Energy Efficiency and Demand Response Potential Study

Public Service Company of New Mexico

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Introductions and Agenda

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- Introductions
- Energy Efficiency Potential Study
- Energy Efficiency Resource Bundling
- Demand Response Potential Study
- Q&A

Energy Efficiency Potential Study

Energy Efficiency Potential Methodology

PNM sales & load data
Customer surveys (RASS)
Regional and federal resources

Market Characterization

Measure List Development

Comprehensive list drawn from PNM studies and programs, regional sources, DOE, and emerging technology research

Measure Characterization

Savings, costs, lifetime, and applicable market

Baseline Projection

Account for applicable codes & standards, PNM customer projections, and other forecast inputs

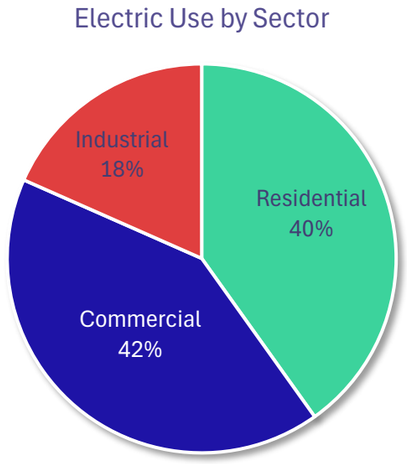
Potential Estimation

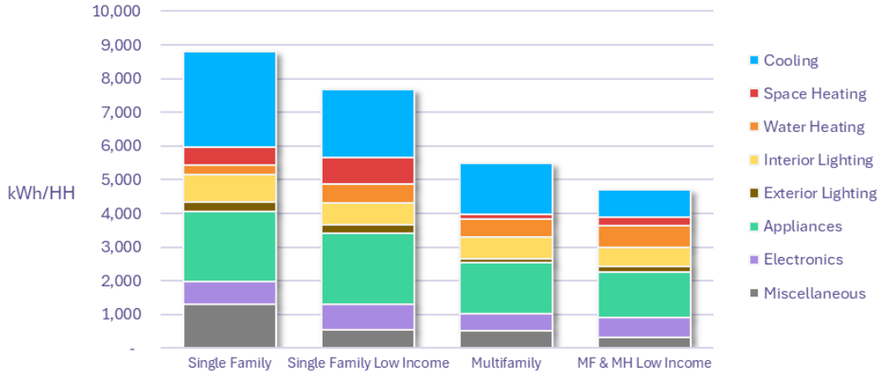
Technical, Economic, and Achievable Potential

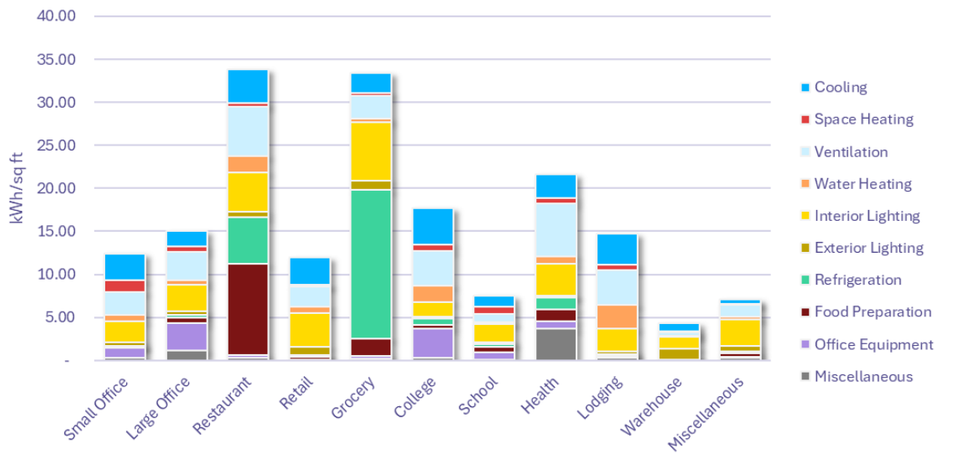
Sensitivity Analyses

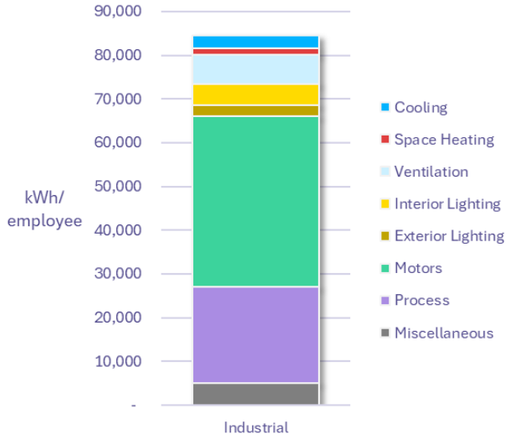
Base-Year Electric Consumption

- The commercial sector represents the largest portion of electric use, but only slightly more than residential
- Each end use contains one or more technologies that have their own saturation and annual consumption estimates for each sector and segment
  - Residential cooling is the largest share of the load, followed by appliances
  - Commercial usage is mostly in lighting and ventilation end uses, except for some segment-specific end uses (e.g., grocery refrigeration)
  - Industrial is dominated by motors and process activities





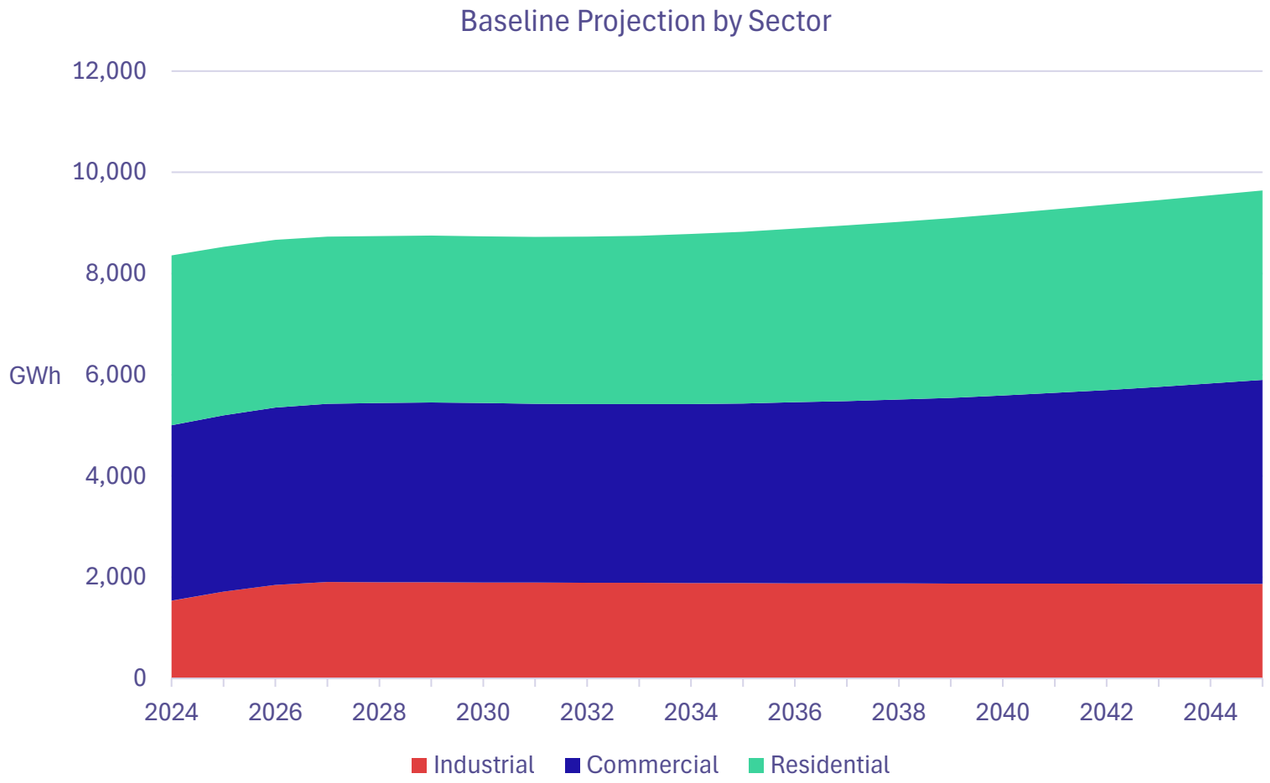




Baseline Projection

The baseline projection includes expected customer growth in PNM's territory provided by the load forecasting team and the expected impacts of applicable codes and standards.

By 2045, total electric consumption is projected to rise 15%, to over 9,600 GWh.

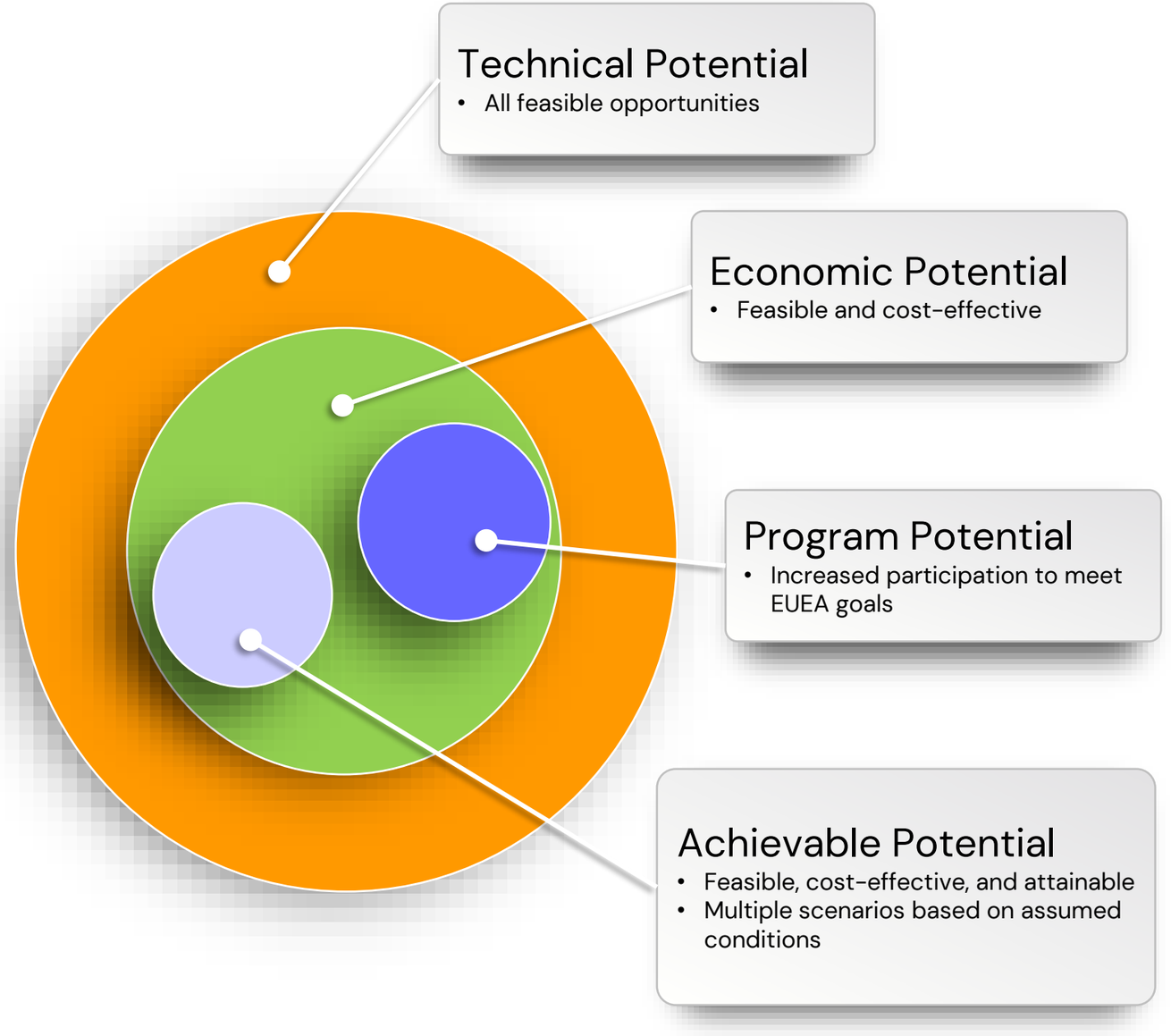


Estimating Energy Efficiency Potential

Potential is estimated by creating an alternate sales forecast incorporating efficient measure adoption and calculating the change from the baseline

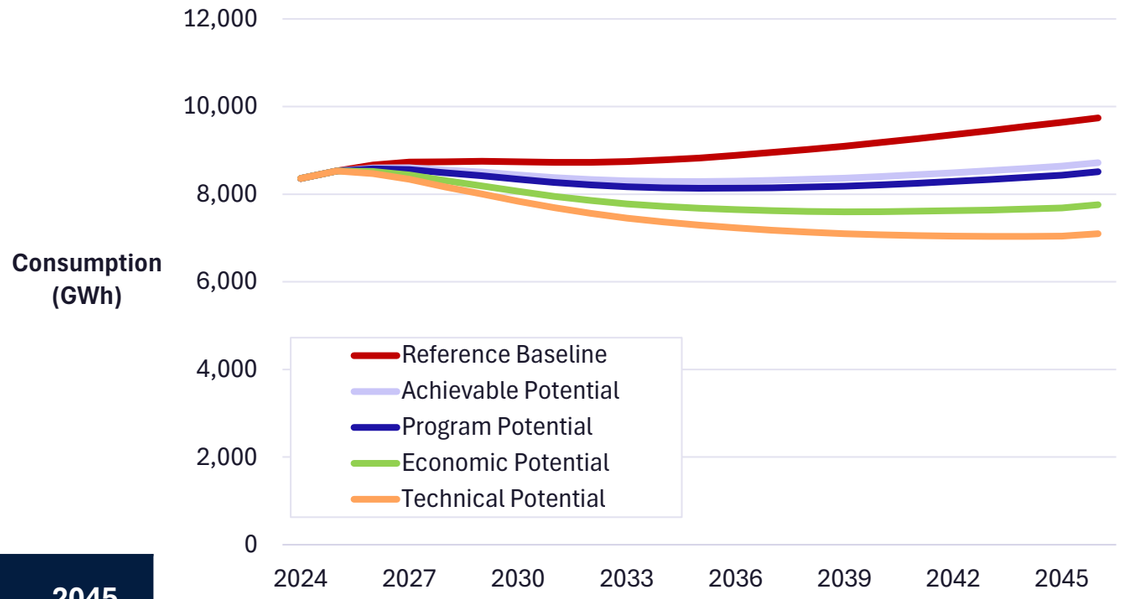
ICF calculated multiple distinct levels of potential:

- **Technical** includes all opportunities, regardless of cost or expected customer uptake
- **Economic** screens measures for cost-effectiveness from the Utility Cost Test perspective
- **Achievable** applies adoption rates to economic potential
  - **Program Potential** applies increased adoption rates to reach EUEA goals
- **Achievable Technical** applies adoption rates to technical potential, without screening for cost-effectiveness. Used to provide inputs for the IRP.



Energy Efficiency Potential Summary

Total achievable potential across all sectors reach 127 GWh, or 1.5% of the baseline over the next biennium (2026–2027), rising to 538 GWh, or 6.1% of the baseline over 10 years.

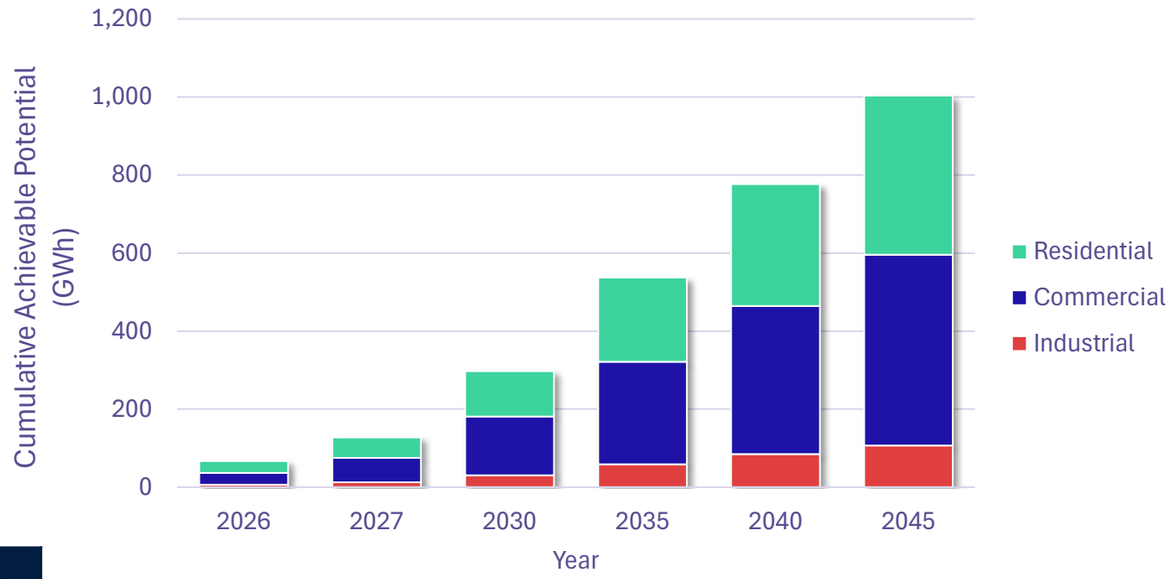


Summary of Energy Savings (GWh), Selected Years	2026	2027	2030	2035	2040	2045
Baseline Forecast (GWh)	8,667	8,731	8,736	8,826	9,180	9,642
Cumulative Savings (GWh)						
Achievable Potential	67	127	297	538	776	1,003
Program Potential	89	171	394	691	966	1,211
Economic Potential	148	290	672	1,149	1,578	1,953
Technical Potential	199	390	895	1,535	2,107	2,601
Energy Savings (% of Baseline)						
Achievable Potential	0.8%	1.5%	3.4%	6.1%	8.5%	10.4%
Program Potential	1.0%	2.0%	4.5%	7.8%	10.5%	12.6%
Economic Potential	1.7%	3.3%	7.7%	13.0%	17.2%	20.3%
Technical Potential	2.3%	4.5%	10.2%	17.4%	23.0%	27.0%

Energy Efficiency Potential by Sector

Commercial sector savings contribute the highest portion of achievable potential at 151 GWh by 2030, followed by the residential sector savings of 116 GWh.

Program potential reaches 394 GWh by 2030, which reflects PNM's increased program activity to meet the EUEA requirement of 5% savings relative to 2025 sales.



Summary of Energy Savings (GWh), Selected Years	2026	2027	2030	2035	2040	2045
Achievable Potential Cumulative Savings (GWh)						
Residential	30	52	116	216	312	407
Commercial	31	62	151	263	379	489
Industrial	6	13	30	58	84	107
Total	**67**	**127**	**297**	**538**	**776**	**1,003**
Program Potential Cumulative Savings (GWh)						
Residential	38	69	154	281	394	500
Commercial	42	85	201	337	469	584
Industrial	8	17	39	73	102	126
Total	**89**	**171**	**394**	**691**	**966**	**1,211**

Energy Efficiency Resource Bundling

Supply Curve Bundling Methodology

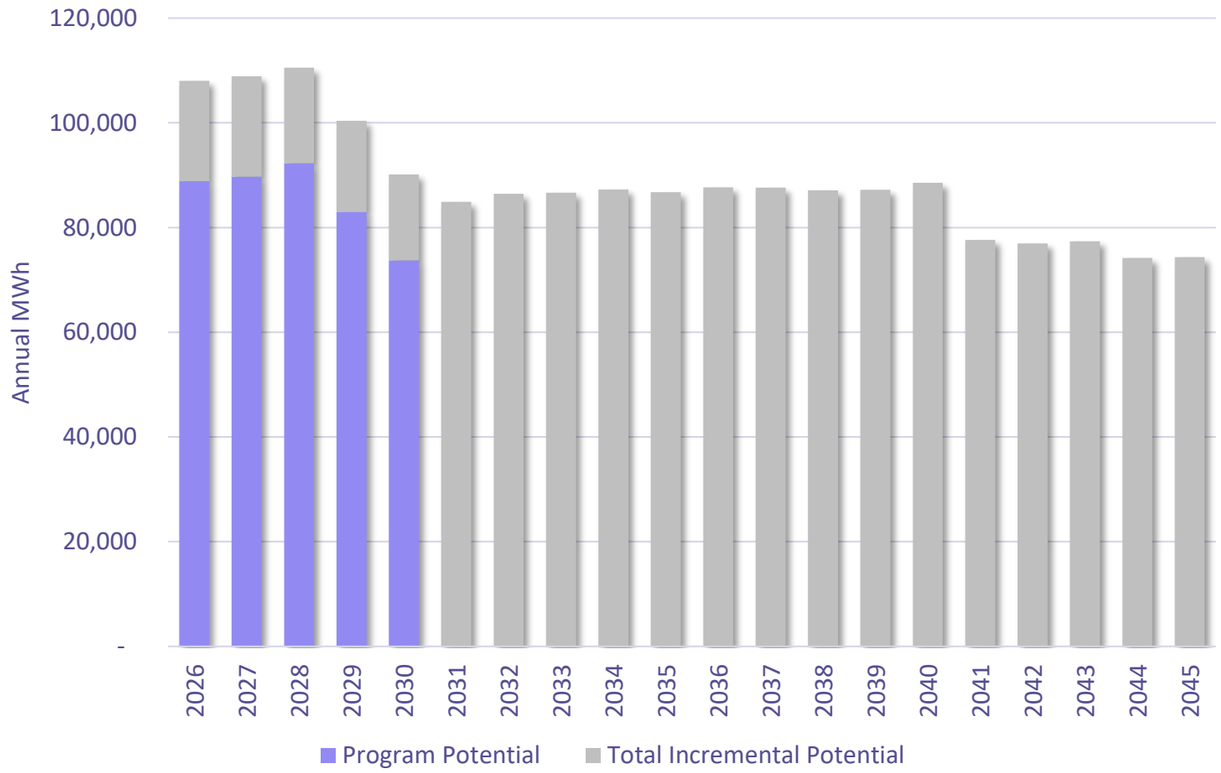
Estimate Achievable Technical Potential	• Incorporates adoption rates, but does not consider cost-effectiveness • Allows IRP model to consider EE resources at all costs
Identify Incremental Potential	• Subtract the Program Potential from Achievable Technical during the 2026-2030 period • For 2031-2045, no statutory goals are assumed
Define Bundles	• Bundle ranges to provide sufficient granularity • Allows IRP to compare EE resources to similar-cost supply-side options
Assign Load Shapes	• Match EE measures to resources bundles and load shapes • Based on building type and end use
Create bundles	• Combine individual measures to calculate total savings, average cost, and measure life for each bundle in each year

Supply Curve Bundling Methodology (Continued)

Step 1: Calculate "Achievable Technical" potential, incorporating achievability rates, but not cost-effectiveness screening.

Step 2: Identify measure-level incremental potential beyond statutory goals

- 2026 – 2030: Incremental Potential = Achievable Technical -Program Potential
- 2031 – 2045: Incremental Potential = Achievable Technical



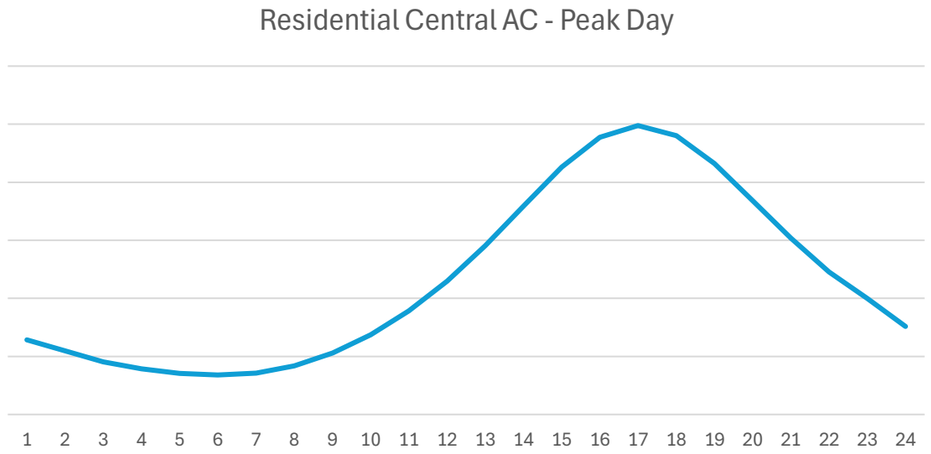
Supply Curve Bundling Methodology (Continued)

Step 3: Define bundles based on levelized cost of conserved energy. Levelized costs are in 2024$

Step 4: Match energy efficiency measures to resource bundles and calibrated load shapes.

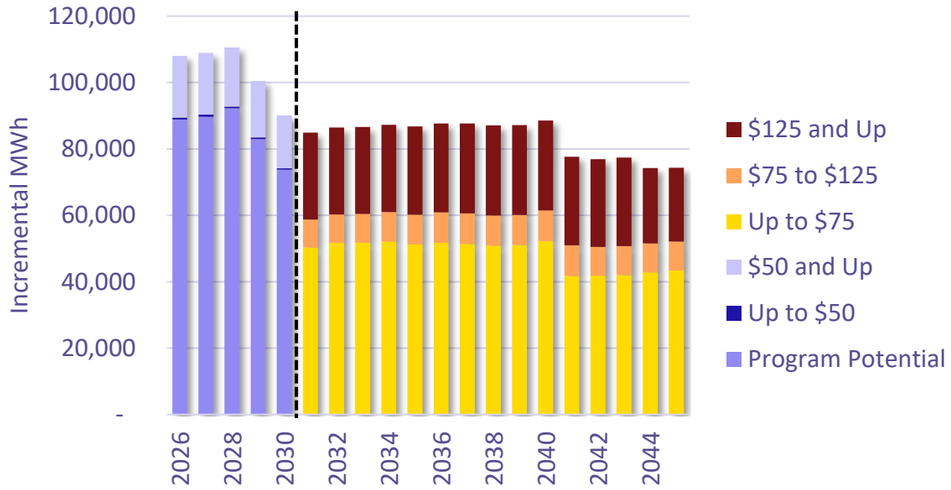
- ICF assigned each measure in the potential study to a bundle in each year based on
  - whether it was included in the program potential, and
  - its levelized cost.
- Each measure was similarly matched to a calibrated load shape by building type and end use.

Statutory Period 2026-2030	Post-Statutory Period 2031-2045
Program Potential	n/a
Up to $50/MWh	Up to $75/MWh
Over $50/MWh	$75/MWh to $125/MWh
	Over $125/MWh

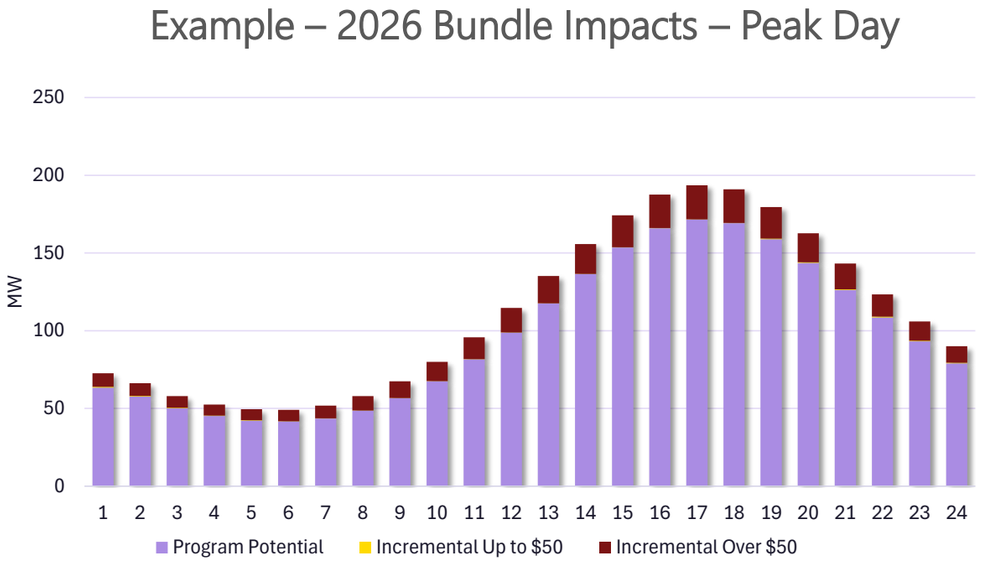


Supply Curve Bundling Methodology (Continued)

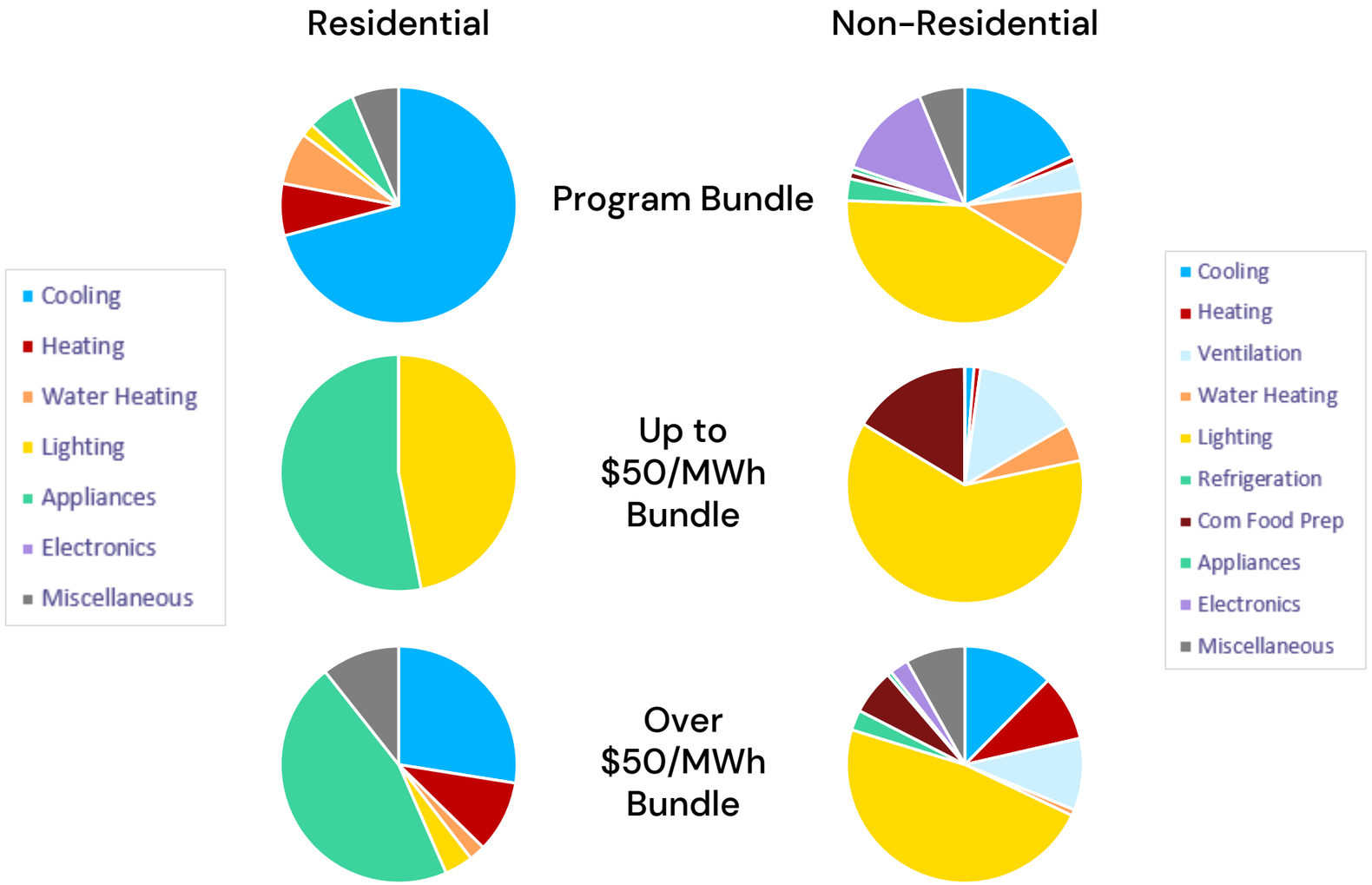
Step 5. Calculate annual incremental energy savings and weighted average cost and measure life for each bundle based on included measures.



Step 6. Develop hourly impacts for each bundle by spreading measure-level impacts over calibrated end use load shapes



Example Bundle Composition



Demand Response Potential Study

Demand Response Potential Modeling

Leverage EE baseline and survey data

Characterize market by sector and customer size

Market Characterization

Resource Characterization

Baseline Projection

Leverage EE baseline, account for interactions with achievable EE potential

Potential Estimation

Achievable Potential

Resource Competition

Scenario Analysis Possible

Develop list of load control and rate options

Research and benchmark costs and impacts

Understand infrastructure capabilities

Demand Response Programs Modeled

Commercial and Industrial Curtailment

- Peak Saver

Direct Load Control

- Electric Vehicle Behavioral Charge Management
- Battery Energy Storage
- Power Saver – HVAC
- Power Saver - Connected Thermostats
- Domestic Hot Water Heater
- Grid Interactive Water Heater

Time-Varying Rates and Behavioral

- Electric Vehicle Time-of-Use Rates
- Behavioral Demand Response
- Time of Day Rates

* Peak Time Rebates and Critical Peak Pricing were considered, but screened out due to feasibility with PNM's current billing system. Future billing system upgrade may enable inclusion in future potential studies

Demand Response Program Characterization

Participation Rates

- Annual estimate of engagement based on appliance saturations, segmentation, and program hierarchy
- Informed by utility enrollment data, evaluations, pilots, and stakeholder input

Customer Impacts

- Estimated as percent of peak load or deemed kW reduction per customer/unit
- Based on utility programs, regional pilots, and tailored secondary sources

Programmatic Costs

- Program costs include development, administration, equipment, and installation
- Participant costs cover equipment, installation, operations and maintenance, marketing, recruitment, and incentives

Average Coincident Peak Demand by Customer Type / Technology

Average % Impact or kW Reduction

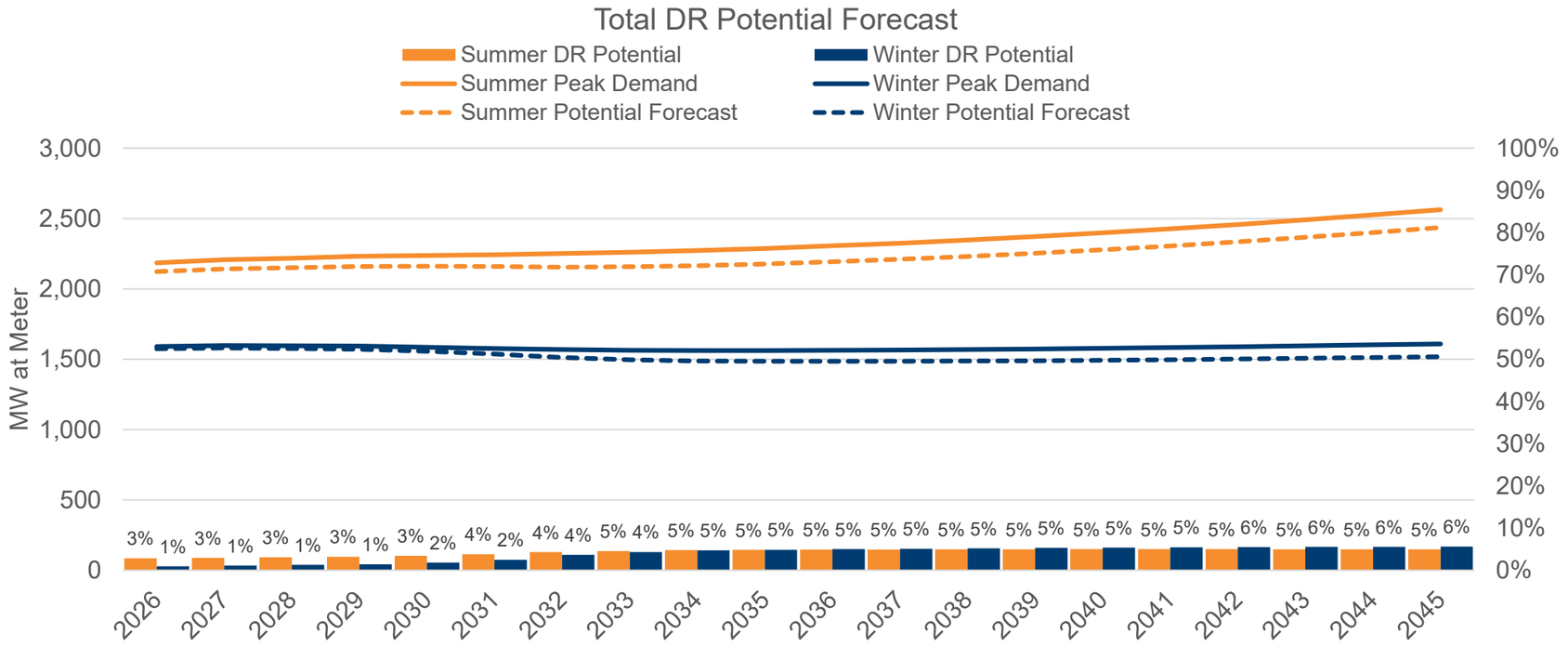
# of Eligible and Participating Customers

Aggregate Demand Response Program Impact

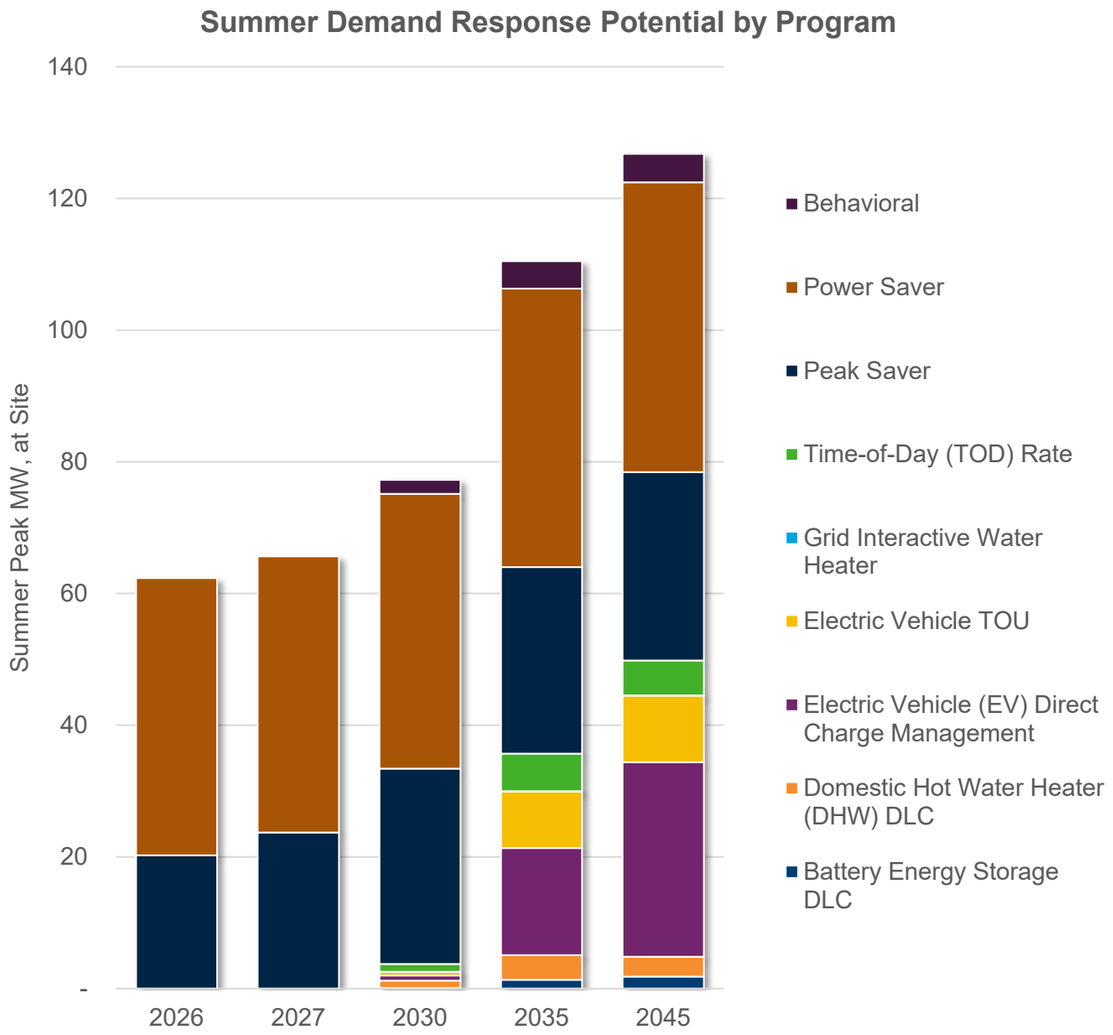
Demand Response Potential

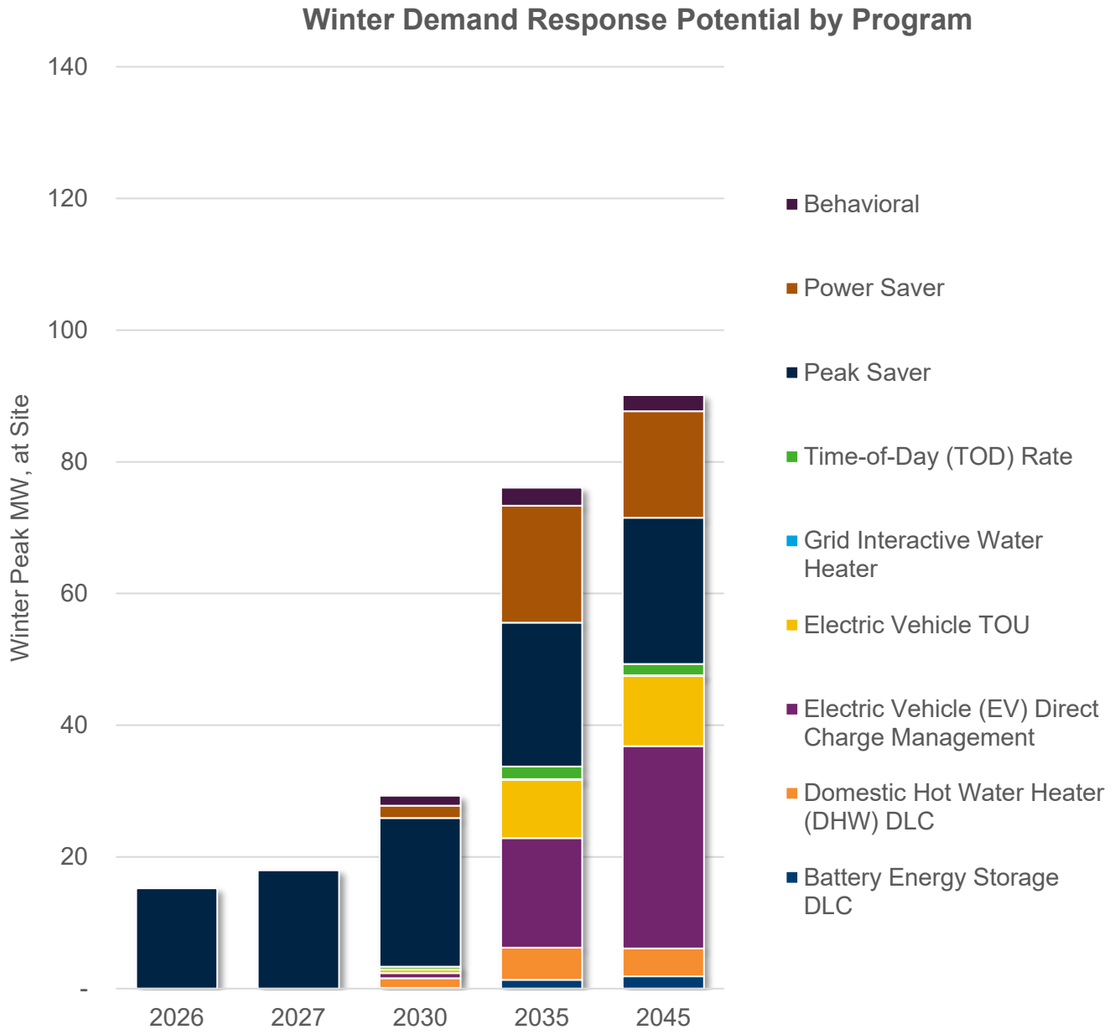
- Demand response potential represents approximately 5%-6% of projected summer and winter peak demand.

- Most of the potential comes from the residential sector, where ICF estimated that residential programs have the potential to contribute 72% of the overall reduction in summer peak demand and 71% of winter peak demand by 2045



Demand Response Potential





Q&A

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