documentation included the application, invoice, and certification rating identification number. However, the nameplate photos or model/serial numbers of the existing units were not provided. Overall, despite the documentation shortfalls, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good*.

Residential Demand Solutions Component

For the Residential Demand Solutions component, the EM&V team evaluated the component by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments at the *electric service identifier ID* (ESIID) level. In PY2024, load management events occurred on the following dates and times:

- July 31, 2024, from 4:00 p.m. to 5:00 p.m.,
- August 19, 2024, from 5:00 p.m. to 6:00 p.m., and
- August 20, 2024, from 4:00 p.m. to 5:00 p.m.

The EM&V team received interval meter data and a spreadsheet summarizing the event-level savings for 1,694 sites.

- The cooperation level was 80 percent.

After the EM&V team applied the *High 3 of 5* baseline calculation method, it was found that the evaluated savings did not match the savings ETI provided for all sites. The difference was in the calculation of the *additive adjustment* value. When the *uncapped additive adjustment* is negative, the *additive adjustment* used to calculate the *final baseline* should be negative. This was not the case in ETI's calculations, as the *additive adjustment* was always positive.

The kW savings for each participating site corresponded to the average across the three events. The kWh savings for each participating site were calculated by multiplying the kW reduction by the total number of event hours. Program-level savings were calculated by adding all site-level savings.

Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Claimed energy savings(kWh)	Evaluated energy savings(kWh)	Realization rate (kWh)	Program documentation score
2,564	2,564	100.0%	7,693	7,693	100.0%	Good

The table above shows the EM&V team's (evaluated) and ETI's (claimed) calculated kW and kWh savings. The pre-adjustment evaluated savings for the Residential Demand Solutions component are 2,564 kW and 7,693 kWh, with realization rates of 66.7 percent for kW and 66.7 percent for kWh. ETI accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kW and kWh savings is 100 percent, with a documentation score of *good*.

2.7.3 Hard-to-Reach SOP

The PY2024 Hard-to-Reach SOP evaluation efforts focused on desk reviews for the HTR SOP and Multifamily HVAC components; the sample of completed desk reviews for this program is listed below.

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
6.6%	1,736	1,736	100.0%	7.2%	3,321,128	3,321,128	100.0%	Fair

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 HTR SOP evaluation efforts focused on desk reviews. Two desk reviews were completed for the HTR SOP component, and one desk review was completed for the Multifamily HVAC component. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for two projects evaluated. The adjustment for both projects was less than five percent compared to the originally claimed savings. ETI accepted the evaluated results and matched the claimed savings to the evaluation for all projects; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 28317: The energy efficiency project consisted of the installation of a *smart thermostat* and the early replacement of an *air conditioning unit with electric resistance heating* with a new *heat pump*. During the desk review, the EM&V team was unable to determine the discrepancy in savings. The adjustment resulted in a realization rate of 95.0 percent and 95.6 percent for demand reduction (kW) and energy savings (kWh), respectively.

Participant ID 31067: The energy efficiency project consisted of the installation of *APSs* and *ceiling insulation* measures. During the desk review, the EM&V team slightly adjusted the savings due to rounding. The adjustment resulted in a realization rate that rounded to 100.0 percent for both demand reduction (kW) and energy savings (kWh).

Documentation Score

The EM&V team verified most of the key inputs and assumptions, including the project scope, *APS* location, R-values, and equipment specifications for all sampled projects that had desk reviews. Project documentation included the invoice, nameplate photo, ceiling insulation photos, and *APS* photos. However, one HTR SOP project was missing photos for the *APS* location to confirm it was installed. Also, all three projects were missing photos of the electric resistance furnace nameplate. One of the HTR SOP projects had a photo of the furnace, but did not capture the nameplate to confirm the heating type. The other HTR SOP project took a sample of the electric resistance furnaces. However, none of the photos in the other projects at the same location included the nameplate. Lastly, the Multifamily HVAC project was missing photos of the furnace entirely. There were no furnace photos or nameplate photos in the sample project folder, nor in the project folders from units at the same location. Due to the level of sufficient documentation falling between 70 percent and 89 percent, a program documentation score of *fair* was assigned.

- **Recommendation***:* Ensure the furnace nameplate is visible in the photo documentation, or model numbers are recorded in utility inspection notes to confirm the electric resistance heating type.

2.8 DETAILED FINDINGS—LOAD MANAGEMENT

2.8.1 Commercial Load Management SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
33.6%	8,831	8,830	100.0%	0.1%	50,496	50,497	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the ETI Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 5-minute increments at the *electric service identifier ID* (ESIID) level. In PY2024, load management events occurred on the following dates and times:

- June 11, 2024, from 2:00 p.m. to 3:00 p.m. (scheduled),
- June 12, 2024, from 4:00 p.m. to 5:00 p.m. (scheduled),
- June 13, 2024, from 1:00 p.m. to 2:00 p.m. (scheduled),
- June 13, 2024, from 4:00 p.m. to 5:00 p.m. (scheduled),
- June 14, 2024, from 1:00 p.m. to 2:00 p.m. (scheduled),
- June 14, 2024, from 3:00 p.m. to 4:00 p.m. (scheduled),
- June 24, 2024, from 4:00 p.m. to 5:00 p.m. (scheduled),

- June 27, 2024, from 4:00 p.m. to 5:00 p.m. (scheduled),
- July 1, 2024, from 4:00 p.m. to 5:00 p.m. (scheduled),
- July 10, 2024, from 1:30 p.m. to 2:30 p.m. (scheduled),
- August 19, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- August 19, 2024, from 8:00 p.m. to 10:00 p.m. (unscheduled), and
- August 20, 2024, from 3:00 p.m. to 6:00 p.m. (unscheduled).

The EM&V team received interval meter data and a spreadsheet summarizing the event-level savings for the 11 sponsors across 183 sites. Each site had one scheduled event and two unscheduled events. A total of 126 sites participated in all three events, 40 participated in only two of the three, and 11 participated in only one of the three. Six sites did not participate in any event.

- The cooperation level was 85 percent.
- **Recommendation**: Increase cooperation to above 90 percent.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it found that the evaluated savings matched the savings ETI provided for all sites. The kW savings for each participating site corresponded to the average across the unscheduled and scheduled events. The kWh savings for each participating site were calculated by multiplying the kW reductions by the total number of event hours. Program-level savings were calculated by adding all site-level savings.

The table above shows the EM&V team's (evaluated), and ETI's (claimed) calculated kW and kWh savings. No adjustments were made to the program savings; however, a negligible difference in kW and kWh resulted from different rounding practices during calculations. The realization rate for kW and kWh savings is 100 percent, with a documentation score of *good*.

3.0 EL PASO ELECTRIC COMPANY

3.1 KEY FINDINGS AND RECOMMENDATIONS

In addition to Volume 1 recommendations that apply to all IOUs, Table 7 below summarizes Volume 3 recommendations specific to El Paso Electric (EPE). Key findings that do not have a recommendation illustrate the type of program information to highlight in future EEPRs.

Table 7. EPE Key Findings and Recommendations

Report Section	Key finding	Recommendation
3.2.1 PY2020-PY2024 Portfolio Key Findings	PY2024 saw a decrease in demand reduction and energy savings across EPE's portfolio and EPE did not meet its energy savings goal.	Respond to this report with EPE's plans to meet its energy savings in future program years.
	EPE had the highest percentage of demand reduction from load management programs for PY2024. Energy efficiency programs accounted for less than one-half of the demand reduction goal for the first time in five years.	Respond to this report with EPE's approach to meeting its legislative goal, considering program design changes to provide access to energy efficiency programs to all customers in all customer classes.
	Most energy savings were achieved by EPE's Commercial MTP. ETI does not offer a Commercial SOP or a Residential SOP.	Pilot a Commercial SOP and Residential SOP if there are areas of EPE's territory with sufficient market infrastructure.
	While overall PY2024 savings decreased, HTR demand reduction and energy savings remained consistent with PY2023 and prior years.	
3.2.2 Commercial Savings	*Other* measures, which primarily consisted of *custom M&V* projects, more than doubled the savings. *HVAC* measures also saw a slight increase in demand reduction and energy savings.	
3.2.3 Residential Savings	EPE's energy savings were primarily derived from *HVAC* measures, representing over two-thirds of kW and approximately one-half of kWh.	
3.2.4 Load Management	The two years with the highest energy savings relative to demand reduction (PY2023 and PY2024) had the highest number of curtailment events.	Respond to this report with reasons for increased events in PY2024.

Report Section	Key finding	Recommendation
3.7 Residential Impact Evaluation Results	Two projects in the HTR MTP were missing key documentation to verify savings.	Include photo documentation of air infiltration and duct testing results showing the manometer readings to verify pre- and post-CFM results for savings inputs.
		Ensure all inputs required for evaporative cooling savings verification are available in the documentation provided.
3.8 Load Management Evaluation Results	The cooperation rates for the Commercial Load Management SOP was less than 90 percent. Past and other IOU programs have achieved 90 percent or higher cooperation rates for commercial load management.	Respond to this report with strategies to increase cooperation to 90 percent.
	The cooperation rate for Residential Load Management SOP was less than 80 percent (75%). Past and other IOU programs have achieved 80 percent or higher cooperation rate for residential load management.	Respond to this report with strategies to increase cooperation to 80 percent.

EPE's PY2024 highlights:

- EPE saw its lowest demand reduction and energy savings in PY2024 compared to prior years,
    - Achieved most of its energy savings through Commercial MTP, which performed below prior years,
    - LI/HTR energy savings and demand reduction stayed consistent in PY2024 with prior years even within the context of lower portfolio achievements,
- EPE had the lowest percentage of demand reduction from energy efficiency programs among all eight utilities.

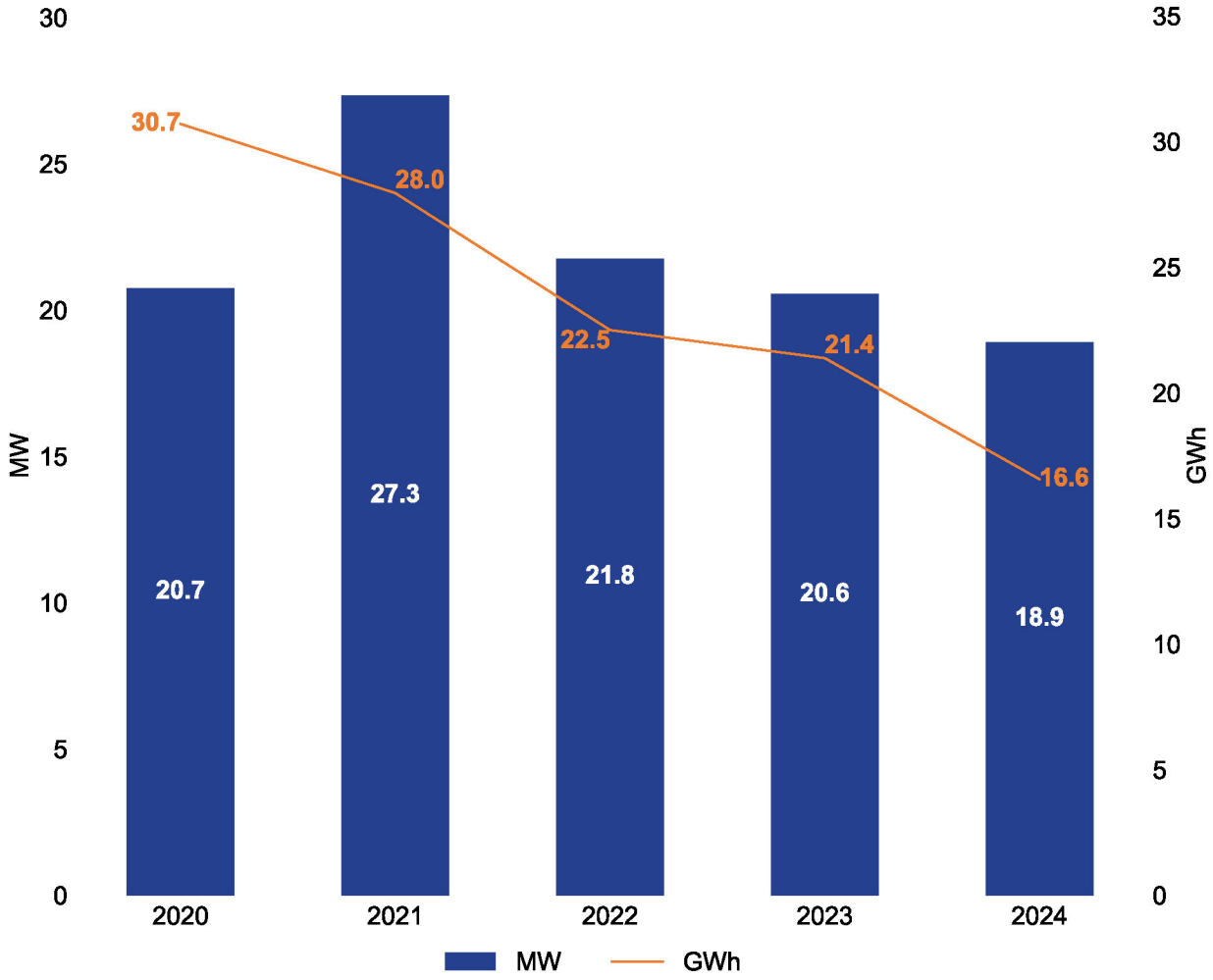
3.2 PY2020-PY2024 COMPARISONS

3.2.1 Portfolio Key Findings

PY2024 saw a decrease in demand reduction and energy savings across EPE's portfolio (Figure 11).

- EPE's demand reduction and energy savings have been trending lower since PY2021.

Figure 11. EPE's Demand Reduction (MW) and Energy Savings (GWh) PY2020-PY2024



Commercial and Residential Load management programs account for 72.5 percent of demand reduction for PY2024 (Figure 12, left graph).

- While demand reduction due to load management is lower in PY2024, EPE's year-over-year demand reduction is also trending lower.

Commercial MTP contributed about two-thirds of the energy savings (Figure 12, right graph) despite its lowest energy savings total in the last five years.

Figure 12. EPE's Demand Reduction (MW) and Energy Savings (GWh) by Program Type PY2020-PY2024

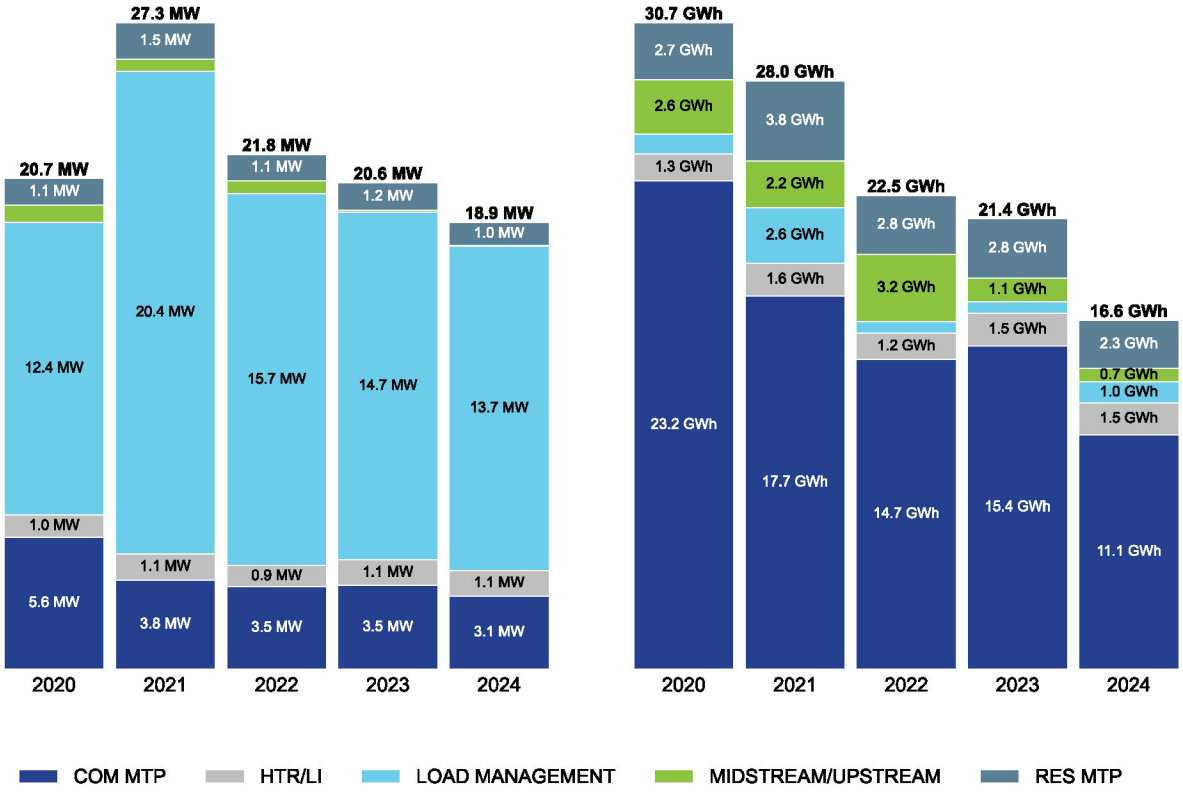


Figure 13 shows that EPE has consistently not met its legislated demand reduction goals with energy efficiency programs, which accounted for less than one-half (46.4 percent) of the demand reduction goal for the first time in five years in PY2024.

Figure 13. EPE's PY2020–PY2024 Legislated Demand Reduction (MW) Goals

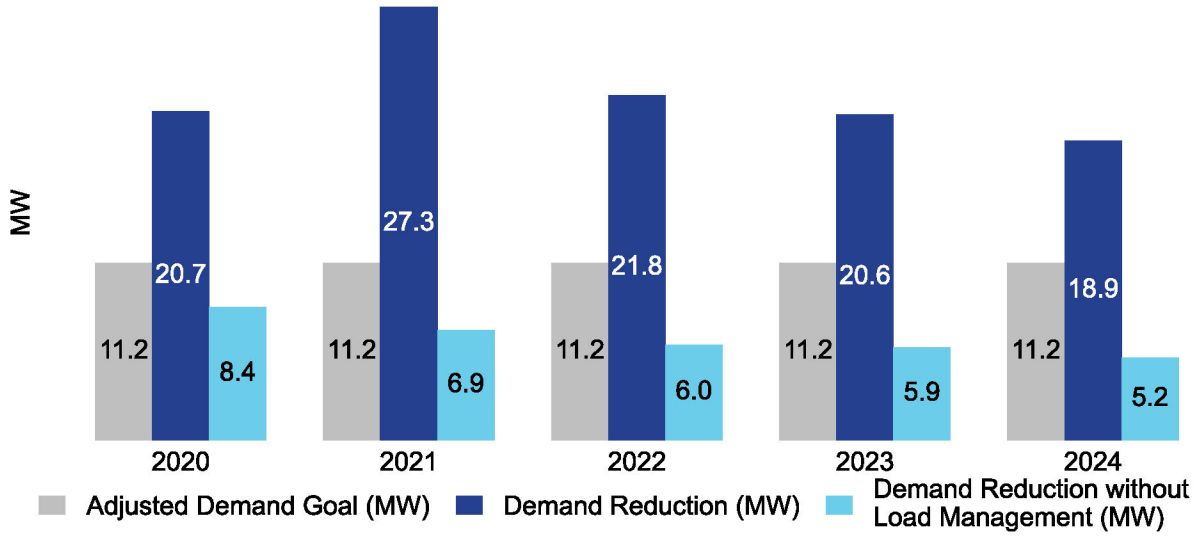
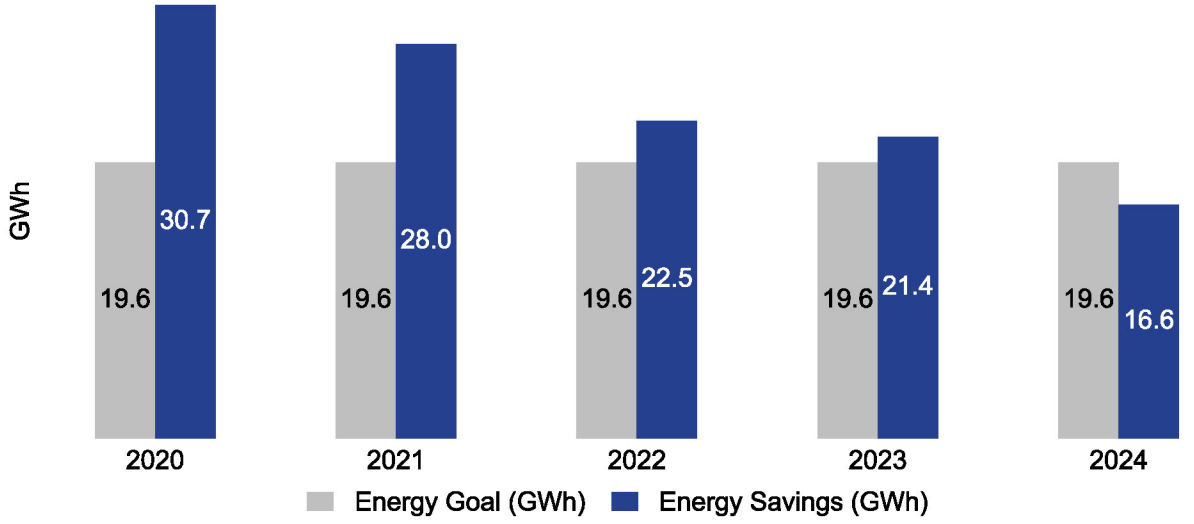


Figure 14 shows the energy savings goals from PY2020 to PY2024.

- In PY2024, EPE failed to meet its energy savings goals for the first time in the five-year analysis period.
- EPE does not offer a Commercial SOP and is the only utility that does not offer a Residential SOP. SOPs have been successful offerings for other utilities and may help EPE achieve energy savings goals in the future.

Figure 14. EPE's PY2020–PY2024 Energy Savings (GWh) Goals



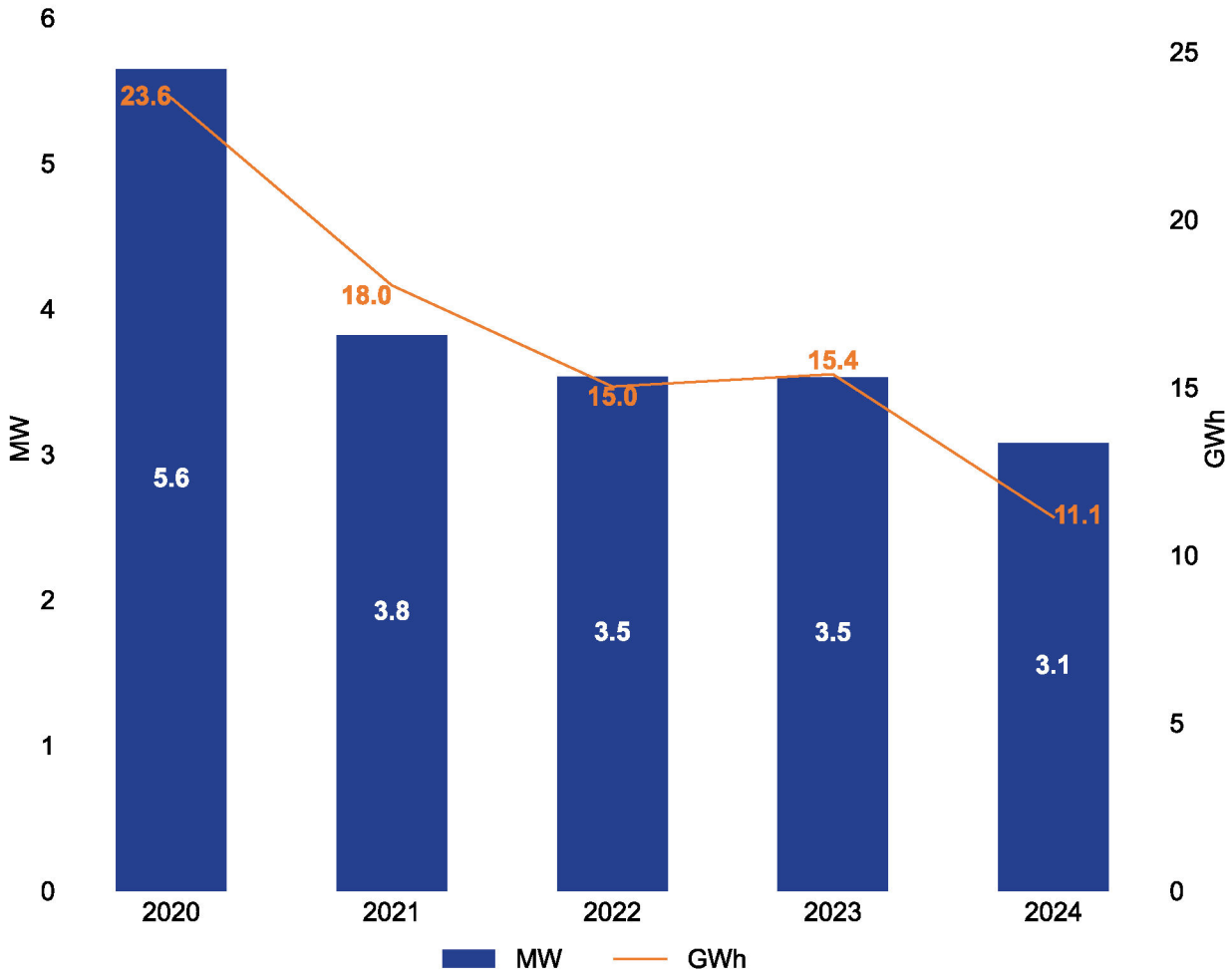
3.2.2 Commercial Savings

The PY2024 gross savings from EPE's commercial sector programs were the following:

- Demand reduction of 3.1 MW, and
- Energy savings of 11.1 GWh.

Figure 15 shows that EPE commercial demand reduction results decreased in PY2024 with a more significant decrease in energy savings.

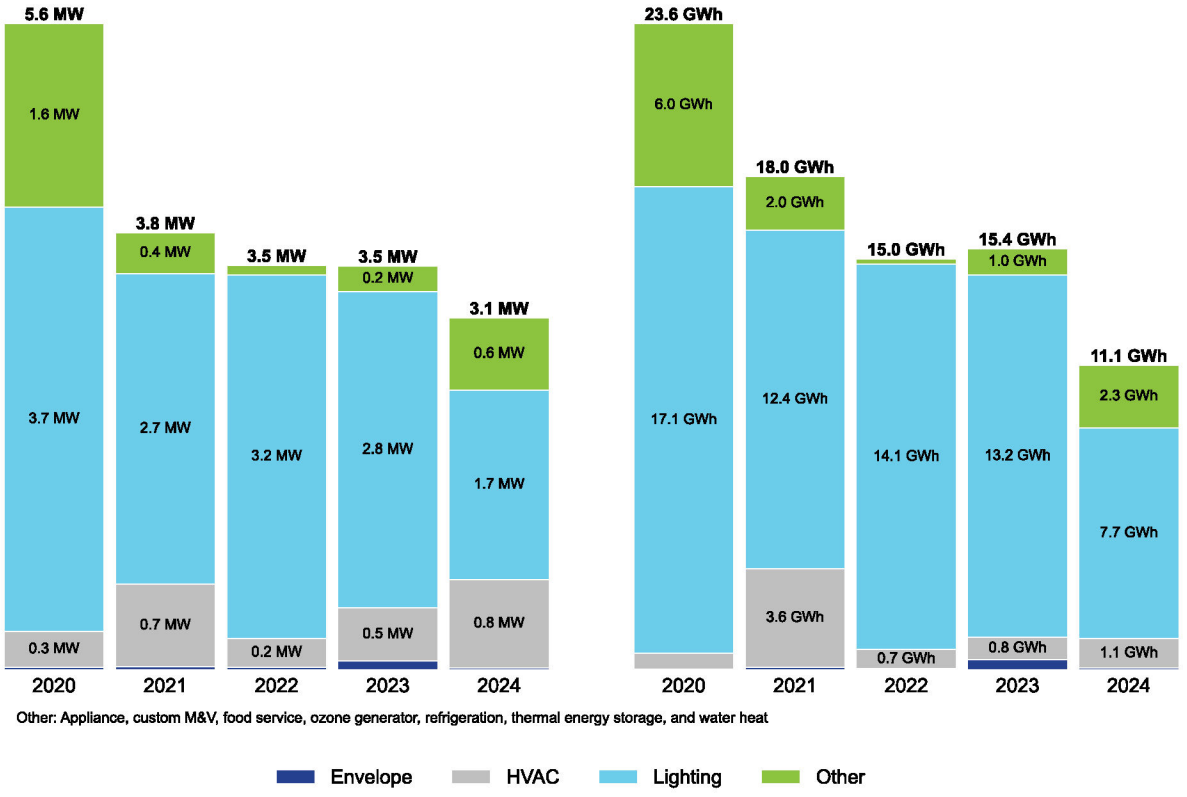
Figure 15. EPE's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Commercial Programs Excluding Load Management, PY2020–PY2024



Lighting measures continue to account for the majority of the demand reduction (Figure 16, left graph) and energy savings (Figure 16, right graph). EPE should continue to develop strategies and plans to diversify its commercial measure offerings to better serve its customer needs and meet energy efficiency goals:

- *Other* measures with *Custom M&V* projects
  - doubled the savings in PY2024, reaching the highest level of savings for the measure since PY2020.
- *HVAC* measures
  - slight increase in demand reduction and energy savings,
  - the highest demand reduction and second-highest energy savings in the last five years for the measure category
- *Envelope* measures
  - reduced savings in PY2024 after achieving a slight increase in savings in PY2023.

Figure 16. Distribution of EPE's Demand Reduction (MW) and Energy Savings (GWh) by Measure Category—Commercial Programs Excluding Load Management PY2020–PY2024



3.2.3 Residential Savings

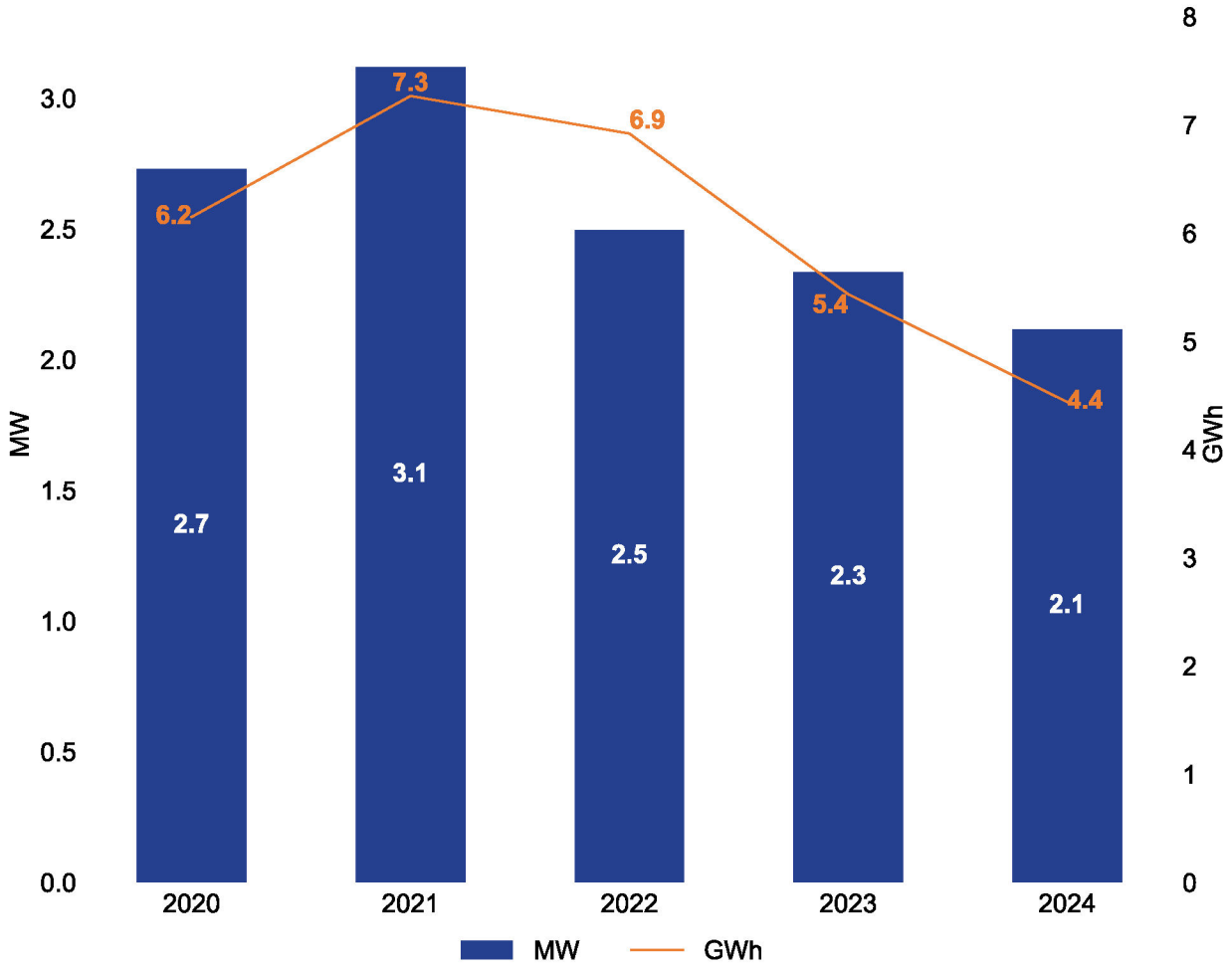
The PY2024 gross savings from EPE's residential sector programs (excluding load management) were the following:

- Demand reduction of 2.1 MW, and

- Energy savings of 4.4 GWh.

EPE achieved its lowest residential demand reduction and energy savings in PY2024 (Figure 17). EPE should develop strategies and plans to diversify measure offerings to better serve its customer needs and meet energy efficiency goals.

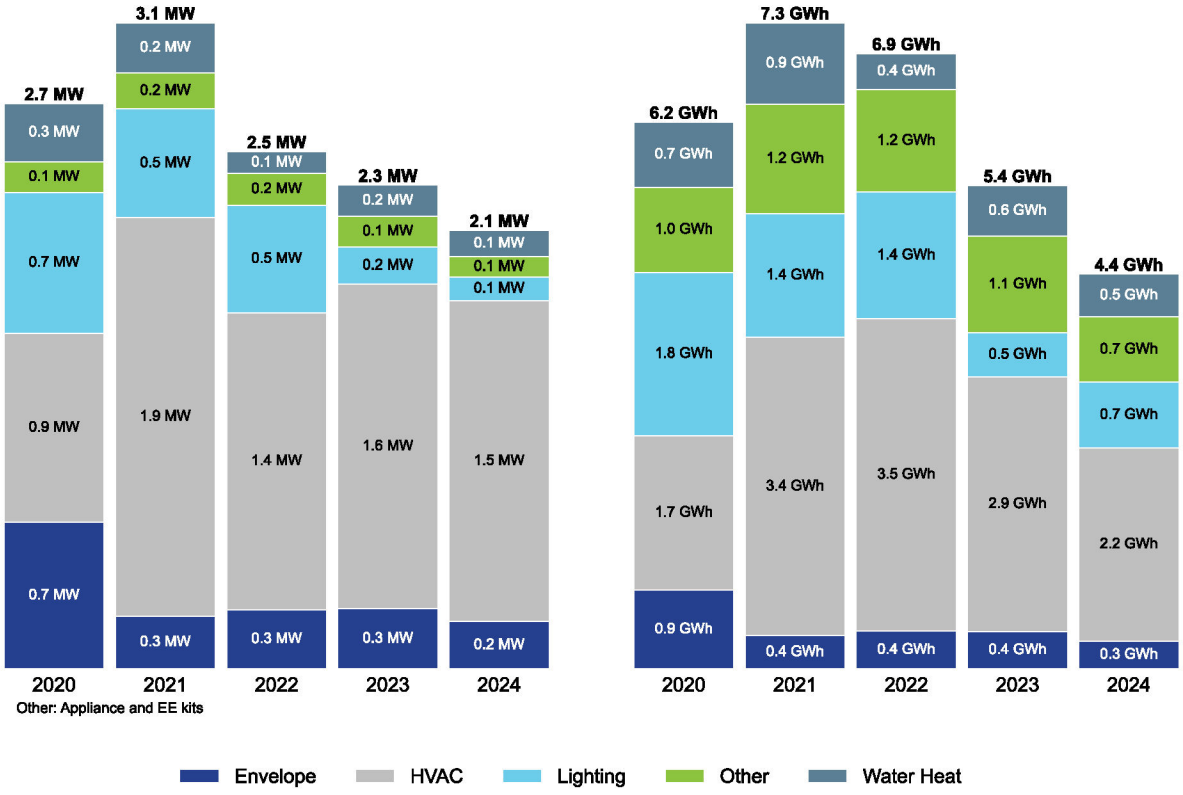
Figure 17. EPE's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Residential Programs PY2020–PY2024



EPE residential program highlights (Figure 18):

- All measures trended lower in PY2024, and
- *HVAC* measures represent over two-thirds of demand reduction (Figure 18, left graph) and over one-half of energy savings (Figure 18, right graph).

Figure 18. Distribution of EPE's Demand Reduction (MW) and Energy Savings (GWh) by Measure Category—Residential Programs PY2020–PY2024



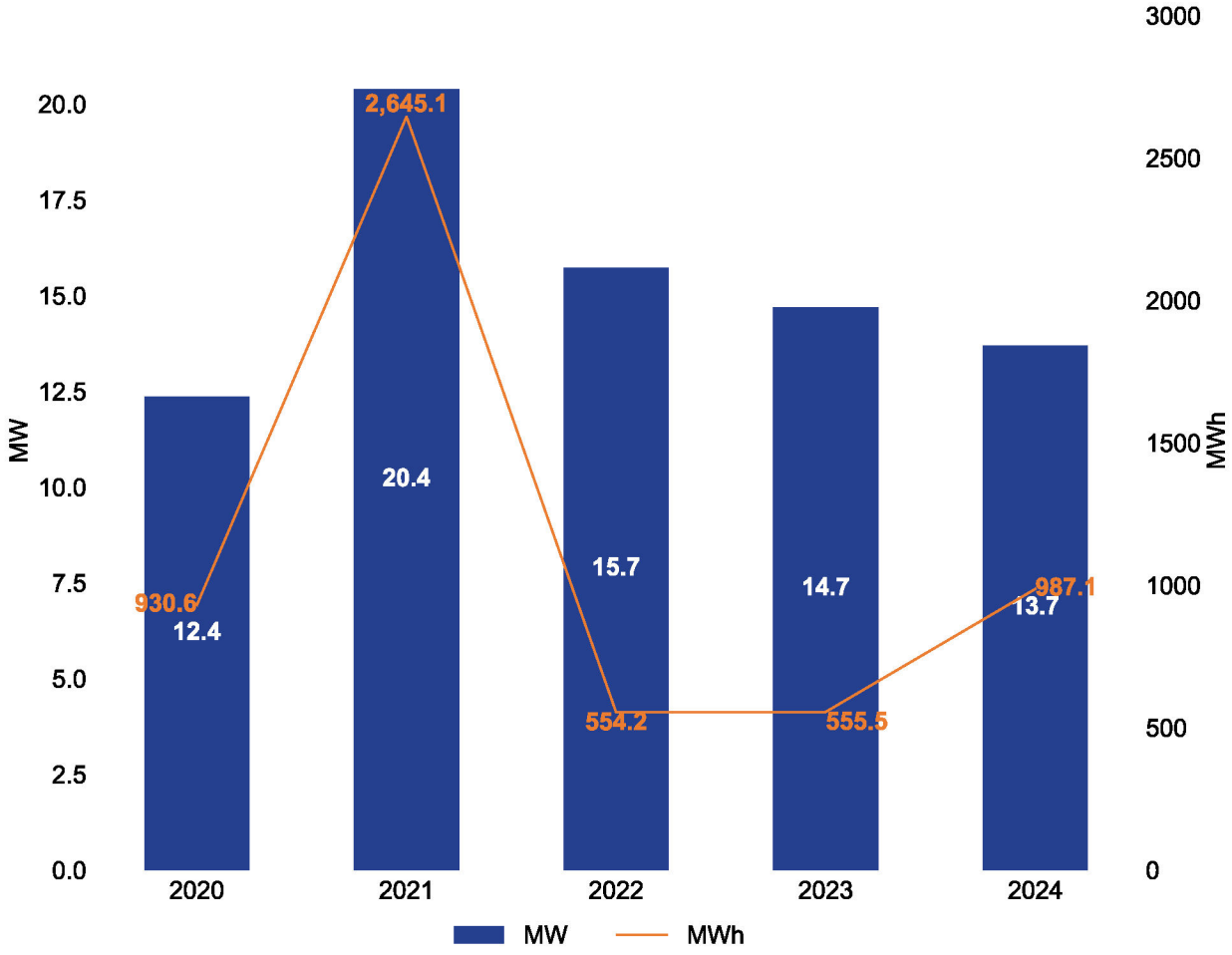
3.2.4 Load Management Savings

The PY2024 gross savings from EPE's load management programs were the following:

- Demand reduction of 13.7 MW, and
- Energy savings of 987.1 MWh.

EPE's load management program, while trending lower, accounts for 72.5 percent of demand reduction goals for PY2024. An increase in the number of curtailment events in PY2024 resulted in increased energy savings from the load management programs.

Figure 19. EPE's Demand Reduction (MW) and Energy Savings (MWh) by Program Year—Load Management Programs PY2020–PY2024

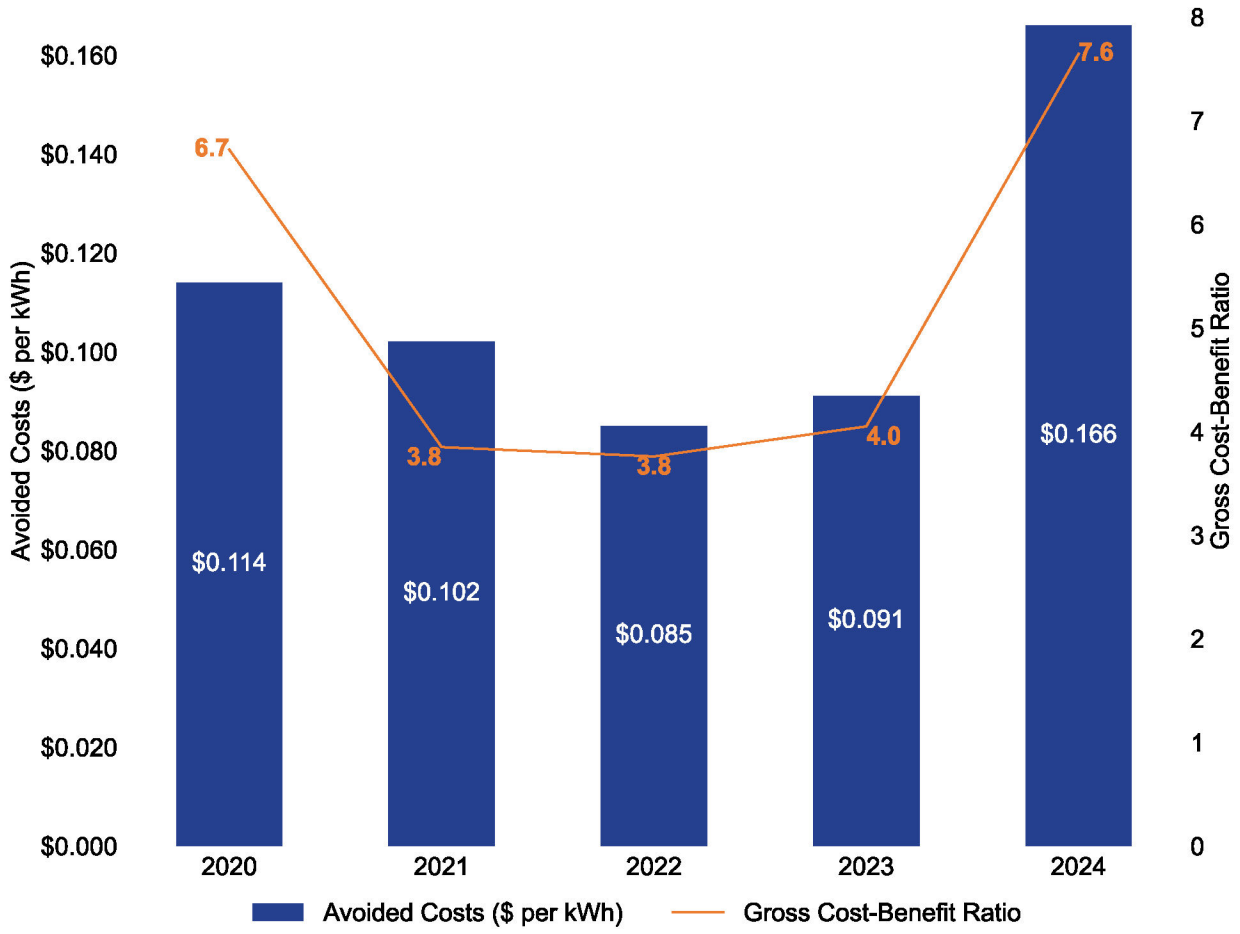


3.3 COST-EFFECTIVENESS

Figure 20 shows the avoided costs for all investor-owned utilities and EPE's cost-effectiveness ratios over the last five years. The overall cost-effectiveness ratio has consistently remained above 3.0 for EPE.

In PY2024, the cumulative cost-effectiveness of EPE's programs was 7.6. The significant increase in cost-benefit ratio from PY2023 to PY2024, and the reason the cost-effectiveness ratios have remained high in the last five years, is attributable to increases in avoided cost of energy in the ERCOT market.

Figure 20. EPE's Gross Cost-Benefit Ratio and Avoided Cost by Program Year



3.4 PY2024 IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for EPE's energy efficiency portfolio. The key findings are summarized first, followed by details for each program with a *high* or *medium* evaluation priority. Finally, a list of programs with a *low* evaluation priority for which claimed savings were verified through the EM&V database is included.

3.4.1 Evaluated Savings

EPE's evaluated savings for PY2024 were 18,891 kW in demand reduction and 16,561,640 kWh in energy savings. The overall kW and kWh portfolio realization rates are approximately 100 percent. EPE adjusted claimed savings based on EM&V results (see Table 12), supporting healthy realization rates.

Table 8 shows the claimed and evaluated demand reduction for EPE's portfolio and broad customer sector and program categories for PY2024. For both Table 8 and Table 9, the review for the load management program included a census review of equations and interval meter

data to estimate the baseline usage and level of load curtailment for each event for all participants.

Table 8. EPE's PY2024 Claimed and Evaluated Demand Reduction (kW)

Level ofanalysis	Percentage portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)
Total portfolio	**100.0%**	**18,891**	**18,891**	**100.0%**
Commercial	16.3%	3,076	3,076	100.0%
Residential	11.2%	2,115	2,115	100.0%
Load management	72.5%	13,700	13,700	100.0%

Table 9 shows the claimed and evaluated energy savings for EPE's portfolio and broad customer sector and program categories for PY2024.

Table 9. EPE's PY2024 Claimed and Evaluated Energy Savings (kWh)

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Total portfolio	**100.0%**	**16,562,147**	**16,561,640**	**100.0%**
Commercial	67.2%	11,134,667	11,134,160	100.0%
Residential	26.8%	4,440,384	4,440,384	100.0%
Load management	6.0%	987,096	987,096	100.0%

Program-level realization rates are discussed in the detailed findings subsections. However, these results should only be viewed qualitatively due to the small sample sizes at the utility program level.

Program-level realization rates also include a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility.

- EPE received *good* documentation scores for the Residential Solutions MTP, and all its commercial and load management evaluated programs.
- EPE received a *fair* documentation score for the Hard-to-Reach SOP program.
    - **Recommendation**: Identify how program documentation will be improved for the program with a *fair* documentation score. See project and program-specific recommendations in program impact results.

3.4.2 Program Funding and Cost-Effectiveness Results

EPE's total portfolio funding for PY2024 was $4,120,058, excluding research and development, EM&V, and its performance bonus[7]; its portfolio had a cost-effectiveness score of 7.7 based on the PACT.

The most cost-effective programs based on claimed and evaluated savings were the Residential Solutions MTP and the Large Commercial Plus Solutions MTP programs; the least cost-effective programs were the Residential Marketplace (Commercial) MTP and the Residential Load Management MTP programs. All programs achieved cost-effectiveness in PY2024.

The lifetime cost of evaluated savings was $0.015 per kWh and $9.53 per kW. Cost per lifetime is calculated by attributing costs to energy savings and avoided demand based on their portion of total benefits and applying that proportion to the total program costs.

Table 10. EPE's Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**7.65**	**7.65**	**6.24**
Commercial	**11.53**	**11.53**	**9.36**
Large Commercial Plus Solutions	14.20	14.19	11.53
Small Commercial Solutions	5.54	5.54	4.49
Residential Marketplace MTP (Commercial)	1.58	1.58	0.79
Residential	**6.20**	**6.20**	**4.93**
Residential Solutions MTP	8.33	8.33	6.75
LivingWise MTP	4.57	4.57	2.28
FutureWise MTP	4.41	4.41	2.20
Hard-to-Reach Solutions MTP	6.09	6.09	6.09
Residential Marketplace MTP (Residential)	6.83	6.83	3.42
Load management	**1.85**	**1.85**	**1.85**
Commercial Load Management SOP	2.11	2.11	2.11
Residential Load Management MTP	1.79	1.79	1.79

3.4.3 Net-to-Gross Results

EPE's NTG ratio was updated for its Commercial Solutions MTP in PY2024 through participant surveys. EPE's IOU Commercial Solutions NTG ratio is 81.2 percent for kWh and 81.2 percent for kW, calculated as 1- free-ridership (excluding spillover).

[7] EPE did not meet energy goals and so did not earn a performance bonus in PY2024.

EPE's free-ridership rate of 18.8 percent for kWh and 18.8 percent for kW slightly decreased from the PY2021 commercial MTP NTG free-ridership estimate of 19 percent for kWh and 20 percent for kW.

Table 11 shows EPE's free-ridership results by program and end-use. While the small number of completed surveys for some measure types is qualitative, end-use free-ridership provides useful insight for IOU's program design considerations.

Table 11. EPE's Free-Ridership by Program and End-Use

Program and end-use	Completed surveys	kWh free-ridership	kW free-ridership
Commercial Solutions MTP			
Lighting	6	18.8%	18.8%
HVAC equipment	1	18.8%	18.8%
Total	**7**	**18.8%**	**18.8%**

3.5 SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. This section summarizes the savings differences identified by the EM&V team, which EPE also used to adjust its claimed savings. The EM&V team requests that utilities adjust projects when evaluated and claimed savings differ by more than five percent. EPE adjusted claimed savings for all projects with a difference of more than five percent, as found by the EM&V team, and included these adjustments in its May 1 filing.

- Overall, EPE's claimed demand reduction (kW) decreased, and energy savings (kWh) increased due to recommended evaluation adjustments.

Table 12. EPE's Claimed Demand Reduction (kW) and Energy Savings (kWh) Adjustments by Program

Program	EM&V demand claimed reduction adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Large Commercial Solutions	81.60	339,555
Commercial Load Management	191.84	3,063
Residential Load Management	-331.67	-7,286.70
Total	**-58.23**	**335,331.30**

3.6 DETAILED FINDINGS—COMMERCIAL

3.6.1 Large Commercial and Industrial (C&I) Solutions MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
10.9%	2,053	2,053	100.0%	57.2%	9.479,010	9,478,503	100.0%	Good

Completed desk reviews*
6

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Large Commercial Plus Solutions MTP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for four projects. Two projects had adjustments of less than five percent compared to the originally claimed savings, and two were larger than five percent. EPE accepted the evaluated results and matched the claimed savings to the two projects that had greater than five percent adjustments. The final program realization rate rounds to 100 percent. Further details of the EM&V findings are provided below.

Participant ID 2-1-0-2-26340: A new construction warehouse installed interior and exterior *LED lighting*. During the desk review, the EM&V team adjusted the savings calculation to separate the exterior lights into different lighting zones and adjusted the quantities of two exterior LED fixtures to match the engineering drawings. The adjustments increased peak demand (kW) reduction and energy (kWh) savings, resulting in a realization rate of 129 percent for both.

Participant ID 2-1-0-1-26703: A new construction warehouse installed interior and exterior *LED lighting*. During the desk review, the EM&V team adjusted the savings calculation to separate the exterior lights into different lighting zones and adjusted the quantity of one LED fixture to match the engineering drawings. The adjustment increased peak demand (kW) reduction and energy (kWh) savings, resulting in a realization rate of 149 percent for demand reduction and 150 percent for energy savings.

Participant ID 2-1-0-1-26792: A new construction school installed *LED lighting* and high-efficiency *HVAC* equipment. During the desk review, the EM&V team adjusted the quantities of lights of two-line items to match the engineering drawings. The adjustment slightly increased peak demand (kW) reduction and had a minimal impact on energy (kWh) savings, resulting in a realization rate of 101 percent for demand reduction and 100 percent for energy savings.

Participant ID 2-1-0-1-26821: An elementary school installed *LED lighting* for a *lighting* retrofit. During the desk review, the EM&V team adjusted the quantities of lights to match the engineering drawings. The adjustment had a minimal impact on peak demand (kW)

reduction and energy (kWh) savings, resulting in the realization rate rounding to 100 percent for both.

Documentation Score

The EM&V team could verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, DesignLights Consortium® qualified products list (QPL), and AHRI certifications) for all six projects that underwent desk reviews because sufficient documentation was provided for the sites. Project documentation included invoices, QPL qualifications or AHRI certifications, pre-inspection and post-inspection notes, project savings calculators, and photographic documentation of existing and new equipment, which are significant efforts by the utility to verify equipment conditions and quantities. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

3.7 DETAILED FINDINGS—RESIDENTIAL

3.7.1 Residential Marketplace MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.7%	691	691	100.0%	6.0%	995,417	995,417	100.0%	Good

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Residential Solutions MTP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team made no adjustments to the claimed savings. EPE accepted the evaluated results, and the final program realization rate is 100 percent.

Documentation Score

The EM&V team could verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, AHRI certifications) for one project that had desk reviews because sufficient documentation was provided for the site. Project documentation included invoices, AHRI certifications, invoices, and an application, which are significant efforts by the utility to verify equipment conditions and quantities. However, two of the projects were missing key inputs to verify the qualification of the products (e.g., Solar Heat Gain Coefficient (SHGC) and U-factor). Due to the documentation shortfalls resulting in sufficient documentation for between 70 percent and 89 percent of sampled projects, the EM&V team assigned a program documentation score of *fair*.

3.7.2 Hard-to-Reach Solutions MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.8%	1,093	1,093	100.0%	9.2%	1,522,026	1,522,026	100.0%	Fair

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Hard-to-Reach MTP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for one project, which had an adjustment of less than five percent. No projects had an adjustment greater than five percent. EPE accepted the evaluated results but did not match the claimed savings for the one project with adjustments of less than five percent; therefore, the final program realization rate is 100.0 percent and 100.0 percent for demand (kW) reduction and energy (kWh) savings, respectively. Further details of the EM&V findings and adjustments are provided below.

- **Participant ID 27355**: The energy efficiency project included the implementation of *air sealing*, *duct sealing*, and *ceiling insulation* measures. During the desk review, the EM&V team found that an incorrect CFM reduction value was used in the calculation. Overall, the adjustments resulted in project-level realization rates of 101.7 percent and 100.0 percent for demand (kW) reduction and energy (kWh) savings, respectively.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for one sampled project that had desk reviews. Two projects were missing key documentation required for verifying savings. The missing documentation included photos of CFM readings for both *duct sealing* and *air infiltration* measures, and saturation effectiveness of an installed unit for the evaporative cooling measure. Project documentation included customer agreements, invoices, income eligibility forms, and incentive forms. Due to the documentation shortfalls, the EM&V team assigned a program documentation score of *fair.*

- **Recommendation***:* Include photo documentation of air infiltration and duct testing results showing the manometer readings to verify pre and post CFM results for savings inputs.
- **Recommendation***:* Ensure all inputs required for evaporative cooling savings verification are available in the documentation provided, e.g., evaporative cooler saturation effectiveness.

3.8 DETAILED FINDINGS—LOAD MANAGEMENT

3.8.1 Commercial Load Management SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings(kWh)	Realization rate (kWh)	Program documentation score
18.7%	3,528	3,528	100.0%	0.3%	55,620	55,620	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the EPE Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 30-minute increments at the electric service identifier ID (ESIID) level. In PY2024, load management events occurred on the following dates and times:

- June 13, 2024, from 4:00 p.m. to 6:00 p.m. (scheduled),
- July 1, 2024, from 2:00 p.m. to 7:00 p.m. (unscheduled),
- August 16, 2024, from 2:00 p.m. to 7:00 p.m. (unscheduled), and
- August 21, 2024, from 2:00 p.m. to 7:00 p.m. (unscheduled).

The EM&V team received the interval meter data and a spreadsheet that summarized the event-level savings for the seven sponsors across 17 sites. Negative savings were associated with several accounts and events. One site had negative savings on the scheduled event, and four sites had negative savings on each of the unscheduled events. Only five of the seven sponsors had at least one site that curtailed during each event.

- The cooperation level was 81 percent.
- **Recommendation**: Investigate ways to increase cooperation to above 90 percent.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it found that the evaluated savings matched the savings provided for most sites. The difference in four cases was due to calculation errors, and several sites had negative savings. While reviewing individual meter savings for the sites with negative savings, the EM&V team found that EPE used a conservative approach by not setting savings to zero in cases where the calculation methodology produced negative savings. Per the TRM, the negative savings can be set to zero for cases that produce negative savings.

After calculating the kW savings, the kWh savings for each participating site were calculated by multiplying the kW reductions by the total number of event hours. Program-level savings were calculated by adding all site-level savings.

The table above shows both the EM&V team's (evaluated) and EPE's (claimed) calculated kW and kWh savings. Evaluated savings for the EPE Commercial Load Management SOP are 3,528 kW and 55,620 kWh, with realization rates of 105.7 percent kW and 105.8 percent kWh. EPE accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kW and kWh savings is 100 percent, with a documentation score of *good*.

3.8.2 Residential Load Management MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
53.8%	10,172	10,172	100.0%	5.6%	931,476	931,476	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the EPE Residential Load Management MTP by applying the deemed savings value from the TRM. As EPE now has advanced metering infrastructure (AMI) meters installed for residential customers, the EM&V team recommends that the deemed value be discontinued in the PY2025 TRM update, and EPE instead utilize the M&V approach detailed in Volume 4, which calculates impacts based on AMI data. In PY2024, load management events occurred on the following dates and times:

- June 7, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- June 13, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- June 26, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- July 9, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- July 25, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- July 30, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- August 1, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- August 8, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- August 16, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled),
- August 20, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled), and
- August 21, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled).

The EM&V team received a list of participants in the program for each device type and event, the PY2024 list of devices purchased through the Marketplace with incentives received, and a savings summary report. The number of participating devices ranged from 6,715 to 7,363, with an average of 7,015 across the 11 events.

- The cooperation level was 75 percent.
- **Recommendation**: Investigate ways to increase cooperation to above 80 percent.

The kW savings for each event were calculated by multiplying the deemed savings value from the TRM by the number of participating devices. The kWh savings for each event were calculated by multiplying the kW reductions by the total number of event hours. Program-level savings were calculated by adding all event-level savings. The EM&V team adjusted the number of participating devices, which decreased the kW and kWh savings.

In addition to savings from the load management events, EPE claimed savings from new thermostat devices purchased through its Marketplace website, which were enrolled in the load management program at the time of the purchase. Only thermostat devices that were enrolled in the program before September 30 were included in the savings calculation. No adjustment was made to this portion of the program savings.

The table above shows both the EM&V team's (evaluated) and EPE's (claimed) calculated kW reduction and kWh savings. The pre-adjustment evaluated savings for the EPE Residential Load Management MTP are 9,413 kW and 914,776 kWh, with realization rates of 89.6 percent kW and 97.4 percent kWh. EPE accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kW and kWh savings is 100 percent, with a documentation score of *good*.

3.9 SUMMARY OF TRACKING-SYSTEM-ONLY EVALUATED PROGRAMS

Table 13 summarizes claimed savings for El Paso's programs in PY2024 that only received a tracking system verification of program impacts. The programs' claimed savings were verified against the final PY2024 tracking data provided to the EM&V team for the EM&V database.

Table 13. EPE's PY2024 Claimed Demand Reduction (kW) and Savings (kWh) (Tracking-System-Only Evaluated Programs)

Program	Contributionto portfolio reduction (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Small Commercial Solutions MTP	5.4%	1,020	1,020	100.0%	9.9%	1,640,484	1,640,484	100.0%
Residential MarketPlace MTP (commercial)	0.0%	3	3	100.0%	0.1%	15,173	15,173	100.0%
Residential Marketplace MTP	0.3%	47	47	100.0%	3.9%	643,830	643,830	100.0%
LivingWise MTP	1.1%	199	199	100.0%	4.1%	672,002	672,002	100.0%
FutureWise MTP	0.5%	86	86	100.0%	3.7%	607,108	607,108	100.0%

4.0 SOUTHWESTERN ELECTRIC POWER COMPANY

4.1 KEY FINDINGS AND RECOMMENDATIONS

In addition to Volume 1 recommendations that apply to all IOUs, Table 14 below summarizes Volume 3 recommendations specific to Southwestern Electric Power Company (SWEPCO). Key findings that do not have a recommendation illustrate the type of program information to highlight in future EEPRs.

Table 14. SWEPCO Key Findings and Recommendations

Report Section	Key finding	Recommendation
4.2.1 PY2020-PY2024 Portfolio Key Findings	PY2024 saw an increase in total demand reduction and energy savings from PY2023.	
	SWEPCO was just shy of its legislated demand reduction goals with energy efficiency alone, delivering over 90 percent of demand reduction through energy efficiency projects;	
4.2.2 Commercial Savings	Energy savings and demand reduction increased in PY2024 for the highest annual achieved savings in the PY2020-PY2024 period. While CMTPs primarily drove the increase, CSOP also increased.	
	In PY2024, *lighting* measures accounted for 85 percent of the demand reduction and 72 percent of energy savings.	Discuss with SWEPCO plans to continue to achieve savings while considering the diversification of offerings beyond *lighting* measures.
4.2.3 Residential Savings	SWEPCO achieved the highest residential demand reduction since the PY2021 TRM update. E*nvelope*, *HVAC, appliance* and *water heating* measures all contributed to this success.	
4.2.4 Load Management	PY2024 saw the addition of a residential load management pilot, which increased demand reduction from load management.	Discuss SWEPCO's plans in regard to growth and use of its residential load management.
4.4.2 Program Funding and Cost-Effectiveness Results	The Bring Your Own Device Pilot SOP scored below the required 1.0 to achieve cost-effectiveness.	Identify and implement program design changes to the Bring Your Own Device Pilot SOP to achieve cost-effectiveness.
4.6 Commercial Impact Evaluation Results	Commercial project documentations were missing key inputs and assumptions. While the EM&V team was able to refer to pre- and post-installation documentation and inspection notes to verify all project inputs and	Document the pre-retrofit conditions and include the photo documentation and site inspection notes in project documentation to verify equipment installation.

Report Section	Key finding	Recommendation
	assumptions, these should be included in program tracking data or documentation.	Contact the EM&V team for technical assistance to ensure consistent calculations and assumptions on large and unique projects, such as the new construction greenhouse.
4.7 Residential Impact Evaluation Results	Photo documentation failed to capture important elements needed to verify savings for Residential SOP *APS* and *furnace* projects.	Require photo documentation of devices connected to *APS*.
		Ensure photo documentation of *furnace* nameplate/model numbers is provided.
4.8 Load Management Impact Evaluation Results	The cooperation rate for the Commercial Load Management SOP were less than 90 percent. Past and other IOU programs have achieved 90 percent or higher for commercial load management.	Investigate ways to increase cooperation to above 90 percent.
	The cooperation rate for the Residential Bring Your Own Thermostat was less than 80 percent (72%). Other IOU programs have achieved 80 percent or higher for residential load management.	Investigate ways to increase cooperation to above 80 percent.

SWEPCO PY2024 highlights are:

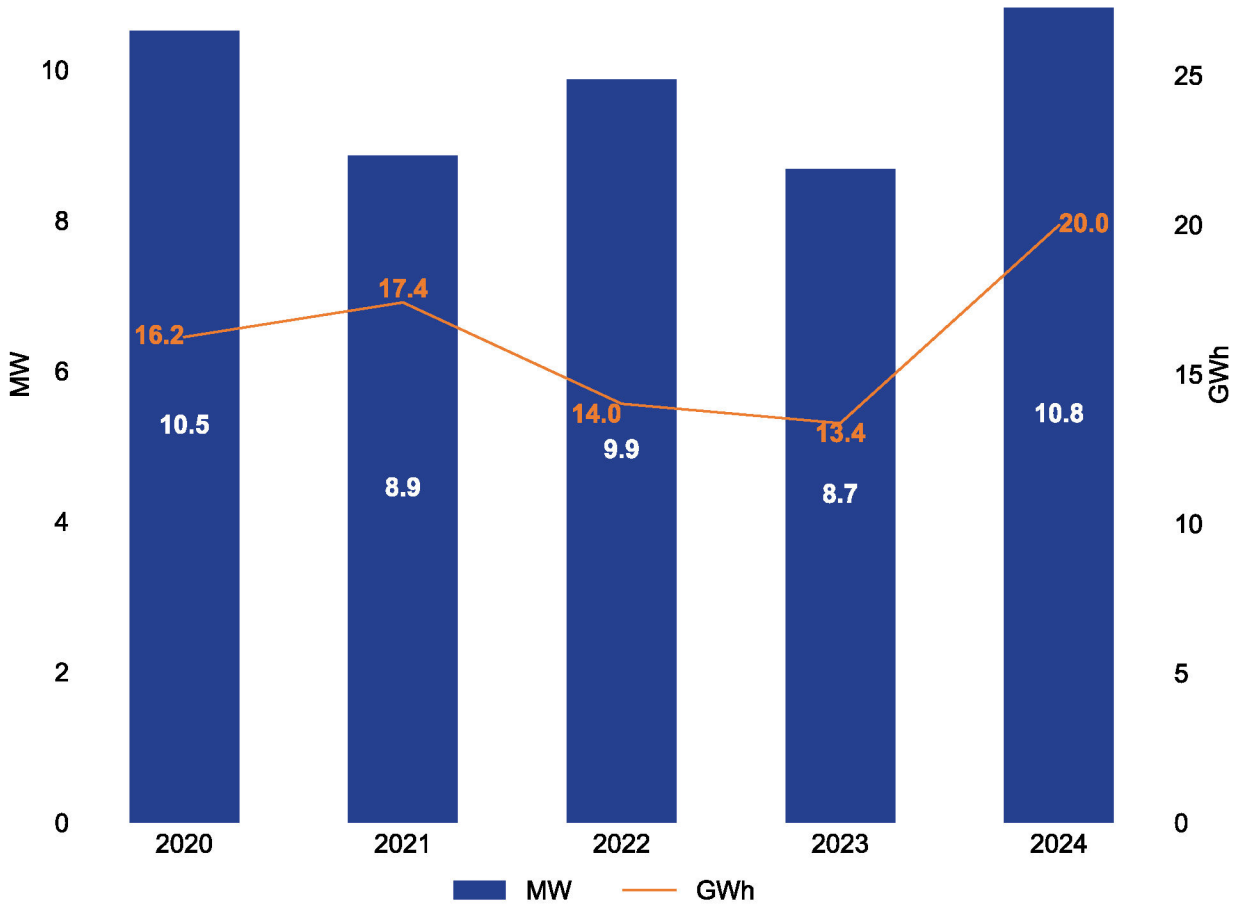
- Over 90 percent of demand reduction was delivered through energy efficiency,
- While Commercial MTP was the primary driver of the significant increase in PY2024 energy savings, increases were seen in Commercial SOP, Residential and HTR SOPs,
- Residential programs addressed diverse end-uses including *envelope*, *HVAC*, *appliances* and *water heating*, and
- *Lighting* accounted for the majority of commercial savings indicating the need to diversify measures to better serve commercial customers.

4.2 PY2020-PY2024 COMPARISONS

4.2.1 Portfolio Key Findings

SWEPCO achieved its highest demand reduction and energy savings in PY2024 (Figure 21).

Figure 21. SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) PY2020-PY2024



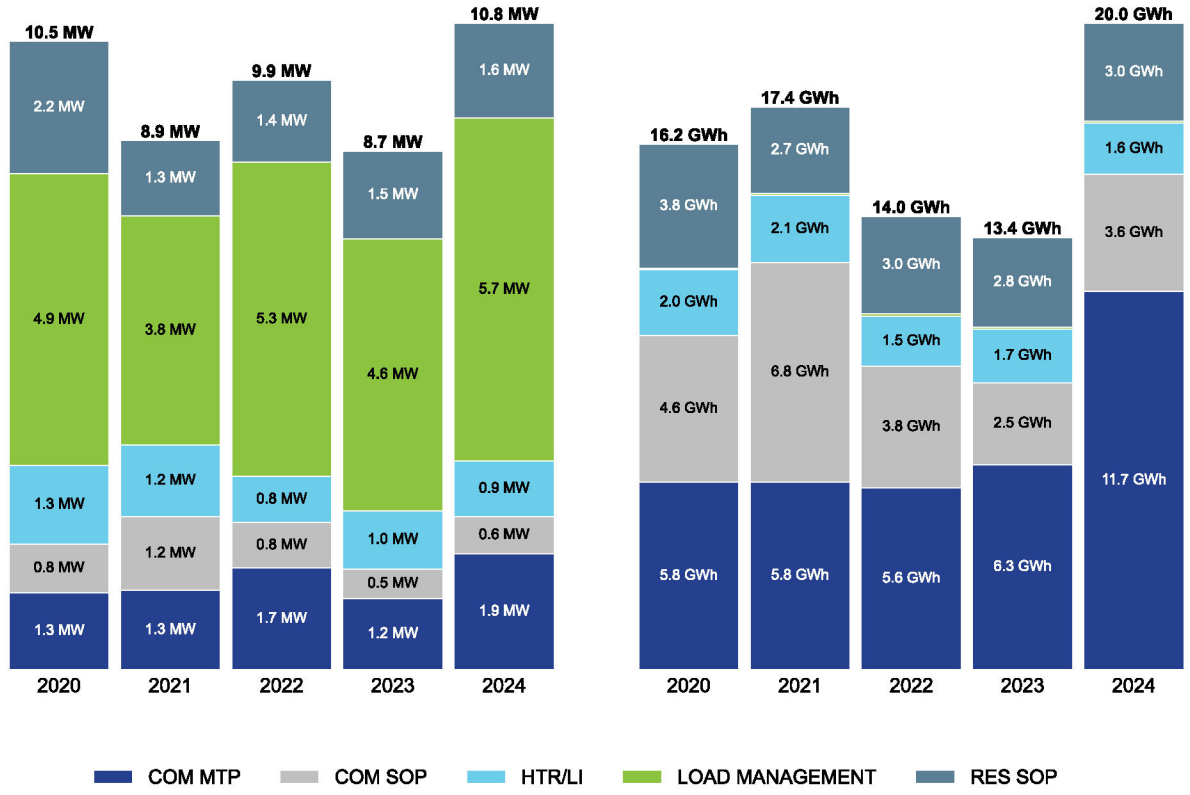
As in PY2023, SWEPCO delivered just under one-half of its demand reduction through energy efficiency programs in PY2024 (Figure 22, left graph).

- SWEPCO achieved the third-highest percentage of demand reduction through energy efficiency programs at 46.9 percent.[8]
- Consistent with the prior two program years, the commercial MTPs, residential SOP, and LI/HTR programs were the three largest contributors to demand reduction.

Most energy savings (Figure 22, right graph) were achieved by the commercial MTP – energy savings almost doubled in PY2024 in comparison to PY2023 while demand reduction slightly increased.

- Residential SOPs and LI/HTR programs achieved energy savings comparable to prior years. Commercial SOP energy savings and demand reduction increased from PY2023.

Figure 22. SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) PY2020-PY2024



[8] Greater than the ERCOT utility average at 30.3 percent and just below the outside-of-ERCOT utility average of 50.3 percent ERCOT, Volume 1, Executive Summary, Figure 4 and outside-of-ERCOT, Figure 5.

SWEPCO was just shy of meeting its legislated demand reduction goals solely by energy efficiency (Figure 23).

Figure 23. SWEPCO's PY2020–PY2024 Legislated Demand Reduction (MW) Goals

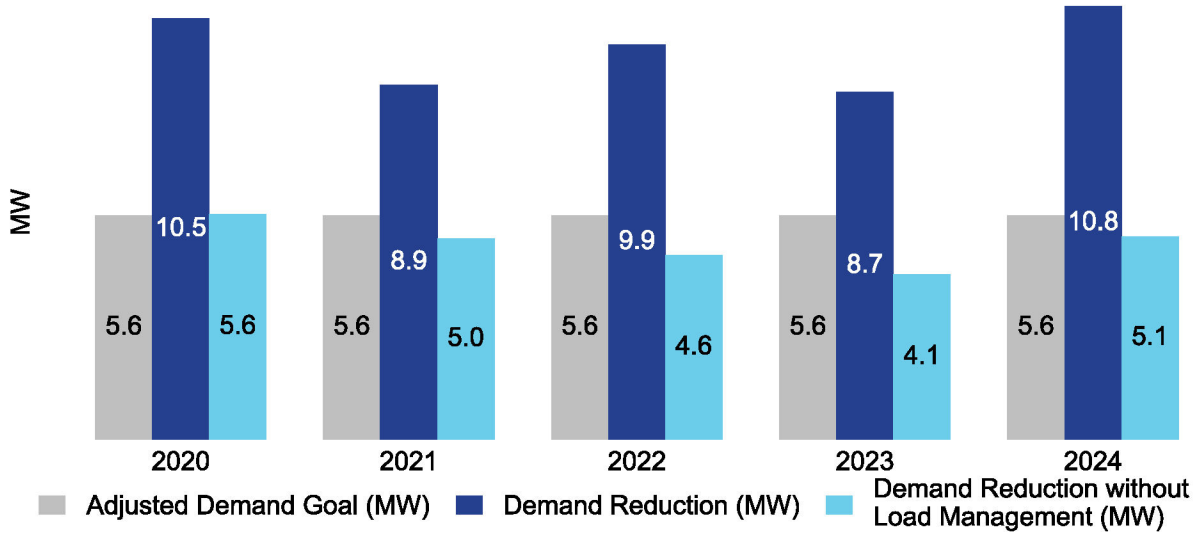
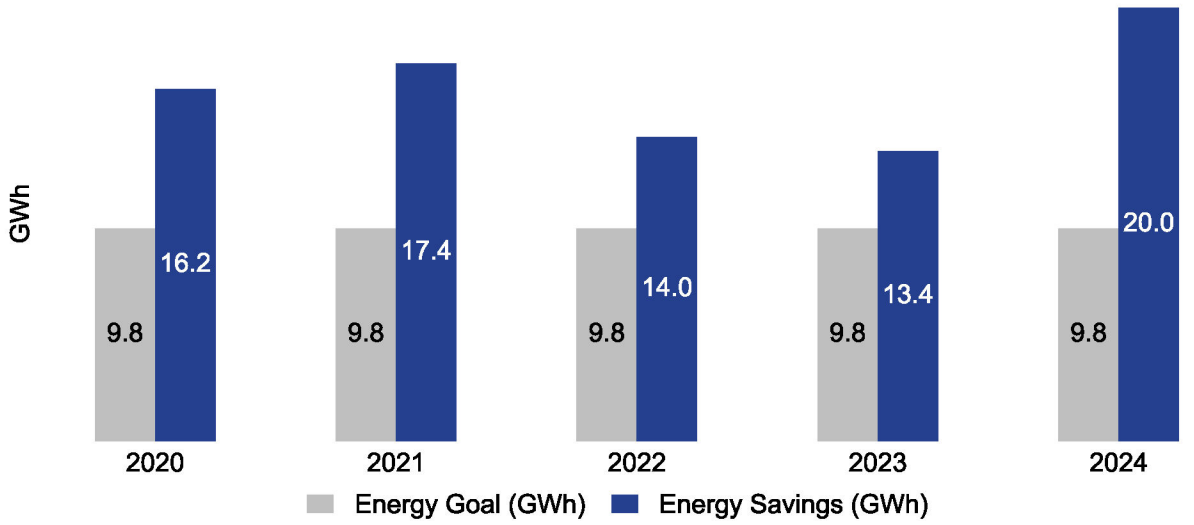


Figure 24 highlights SWEPCO's progress towards its energy savings goal.

- SWEPCO's energy savings in PY2024 were twice the energy savings goal.

Figure 24. SWEPCO's PY2020–PY2024 Energy Savings (GWh) Goals



4.2.2 Commercial Savings

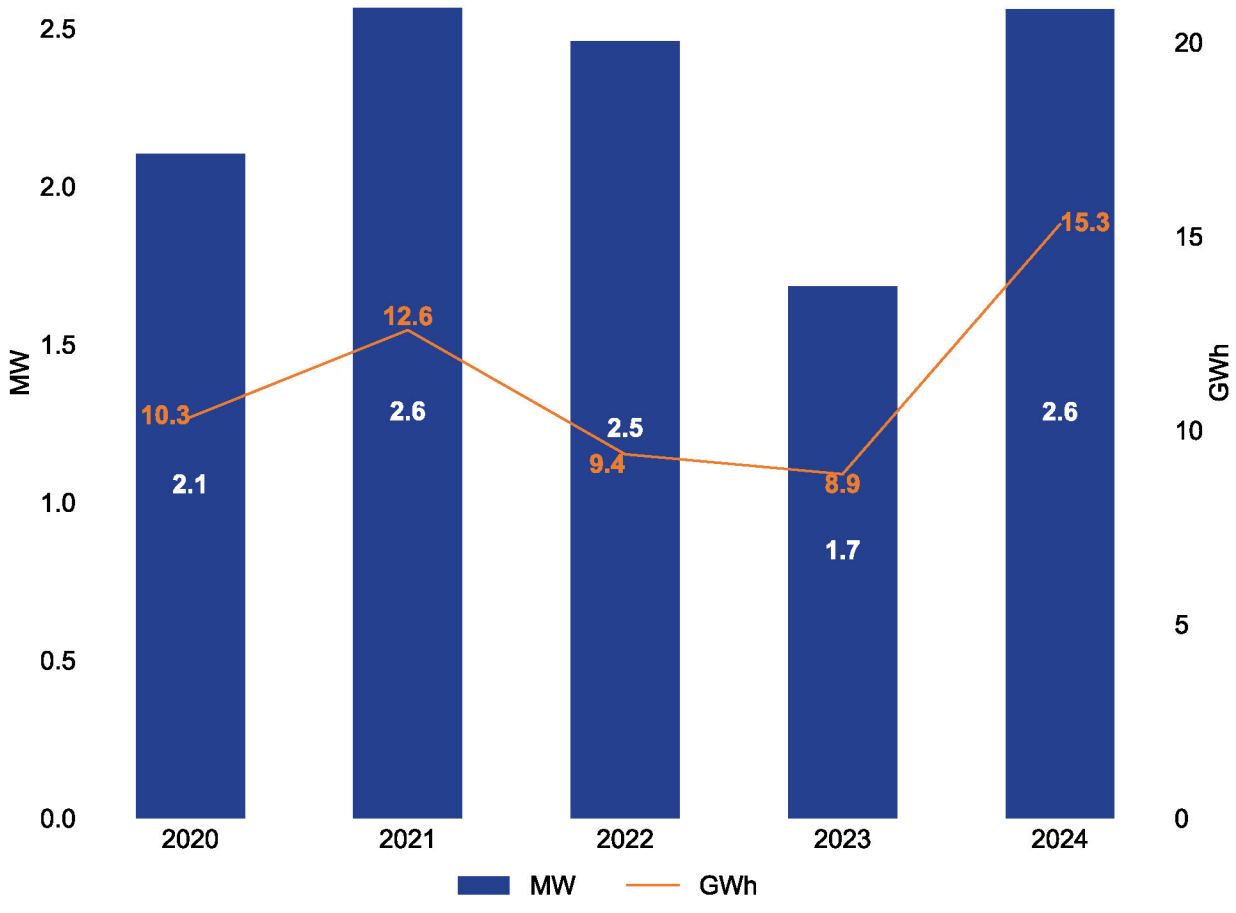
The PY2024 gross savings from SWEPCO's commercial sector programs were the following:

- Demand reduction of 2.6 MW, and
- Energy savings of 15.3 GWh.

Figure 25 shows increased demand reduction as compared to the prior two years (PY2022 and PY2023). Commercial demand reduction was similar in PY2024 to those in PY2021.

- Energy savings increased in PY2024 for the highest annual achieved savings from PY2020-PY2024.
- Commercial savings recovered from the PY2023 decrease, reported by SWEPCO program design and delivery staff as partly caused by the transition process to a new implementation contractor.

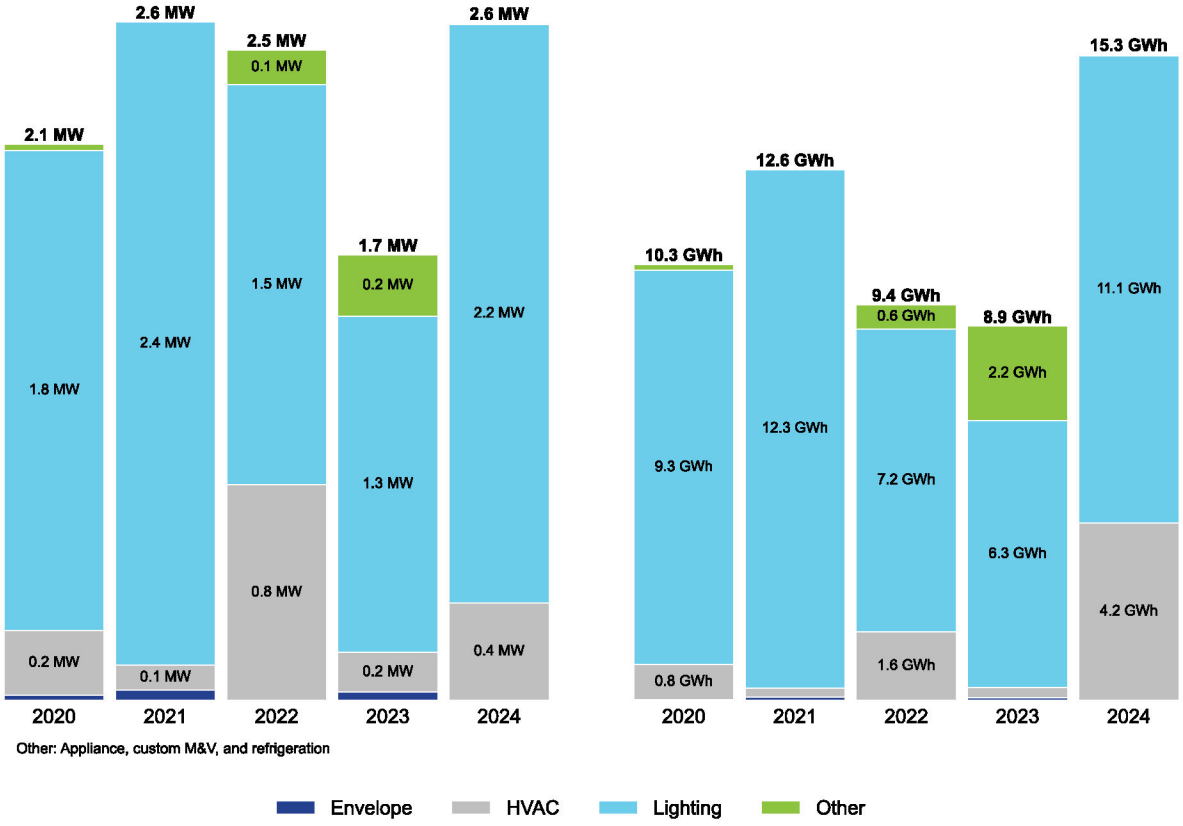
Figure 25. SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Commercial Programs Excluding Load Management, PY2020–PY2024



Lighting measures accounted for 85 percent of the demand reduction (Figure 26, left graph) and 72 percent of energy savings (Figure 26, right graph) in PY2024. SWEPCO should also consider diversification of measures beyond *lighting* measures in commercial projects to best serve its customers.

- Figure 26 also highlights the increased demand reduction and energy savings from *HVAC* measures in PY2024, which SWEPCO could continue to build on.

Figure 26. Distribution of SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) by Measure Category—Commercial Programs Excluding Load Management PY2020–PY2024



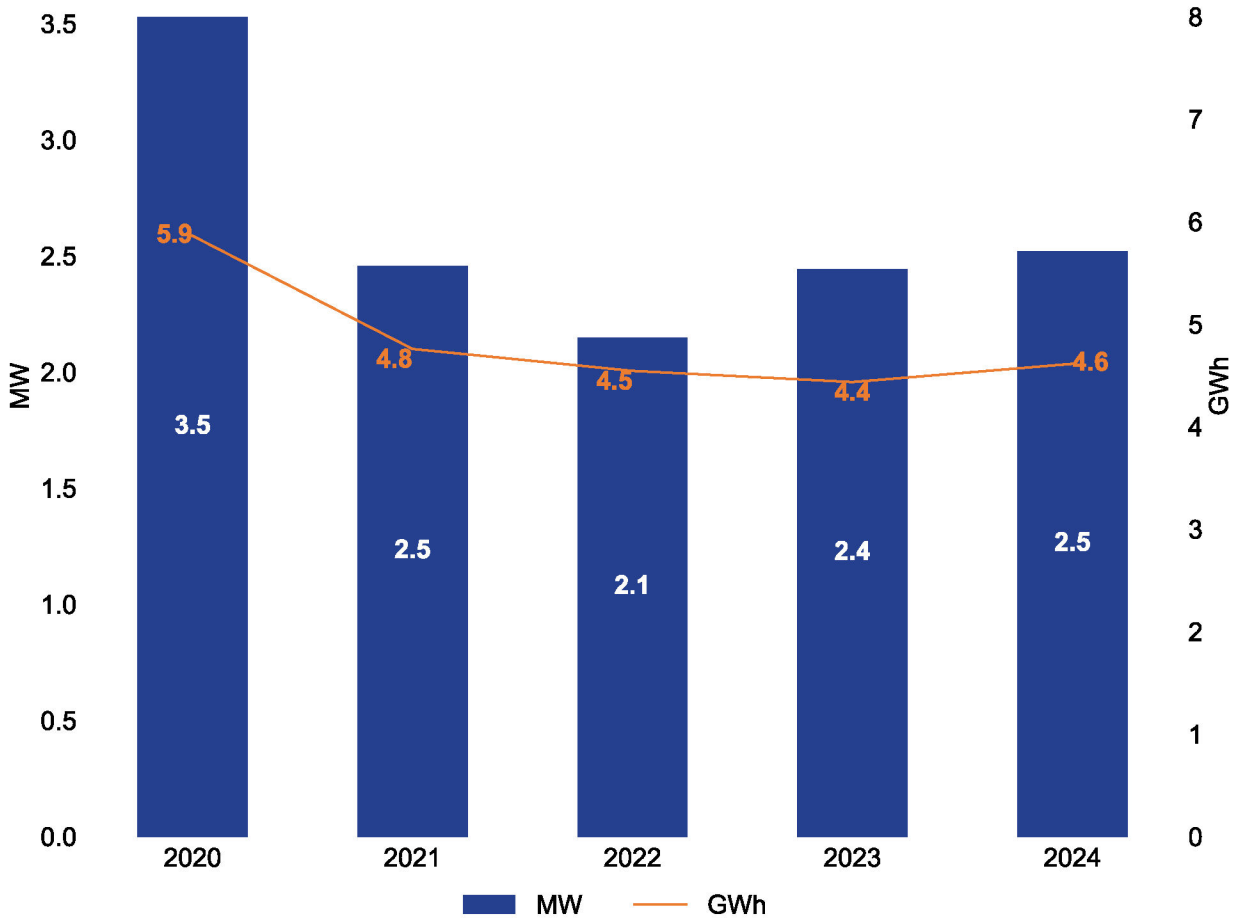
4.2.3 Residential Savings

The PY2024 gross savings from SWEPCO's residential sector programs (excluding load management) were the following:

- Demand reduction of 2.5 MW, and
- Energy savings of 4.6 GWh.

Figure 27 shows the residential demand reduction achieved in PY2024 is the highest since the update to residential retrofit savings starting with the PY2021 TRM.[9]

Figure 27. SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Residential Programs PY2020–PY2024



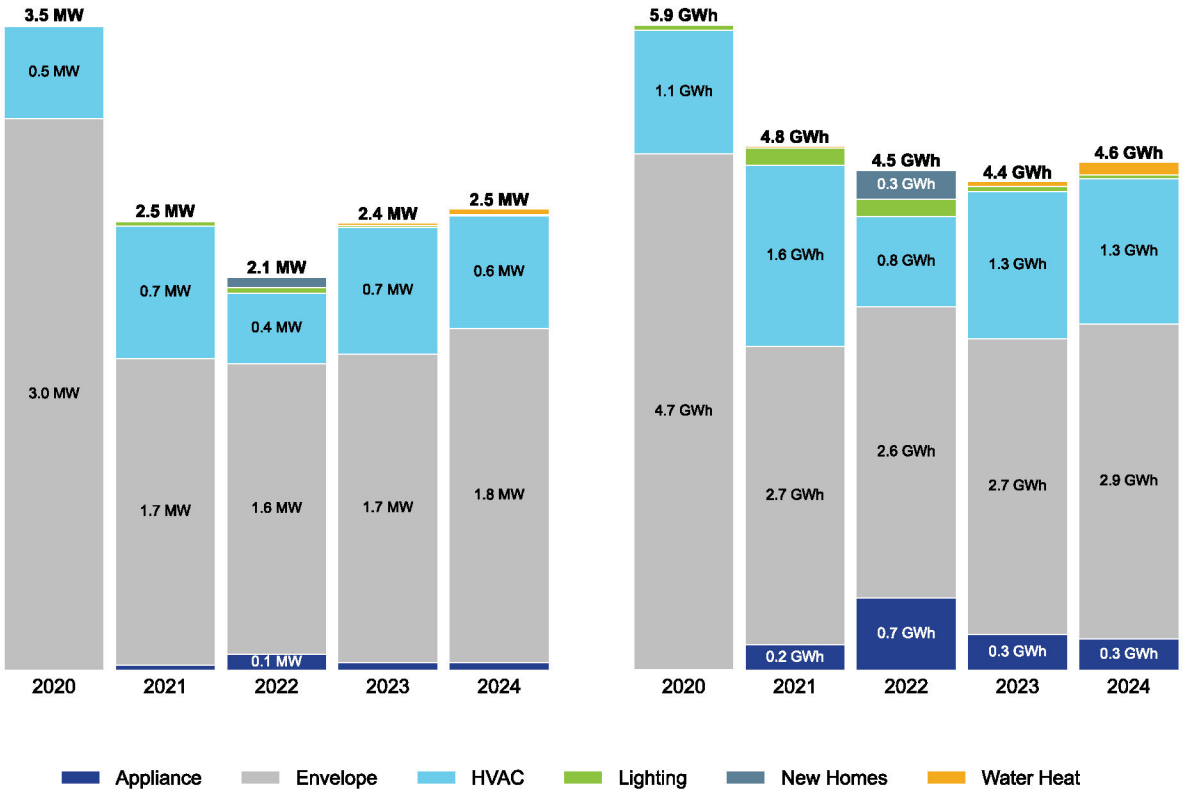
SWEPCO residential measures in PY2024:

- *Envelope*
  - primary driver delivering just under three-fourths of total residential demand reduction (Figure 28, left graph) and almost two-thirds of energy savings (Figure 28, right graph).
- *HVAC*
  - Delivering year-over-year demand reduction and energy savings.

[9] Based on the results of the 2020 residential retrofit consumption analysis, which found that the TRM was overestimating savings, starting with the PY2021 TRM, several baseline requirements were put in place for residential retrofit measures.

- *Appliances* and *water-heating* are newer measures with growth in PY2024 also contributing to increased energy savings
    - Though savings from *water heater* measures are still relatively small, they more than doubled compared to PY2023.

Figure 28. Distribution of SWEPCO's Demand Reduction (MW) and Energy Savings (GWh) by Measure Category—Residential Programs PY2020–PY2024



4.2.4 Load Management Savings

The PY2024 gross savings from SWEPCO's load management programs were the following:

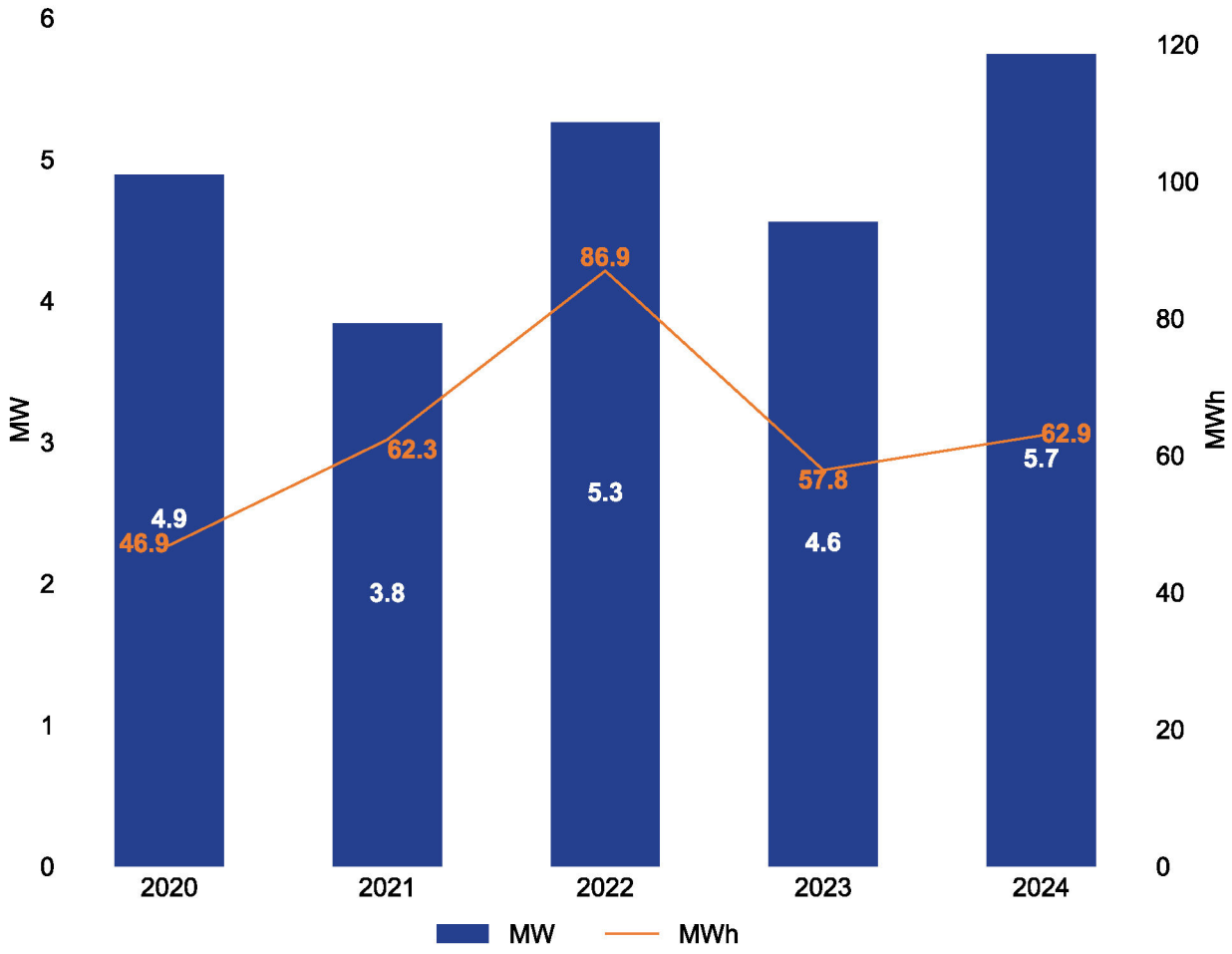
- Demand reduction of 5.7 MW, and
- Energy savings of 62.9 MWh.

While PY2024 saw the highest load management demand reduction over the past five years (Figure 29), load management as a percentage of total demand reduction did not increase.

- Load management as a percent of total demand reduction was 53 percent in PY2024, consistent with PY2023.
- SWEPCO added a Residential Load Management pilot in PY2024 while keeping Commercial Load Management at consistent participation levels as prior years.

Energy savings depend upon the number of events occurring each year and their duration. The two years with the highest energy savings relative to demand reduction (PY2021 and PY2022) had the highest number of events.

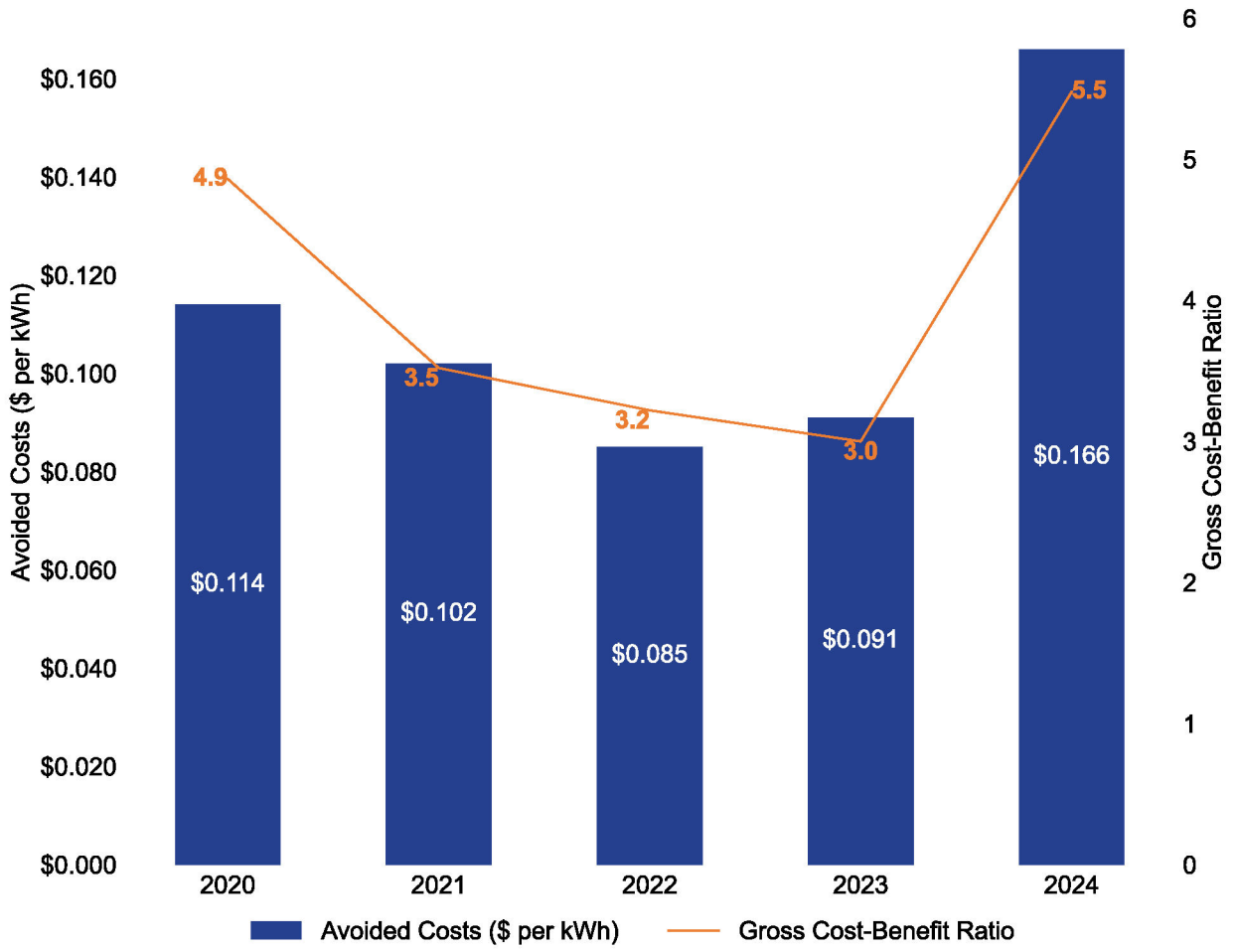
Figure 29. SWEPCO's Demand Reduction (MW) and Energy Savings (MWh) by Program Year—Load Management Programs PY2020–PY2024



4.3 COST-EFFECTIVENESS

Figure 30 shows the avoided costs for all investor-owned utilities and SWEPCO's cost-effectiveness ratios over the last five years. The overall cost-effectiveness ratio has consistently remained above 3.0 for SWEPCO. In PY2024, the cumulative cost-effectiveness of SWEPCO's programs was 5.5. The significant increase in cost-benefit ratio from PY2023 to PY2024 is attributable to increases in avoided cost of energy in the ERCOT market.

Figure 30. SWEPCO's Gross Cost-Benefit Ratio and Avoided Cost by Program Year



4.4 PY2024 IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for SWEPCO's energy efficiency portfolio. The key findings are summarized first, followed by details for each program with a *high* or *medium* evaluation priority.

4.4.1 Evaluated Savings

SWEPCO's evaluated savings for PY2024 were 10,821 kW in demand reduction and 19,985,117 kWh in energy savings. The overall kW and kWh portfolio realization rates are approximately 100 percent. SWEPCO adjusted claimed savings based on EM&V results (see Table 19), supporting healthy realization rates.

Table 15 shows the claimed and evaluated demand reduction for SWEPCO's portfolio and broad customer sector and program categories for PY2024. For both Table 15 and Table 16, the review for the commercial load management program included a census review of equations and interval meter data to estimate the baseline usage and level of load curtailment for each

event for all participants[10]. Also, total portfolio numbers may not equal the sum of all program sector totals due to rounding.

Table 15. SWEPCO's PY2024 Claimed and Evaluated Demand Reduction (kW)

Level of analysis	Percentage portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)
Total portfolio	**100.0%**	**10,822**	**10,821**	**100.0%**
Commercial	23.7%	2,560	2,560	100.0%
Residential	23.3%	2,519	2,519	100.0%
Load management	53.1%	5,742	5,742	100.0%

Table 16 shows the claimed and evaluated energy savings for SWEPCO's portfolio and broad customer sector and program categories for PY2024.

Table 16. SWEPCO's PY2024 Claimed and Evaluated Energy Savings (kWh)

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Total portfolio	**100.0%**	**19,985,116**	**19,985,117**	**100.0%**
Commercial	76.6%	15,308,865	15,308,865	100.0%
Residential	23.1%	4,613,349	4,613,349	100.0%
Load management	0.3%	62,902	62,903	100.0%

Program-level realization rates are discussed in the detailed findings subsections. However, these results should only be viewed qualitatively due to the small sample sizes at the utility program level.

Program-level realization rates also include a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility.

- SWEPCO received *good* documentation scores for the Hard-to-Reach Standard Offer Program (SOP), Commercial SOP, and load management (Commercial and Bring Your Own Device SOP) evaluated programs, and
- SWEPCO received *fair* documentation scores for Residential SOP, COMPASS Large Commercial MTP and COMPASS for Schools MTP.
    - **Recommendation:** Improve program documentation for the three programs with *fair* documentation scores. See project and program-specific recommendations in program impact results.

[10] The PY2024 residential load management program used the TRM deemed savings as SWEPCO was still deploying AMI meters. SWEPCO plans to use the TRM M&V methodology for residential load management starting with PY2025.

4.4.2 Program Funding and Cost-Effectiveness Results

SWEPCO's total portfolio funding for PY2024 was $4,229,425, excluding research and development, EM&V, and its performance bonus; its portfolio had a cost-effectiveness score of 5.5 based on the PACT.

The most cost-effective programs were the COMPASS Large Commercial MTP and the Commercial SOP; the least cost-effective programs were the Commercial Load Management SOP and the Bring Your Own Device Pilot SOP. The Bring Your Own Device Pilot SOP scored below the required 1.0 to achieve cost-effectiveness.

- **Recommendation**: Identify and implement program design changes to the Bring Your Own Device Pilot SOP to achieve cost-effectiveness.

The lifetime cost of evaluated savings was $0.021 per kWh and $12.04 per kW. Cost per lifetime is calculated by attributing costs to energy savings and avoided demand based on their portion of total benefits and applying that proportion to the total program costs.

Table 17. SWEPCO's Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**5.48**	**5.48**	**4.63**
Commercial	**9.74**	**9.74**	**8.03**
Commercial SOP	8.05	8.05	7.15
COMPASS Small Business MTP	5.61	5.61	4.55
COMPASS Large Commercial MTP	18.12	18.12	16.07
COMPASS for Schools MTP	7.63	7.63	4.97
Residential	**3.11**	**3.11**	**2.74**
Residential SOP	3.02	3.02	2.46
Hard-to-Reach SOP	3.29	3.29	3.29
Load management	**1.04**	**1.04**	**1.04**
Commercial Load Management SOP	1.55	1.55	1.55
Bring Your Own Device Pilot SOP	0.33	0.33	0.33

4.4.3 Net-to-Gross Results

SWEPCO's NTG ratio was updated for its Commercial Solutions SOP as well as Commercial Solutions MTP in PY2024 through participant surveys. SWEPCO's IOU Commercial Solutions SOP NTG ratio is 89.1 percent for kWh and 86.4 percent for kW, calculated as 1- free-ridership (excluding spillover). SWEPCO's IOU Commercial Solutions MTP NTG ratio is 82.6 percent for kWh and 82.8 percent for kW, calculated the same as SOP.

SWEPCO's free-ridership rate for SOP of 10.9 percent for kWh and 13.6 percent for kW decreased from the PY2021 commercial SOP NTG free-ridership estimate of 23 percent for kWh and 22 percent for kW. SWEPCO's free-ridership rate for MTP of 17.4 percent for kWh and 17.2 percent for kW slightly decreased from the PY2021 commercial MTP NTG free-ridership estimate of 19 percent for kWh and 20 percent for kW.

Table 18 shows SWEPCO's free-ridership results by program and end-use. While the small number of completed surveys for some measure types is qualitative, end-use free-ridership provides useful insight for IOU's program design considerations.

Table 18. SWEPCO's Free-Ridership by Program and End-Use

Program and end-use	Completed surveys	kWh free-ridership	kW free-ridership
Commercial Solutions SOP			
HVAC tune-up	2	31.2%	31.2%
HVAC equipment	1	20.0%	20.0%
Custom & other	1	8.3%	8.3%
Total	**4**	**10.9%**	**13.6%**
Commercial Solutions MTP			
HVAC equipment	9	34.5%	31.7%
Lighting	4	11.0%	14.8%
Total	**13**	**17.4%**	**17.2%**

4.5 SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. This section summarizes the savings differences identified by the EM&V team, which SWEPCO also used to adjust its claimed savings. The EM&V team requests that utilities adjust projects when evaluated and claimed savings differ by more than five percent. SWEPCO adjusted claimed savings for all projects with any differences found by the EM&V team and included these adjustments in its May 1 filing.

- Overall, SWEPCO's claimed demand reduction (kW) and energy savings (kWh) decreased due to recommended evaluation adjustments.

Table 19. SWEPCO's Claimed Demand Reduction (kW) and Energy Savings (kWh) Adjustments by Program

Program	EM&V demand claimed reduction adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Commercial SOP	0.00	-47,012.00
COMPASS Large Commercial MTP	-369.11	-3,332,836.00
Hard-to-Reach SOP	0.02	149.94

Program	EM&V demand claimed reduction adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Residential SOP	0.00	4.02
Total	**-369.09**	**-3,379,694**

4.6 DETAILED FINDINGS—COMMERCIAL

4.6.1 Commercial SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.8%	624	624	100.0%	18.1%	3,614,518	3,614,518	100.0%	Good

Completed desk reviews*
1

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Commercial SOP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for one project. The project had an adjustment of greater than five percent compared to the originally claimed savings. SWEPCO accepted the evaluated results and matched the claimed savings to those of the evaluations for all projects; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 9-4-0-1-75457: A retail store installed *LED lighting* to replace linear fluorescent lighting. During the desk review, the EM&V team adjusted the building type to *mercantile: strip mall* from *mercantile: enclosed mall* based on the photo of the site. The adjustment resulted in reduced energy savings (kWh) and did not adjust the peak demand reduction (kW). The resulting realization rate is 83 percent for energy and 100 percent for peak demand.

Documentation Score

The EM&V team could verify key inputs and assumptions (e.g., *lighting* quantity, *lighting* wattage, Qualified Products List (QPL) qualifications) for the project that underwent desk reviews. Project documentation typically includes invoices, QPL qualifications, final project savings calculators, and photographic documentation of existing and new lighting, which are significant efforts by the utility to verify equipment conditions and quantities. However, the projects did not include any written inspection notes, which limited the ability to confirm that the other documentation was complete. Because SWEPCO provided sufficient project documentation, the EM&V team assigned a program documentation score of *good*.

4.6.2 COMPASS Large Commercial MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
11.1%	1,200	1,200	100.0%	29.5%	5,884,771	5,884,771	100.0%	Fair

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 COMPASS Large Commercial MTP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for one project. The project had an adjustment greater than five percent compared to the originally claimed savings. SWEPCO accepted the evaluated results and matched the claimed savings to those of the evaluations for all projects; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 9-4-0-1-75124: A new greenhouse facility installed *LED lighting* in its horizontal growing facility, which combines natural sunlight and supplemental *LED lighting* to grow leafy vegetables. During the desk review, the building type was adjusted to a *custom-building* type based on growing leafy greens that need an average of 18 hours of light per day from sunlight and supplemental *LED lighting*. This adjusted facility operation has a winter peak coincidence factor of 0.71 and 3,585 hours of operation. These values are both less than the values for the building type selected: *agriculture long day lighting.* In addition, the installed wattage for fixtures (model number VAE2 3 PKR XVOLT GZ10 XWD) was adjusted from *1002 W* to *1021.5 W* based on the tested wattage on its Design Lights Consortium (DLC) certification. These adjustments decreased peak demand reduction (kW) and resulted in a realization rate of 70 percent. The adjustments also decreased energy savings (kWh) and resulted in a realization rate of 57 percent.

Documentation Score

The EM&V team was partially able to verify key inputs and assumptions (e.g., *lighting* quantity, *lighting* wattage, QPL qualifications) for the three projects with desk reviews. Documentation consistently included invoices, specifications/certifications, and final project savings calculators. However, the documentation for the pre-installation conditions did not consistently provide photos or other documentation to verify the pre-retrofit condition. The post-installation documentation included a small number of photos and did not include post-installation inspection notes for the two retrofit projects. Due to the documentation shortfalls, a program documentation score of *fair* was assigned.

- **Recommendation***:* Request project documentation to confirm the pre-retrofit conditions and increase the photo documentation and site inspection notes to verify the project equipment installation.

- **Recommendation**: Contact the EM&V team for technical assistance to ensure consistent calculations and assumptions on large and unique projects, such as the new construction greenhouse.

4.6.3 COMPASS for Schools MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.6%	393	393	100.0%	22.0%	4,387,275	4,387,275	100.0%	Fair

Completed desk reviews*
2

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 COMPASS for Schools MTP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above.

The EM&V team did not adjust the claim for either of the two projects. SWEPCO accepted the evaluated results because the claimed savings matched the evaluation savings for all projects; therefore, the final program realization rate is 100 percent.

Documentation Score

The EM&V team was partially able to verify key inputs and assumptions (e.g., equipment quantity, rated qualifications) for the two projects with desk reviews. One project was an M&V analysis, and the documentation was available to support the analysis of the billing records. The second project was new construction and did not include photo documentation or post-installation inspection notes, and the installation completion date was not provided. The evaluation did not include verification site visits to confirm installation. Due to the documentation shortfalls, a program documentation score of *fair* was assigned.

- **Recommendation**: Request project documentation to confirm the pre-retrofit conditions and increase the photo documentation and site inspection notes to verify the project equipment installation.

4.7 DETAILED FINDINGS—RESIDENTIAL

4.7.1 Residential SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
14.7%	1,588	1,588	100.0%	15.2%	3,026,938	3,026,938	100.0%	Fair

Completed desk reviews*
2

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Residential SOP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for both projects evaluated, each of which had adjustments of less than five percent. SWEPCO accepted the evaluated results and matched the claimed savings to the evaluation for all projects; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 76270: The energy efficiency project included the implementation of an *advanced power strip (APS)*, *air purifier*, *duct sealing*, *LED*, *low-flow faucet aerator*, and *low-flow showerhead* measures. During the desk review, the EM&V team was unable to determine the slight adjustment in *LED lighting* savings. The remaining measures had no adjustment. Overall, the adjustments decreased the energy savings slightly and resulted in project-level realization rates of 100.0 percent for demand reduction (kW) and 100.2 percent for energy savings (kWh).

Participant ID 76536: The energy efficiency project included the implementation of an *APS*, *air purifier*, *duct sealing*, and *LED lighting* measures. During the desk review, the EM&V team slightly adjusted savings due to rounding. Overall, the adjustments resulted in project-level realization rates that rounded to 100.0 percent for both demand reduction (kW) and energy savings (kWh).

Documentation Score

The EM&V team verified most key inputs and assumptions, including the project scope, baselines, and equipment specifications for the measures, including *air purifiers*, *APS*, *low-flow faucet aerators*, *low-flow showerheads*, *duct sealing*, and *LED lighting*. Key project documentation that was provided included photos of cubic feet per minute (CFM) measurements, pre- and post-*LED lighting* photos, pre- and post-installation of *low-flow faucet aerators* and *showerheads*, and photos of the *air purifiers* installed. The Efficient Products component of the project included the invoice and customer information. However, the photos of the *APS* did not show the devices connected to the power strip. Also, some of the *APS* photos indicated that only one device was connected. While this did not result in a savings adjustment, it could indicate potential overestimation in savings. Lastly, photos of the furnace were provided, but photos of the furnace nameplate and/or model numbers were not provided. Due to the documentation shortfalls, a program documentation score of *fair* was assigned.

- **Recommendation***:* Require devices connected to *APS* as part of program documentation, and
- **Recommendation***:* Ensure furnace nameplate/model numbers are provided.

4.7.2 Hard-to-Reach SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
8.6%	931	931	100.0%	7.9%	1,586,412	1,586,412	100.0%	Good

Completed desk reviews*
2

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Hard-To-Reach SOP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for one project evaluated. The project had an adjustment of greater than five percent compared to the originally claimed savings. SWEPCO accepted the evaluated results and matched the claimed savings to the evaluation for all projects; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 76116: The energy efficiency project consisted of the installation of a *smart power strip*, *ceiling insulation*, and *LED lighting*. During the desk review, the EM&V team adjusted the *APS* location from home office to *home entertainmen*t. Also, the *lighting* project type was adjusted to 4, *early retirement* and 1, *replace-on-burnout*. The adjustment resulted in a realization rate of 102.1 percent for demand reduction (kW) and 107.3 percent for energy savings (kWh).

Documentation Score

The EM&V team verified most key inputs and assumptions, including the project scope, test results, and equipment specifications for all sampled projects that had desk reviews. Project documentation included the invoice, nameplate photo, field report, CFM measurements, and pre- and post-installation photos. Overall, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good.*

4.8 DETAILED FINDINGS—LOAD MANAGEMENT

4.8.1 Commercial Load Management SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
46.0%	4,976	4,976	100.0%	0.3%	62,902	62,903	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the SWEPCO Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments at the *electric service identifier ID* (ESIID) level. In PY2024, load management events occurred on the following dates and times:

- May 24, 2024, from 2:00 p.m. to 3:00 p.m. (scheduled),
- June 7, 2024, from 2:00 p.m. to 3:00 p.m. (scheduled),
- June 13, 2024, from 5:00 p.m. to 6:00 p.m. (scheduled),
- July 3, 2024, from 2:00 p.m. to 6:00 p.m. (unscheduled),
- August 2, 2024, from 2:00 p.m. to 6:00 p.m. (unscheduled), and
- August 7, 2024, from 2:00 p.m. to 6:00 p.m. (unscheduled).

The EM&V team received interval meter data and a spreadsheet summarizing the event-level savings for the six sponsors across eight sites. Two sites did not participate in their associated scheduled event (used as a test event). Two sites did not participate in the first and third unscheduled events, and one site did not participate in the second unscheduled event.

- The cooperation level was 75 percent.
- **Recommendation**: Investigate ways to increase cooperation to above 90 percent.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it found that the evaluated savings matched the savings SWEPCO provided for all sites. The kW savings for each participating site corresponded to the average across the unscheduled events. The kWh savings for each participating site were calculated by multiplying the kW reductions of all events (including the scheduled event) by the total number of event hours. Program-level savings were calculated by adding all site-level savings.

The table above shows the EM&V team's (evaluated) and SWEPCO's (claimed) calculated kW and kWh savings. No adjustments were made to the program savings; however, a negligible difference in kW and kWh savings resulted from different rounding practices during calculations. The realization rate for kW and kWh savings is 100 percent, with a documentation score of *good*.

4.8.2 Bring Your Own Device Pilot SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
7.1%	766	766	100.0%	0.0%	0	0	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the SWEPCO Bring Your Own Device Pilot SOP by applying the recommended TRM deemed savings value for IOUs without advanced metering infrastructure (AMI) data. In PY2024, load management events occurred on the following dates and times:

- August 2, 2024, from 3:00 p.m. to 5:00 p.m. (unscheduled),
- August 7, 2024, from 4:00 p.m. to 6:00 p.m. (unscheduled), and
- August 28, 2024, from 4:00 p.m. to 5:00 p.m. (unscheduled).

The EM&V team received interval meter data and a spreadsheet summarizing the event-level savings for 754 sites.

- The cooperation level was 72 percent.
- **Recommendation**: Investigate ways to increase cooperation to above 80 percent.

The kW savings for each event were calculated by multiplying the recommended statewide deemed savings value of 1.4 kW by the number of participating devices. Program-level kW savings were calculated by averaging across event-level savings. No kWh savings were claimed for this program.

The table above shows the EM&V team's (evaluated) and SWEPCO's (claimed) calculated kW and kWh savings. No adjustments were made to the program savings. Therefore, the realization rate for demand reduction (kW) and energy savings (kWh) is 100 percent, with a documentation score of *good*.

4.9 SUMMARY OF TRACKING-SYSTEM-ONLY EVALUATED PROGRAMS

Table 20 summarizes claimed savings for SWEPCO's programs in PY2024 that only received a tracking system verification of program impacts. The programs' claimed savings were verified against the final PY2024 tracking data provided to the EM&V team for the EM&V database.

Table 20. SWEPCO's PY2024 Claimed Demand Reduction (kW) and Savings (kWh) (Tracking-System-Only Evaluated Programs)

Program	Contributionto portfolio reduction (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
COMPASS for Small Business MTP	3.2%	343	343	100.0%	7.1%	1,422,302	1,422,302	100.0%

5.0 XCEL ENERGY SOUTHWESTERN PUBLIC SERVICE COMPANY

5.1 KEY FINDINGS AND RECOMMENDATIONS

In addition to Volume 1 recommendations that apply to all IOUs, Table 21 summarizes Volume 3 recommendations specific to Xcel Energy Southwestern Public Service Company (Xcel SPS). Key findings that do not have a recommendation illustrate the type of program information to highlight in future EEPRs.

Table 21. Xcel SPS Key Findings and Recommendations

Report Section	Key finding	Recommendation
5.2.1 PY2020-PY2024 Portfolio Key Findings	PY2024 saw a decrease in total demand reduction and energy savings across Xcel SPS's portfolio.	Respond to this report with Xcel SPS's future plans and challenges to maintain program savings.
	Xcel SPS achieved the second-highest percentage of demand reduction, half through energy efficiency programs.	
	In PY2024, commercial SOP energy savings increased within the context of decreased MTP savings indicating a SOP infrastructure in Xcel SPS's territory.	
	Xcel SPS has not met its legislated demand reduction goals with energy efficiency since PY2021; demand reduction from energy efficiency decreased in PY2024 from PY2023.	Respond to this report with Xcel SPS's plans to increase the amount of its legislated demand reduction goal met through energy efficiency.
5.2.2 Commercial Savings	In PY2024, *lighting* measures continued to account for the majority of commercial demand reduction and energy savings.	Respond to this report with Xcel SPS's plans to continue to achieve savings while considering the diversification of measures beyond *lighting*.
5.2.3 Residential Savings	Xcel SPS's residential savings decreased to the lowest level in PY2024 in the past five years, with the majority of savings coming from *lighting*, but a slight uptick in *HVAC* and *envelope* measures.	Highlight Xcel SPS's successful strategies to deliver *HVAC* and *envelope* measures to residential customers and how this will support residential savings in future EEPRs.
5.4.2 Program Funding and Cost-Effectiveness Results	Xcel SPS's least cost-effective program was the Refrigerator Recycling MTP, and it was the only program with claimed savings that did not pass cost-effectiveness.	Identify and implement program design changes to the Refrigerator Recycling MTP to achieve cost-effectiveness.

Report Section	Key finding	Recommendation
5.6 Commercial Impact Evaluation Results	Project documentation still needs improvement.	Organize documentation files into at least four categories to provide a better understanding of available documentation for the project: pre-inspection, post-inspection, supporting documents, and savings calculation.
		Complete documentation or inspection notes to support the invoice and photo documentation of pre-retrofit and installed conditions. Alternately, Xcel SPS could increase the photo documentation requirement to provide more comprehensive documentation of conditions.

Xcel SPS PY2024 portfolio highlights include:

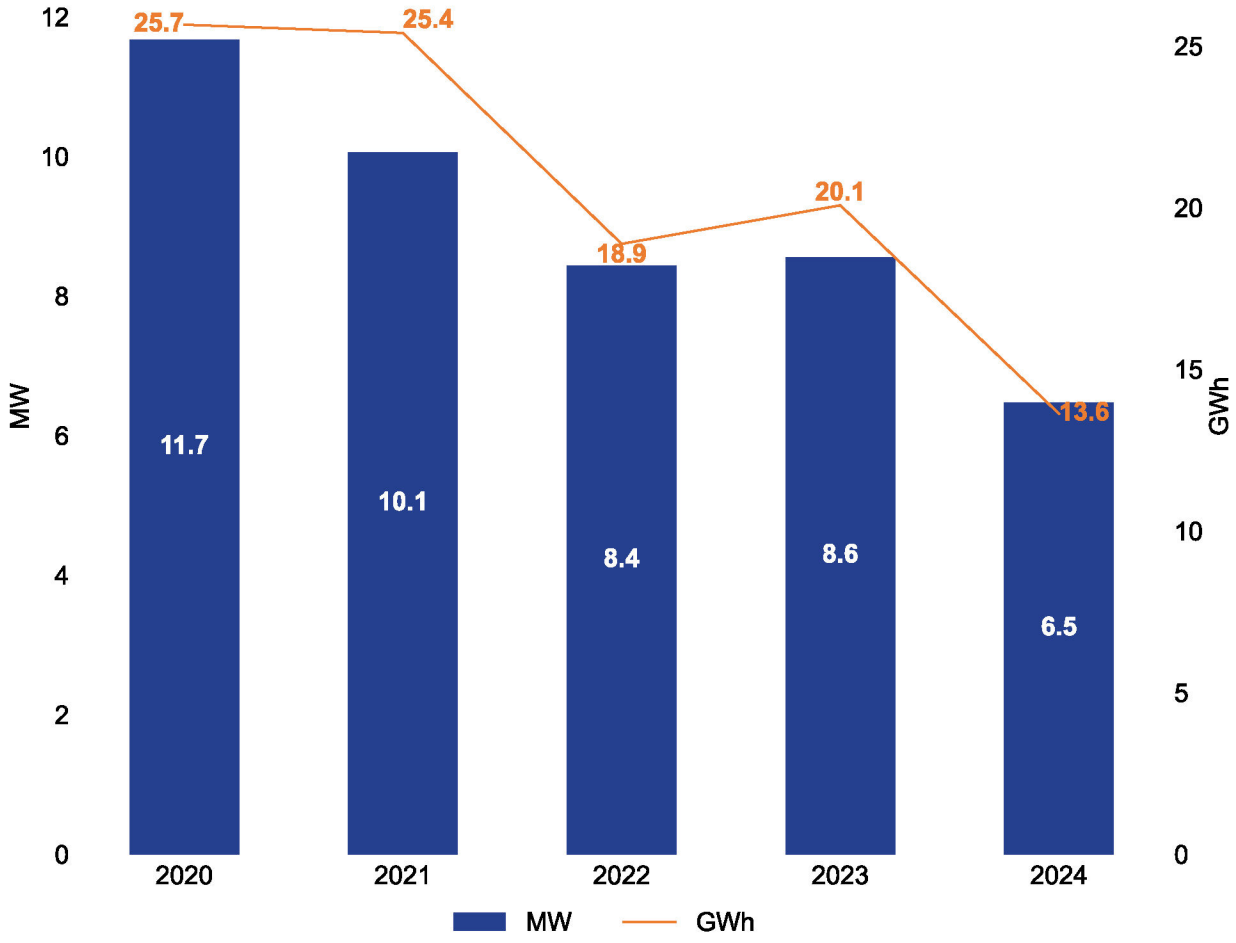
- The last three years show a trend of decreased savings year-to-year,
  - Xcel SPS's portfolio was particularly sensitive to changes in *lighting* baselines that came into effect in PY2023.
  - Substantial decreases in the Recommissioning program further impacted Xcel SPS's portfolio achievements negatively.
- Xcel SPS continues to deliver more than half of its demand reduction through energy efficiency,
- *Lighting* accounts for the majority of commercial and residential energy savings, and
- Xcel SPS delivers the highest percentage of portfolio savings to LI/HTR customers.

5.2 PY2020-PY2024 COMPARISONS

5.2.1 Portfolio Key Findings

Xcel SPS's portfolio shows a marked decrease in demand reduction and energy savings (Figure 31) for PY2024.

Figure 31. Xcel SPS's Demand Reduction (MW) and Energy Savings (GWh) PY2020-PY2024



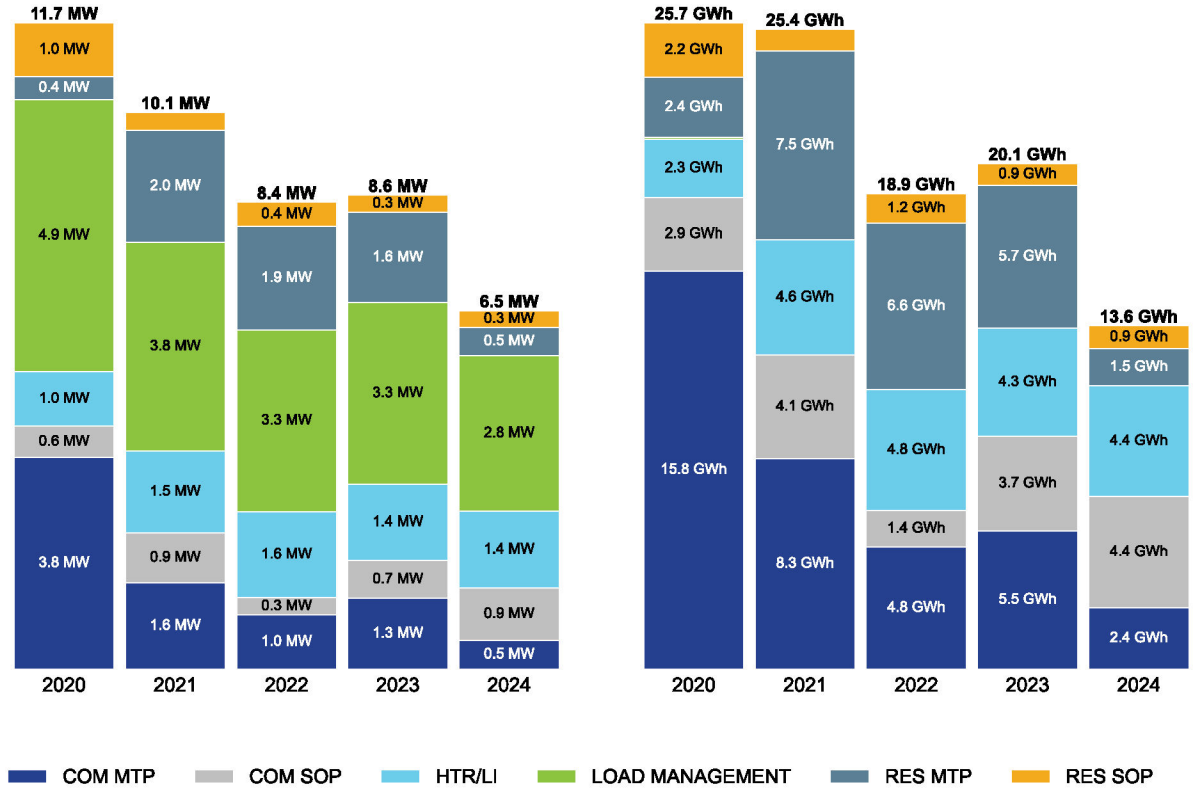
Xcel SPS achieved just over half of its demand reduction goals through energy efficiency programs in PY2024 (Figure 32, left graph).

- Xcel SPS programs achieved over half of the demand reduction through energy efficiency (56.5 percent), the second highest percentage across the eight IOUs.
- Commercial MTPs, the Commercial SOP, and LI/HTR programs were the main contributors to demand reduction beyond load management.

In PY2024, energy savings (Figure 32, right graph) achieved by the commercial SOP continued to increase. Savings achieved through commercial and residential MTP programs, however, decreased by 56 percent.

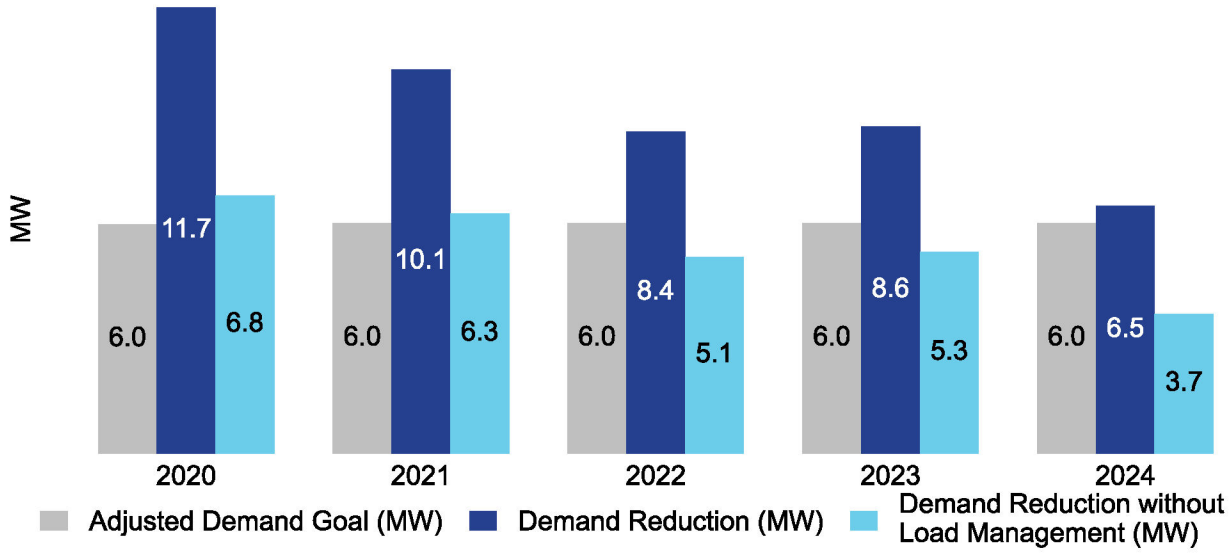
Xcel SPS is the only outside-of-ERCOT utility that offers an LI program in addition to an HTR program. Over one-fifth of its PY2024 portfolio demand reduction and nearly one-third of its PY2024 energy savings were delivered to HTR/LI customers, which was the highest among all IOUs.

Figure 32. Xcel SPS's Demand Reduction (MW) and Energy Savings (GWh) by Program Type PY2020-PY2024



Xcel SPS has not met its legislated demand reduction goal through energy efficiency since PY2021.

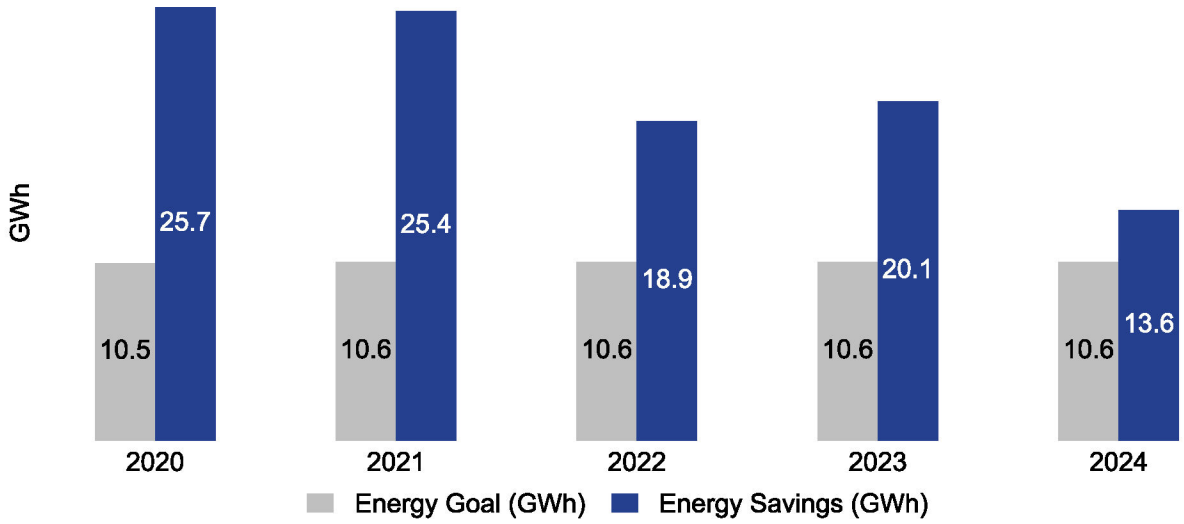
Figure 33. Xcel SPS's PY2020–PY2024 Legislated Demand Reduction (MW) Goals



Xcel SPS's has continued to achieve energy savings goals (Figure 34).

- Achievement over goal has decreased in recent years, falling to not quite a third above goal in PY2024.

Figure 34. Xcel SPS's PY2020–PY2024 Energy Savings (GWh) Goals



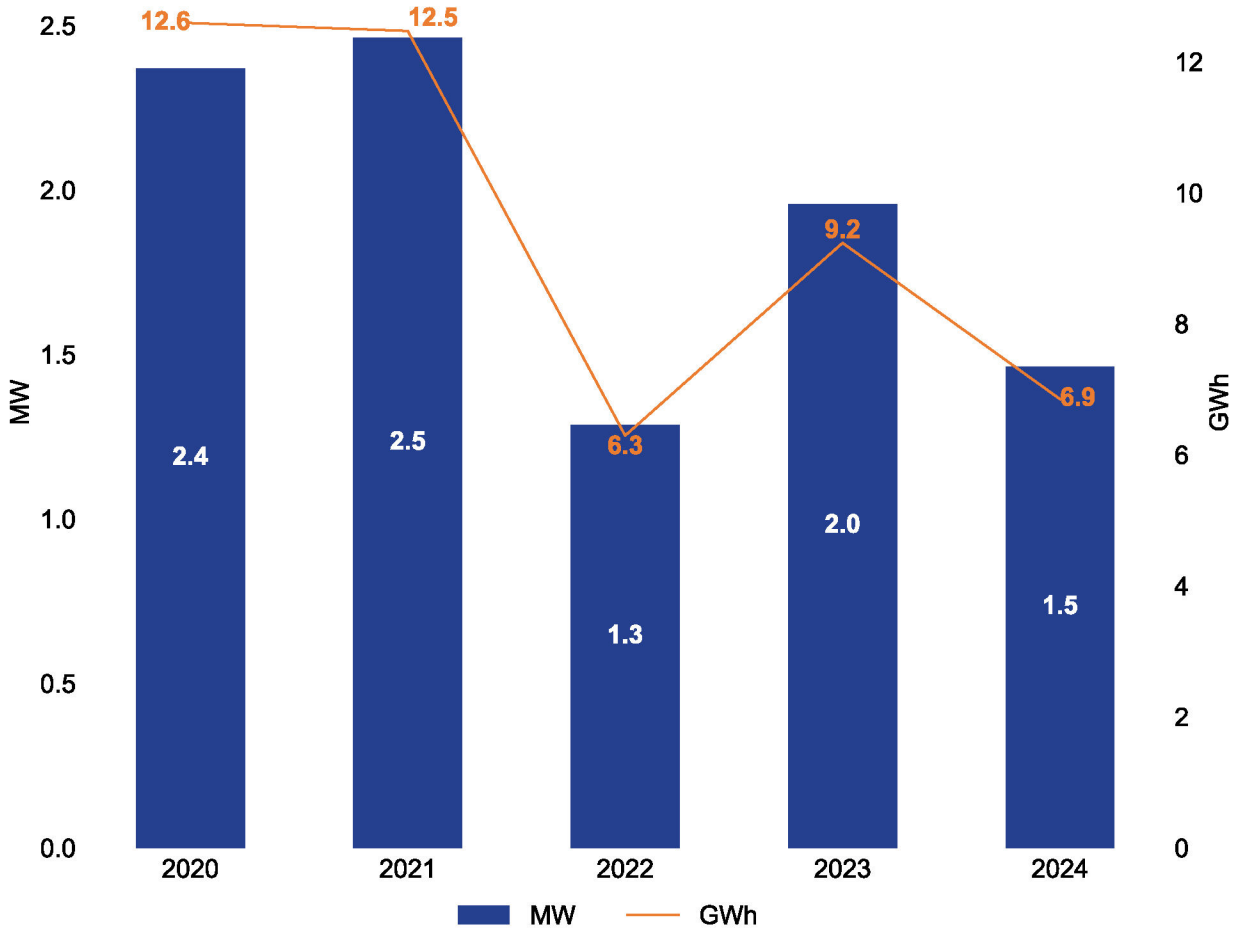
5.2.2 Commercial Savings

The PY2024 gross savings from Xcel SPS's commercial sector programs were the following:

- Demand reduction of 1.5 MW, and
- Energy savings of 6.9 GWh.

Demand reduction and energy savings for Xcel SPS decreased in PY2024 (Figure 35).

Figure 35. Xcel SPS's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Commercial Programs Excluding Load Management, PY2020–PY2024

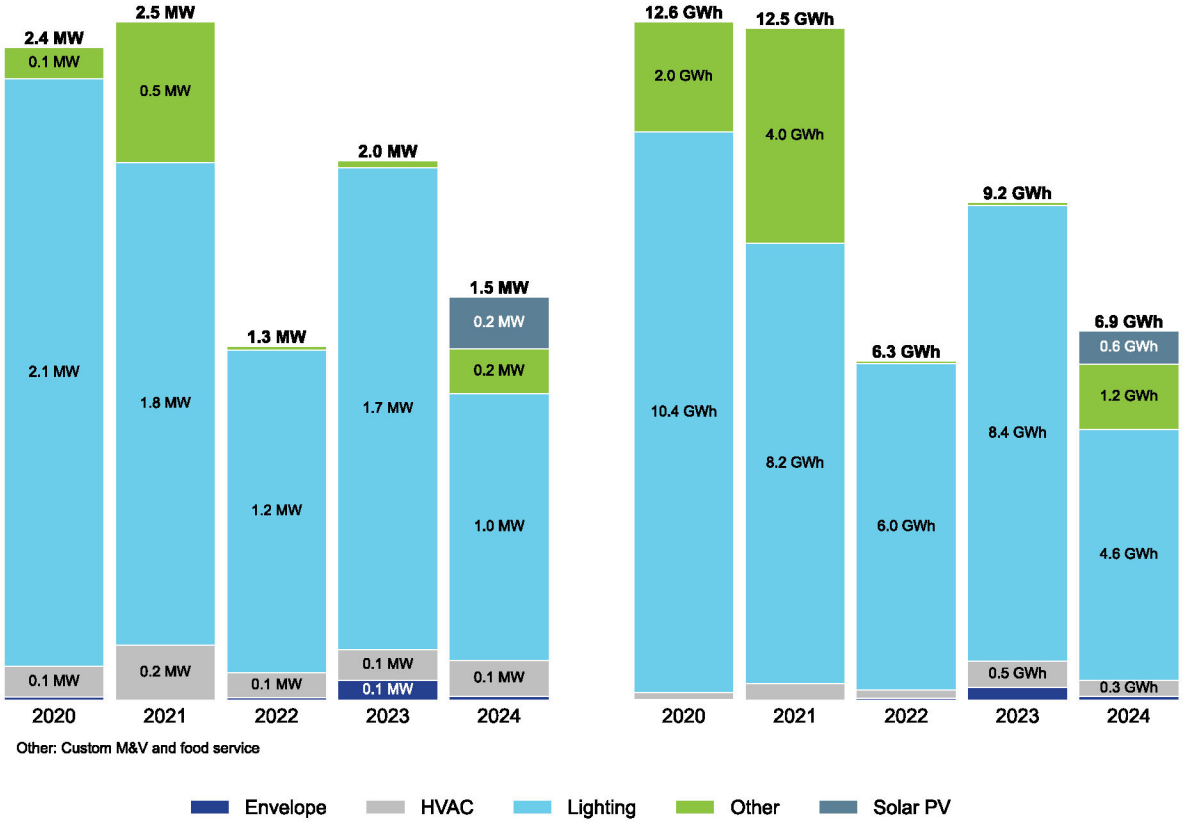


Consistent with the past five years, *lighting* accounted for the largest share of both demand reduction (Figure 36, left graph) and energy savings (Figure 36, right graph) across measures. Xcel SPS should consider diversification of measures beyond *lighting* measures in commercial projects to better serve its customers:

- Figure 36 highlights that in PY2024, *lighting* measures represented around two-thirds of total demand reduction and energy savings,

- In PY2024, the *HVAC* measures accounted for savings values comparable to PY2023, and
- The introduction of *Solar PV* measures resulted in an additional 0.2 MW and 0.6 GWh in demand reduction (kW) and energy savings (kWh), respectively.

Figure 36. Distribution of Xcel SPS's Demand Reduction (Mw) and Energy Savings(GWh) by Measure Category—Commercial Programs Excluding Load Management PY2020–PY2024



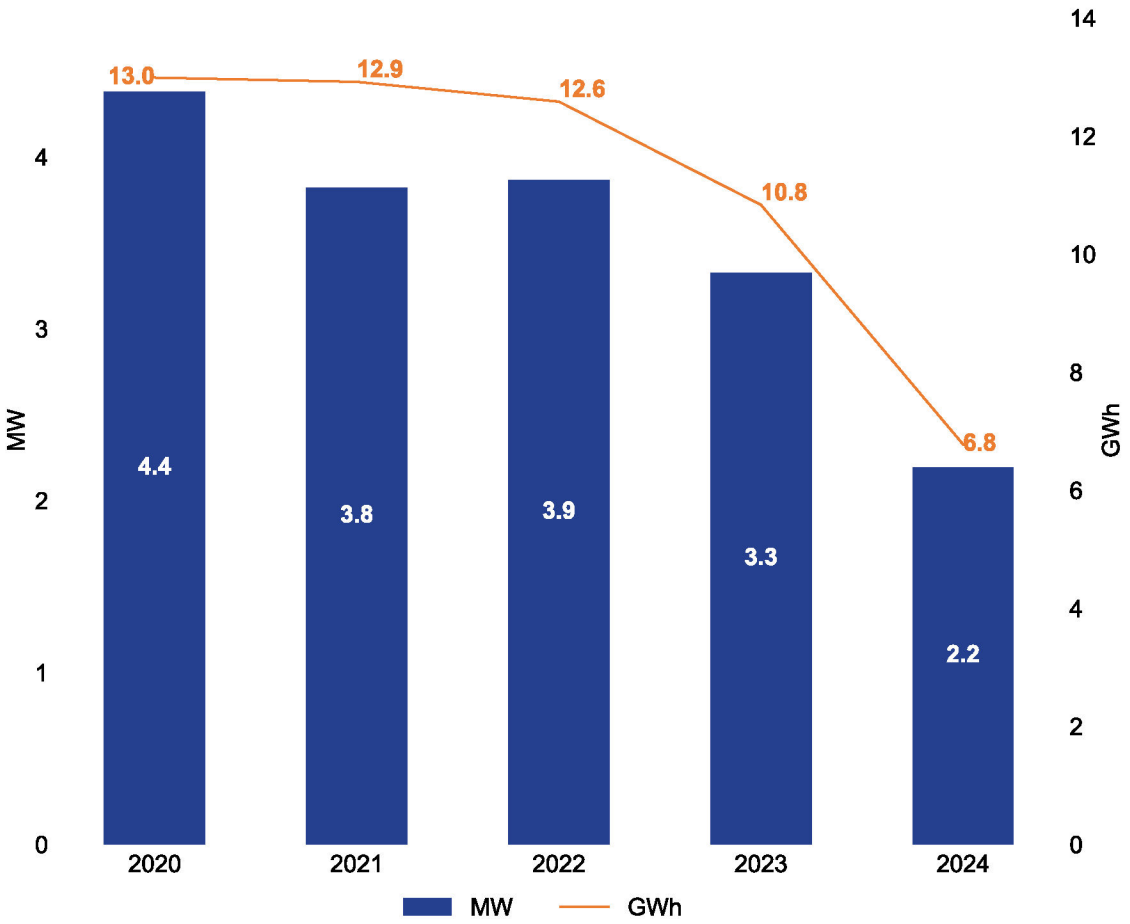
5.2.3 Residential Savings

The PY2024 gross savings from Xcel SPS's residential sector programs (excluding load management) were the following:

- Demand reduction of 2.2 MW, and
- Energy savings of 6.8 GWh.

Xcel SPS had the lowest residential demand reduction and energy savings in PY2024 (Figure 37).

Figure 37. Xcel SPS's Demand Reduction (MW) and Energy Savings (GWh) by Program Year—Residential Programs PY2020–PY2024

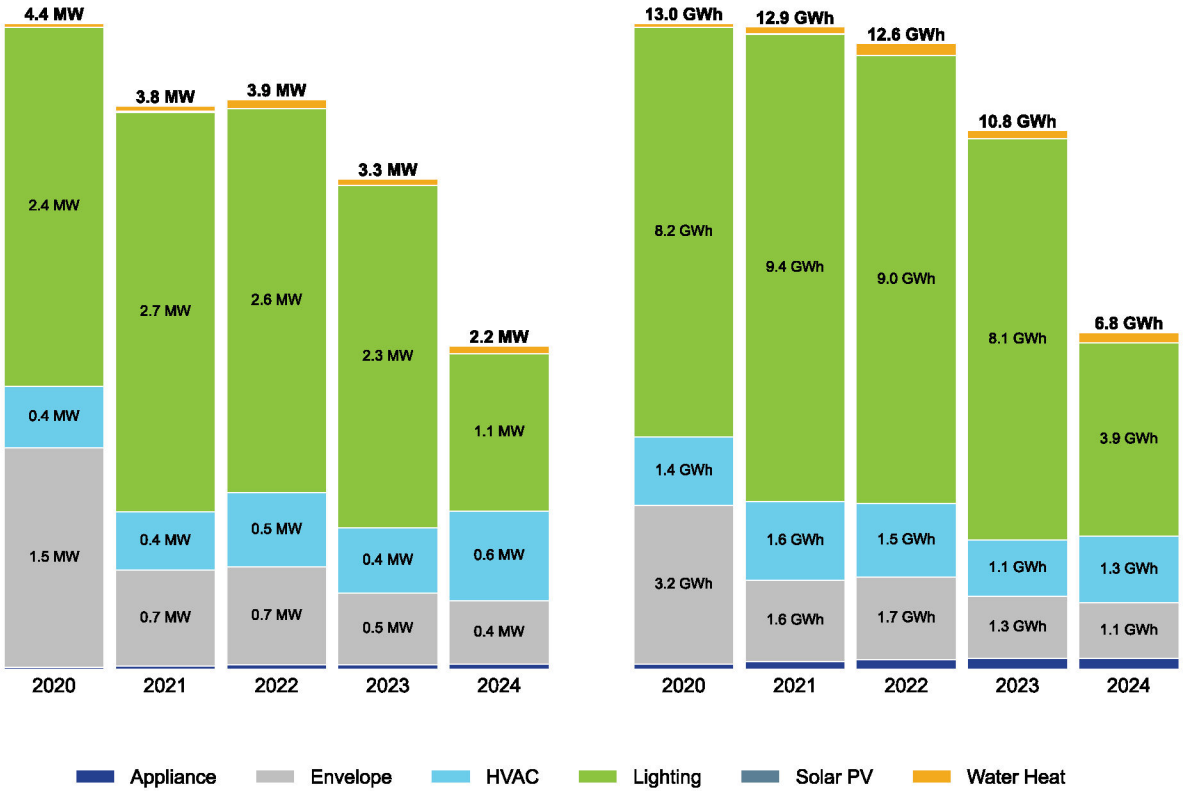


In PY2024, Xcel SPS's residential demand reduction and energy savings were primarily derived from *lighting* measures, representing just under half of the MW reduction (Figure 38, left graph) and over half of the GWh savings (Figure 38, right graph). However, both *HVAC* and *envelope* saw slight increases.

Xcel SPS should continue its efforts to diversify measures to better serve its residential customers:

- Figure 38 presents the breakdown of savings distribution by measure category, demonstrating that Xcel SPS has slightly increased *HVAC* measures in its residential portfolios.
- *HVAC* measures are the second-highest contributors to demand reduction (Figure 38, left graph) and energy savings (Figure 38, right graph).
- *Envelope* measures still account for meaningful savings, ranking third in their impact on demand reduction and energy savings.

Figure 38. Distribution of Xcel SPS's Demand Reduction (MW) and Energy Savings (GWh) by Measure Category—Residential Programs PY2020–PY2024



5.2.4 Load Management Savings

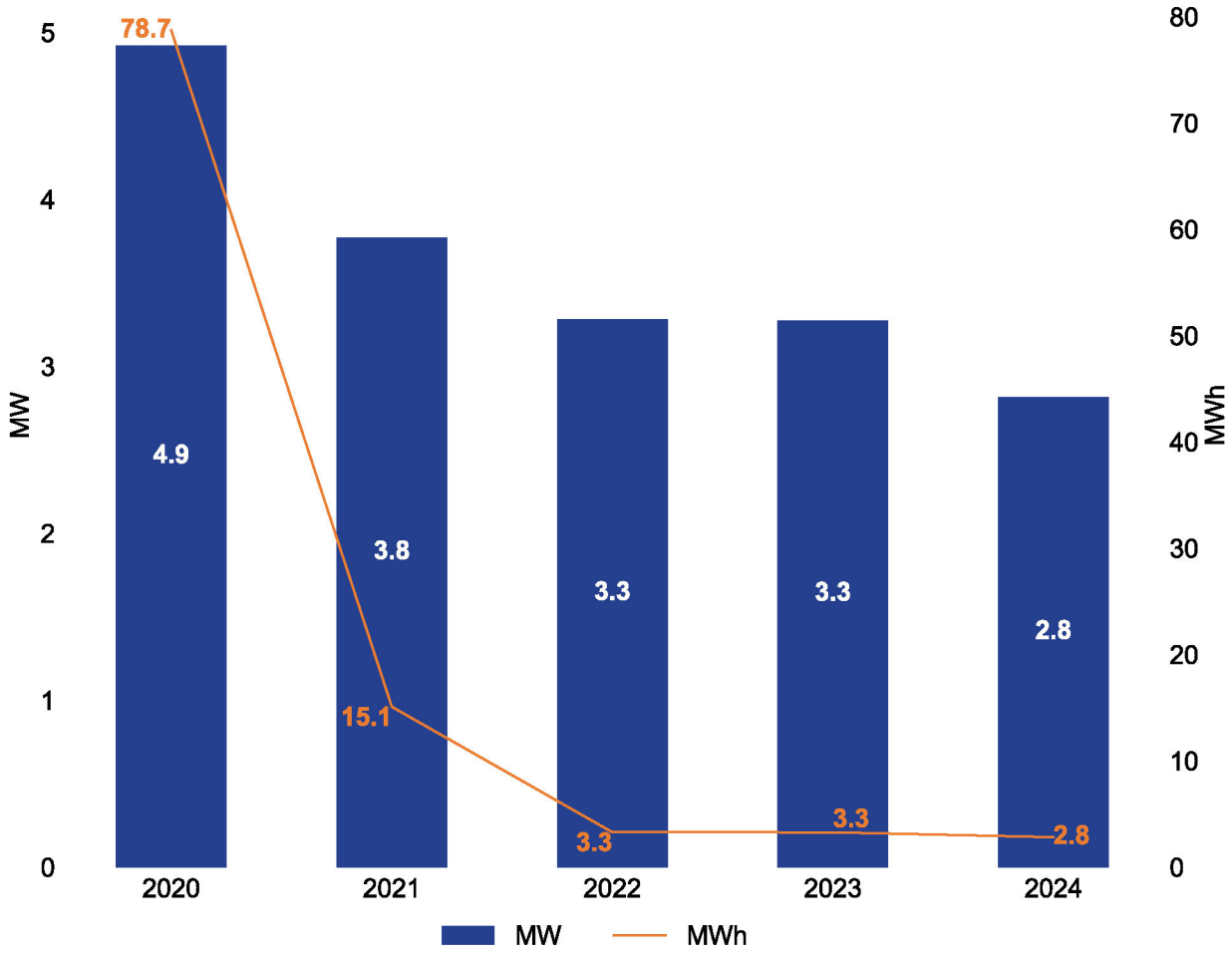
The PY2024 gross savings from Xcel SPS's load management programs were the following:

- Demand reduction of 2.8 MW, and
- Energy savings of 2.8 MWh.

Figure 39 shows the demand reduction and energy savings for Xcel SPS's load management programs for the past five years, showing fairly stable demand reduction over the past three years.

The number and duration of curtailment events in PY2024 have remained steady since PY2022.

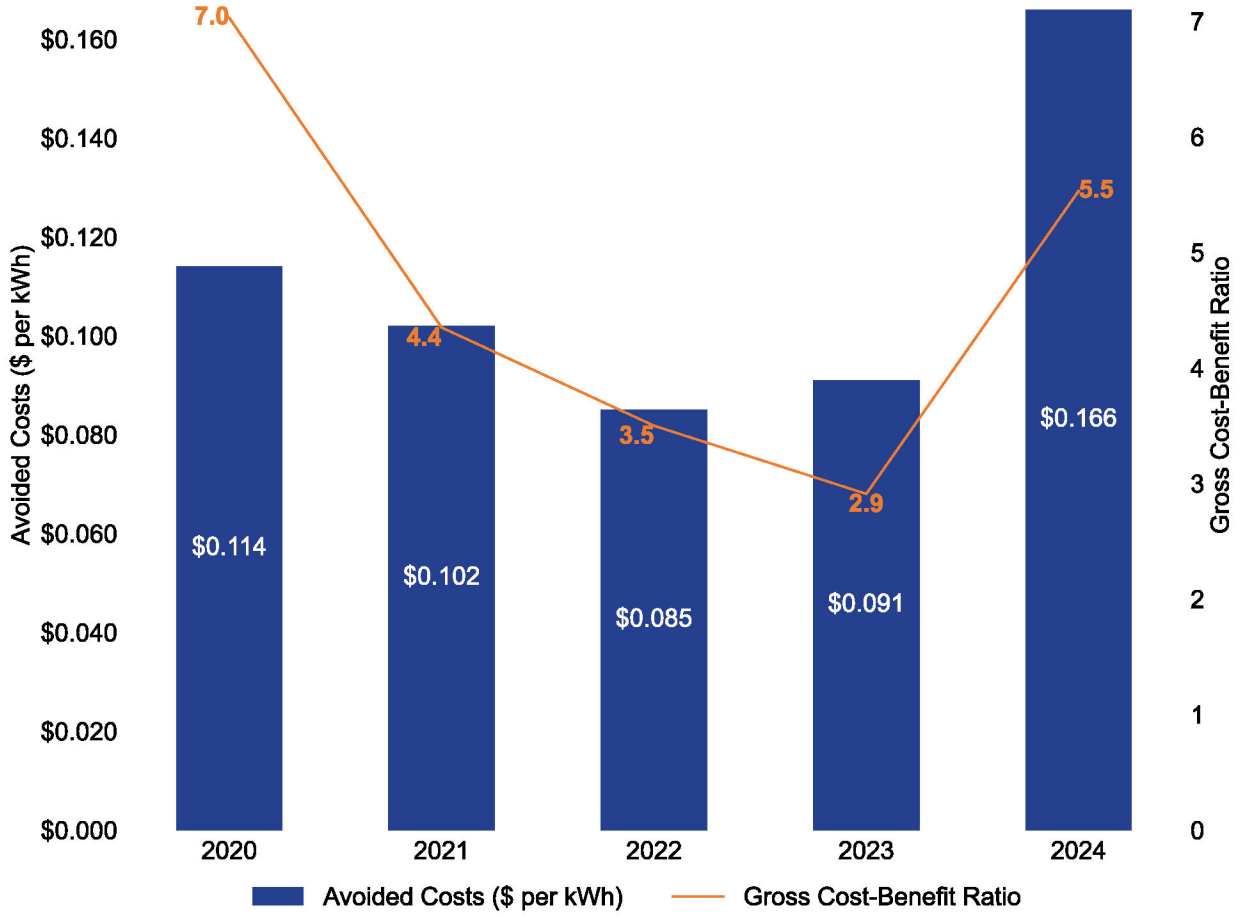
Figure 39. Xcel SPS's Demand Reduction (MW) and Energy Savings (MWh) by Program Year—Load Management Programs PY2020–PY2024



5.3 COST-EFFECTIVENESS

Figure 40 shows the avoided costs for all investor-owned utilities and Xcel SPS's cost-effectiveness ratios over the last five years. The overall cost-effectiveness ratio for Xcel SPS has consistently remained above 2.0. PY2020 saw a high of 7.0, and the cumulative cost-effectiveness of Xcel SPS's programs was 5.5 in PY2024. The significant increase in cost-benefit ratio from PY2023 to PY2024 is attributable to increases in avoided cost of energy in the ERCOT market.

Figure 40. Xcel SPS's Gross Cost-Benefit Ratio and Avoided Cost by Program Year



5.4 PY2024 IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Xcel SPS's energy efficiency portfolio. The key findings are summarized first, followed by details for each program in the portfolio that had a *high* or *medium* evaluation priority. Finally, a list of programs with a *low* evaluation priority for which claimed savings were verified through the EM&V database is included.

5.4.1 Evaluated Savings

Xcel SPS's evaluated savings for PY2024 were 6,470 kW in demand reduction and 13,621,612 kWh in energy savings. The overall kW and kWh portfolio realization rates are approximately 100 percent. Xcel SPS adjusted claimed savings based on EM&V results (see Table 26), supporting healthy realization rates.

Table 22 shows the claimed and evaluated demand reduction for Xcel SPS's portfolio and broad customer sector and program categories for PY2024. For both Table 22 and Table 23, the review for the load management program included a census review of equations and interval

meter data to estimate the baseline usage and level of load curtailment for each event for all participants. Also, total portfolio numbers may not equal the sum of all program sector totals due to rounding.

Table 22. Xcel SPS's PY2024 Claimed and Evaluated Demand Reduction (kW)

Level of analysis	Percentage portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)
Total portfolio	**100.0%**	**6,473**	**6,470**	**100.0%**
Commercial	22.6%	1,464	1,462	99.9%
Residential	29.6%	1,918	1,918	100.0%
Low-income	4.3%	275	275	100.0%
Load management	43.5%	2,816	2,815	100.0%

Table 23. Xcel SPS's PY2024 Claimed and Evaluated Energy Savings (kWh)

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Total portfolio	**100.0%**	**13,631,436**	**13,621,612**	**99.9%**
Commercial	50.2%	6,850,711	6,840,888	99.9%
Residential	45.0%	6,123,803	6,123,803	100.0%
Low-income	4.8%	654,106	654,106	100.0%
Load management	0.0%	2,816	2,815	100.0%

Program-level realization rates are discussed in the detailed findings subsections. However, these results should only be viewed qualitatively due to the small sample sizes at the utility program level.

Program-level realization rates also include a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility.

- Xcel SPS received *good* documentation scores for all residential, low-income, and load management evaluated programs.
- Xcel SPS received *fair* documentation scores for the Commercial SOP and the Retro-Commissioning MTP.
    - **Recommendation:** Identify how program documentation will be improved for the two programs with *fair* documentation scores. See project and program-specific recommendations in the two programs' impact results.

5.4.2 Program Funding and Cost-Effectiveness Results

Xcel SPS's total portfolio funding for PY2024 was $4,135,125[11], excluding research and development, EM&V, and its performance bonus; its portfolio had a cost-effectiveness score of 5.5, or 5.9 excluding low-income programs, based on the PACT.

The more cost-effective programs were the Large Commercial SOP and the Commercial Home Lighting MTP programs; the least cost-effective program was the Refrigerator Recycling MTP, and it was the only program with claimed savings that did not pass cost-effectiveness.

- **Recommendation**: Identify and implement program design changes to the Refrigerator Recycling MTP to achieve cost-effectiveness, as the program also did not pass PY2023.

The lifetime cost of evaluated savings, including low-income programs, was $0.019 per kWh and $11.32 per kW. Cost per lifetime is calculated by attributing costs to energy savings and avoided demand based on their portion of total benefits and applying that proportion to the total program costs.

Table 24. Xcel SPS's Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**5.48**	**5.47**	**4.70**
Total portfolio excluding low-income programs	**5.91**	**5.88**	**5.00**
Commercial	**7.08**	**7.07**	**5.90**
Large Commercial SOP	13.79	13.79	11.90
Retro-Commissioning MTP	2.47	2.45	2.09
Small Commercial MTP	4.36	4.36	3.53
Home Lighting MTP	35.08	35.08	17.54
Residential[12]	**5.44**	**5.44**	**4.69**
Residential SOP	4.64	4.64	3.78
Home Lighting MTP	5.61	5.61	2.81
Refrigerator Recycling MTP	0.41	0.41	0.31
Residential HVAC MTP	11.61	11.61	8.73
Smart Thermostat MTP	3.02	3.02	1.51
Hard-to-Reach SOP	3.01	3.01	3.01
Hard-to-Reach Food Bank SOP	8.21	8.21	8.21

[11] Total portfolio funding includes funds expended for the Residential Codes MTP that was not included in the cost-effectiveness analysis due to no savings claimed in PY2024.

[12] The Residential Codes MTP program is not included and had a cost-effectiveness of 0 because incentives were paid in the program in 2024, but no savings were claimed. Xcel SPS's savings estimation study for the program was still in progress through Q1 of 2025; therefore, Xcel SPS did not claim savings since they could not be verified by the EM&V team.

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Low-income*	**2.65**	**2.65**	**2.65**
Low-Income Weatherization*	2.65	2.65	2.65
Load management	**1.59**	**1.58**	**1.58**
Commercial Load Management SOP	1.59	1.58	1.58

* The low-income program is evaluated using the Savings-to-Investment Ratio (SIR).

5.4.3 Net-to-Gross Results

Xcel Energy's NTG ratio was updated for its Commercial Solutions SOP as well as Commercial Solutions MTP in PY2024 through participant surveys.

Xcel Energy's free-ridership rate for CSOP of 13.8 percent for kWh and 12.9 percent for kW decreased from the PY2021 commercial SOP NTG free-ridership estimate of 23 percent for kWh and 22 percent for kW. Xcel Energy's free-ridership rate for MTP of 14.5 percent for kWh and 15.0 percent for kW decreased from the PY2021 commercial MTP NTG free-ridership estimate of 19 percent for kWh and 20 percent for kW.

Table 25 shows Xcel Energy's free-ridership results by program and end-use. While the small number of completed surveys for some measure types is qualitative, end-use free-ridership provides useful insight for IOU's program design considerations.

Table 25. Xcel SPS's Free-Ridership by Program and End-Use

Program and end-use	Completed surveys	kWh free-ridership	kW free-ridership
Commercial Solutions SOP			
Lighting	8	13.8%	12.9%
HVAC equipment	1	13.0%	13.0%
Total	**9**	**13.8%**	**12.9%**
Commercial Solutions MTP			
Lighting	4	14.0%	13.3%
HVAC equipment	3	23.4%	30.9%
Total	**7**	**14.5%**	**15.0%**

5.5 SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 26 summarizes savings differences identified by the EM&V team, which Xcel SPS also used to adjust its claimed savings. The EM&V team requests that utilities adjust projects when evaluated and claimed savings differ by more than five percent. Xcel SPS adjusted claimed savings for all projects with a difference of more than five percent, as found by the EM&V team, and will include these adjustments in its May 1 filing.

- Overall, Xcel SPS's claimed demand reduction (kW) and energy savings (kWh) decreased due to recommended evaluation adjustments.

Table 26. Xcel SPS's Claimed Demand Reduction (kW) and Energy Savings (kWh) Adjustments by Program

Program	EM&V demand claimed reduction adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Commercial SOP	-25.29	-108,459.97
Retro-Commissioning MTP	0.05	743.00
Residential HVAC MTP	-0.083	-156.68
Low-Income Weatherization	-.01	-26.06
Total	**-25.33**	**-107,899.71**

5.6 DETAILED FINDINGS—COMMERCIAL

5.6.1 Commercial SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
14.6%	945	945	100.0%	32.4%	4,423,388	4,423,388	100.0%	Fair

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Commercial SOP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for two projects. Both projects had adjustments greater than five percent compared to the original claimed savings. Xcel SPS accepted the evaluated results for two projects and matched the claimed savings to the evaluated savings. Therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 6-4-0-1-81967: An office building installed *LED lighting* to replace existing lighting. During the desk review, the EM&V team adjusted the installed wattage of several lighting fixtures to match the DesignLights Consortium® qualified products list (DLC QPL). The quantity was adjusted to match the invoices provided because there was not enough supporting documentation for the quantities of fixtures claimed in the calculator. These adjustments decreased peak demand (kW) reduction and energy (kWh) savings and resulted in a realization rate of 75 percent for both.

Participant ID 6-4-0-1-82276: A newly constructed supermarket installed energy-efficient *LED lighting*, *air conditioners*, and *heat pumps*. During the desk review, the EM&V team underwent adjustments for the *air conditioners*, *heat pump*, and *lighting*. The EM&V team adjusted the capacities and efficiencies of the *air conditioners* and *heat pumps* to Air Conditioning, Heating and Refrigeration Institute (AHRI)-rated energy efficiency ratio 2/seasonal energy efficiency ratio 2 (EER2/SEER2) values. The EM&V team adjusted four interior lighting fixture types to non-qualified because they could not be identified on the DLC QPL. The EM&V team also adjusted the exterior lighting area to estimate the exterior paved area from the whole property area. These adjustments decreased peak demand (kW) to a combined realization rate of 84 percent and decreased the energy (kWh) savings to a combined realization rate of 85 percent.

Documentation Score

The EM&V team was partially able to verify key inputs and assumptions (e.g., equipment quantity, DLC QPL qualifications) for the three projects with desk reviews. One desk review was provided to the EM&V team as part of the technical assistance service. The documentation provided for the impact evaluation was not sufficient to complete the evaluations, but the previous technical assistance provided support. The new construction project did not provide building areas or exterior lighted areas, and the *lighting* and *HVAC* equipment did not include certification sheets to go with the provided specification sheets for the installed equipment. In addition, the project did not include pre-installation or post-installation inspection notes. The EM&V team recognizes that the invoices and photo verification provided were improved from previous years and recommends that Xcel SPS continue to collect that information and provide documentation on the differences between calculated and documented quantities and equipment. Due to the documentation shortfalls, a program documentation score of *fair* was assigned.

- **Recommendation***:* Organize documentation files into at least four categories to provide a better understanding of available documentation for the project: pre-inspection, post-inspection, supporting documents, and savings calculation.
- **Recommendation***:* Complete documentation or inspection notes to support the current level of invoice and photo documentation of pre-retrofit and installed conditions. Alternately, Xcel SPS could increase the photo documentation requirement to provide more comprehensive documentation of conditions.

5.6.2 Retro-Commissioning MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
4.2%	269	267	99.4%	13.1%	1,247,575	1,237,752	99.2%	Fair

Completed desk reviews*
3

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Retro-Commissioning MTP evaluation efforts focused on desk reviews. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for two projects. One project had an adjustment of less than five percent, and one project had adjustments of greater than five percent compared to the originally claimed energy savings. Xcel SPS accepted the evaluated results and matched the claimed savings for the projects with an adjustment of greater than five percent; therefore, the final program realization rate is 99 percent. Further details of the EM&V findings are provided below:

Participant ID 6--0-1-81394: A new construction office building installed energy-efficient *HVAC* equipment. During the desk review, the EM&V team adjusted the quantities of the *variable refrigerant flow (VRF) air conditioners* in the project based on documentation. These adjustments increased peak demand (kW) reduction and resulted in a realization rate of 102 percent. The adjustments also increased energy (kWh) savings and resulted in a realization rate of 107 percent.

Participant ID 6--0-1-82851: A new construction retail site installed *interior* and *exterior lighting* measures. During the desk review, the EM&V team adjusted the quantity of one lighting fixture to match the electrical plans, the wattage of one lighting fixture to meet the DLC QPL, and the exterior area to match the sales canopies where the claimed lighting was located. These adjustments decreased peak demand (kW) reduction and resulted in a realization rate of 96 percent. The adjustments also decreased energy (kWh) savings and resulted in a realization rate of 96 percent.

Documentation Score

The EM&V team was partially able to verify key inputs and assumptions (e.g., equipment quantity, DLC QPL qualifications) for the three projects with desk reviews. One new construction project provided building and exterior areas, shop drawings, and equipment plan quantity verification, while the other included none of these. Neither new construction project included post-installation inspection notes. The *HVAC* project had incomplete post-installation verification photos and inspection notes, but some were present. The EM&V team recognizes that the invoices and photo verification provided were improved from previous years but recommends that Xcel SPS continue to collect that information and provide documentation on the differences between calculated and documented quantities and equipment. Due to the documentation shortfalls, a program documentation score of *fair* was assigned.

- **Recommendation***:* Organize documentation files into at least four categories to provide a better understanding of available documentation for the project: pre-inspection/preliminary assessment, post-inspection, supporting documents, and savings calculation/verification.
- **Recommendation***:* Complete documentation or inspection notes to support the current level of invoice and photo documentation of pre-retrofit and installed conditions. Alternately, Xcel SPS could increase the photo documentation requirement to provide more comprehensive documentation of conditions.

5.7 DETAILED FINDINGS—RESIDENTIAL

5.7.1 Residential SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
4.7%	303	303	100.0%	6.6%	903,892	903,892	100.0%	Good

Completed desk reviews*
1

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Residential SOP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team did not need to adjust the claimed savings for any projects; therefore, the final program realization rate is 100 percent.

Documentation Score

The EM&V team verified most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included the customer agreement, photos, test results, and certifications. Overall, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good.*

5.7.2 Hard-to-Reach SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.4%	350	350	100.0%	6.6%	895,252	895,252	100.0%	Good

Completed desk reviews*
1

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Hard-to-Reach SOP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team did not need to adjust the claimed savings for any projects; therefore, the final program realization rate is 100 percent.

Documentation Score

The EM&V team verified most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included the customer agreement, photos, test results, and certifications. Overall, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good.*

5.7.3 Residential HVAC MTP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.2%	206	206	100.0%	3.0%	406,108	406,108	100.0%	Good

Completed desk reviews*
1

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Residential HVAC MTP evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for one project. The lone project had an adjustment of greater than five percent. Xcel SPS accepted the adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below:

Participant ID 82040: The energy efficiency project included the installation of an *A/C unit*. During the desk review, the EM&V team used the replace-on-burnout calculation methodology and assumptions. It was assumed the claimed savings were calculated with the early retirement baseline. Overall, the adjustments decreased the demand reduction and energy savings and resulted in project-level realization rates of 89.7 percent for demand (kW) reduction and 73 percent for energy (kWh) savings.

Documentation Score

The EM&V team verified most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included the customer agreement, photos, and certifications. However, the documentation did not include information on the existing A/C unit. Overall, despite the documentation shortfalls, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good.*

5.8 DETAILED FINDINGS—LOW-INCOME

5.8.1 Low-Income Weatherization Program

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
4.3%	275	275	100.0%	4.8%	654,106	654,106	100.0%	Good

Completed desk reviews*
1

*Confidence intervals are not reported at the utility program level due to the small sample sizes.

The PY2024 Low-Income Weatherization program evaluation efforts focused on desk reviews. The number of sampled and completed desk reviews for this program is listed above. The desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system and that savings were calculated in accordance with the TRM.

The EM&V team adjusted the savings for one project. The lone project had savings adjustments of less than five percent. Xcel SPS partially agreed to the adjustments; therefore, the overall realization rates for the program are rounded to 100 percent for demand reduction and equal to 100 percent for energy savings. Further details of the EM&V findings are provided below:

Participant ID 81944: The energy efficiency project included the installation of an *air purifier*, *ceiling insulation*, *LED lighting*, and *solar screens*. During the desk review, the EM&V team rounded the air purifier demand reduction. The EM&V team adjusted the *LED lighting* quantity based on the photos provided. Overall, the adjustments slightly decreased the demand reduction and energy savings and resulted in project-level realization rates of 99.6 percent for demand (kW) reduction and 98.1 percent for energy (kWh) savings.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baseline, and installed equipment information, and income eligibility verification forms for all sampled projects that had desk reviews. Project documentation included the customer agreement, nameplate photos, specification sheets, and pre- and post-installation photos.

Overall, the level of sufficient documentation remained above 90 percent, and the EM&V team assigned a program documentation score of *good.*

5.9 DETAILED FINDINGS—LOAD MANAGEMENT

5.9.1 Commercial Load Management SOP

Program contribution to portfolio savings (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
43.5%	2,816	2,815	100.0%	0.0%	2,816	2,815	100.0%	Good

Completed desk reviews*
N/A

*The review for the load management program included a census review of equations and interval meter data to estimate the baseline usage and the resulting level of load curtailment achieved for each event for all participants.

The EM&V team evaluated the Xcel SPS Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data was supplied in 15-minute increments at the *electric service identifier ID* (ESIID) level. In PY2024, load management events occurred on the following dates and times:

- June 26, 2024, from 3:00 p.m. to 4:00 p.m. (scheduled), and
- August 29, 2024, from 3:00 p.m. to 4:00 p.m. (scheduled).

The EM&V team received the interval meter data and a spreadsheet summarizing the event-level savings for the five sponsors across six sites. All sites participated in their respective curtailment event.

- The cooperation level across the two events was 100 percent.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it found that the evaluated savings matched the savings Xcel SPS provided for all sites. The kW savings for each participating site corresponded to the energy reduced during the scheduled event. The kWh savings for each participating site were calculated by multiplying the kW reductions by the total number of event hours. Program-level savings were calculated by adding all site-level savings.

The table above shows the EM&V team's (evaluated) and Xcel SPS's (claimed) calculated kW and kWh savings. No adjustments were made to the program savings; however, a negligible difference in kW and kWh savings resulted from different rounding practices during calculations. The realization rate for kW and kWh savings is 100 percent, with a documentation score of *good.*

5.10 SUMMARY OF TRACKING-SYSTEM-ONLY EVALUATED PROGRAMS

Table 27 summarizes claimed savings for Xcel SPS's programs in PY2024 that only received a tracking system review for program impacts. The programs' claimed savings were verified against the final PY2024 tracking data provided to the EM&V team for the EM&V database.

Table 27. Xcel SPS's PY2024 Claimed Demand Reduction (kW) and Savings (kWh) (Tracking-System-Only Evaluated Programs)

Program	Contribution to portfolio reduction (kW)	Claimed demand reduction (kW)	Evaluated demand reduction (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Small Commercial MTP	2.7%	177	177	100.0%	5.9%	806,061	806,061	100.0%
Home Lighting MTP (Commercial)	1.1%	72	72	100.0%	2.7%	373,686	373,686	100.0%
Home Lighting MTP (Residential)	4.6%	297	297	100.0%	7.4%	1,008,930	1,008,930	100.0%
Smart Thermostat MTP	0.0%	0	0	0.0%	0.3%	40,513	40,513	100.0%
Residential Codes MTP	0.0%	0	0	100.0%	0.0%	0	0	100.0%
Refrigerator Recycling MTP	0.0%	3	3	100.0%	0.2%	24,233	24,233	100.0%
Hard-to-Reach Food Bank SOP	11.7%	759	759	100.0%	20.9%	2,844,875	2,844,875	100.0%

APPENDIX A: EVALUATION, MEASUREMENT, AND VERIFICATION APPROACH

Appendix A discusses the PY2024 EM&V methodology. The foundation of the evaluation process was to create a statewide EM&V database with a streamlined data request process and a secure retrieval system. Complete PY2023 program data were requested from utilities and integrated into the database. A visual representation of the EM&V database import, review, and validation process can be found in Appendix B.

The EM&V database allowed the EM&V team to complete:

- due diligence reviews of claimed savings,
- program tracking system reviews, and
- efficient sampling across utilities and programs.

A.1 IMPLEMENTING IMPACT EVALUATIONS

The impact evaluations are used to calculate realization rates. The realization rate is determined by dividing the evaluated savings by the utility-claimed savings. Utility-claimed savings are verified in the EM&V database from the tracking systems.

The EM&V team performed a tracking system review and a series of desk reviews for an initial assessment of the reasonableness of the claimed savings. Primary data were then collected for sampled projects to assess the accuracy of the claimed savings further.

Demand-side management (DSM)[13] program evaluations routinely employ 90 percent confidence intervals with ±10 percent precision as the industry standard ("90/10"). A confidence interval is a range of values believed to contain the true population quantity with some stated level of confidence. The confidence level is the probability that the interval includes the target quantity. Precision provides a convenient shorthand for expressing the interval believed to contain the estimator; for example, if the estimate is 530 kWh, and the relative precision level is ten percent, then the interval is 530 ±53 kWh.

It is essential to provide both the precision and corresponding confidence levels in reporting estimates from a sample. In general, high confidence levels can be achieved with wider intervals, while narrower, more precise intervals permit less confidence. In other words, when all else is held constant, there is a trade-off between precision and confidence. As a result, any precision statement without a corresponding confidence level is incomplete and impossible to interpret. For example, assume the average savings among participants in an appliance program is estimated as 1,000 kWh per year. It is determined this estimate has 16 percent relative precision at the 9 percent confidence level. The same dataset and the same formulas may be used to estimate 10 percent relative precision at the 70 percent confidence level. If the confidence level is not reported, the second formulation would appear less uncertain when the two are identical.

[13] Demand Side Management (DSM) encompasses a broad array of utility strategies designed to reduce customer usage of electricity at the meter. In the context of Texas IOU programs, DSM refers to energy efficiency and load management initiatives.

The estimators commonly used in DSM evaluations generally have sampling errors that are approximately normal in distribution. In Texas, EM&V activities were designed to achieve 90/10 confidence and relative precision for gross evaluated savings estimates at the utility portfolio level. This level was achieved via the sampling process used to select a random sample of commercial participants that received desk reviews and census reviews of residential deemed savings and load management savings.

A.2 TRACKING SYSTEM AND DESK REVIEWS

The EM&V team reviewed the program tracking system and its link to any deemed savings tools or methods used to estimate savings at the measure and site level for each residential program. Then, for each *medium-* or *high*-priority program, the EM&V team reviewed a sample of applications entered into the utilities' tracking systems for accuracy and completeness.

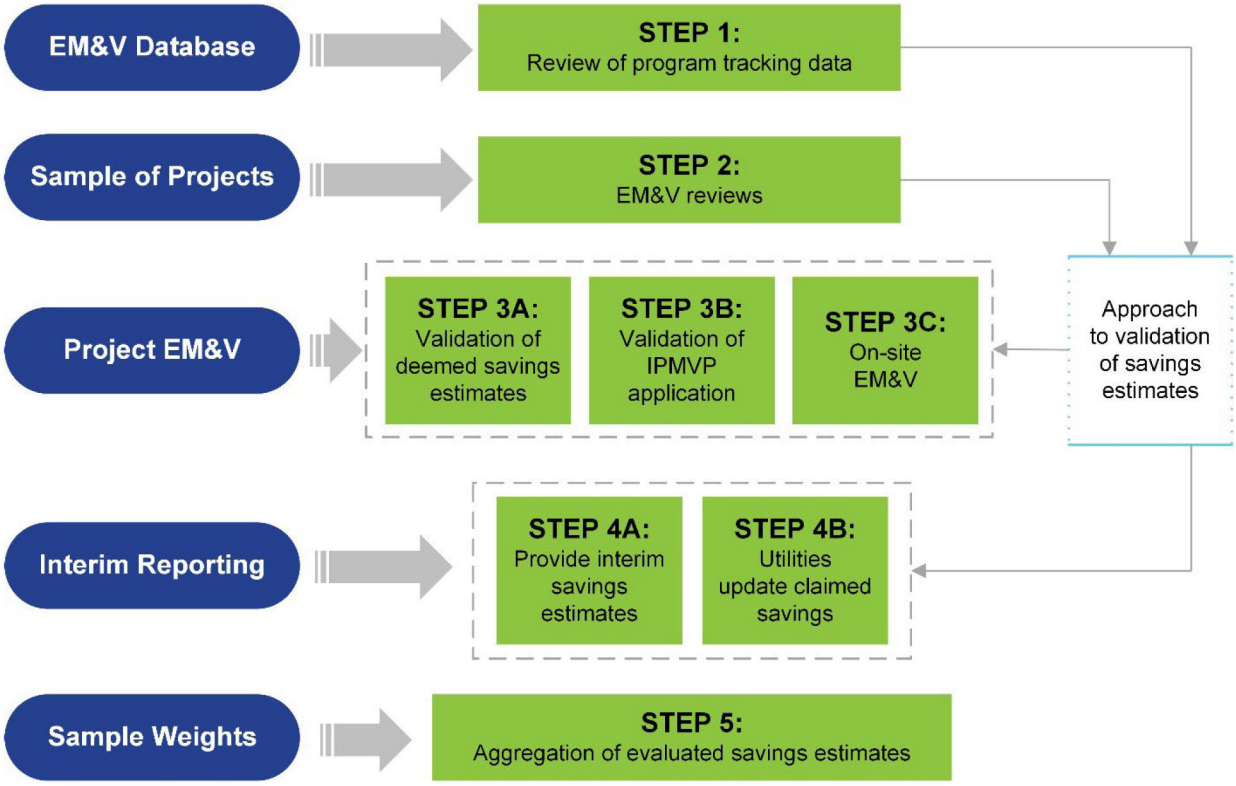
Our review accomplished two primary objectives. First, it ensured that the measures installed were consistent with those listed in the tracking system. Second, it verified that the savings estimates in the tracking system were consistent with the savings calculated in the deemed calculation tools, tables, or M&V methods used to estimate project savings.

The desk reviews included a review of the assumptions used for the savings assumptions and, when available, utility M&V reports gathered through the supplemental data request for sampled projects.

A.3 REALIZATION RATES

The evaluated savings are based on project-level realization rate calculations that are then weighted to represent program-, sector-, and portfolio-level realization rates. These realization rates incorporate any adjustments for incorrect application of deemed savings values, any equipment details determined through the tracking system, desk reviews, and primary data collected by the EM&V team. For example, baseline assumptions or hours of use may be corrected through the evaluation review and thus affect the realization rates. Utilities have the opportunity to adjust claimed savings based on interim findings on evaluation savings, thereby providing an opportunity for realization rates to be close to 100 percent. A flow chart of the realization rate calculations is provided in Figure 41.

Figure 41. Realization Rate Flowchart



A.4 PROGRAM DOCUMENTATION SCORE

The EM&V team assigned a program documentation score of *good*, *fair*, or *limited* based on the level of program documentation provided to complete a third-party due diligence review of claimed savings.

Program documentation scores were assigned as follows:

- **Good:** at least 90 percent of sampled projects have sufficient documentation.
- **Fair:** 70–89 percent of sampled projects have sufficient documentation; the remaining sampled projects had limited or no documentation.
- **Limited:** less than 70 percent of the sampled projects have sufficient documentation.

Sufficient documentation is defined as the necessary information required to verify savings. The documentation included completed savings calculators, customer invoices, pre- and post-inspection reports, and equipment cut sheets for nonresidential programs. The documentation provided all inputs needed to replicate the savings calculations based on the deemed savings manual, the approved calculation method, and supporting materials for programs.

Limited documentation is defined as the documentation provided to verify some, but not all, key inputs to savings calculations.

No documentation is defined as only the savings calculator or measure attributes were provided, with no supporting materials.

A.5 COST-EFFECTIVENESS TESTING

The EM&V team conducted cost-effectiveness testing using the PACT method and PY2023 actual results, except for low-income programs, as discussed below. Cost-effectiveness tests were run using a uniform model for all utilities. The EM&V team collected required inputs for the model from several sources, including program tracking data, deemed savings, the PUCT, and utilities. Table 28 lists the required inputs to the cost-effectiveness model and the sources of information.

Table 28. Cost-Effectiveness Model Inputs and Sources

Model input	Measurement level	Source
Reported energy and demand reduction	Measure type	EM&V database
Summer and winter peak coincidence factors (CF)	Measure type	Deemed savings
Effective useful life	Measure type	Deemed savings
Incentive payments	Program	Energy Efficiency Plan and Report (EEPR)
Administrative and research and development (R&D) costs	Program/portfolio	EEPRs
EM&V costs	Program/portfolio	EM&V team budgets
Performance bonus earned in the program year[14]	Portfolio	Energy efficiency cost recovery factor (EECRF)
Avoided costs	Statewide	PUCT (utilities)
Weighted average cost of capital (WACC)	Utility	Utilities
Line loss factor (outside-of-ERCOT utilities only)	Utility	Utilities
Realization rates	Program	Evaluation results

The EM&V team conducted PY2023 cost-effectiveness tests separately using claimed gross savings and evaluated gross savings. The model produces results at the portfolio, program category, [15] and program levels.

All benefits and costs are expressed in program year dollars. Benefits resulting from energy savings occurring in future years are net-to-program-year dollars using the utility's WACC as the discount rate.

[14] Performance bonuses as an input into cost-effectiveness testing came into effect in 2012.
[15] Program categories are currently defined as nonresidential, residential, low-income, load management, and pilot.

When running program-level tests, if only portfolio or other grouped information was available, the EM&V team allocated data proportionate to costs (§ 25.182 (e)(6)). For example, the performance bonus was calculated for the overall portfolio and allocated to individual programs proportionate to the programs' costs associated with meeting demand and energy goals. These program costs include program administrative and incentive costs. Portfolio-level costs include the performance bonus, EM&V, administrative, and R&D costs.

Low-income programs were evaluated using the savings-to-investment ratio (SIR). This model only includes net incentive payments under program costs. The SIR methodology is only used when testing the low-income programs.

Portfolio-level cost-effectiveness analyses are based on the PACT in each Utility's report section, including and excluding low-income and low-income/hard-to-reach customers.

The calculations used for the PACT cost-effectiveness methodology are in Appendix C.

Also, the EM&V team reported the cost-per-lifetime kWh and kW. Cost per lifetime is calculated by attributing costs to energy savings and avoided demand based on their portion of total benefits and applying that proportion to the total program costs.

A.6 REPORTING

There are two EM&V report deliverables per PY: (1) impact evaluation reports and (2) the Annual Statewide Portfolio Report. There are also several status reports, ad hoc reports, data collection and sampling deliverables, and interim results.

The impact evaluation reports are delivered separately for each utility and discussed with the PUCT and each utility before drafting the Annual Statewide Portfolio Report. The impact reports allow the EM&V team to discuss the impact results with the PUCT and utilities, receive their input, and conduct supplemental analysis if needed prior to the Annual Statewide Portfolio Report. The Annual Statewide Portfolio Report is a comprehensive report across all utility portfolios.

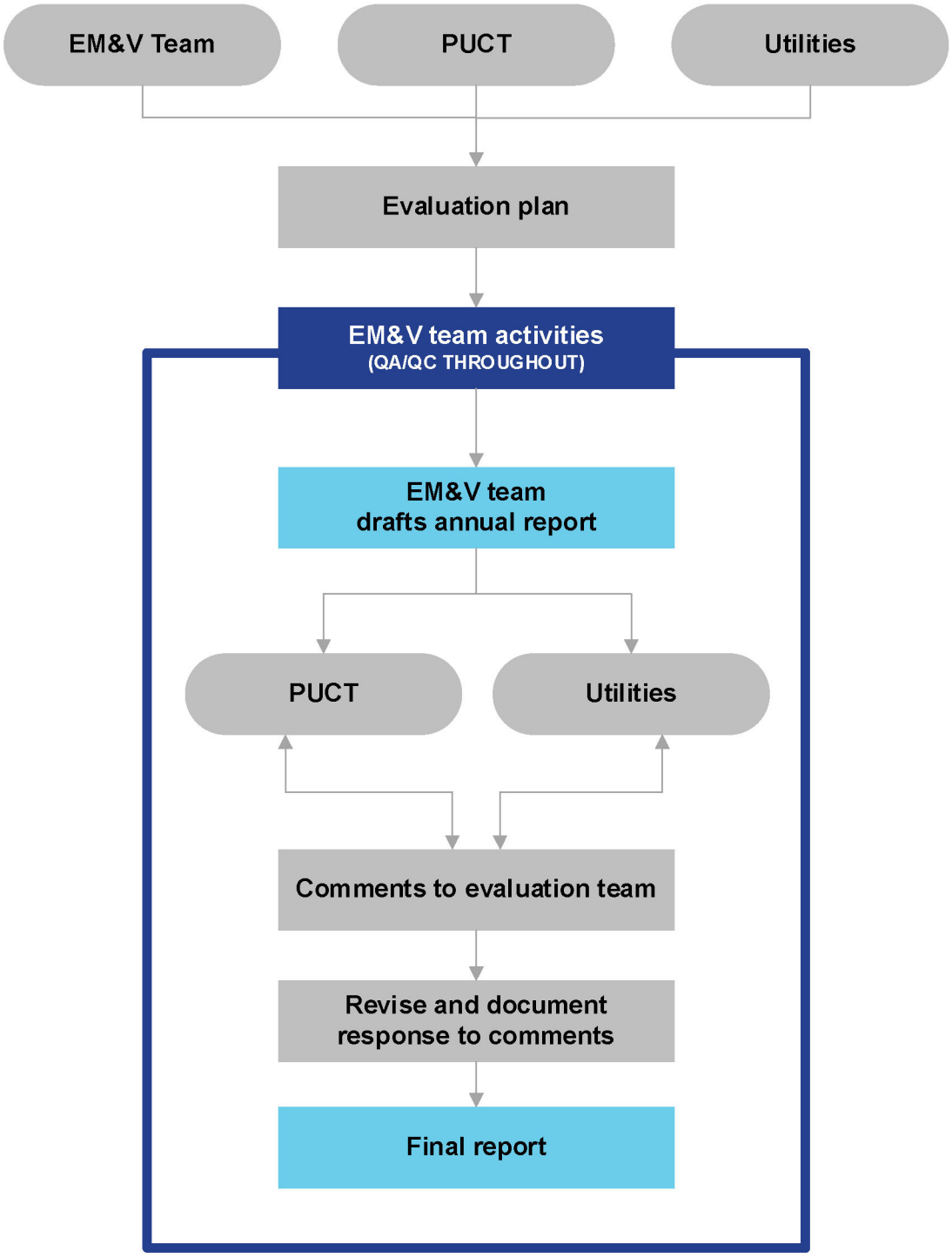
For PY2024, the metrics used as the basis for recommendations in the reports are the programs' gross savings realization rate and associated program documentation score; tracking system and interval meter data reviews; desk reviews; on-site M&V findings, including site-specific realization rates; and the programs' cost-effectiveness.

The EM&V database is at the core of reporting results; it houses the claimed and evaluated savings. The database allows structured queries to provide results by utility, program categories and types, measure types, or sectors. QA and QC are conducted to ensure that results entered into and extracted from the database are accurate. The EM&V team's QA/QC plan for the reported evaluated savings is in Appendix D.

The EM&V team encourages feedback and comments on EM&V reports; the EM&V team reviews feedback and documents how it was taken into consideration in finalizing deliverables. While the interim impact reports are distributed and reviewed separately for each utility, the EM&V team seeks input from a larger group of stakeholders on the Annual Statewide Portfolio Report. These are presented and discussed at Energy Efficiency Implementation Project (EEIP) meetings between draft and final versions.

The flow chart in Figure 42 describes the general reporting process flow.

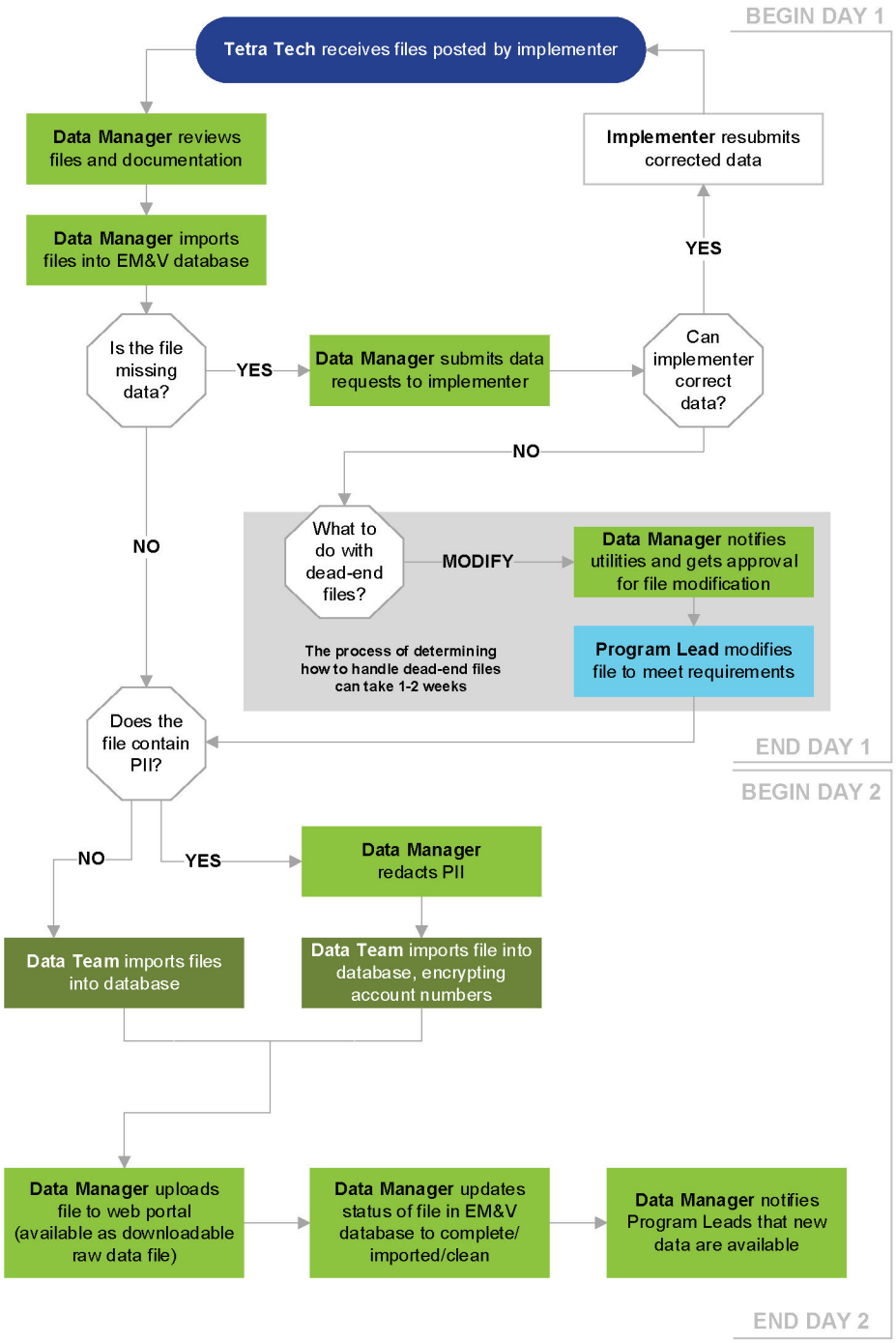
Figure 42. Reporting Flowchart



APPENDIX B: DATA MANAGEMENT PROCESS

Figure 43 details the data management process.

Figure 43. Data Management Process



APPENDIX C: COST-EFFECTIVENESS CALCULATIONS

This appendix describes the calculations used for modeling cost-effectiveness. This approach provides the PUCT with a consistent methodology for evaluating cost-effectiveness across the utilities.

C.1 APPROACH

The approach to the EM&V team's benefit-cost testing is based on 16 Tex. Admin. Code § 25.181, where costs and benefits are defined in section (d):

> *"The cost of a program includes the cost of incentives, measurement and verification, any shareholder bonus awarded to the utility, and actual or allocated research and development and administrative costs. The benefits of the program consist of the value of the demand reduction and energy savings, measured in accordance with the avoided costs prescribed in this subsection. The present value of the program benefits shall be calculated over the projected life of the measures installed or implemented under the program."*

This description is consistent with the PACT. Based on this definition, we collected the costs reported in the utilities' 2020 Energy Efficiency Plan and Reports, filed on April 1, 2020.[16] The program benefits must be calculated at a measure level in order to apply individual effective useful lives. Therefore, the savings were derived from the EM&V database, which is a comprehensive, centralized source of the utilities' program tracking data.

The present value of the benefits is calculated separately for energy and demand as follows:

$$PV = \frac{AC}{WACC - E}\left[1 - \left(\frac{1+E}{1+WACC}\right)^{n}\right]$$

Where:

AC is the avoided cost of the benefit (energy or demand).

The discount rate, *WACC*, is the utility's weighted average cost of capital.

E is the escalation rate.

n is the effective useful life of the measure.

This calculation was modified from the original evaluation plan in order to allow for including an escalation rate. The EM&V team has provided results for benefit-cost calculation using an escalation rate of two percent and without an escalation rate.

[16] PUCT filing number 50666.

The benefit-cost ratio is calculated as:

$$BC = \frac{PV_e + PV_d}{C}$$

Where:

PV_e is the present value of the avoided energy costs.

PV_d is the present value of the avoided demand costs.

C is the total program cost, including incentives, administrative, EM&V, shareholder bonus, and research and development (R&D) costs.

Some costs are reported by the utilities at the portfolio level, such as R&D and shareholder bonus costs. These costs are attributed to individual programs based on each program's incentive costs as a percentage of the portfolio.

C.2 SAVINGS-TO-INVESTMENT RATIO

Targeted low-income energy efficiency programs are run by all unbundled transmission and distribution utilities. These programs are evaluated using the SIR rather than the PACT described above.

The SIR is significantly different in both the benefits and costs included. The benefits are comprised of the customer's avoided energy costs, which means that the retail electric rate is used, rather than the utility's avoided cost, and there is no cost associated with avoided demand. Rather than the WACC, the SIR uses a societal discount rate of three percent. The only costs included are the incentives paid to the weatherization agencies.

Table 29 lists the average retail rates paid by customers. These rates are based on data collected by Frontier Energy through weatherization agencies. The rates are updated annually based on data from the Energy Information Administration, the Bureau of Labor Statistics, and the PUCT.

Table 29. Average Energy Cost by Utility

Utility	Average kWh rate
AEP Texas	$0.17
CenterPoint	$0.17
Oncor	$0.17
TNMP	$0.17
Xcel SPS	$0.16

C.3 NET-TO-GROSS RATIOS

The following NTG ratios were used to calculate cost-effectiveness based on net savings. The EM&V team determines the NTG ratios through primary research periodically (approximately every four to five years), as indicated in the table below. NTG ratios were updated for the Residential SOP, in 2022. NTG ratios were updated Commercial SOP, Commercial MTP, SCORE/CitySmart MTP, Solar PV MTP, and Retro-Commissioning programs in 2025. Note that the NTG ratios are conservative and represent 1-free-ridership (excluding spillover).

Table 30. Net-to-Gross Ratios Used to Calculate Cost-Effectiveness

Program	kWh NTG	kW NTG	Research year
Commercial			
Commercial SOP	0.81	0.75	2025
Commercial Solutions MTP	0.85	0.84	2025
SCORE/CitySmart MTP	0.82	0.80	2025
CoolSaver Tune-Up MTP	0.91	0.91	2025
Solar PV MTP	0.81	0.78	2025
Small Business	0.81	0.81	2015
Upstream Lighting	0.50	0.50	2020
Retro-Commissioning	0.74	0.80	2025
Residential			
Residential SOP, *non-HVAC* measures	0.89	0.90	2022
Residential SOP, *HVAC* measures	0.75	0.76	2022
Residential SOP, overall	0.81	0.83	2022
Solar PV SOP	0.86	0.86	2014
New Homes	0.49	0.49	2020
Upstream Lighting	0.50	0.50	2020
A/C Tune-Up/Residential MTP	0.80	0.80	2014
Hard-to-Reach SOP	1.00	1.00	N/A—industry standard is to set at 1.0
Midstream MTP	0.50	0.50	2014
Appliance Recycling	0.76	0.76	2015
Low-income			
Targeted Low-Income	1.00	1.00	N/A—industry standard is to set at 1.0

Load management			
Commercial Load Management SOP	1.00	1.00	N/A—industry standard is to set at 1.0
Residential Load Management SOP	1.00	1.00	N/A—industry standard is to set at 1.0

APPENDIX D: QUALITY ASSURANCE/QUALITY CONTROL PROTOCOLS

This appendix documents the QA/QC protocols established for the PUCT EM&V team for reporting claimed and evaluated impacts. Although quality control is a function of all evaluation stages (e.g., populating the EM&V database, sampling, analysis), this appendix focuses on the QA/QC processes within the reporting stage.

Below we summarize the specific activities that will be subject to QA/QC processes. Note that these QA/QC processes focus on the accuracy of data; this section does not address methodological issues.

Accuracy of ex ante program data. The EM&V team houses data, analysis, and reporting functions within the EM&V database. Data is provided by program implementers, read into the database in raw form, and organized for analysis. The database centrally stores the claimed (ex ante) savings, which are used for sampling and reporting those claimed savings. Data are provided to the EM&V team quarterly. The EM&V team characterizes the data received in terms of energy savings and demand reduction and participants served and reports the information within the detailed research plans; these detailed research plans are delivered to the utilities for review and confirmation that the population data is accurate. Inaccurate population data may indicate missing data, errors in the data importation process, or misunderstanding of the data fields.

- Responsibility: program leads
- Accountability: QA/QC team
- Consulted: utility staff, implementation contractors, and EM&V project manager

Application of verification rates and NTG ratios. The impacts are generated in the EM&V database. The database categorizes measure-level information in the format it was provided to the EM&V team per the data acquisition process. Although projects may be sampled and verified at the measure level, the EM&V team conducts impact evaluations to obtain and report verification and NTG estimates at the utility and program type level, which then are aggregated and reported at the program group level.

These impact estimates are provided by the program leads and stored in two locations. First, the program leads enter the impact results within an Excel tracking sheet stored on the SharePoint site. The Excel tracking sheet includes the following fields—program year (PY), utility, program group, program type, measure group, program lead, verification rate, NTG ratio, report source of verification rate, report source of NTG ratio, and modification date. Only one sheet maintains current impact information. Should data be updated throughout the process, the outdated records are moved to a separate worksheet within that file. Doing so ensures one sheet maintains the correct rates and that any modifications are documented, including the reason for the modification.

Second, the EM&V database includes an interface where program leads directly enter their impact results. These results are then stored and applied against the claimed savings to calculate the evaluated gross and evaluated net results for the annual reporting.

By creating a two-stage impact reporting process, the EM&V team builds a point of verification of the data into the process. The evaluated and net savings results are directly calculated out of the EM&V database using the rates supplied within the web interface. The EM&V team then verifies that the results are as expected using the values documented within the Excel impact reporting file. Should the results differ, the QA/QC team will be able to refer to the original source to verify the results.

- Responsibility: program leads
- Accountability: QA/QC team
- Consulted: impact leads, EM&V data lead, and project manager

Accuracy of reported savings. As documented in the report outline, program impacts are aggregated and reported in various ways. At the most aggregate level, the data are reported by program group overall and then by utility. At the most granular level, the data are reported by program group for each utility. The annual report will, therefore, represent impacts in over 100 tables. It is critical to spend considerable time conducting QA/QC against those reported values.

The EM&V database calculates the full year claimed savings by utility, program type, and program group. Although claimed savings are documented in quarterly detailed research plans, adjustments made in claimed savings are likely to occur throughout the year. Therefore, it is necessary to calculate the full PY claimed savings and verify results against the utility claimed data, which is reported to the PUCT. The EM&V team requests that the utilities provide draft claimed savings to verify against the reported claimed savings within the EM&V database. Any differences in the evaluation and utility claimed savings are clearly documented within the report.

All results tables are cross-referenced to ensure the results true up and are consistent with each other. For example, the sum of all residential MTPs evaluated net savings documented within the utility-specific sections should equal the residential MTP results captured in Technical Reference Manual (TRM) Volume 1. The QA/QC team develops a checklist of tables to be cross-checked against which sources and will systematically go through this checklist throughout the report-proofing process.

Although not a specific QA/QC function, the team's development of these reporting functions with the overarching goal of ensuring transparency inherently allows for ad hoc QA/QC checks by the PUCT, utilities, implementation contractors, or other interested parties. For example, the EM&V database can export results and resulting calculations within easy-to-use Excel files. In addition, impact-related reports tie back to results clearly for a secondary review.

- Responsibility: utilities (for providing claimed savings) and program leads (for verifying claimed impacts provided)
- Accountability: QA/QC team (for final review and cross-checks of impact tables)
- Consulted: impact leads, EM&V data lead, utilities, and EM&V project manager