these communities.<sup>58,59</sup>

9    **Q       Does PNM’s EE and LM Plan identify Justice40 communities and**  
10           **investments, savings, or benefits for those communities?**

11   **A**No, energy efficiency implementation in Justice40 communities is not  
12           distinguished in PNM’s EE and LM Plan.

13   **Q       Should PNM explicitly identify Justice40 communities and benefits flowing**  
14           **to these communities in its EE and LM Plans?**

15   **A**Yes. While electric utilities are not required to meet this goal, Justice40 will be  
16           incorporated into eligibility requirements for funding from the IRA, the BIL, and  
17           the American Rescue Plan. PNM should maximize the use of other sources of  
18           funding to reduce ratepayer costs of its energy efficiency programs. Federal  
19           incentives will be directed to Justice40 communities. PNM will need to

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<sup>57</sup> Justice40 Initiative. Available at: <https://www.whitehouse.gov/environmentaljustice/justice40/>.

<sup>58</sup> Climate and Economic Justice Screening Tool. Available at: <https://screeningtool.geoplatform.gov/en/>

<sup>59</sup> It is important to note that the Climate and Economic Justice Screening Tool may be different than the tool(s) PNM used to identify disadvantaged communities in its rate case and grid modernization case.

1 distinguish and target its program efforts to Justice40 communities if it wants to  
2 take advantage of those funds.

3 **Q How do you recommend PNM proceed regarding Justice40?**

4 **A** I recommend that PNM use the Climate and Economic Justice Screening Tool to  
5 identify Justice40 communities and list them in its 2024-2026 EE and LM Plan.  
6 PNM should report the actual proportion of spending, savings, and benefits for  
7 Justice40 communities in its 2023 Annual Report. PNM should then use that  
8 baseline to set targets for spending, savings, and benefits in Justice40  
9 communities for 2024, 2025, and 2026 and include these targets in its 2024–2026  
10 EE and LM Plan.

11 **8. DEMAND RESPONSE**

12 **Q What demand response is PNM proposing in its 2024–2026 EE and LM**  
13 **Plan?**

14 **A** PNM is proposing the continuation of its two existing demand response programs,  
15 the Power Saver Program and the Peak Saver Program. According to PNM, the  
16 Power Saver Program, which is an air-conditioner cycling program targeting  
17 residential customers, will offer a 20 MW firm capacity commitment with a  
18 maximum capacity reduction of 40 MW. The Peak Saver Program, which is a  
19 load-curtailement program targeting commercial and industrial customers, will  
20 have a firm capacity of 15 MW with a maximum capacity reduction of 30 MW.<sup>60</sup>  
21 PNM lacks plans for additional programs despite a Commission order in Case No.  
22 19-00195-UT that directed it to do so.

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<sup>60</sup> PNM 2024-2026 EE and LM Plan, page 41 and Appendix C, page 46.

1    **Q     What responsibility does PNM have to implement additional demand**  
2           **response programs?**

3    **A**According to a directive of the Commission in the Final Order of Case No. 19-  
4           00195-UT issued July 29, 2020, PNM must provide 24 MW of additional demand  
5           response as part of the CCAE-1 portfolio—the portfolio that, among other things,  
6           was developed to replace the San Juan coal-fired power station. Since that time,  
7           PNM has failed to gain approval for a plan to procure the 24 MW mandated in  
8           Case No. 20-00182-UT.

9    **Q     Does PNM plan to meet the Commission’s directive in its proposed EE and**  
10           **LM Plan?**

11   **A**No. According to PNM, this EE and LM Plan does not meet the Commission’s  
12           directive. Instead, PNM states that its 2023 IRP “will address capacity  
13           requirements.”<sup>61</sup> In other words, PNM’s proposed load-management plan does not  
14           include a plan for meeting PNM’s load-management obligations.

15   **Q     What do you make of PNM’s preference to address the Commission’s 24**  
16           **MW demand response directive in its IRP?**

17   **A**PNM should ensure that it includes the 24 MW of incremental demand response  
18           in its IRP. To make that inclusion realistic, however, PNM must first propose a  
19           method for achieving that level of demand response. That is what the current EE  
20           and LM Plan is for—to develop a plan to implement demand response. Delaying  
21           consideration of what is needed to achieve 24 MW of demand response to the IRP  
22           takes this consideration out of its appropriate place and needlessly prolongs  
23           PNM’s failure to fulfill the Commission’s directive. Further, for accurate

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<sup>61</sup> PNM response to Interrogatory OAG 1-18(b).

1 representation of demand response in the IRP—both in modeling and to  
2 accurately capture the expected costs and benefits of different portfolios—the cost  
3 of delivering 24 additional MW of demand response must be well understood.  
4 Without completing the process of acquiring this required demand response  
5 capacity before the IRP, PNM will be unable to accurately represent its costs in  
6 the IRP. PNM lacks plans for future programs despite potential and technical  
7 capability.

8 **Q Is there more demand response potential in New Mexico? If so, what other**  
9 **demand response measures can PNM implement?**

10 **A** Yes. PNM retained Applied Energy Group to conduct an energy efficiency and  
11 demand response study for its jurisdiction in 2020 (“AEG 2020 study”), which  
12 assessed the potential of various new demand response measures and programs  
13 through 2040.<sup>62</sup> The realistic achievable potential estimates by program<sup>63</sup> are  
14 shown in Figure 3 below. The study found peak load reduction potential in PNM  
15 territory from new measures such as direct load control (DLC) water heating (4 to  
16 7.7 MW from 2025 to 2030), DLC electric vehicle charging (0.2 to 1.1 MW),  
17 demand bidding (5.4 to 18.1 MW), and behavioral program (1.7 to 3.6 MW).  
18 Further, the study found 8.2 MW to 9.1 MW of demand response potential from  
19 DLC smart thermostats from 2025 to 2030. This potential estimate for smart

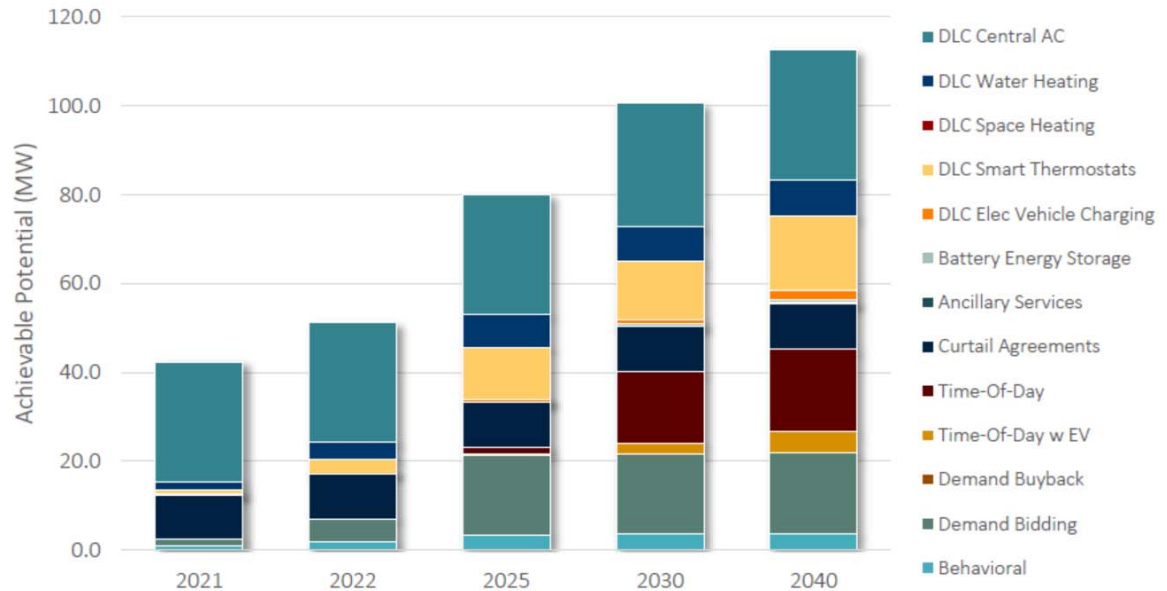
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<sup>62</sup> AEG. 2020. *Demand Side Management Potential Study*. Prepared for Public Service of New Mexico. Available at: [https://www.pnm.com/documents/396023/428013/PNM+2020+Potential+Study\\_Final.pdf/d7a344de-b497-9887-5ed0-b2cc8bc327c8?t=1622731726771](https://www.pnm.com/documents/396023/428013/PNM+2020+Potential+Study_Final.pdf/d7a344de-b497-9887-5ed0-b2cc8bc327c8?t=1622731726771).

<sup>63</sup> Impacts of some programs (e.g., time-of-day tariffs) overlap with impacts of other programs targeting specific end-uses (e.g., central AC). For estimating the realistic achievable potential, the study applied a loading order, or hierarchy, to determine which programs take precedent over other programs and to avoid double-counting of peak load impacts from the same end-uses across different programs.

1 thermostats is substantially more than the current level of peak reduction (2.3  
2 MW in 2022) in PNM's Power Saver program.<sup>64</sup>

3 **Figure 3. Realistic achievable potential by program through 2040 (Summer)**



4

5 *Source: AEG 2020 study. Figure 8-3.*

5

6 **Q Have any neighboring states recently studied demand response potential?**

6

7 **A** Yes. In 2022, Brattle Group studied demand response potential for Xcel Energy,  
8 Colorado.<sup>65</sup> This study evaluated cost-effective, achievable demand response  
9 potential estimates both for the summer and winter seasons for 2030. As shown in  
10 Figure 4, the study found approximately 650 MW more demand response  
11 potential than what Xcel is currently achieving for the summer season (or

<sup>64</sup> Appendix C to PNM 2024-2026 EE and LM plan, the Evergreen Economics. 2023. Evaluation of the 2022 Public Service Company of New Mexico Energy Efficiency and Demand Response Programs Page 83.

<sup>65</sup> Brattle Group. 2022. Xcel Energy Colorado Demand Response Study: Opportunities in 2030. Available at <https://www.brattle.com/wp-content/uploads/2022/09/Xcel-Energy-Colorado-Demand-Response-Study-Opportunities-in-2030.pdf>.

1 approximately 9 percent of the current summer peak load). This amount of  
2 demand response potential more than doubles the current demand response  
3 capability. About 75 percent of the demand response potential is expected to  
4 come from new measures and programs including peak-time rebate, time-of-use  
5 rates (“TOU”) for electric vehicles owners and other customers, and battery  
6 storage. The rest of the potential is found in air-conditioning demand response  
7 measures, which would increase the current air-conditioning demand response  
8 potential by about 60 percent. In addition, the study found approximately 270  
9 MW of additional peak load reductions for the winter season (or a total of 540  
10 MW including the existing demand response capability). Potential new winter  
11 demand response resources include grid interactive water heater, battery storage,  
12 TOU for electric vehicle owners and other customers, auto demand response for  
13 lighting and AC/HVAC, and peak-time rebates.<sup>66</sup> This study demonstrates that  
14 there is additional demand response potential related to new and existing  
15 measures in nearby jurisdictions as well.

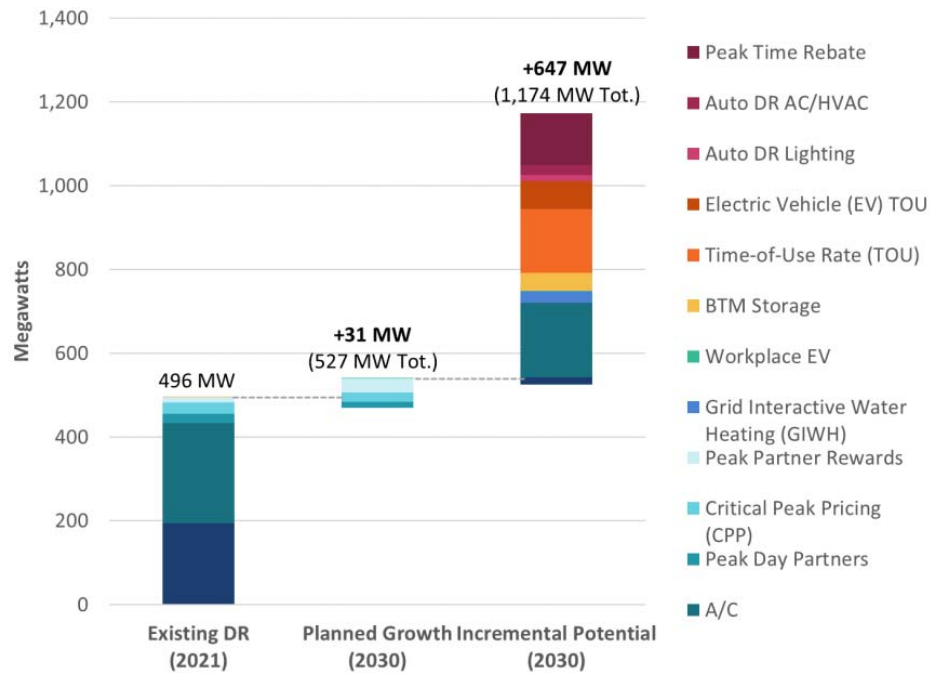
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<sup>66</sup> Brattle Group. 2022. Figure 16. Page 33.



1

**Figure 4. Xcel Energy’s demand response achievable potential for summer (2030)**



2

Source: Brattle Group. 2022. Xcel Energy Colorado Demand Response Study: Opportunities in 2030. Figure 17. Page 35.

3  
4

5 **Q Are any jurisdictions implementing the demand response measures identified**  
 6 **in the demand response potential studies by Applied Energy Group and**  
 7 **Brattle Group?**

8 **A** Yes. In recent years, the U.S. Department of Energy, Bonneville Power  
 9 Administration, Portland General electric, and 10 utilities in the Northwest have  
 10 shown that heat pump water heaters can reduce 90 percent of evening peak load  
 11 relative to electric resistance water heaters.<sup>67</sup> Residential and commercial bring-  
 12 your-own-battery demand response programs are also becoming common, with

<sup>67</sup> US Department of Energy. 2019. “Heat Pump Water Heaters Achieve Significant Peak Reduction and Energy Savings.” Available at <https://www.energy.gov/eere/buildings/articles/heat-pump-water-heaters-achieve-significant-peak-reduction-and-energy>.

1 examples in Vermont, Massachusetts, and Florida.<sup>68</sup> Managed charging of electric  
2 vehicles through time-varying rates and other structures is even more common  
3 throughout the United States. Between 2012 and 2019, utilities in Ohio, Oregon,  
4 Washington, Maryland, Vermont, Hawaii, California, Massachusetts, New York,  
5 Colorado, Tennessee, Minnesota, Michigan, Texas, and Florida ran managed  
6 charging programs for electric vehicles.<sup>69</sup> Vehicle-to-grid applications of electric  
7 vehicles are still in early development but are being piloted in select locations.<sup>70</sup>

8 **Q Is PNM equipped to implement additional programs like these?**

9 **A** Yes. PNM selected a third-party vendor, Itron, to run the Peak Saver and Power  
10 Saver demand response programs. For these programs, Itron is planning to use  
11 “IntelliSOURCE” platform, which PNM claims “could be used in the future to  
12 help integrate distributed energy resources, including: controllable load, batteries,  
13 smart inverters, and electric vehicles.”<sup>71</sup> Getting the best value out of Itron’s

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<sup>68</sup> Eversource Energy Storage Solutions in Connecticut. Accessed September 6, 2023. Available at <https://www.eversource.com/content/residential/save-money-energy/clean-energy-options/home-battery-storage/energy-storage-solutions>. Green Mountain Power Bring Your Own Device, Accessed September 6, 2023. Available at <https://greenmountainpower.com/rebates-programs/home-energy-storage/bring-your-own-device/>

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<sup>69</sup> Smart Electric Power Alliance (2019), “A Comprehensive Guide to Electric Vehicle managed Charging.” Available at <https://sepapower.org/resource/a-comprehensive-guide-to-electric-vehicle-managed-charging/>.

<sup>70</sup> “Highland Electric Fleets Coordinates Electric School Buses' Summer Job - Supporting Local Grid with Vehicle-to-Grid Technology.” Available at <https://www.prnewswire.com/news-releases/highland-electric-fleets-coordinates-electric-school-buses-summer-job--supporting-local-grid-with-vehicle-to-grid-technology-301611928.html> “San Diego County's Ramona Unified School District, Blue Bird and Nuvve Unveil 8 New V2G-Enabled and Qualified Electric School Buses.” Available at <https://www.prnewswire.com/news-releases/san-diego-countys-ramona-unified-school-district-blue-bird-and-nuvve-unveil-8-new-v2g-enabled-and-qualified-electric-school-buses-301645407.html>

<sup>71</sup> PNM EE and LM Plan, page 40.

1 platform requires using its full capability. The Company could be utilizing the  
2 platform's full capabilities effective immediately.

3 **Q What is your overall recommendation based on this discussion?**

4 **A** PNM has a responsibility, ordered by the New Mexico Commission, to  
5 incorporate more demand response into its resource planning. Based on the  
6 existing demand response potential studies including the AEG demand response  
7 potential study for PNM as well as emerging demand response programs  
8 implemented by many other jurisdictions, PNM should seek to develop additional  
9 demand response capacity; the utility is equipped to do so. I recommend that  
10 PNM propose pilot programs for demand response that implement promising  
11 measures and utilize the full capabilities of Itron's IntelliSOURCE platform.  
12 These pilot programs should test adoption of these measures in PNM's service  
13 territory and PNM should report its progress to the Commission. With this  
14 information, PNM should develop new demand response programs that can be  
15 scaled throughout its service territory. Finally, I recommend that PNM propose a  
16 concrete plan to meet the Commission's directive in Case No. 19-00195-UT to  
17 procure at least 24 MW of incremental demand response prior to its IRP, so the  
18 Commission and intervenors can review its plan and so that costs are well  
19 understood during the IRP process.

20 **Q Does this conclude your testimony?**

21 **A** Yes.

**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. 23-00138-UT**

**AFFIRMATION (IN LIEU OF AFFIDAVIT)  
OF KENI TAKAHASHI**

In compliance with Paragraph (3) of Subsection A of Section 1.2.2.35 NMAC (2021) of the Public Regulation Commission Rules of Procedure, I, Kenji Takahashi, hereby file this unsworn affirmation and states as follows: I hereby affirm in writing under penalty of perjury under the laws of the State of New Mexico that the statements contained in the foregoing *Direct Testimony of Kenji Takahashi on Behalf of the Office of the Attorney General*, are true and correct to the best of my knowledge, information, and belief.

I further declare under penalty of perjury that the foregoing is true and correct.

Executed September 18, 2023.

*Kenji Takahashi*

Kenji Takahashi (electronically signed)  
Principal Associate, Synapse Energy Economics, Inc.  
Expert Witness on Behalf of the New Mexico Attorney General  
485 Massachusetts Avenue, Suite 3  
Cambridge, MA 02139

## Kenji Takahashi, Principal Associate

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### PROFESSIONAL EXPERIENCE

**Synapse Energy Economics Inc**, Cambridge, MA. *Principal Associate*, April 2023 – Present; *Senior Associate*, 2015–April 2023; *Associate*, 2004–2015.

Analyzes technologies, policies, and regulations associated with supply- and demand-side energy resources. Assesses the performance, costs, and potential of energy efficiency measures, renewable energy resources, and building decarbonization and electrification measures. Examines economic and environmental implications of clean energy policies and programs associated with energy efficiency, demand response, distributed generation, and renewable energy. Analyzes ratemaking issues such as standby rates and time of use rates for distributed generation, and decoupling rate mechanisms for energy efficiency measures. Investigates electricity and natural gas market price trends and fluctuations. Prepares expert testimony and reports for regulatory proceedings.

**Center for Energy and Environmental Policy**, University of Delaware, Newark, DE. *Research Associate*, 2002 – 2004.

Researched the market potential of distributed resources under different electric distribution rate designs (report prepared for Conectiv Power Delivery Company). Investigated the potential of the Clean Development Mechanisms (CDM) in Asian developing countries and the Japanese government's policy for CDM. Contributed to a market penetration study for photovoltaic technologies in comparison with the predicted oil production from the oil reservoirs in the Arctic National Wildlife Refuge (report prepared for Astropower, Inc.). Analyzed the installation of PV and generation-set options for the Assateague Beach Coastal Guard Station at the Assateague Island National Seashore in Maryland (report prepared for the U.S. National Park Service).

**Delaware Division of Public Advocate**, Wilmington, DE. *Research Intern*, 2003.

Researched and wrote reports on states' policies regarding (1) energy efficiency/load management programs in order to identify cost-effective programs for implementation in Delaware; (2) electric standard offer service/default service (rate designs) for those who do not choose alternative suppliers under the deregulation process; (3) electric universal service and system benefit charges for protecting consumers from risks associated with electricity restructuring; and (4) Contributions and Advances-in-Aid-of-Construction for water supply extensions.

**Resources for the Future**, Washington DC. *Research Intern*, 2002.

Investigated current and planned wind power capacity for the United States. Analyzed the EPA and EIA market models to estimate technical and economic potential of wind power in the United States.

Researched the status of renewable energy supply in Japan's electricity sector for the Economic and Social Research Institute, Cabinet Office, Government of Japan.

**Citizens' Alliance for Saving the Atmosphere and the Earth (CASA)**, Osaka, Japan. *Volunteer and Researcher*, 1999 – 2001.

Worked as a newsletter writer, editor, and event organizer. Wrote a report on the first experimental biomass energy facility in Japan and the photovoltaic system at Yagi Junior High School in Kyoto, Japan. Participated in a research project to investigate renewable energy potential and policies in Japan. Wrote a report on problems of nuclear power plants affecting communities in Fukui prefecture, Japan.

## EDUCATION

**University of Delaware, Center for Energy and Environmental Policy, Joseph R. Biden, Jr School of Public Policy and Administration**, Newark, DE

Master of Arts in Urban Affairs and Public Policy with a focus on Energy and Environmental Policy, 2003. Master's thesis: *Policies to Support Distributed Resources under Different Electricity Restructuring Models*. Courses in energy economics, energy and environmental policy, electricity policy and planning, political economy of environment, solar electric technology, cost-benefit and decision-making analyses, and geographic information system.

**Kansai University**, Osaka, Japan

Bachelor of Arts in Law with a concentration in Public Administration, 2000.

## ADDITIONAL EDUCATION

**Massachusetts Institute of Technology**, Cambridge, MA

Professional Education Course: Sustainable Infrastructure Systems: Planning and Operations, 2022.

## AWARDS AND SCHOLARSHIPS

- Director's Citation, Joseph R. Biden, Jr School of Public Policy and Administration, University of Delaware. May 2003.
- NEC scholarship for an environmental education leader-training program funded by one of the leading Japanese computer companies, NEC. November 2000.

## ADDITIONAL SKILLS

**Software:** MS Office, Minitab, Analytica, IMPLAN, AVOIDed Emissions and geneRation Tool (AVERT), CO-Benefits Risk Assessment (COBRA), RETScreen, BEopt™, REM/Rate™

**Language:** Japanese, Spanish, and Cantonese

## OTHER RELEVANT WORK

- Assisted NYSERDA with developing (a) a database of renewable heating and cooling (RH&C) technologies, (b) an Excel-based tool to analyze benefits and costs of RH&C, and (c) a state RH&C Policy Framework titled “Renewable Heating and Cooling Policy Framework: Options to Advance Industry Growth and Markets in New York.”
- Assisted U.S. EPA with its analysis for and preparation for technical support documents on energy efficiency associated with U.S. EPA’s Clean Power Plan under 111(d) regulation
- Assisted New Jersey Division of Rate Counsel with reviewing and commenting on various energy related proposals and documents in New Jersey including utility and the state energy efficiency programs and the state’s energy plans. 2009 to present.
- Assisted Nova Scotia Utility and Review Board with a review of energy efficiency potential and integrated resource planning for Nova Scotia Power’s jurisdiction. 2013
- Assisted the Hawaii Division of Consumer Advocacy in proceedings to develop and review IRPs for three electric companies and to review the state’s energy efficiency programs. 2012 to 2014.
- Assisted the Arkansas Public Service Commission staff with (a) reviewing and assessing utility integrated resource planning and energy efficiency program proposals and (b) drafting regulatory orders on comprehensive energy efficiency program designs and reporting methods. 2012 to 2013.
- Assessed on behalf of Sierra Club energy efficiency and demand response potential estimates by the Cadmus Group for Puget Sound Energy, September 2012.
- Assumed a general contractor role for renovating an existing multi-family house into an ultra-low energy use house equipped with state-of-art energy efficiency measures (such as R-7 windows, R-70 roof insulation, a 95 percent efficient energy recovery ventilation system, cold climate heat pumps) and a 5 kW solar photovoltaic system. December 2012.
- Assessed on behalf of Sierra Club energy efficiency goals proposed in the Los Angeles Department of Water and Power’s 2010 integrated resource plan.
- Assisted Nova Scotia Utility and Review Board with developing Community Based Feed-In Tariffs (COMFITs) for five different technologies: small wind projects, medium-sized wind projects, small hydro, small tidal, and biomass CHP projects. April 2011.
- Analyzed existing deep energy retrofit (DER) project data and analyzed potential energy savings from model partial DER projects (e.g., attic, above-grade wall, windows, basement wall) using REM/Rate building energy software and Synapse’s own spreadsheet building energy model developed for this research project. The results from the analysis were used to project energy savings from and to set incentive levels for partial DER projects as part of National Grid’s 2013-2015 efficiency program filing.
- Assisted several states, including Alaska, Colorado, Florida, Maryland, Massachusetts, and South Carolina with developing and analyzing their state climate change action plans; evaluated costs and benefits of demand and supply-side policy options, including quantifying expected greenhouse emission reductions. 2007 to 2010.

- Arranged meetings for Union Fenosa/Gas Natural, a Spanish electric and gas company, with Japanese and Korean organizations to study energy efficiency technologies, programs and policies in those countries; Visited Japanese organizations with the delegates of Union Fenosa, provided them technical and translation assistance on energy efficiency in Japan. July 26 to July 31, 2009.

## PUBLICATIONS

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Kwok, S., K. Takahashi, J. Litynski, A. S. Hopkins. 2022. Memo: Massachusetts DPU Docket-2080: Proposed "Common Regulatory Framework." Synapse Energy Economics for Conservation Law Foundation.

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*Low-Income Efficiency Programs*. Synapse Energy Economics for Sierra Club and Gulf Coast Community Foundation.

Wilson, R., I. Addleton, K. Takahashi, J. Litynski. 2021. *Clean, Affordable, and Reliable – A Plan for Duke Energy’s Future in the Carolinas*. Synapse Energy Economics for North Carolina Sustainable Energy Association, Carolinas Clean Energy Business Alliance, Southern Alliance for Clean Energy, Natural Resources Defense Council and the Sierra Club.

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## **TESTIMONY ASSISTANCE**

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- 2019 Electrification U.S. Symposium Series – Pathways to Decarbonization in the Northeast, August 27-29, 2019.
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- 2018 ACEEE Summer Study on Energy Efficiency in Buildings, August 12, 2018.
- 2017 ACEEE National Conference on Energy Efficiency as a Resource, October 30, 2017.
- 9th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'17), September 13-15, 2017.
- NEEP Northeast Strategic Energy Management Collaborative Workshop, November 15, 2016.
- NEEP 2016 EM&V Forum Annual Public Meeting: the Future of Evaluation, March 30, 2016.
- 2015 ACEEE National Conference on Energy Efficiency as a Resource, September 21, 2015.
- EUCI Conference on Utility Integrated Resource Planning (IRP), May 13-15, 2015.
- 2013 ACEEE National Conference on Energy Efficiency as a Resource, September 22-24, 2013.
- 7th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'13), September 11-13, 2013.
- Energy Measure Verification Workshop (sponsored by Massachusetts Department of Energy Resources), September 2013.
- Smart Building: High Performance Homes - Workshop for building professionals, June 22, 2011.
- NESEA Building Energy 11 Conference, March 8-10, 2011.

- Build Boston 2010 on Residential Design and Construction, November 17, 2010.
- ACI New England Conference 2010, October 6, 2010.
- 2010 ACEEE Summer Study on Energy Efficiency in Buildings, August 18-20, 2010.
- NESEA Building Energy 10 Conference, March 8-10, 2010.
- 5th International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL'09), June 24, 2009.
- 2008 ACEEE Summer Study on Energy Efficiency in Buildings, August 21, 2008.
- Tufts University Clean Distributed Energy Workshop, June 8, 2006.
- The 2006 Northeast Energy Efficiency Summit, May 17.
- The 2006 Distributed Generation & Interconnection Conference held by DTE Energy, April 26-28, 2006.
- United Nations Climate Change Conference at its eleventh session / Twenty-third sessions of the Subsidiary Bodies and COP/MOP 1, December 2005.

*Resume updated September 2023*

**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 ) Case No. 23-00138-UT  
EFFICIENCY PROGRAM PLAN, PROFIT INCENTIVE )  
AND REVISED RIDER NO. 16 PURSUANT TO THE NEW )  
MEXICO PUBLIC UTILITY ACT, EFFICIENT USE OF )  
ENERGY AND ENERGY EFFICIENCY RULE )

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that a true and correct copy of the foregoing **Direct Testimony of Kenji Takahashi** was emailed to the parties listed below on September 18, 2023:

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Before the New Mexico Public Regulation Commission

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