Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the technical reference manual (TRM).
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for 19 projects. AEP Texas accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 50711: The energy efficiency project included the implementation of a *central air conditioner* at a single-family home. The ex-ante savings were calculated assuming the replacement of a *like-for-like system capacity*. However, during the desk review, the EM&V team found the installed system was *upsized by one-half ton* compared to the existing system. Per the TRM, the *new construction baseline* should be used for upsized projects. The EM&V team calculated the ex-post savings using the new construction methodology, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 66.7 percent and 67.0 percent for demand and energy savings, respectively.

Multiple Participant IDs: A multifamily building complex that reported *ceiling insulation* in multiple buildings was sampled for on-site M&V. During the site visit, the EM&V team found that *ceiling insulation* had not been installed in several buildings, affecting 18 participants. A follow-up call with the property manager in December 2022 confirmed the *insulation* had not been installed by the end of the program year. The EM&V team adjusted ex-post savings representative of *no insulation* in the affected units. Overall, the adjustments resulted in project-level realization rates of 0.0 percent for both demand and energy savings.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, certifications, and field notes. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

2.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
2.8%	1,470	1,470	100.0%	6.3%	5,247,286	5,247,286	100.0%	Fair

Completed desk reviews*	Completed on-site M&V
6	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for two projects. AEP Texas accepted the evaluated results and matched the claimed savings for one project with significant adjustments. AEP Texas also accepted the evaluated results for one project that had adjustments of less than five percent compared to the originally claimed savings. Therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 11538: The energy efficiency project included the implementation of two *advanced power strips* and two *ENERGY STAR air purifiers*. During the desk review, the EM&V team found that the *advanced power-strip* claimed savings did not match the tier shown in the photos and that the *air purifier clean air delivery rate (CADR) range* selected did not match the model number in the photo. The EM&V team adjusted the *advanced powerstrip tier* and *air purifier CADR*, resulting in decreased savings. Overall, the adjustments resulted in project-level realization rates of 66.0 percent and 84.4 percent for demand and energy savings, respectively.

Participant ID 11351: The energy efficiency project included the implementation of *LED lighting, ceiling insulation, air infiltration, duct sealing, low-flow showerhead,* and *water heater pipe insulation*. During the desk review, the EM&V team calculated a slight difference in ex-post savings for the *water heater pipe insulation* measure compared to the ex-ante savings. The slight increase in savings did not significantly impact the project-level realization rates. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Documentation Score

The EM&V team was able to verify some key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and field notes. However, one *duct sealing* project was missing pre- and post-test result documentation, and there was limited documentation for direct installs such as *LEDs, low-flow showerheads,* and *water heater pipe insulation*. Overall, the EM&V team was mostly satisfied with the project documentation provided and assigned a program documentation score of *fair.*

2.4.3 High-Performance New Homes Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.0%	2,657	2,657	100.0%	5.5%	4,578,039	4,578,039	100.0%	Fair

Completed desk reviews*
5

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 High-Performance New Homes MTP evaluation efforts focused on desk reviews. The number of completed desk reviews for this program is listed above. Five desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.

The EM&V team adjusted the total claimed savings for the program. AEP Texas accepted the evaluated results and matched the claimed savings to those of the evaluation. Therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

During the desk review process, the EM&V team identified an issue with the *modeled savings* reported in the documentation submitted by the HERS raters not matching the *ex-ante savings* reported by the utility for all five sampled projects. Upon further review, the implementer identified a programming error in their system, causing the tracking system to report different ex-ante savings than calculated in the project models, affecting all projects reported in the High-Performance New Homes MTP for PY2022. The EM&V team reviewed additional documentation provided by the implementer and the modeling software to determine the program-wide adjustment.

Documentation Score

The EM&V team met with the utility and implementer on multiple occasions to review the documentation requirements and ensure all required documentation was made available for the evaluation. Once documentation was received, the EM&V team was able to verify key inputs and assumptions for the five projects that had desk reviews. Project documentation at these sites included HERS certificates, fuel summary reports, and new equipment specifications. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. However, overall, the EM&V team assigned a program documentation score of *fair*.

2.5 DETAILED FINDINGS—LOW-INCOME

2.5.1 Targeted Low-Income Weatherization Program

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
1.3%	671	671	100.0%	1.5%	1,231,753	1,231,753	100.0%	Good

Completed desk reviews*	Completed on-site M&V
3	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Target Low-Income Weatherization evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team did not have any adjustments from the desk reviews or the on-site M&V, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, certifications, and field notes. Documentation also included low-income certification. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

2.6 DETAILED FINDINGS—LOAD MANAGEMENT

2.6.1 Commercial Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
54.2%	28,968	28,967	99.9%	0.0%	28,968	28,967	99.9%	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 AEP Texas Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. Load management events in PY2022 occurred on the following dates and times shown by AEP Texas' Southern and Northern territories:

- Southern territory:
  - May 26, 2022, from 4:30 p.m. to 5:30 p.m. (scheduled),
  - July 14, 2022, from 3:30 p.m. to 4:30 p.m. (scheduled), and
  - August 19, 2022, from 1:00 p.m. to 2:00 p.m. (scheduled).

- Northern territory:
  - May 26, 2022, from 4:30 p.m. to 5:30 p.m. (scheduled), and
  - August 3, 2022, from 4:00 p.m. to 5:00 p.m. (scheduled).

There were no unscheduled events in PY2022. The EM&V team received the interval meter data and a spreadsheet that summarized the event-level savings for the fifteen sponsors across 292 sites. One-hundred-sixty-seven sites did not participate in any of the scheduled events. All sponsors had at least one site that curtailed during each event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings provided for all sites. The kilowatt savings for each participating site corresponded to the kilowatt reductions that occurred at the scheduled event (no averaging was necessary because each participating site participated in only one event). The kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 (evaluated) and AEP Texas' (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings; however, a negligible difference in kilowatt and kilowatt-hour was a result of different rounding practices during calculations. Evaluated savings for the AEP Texas Load Management SOP are 28,967 for both kilowatt and kilowatt-hour since each site participated in only one hour-long event. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

2.7 DETAILED FINDINGS—CROSS-SECTOR

2.7.1 CoolSaver℠ A/C Tune-Up Market Transformation Program (MTP) (Medium Evaluation Priority)

Sector	Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realizationrate (kWh)	Program documentation score
Commercial	10.7%	5,711	5,711	100.0%	13.9%	11,683,276	11,683,276	100.0%	Good
Residential	2.9%	1,522	1,522	100.0%	9.2%	7,755,633	7,755,633	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 CoolSaver℠ A/C Tune-Up MTP evaluation efforts focused on desk reviews and on-site M&V for the commercial sector. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for two commercial projects. The projects had adjustments of less than five percent compared to the originally claimed savings. AEP Texas accepted the evaluated results and matched the claimed savings to those of the evaluations for all two projects. Therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 911: The project included the tune-up of 55 *air conditioning units* at a middle school. During the desk review and on-site M&V visit, the EM&V team adjusted the *capacity* of two *packaged air conditioning units* based on nameplate photos. Overall, the adjustments resulted in project-level realization rates of 99 percent for both demand and energy savings.

Participant ID 985: The project included the tune-up of 49 *air conditioning units* at an elementary school. During the desk review and on-site M&V visit, the EM&V team adjusted the *capacity* of two *packaged air conditioning units* based on nameplate photos. Overall, the adjustments resulted in project-level realization rates of 98 percent for both demand and energy savings.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project tune-up enhancements and the existing equipment specifications for all sampled units. Project documentation included customer agreements, invoices, nameplate photos, and a data collection spreadsheet. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

2.7.2 SMART Source[SM] Solar Photovoltaic Market Transformation Program (MTP) (Medium Evaluation Priority)

Sector	Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realizationrate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realizationrate (kWh)	Program documentation score
Commercial	.6%	320	320	100.0%	1.2%	1,010,922	1,010,922	100.0%	Good
Residential	1.7%	897	897	100.0%	3.8%	3,223,034	3,223,034	100.0%	Good

Completed desk reviews*	Completed On-site M&V
7	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 SMART Source[SM] Solar Photovoltaic (PV) MTP evaluation efforts focused on desk reviews and on-site M&V for both the commercial and residential sectors. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for one commercial project. AEP Texas accepted the evaluated results and matched the claimed savings. The EM&V team did not have any adjustments from the residential desk reviews or the on-site M&V resulting in 100 percent realization rates for the residential sector. Therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 68245: The project included installing a *roof-mounted solar array system* on an industrial facility. During the desk review and on-site M&V visit, the EM&V team found that the installed panels were at a *tilt between 11.0 and 11.4 degrees* and an *azimuth of 188 degrees*. The ex-ante calculation used *tilt at* 2.0 degrees and *azimuth* at 189 degrees. These adjusted variables slightly decreased the project's energy (kilowatt-hour) production and resulted in a realization rate of 98 percent. The peak demand (kilowatt) reduction did not change and resulted in a realization rate of 100 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, and field notes. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

2.8 SUMMARY OF LOW EVALUATION PRIORITY PROGRAMS

Table 6 summarizes claimed savings for AEP Texas' *low* evaluation priority programs in PY2022, including the programs' overall contribution to portfolio savings. *Low*-priority programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 6. PY2022 Claimed Savings (Low Evaluation Priority Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Open MTP	2.4%	1,252	1,252	100.0%	5.4%	4,529,866	4,529,866	100.0%

3.0 CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for CenterPoint Energy Houston Electric, LLC's (CenterPoint) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

3.1 KEY FINDINGS

3.1.1 Evaluated Savings

CenterPoint's evaluated savings for program year (PY) 2022 (PY2022) were 216,730 in demand (kilowatt, kW) and 226,576,876 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. CenterPoint was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (see Table 10), supporting healthy realization rates.

Table 7 shows the claimed and evaluated demand savings for CenterPoint's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 7. CenterPoint PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**216,730**	**216,730**	**100.0%**	**N/A**
Commercial	8.9%	19,335	19,335	100.0%	N/A
Residential	13.1%	28,845	28,845	100.0%	N/A
Low-income	2.2%	4,820	4,820	100.0%	N/A
Load management*	75.5%	163,426	163,426	100.0%	N/A
Pilot	0.1%	303	303	100.0%	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.

Table 8 shows the claimed and evaluated energy savings for CenterPoint's portfolio and broad customer sector and program categories for PY2022.

Table 8. CenterPoint PY2022 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**226,576,875**	**226,576,876**	**100.0%**	**N/A**
Commercial	39.4%	89,440,289	89,440,289	100.0%	N/A
Residential	55.8%	126,370,983	126,370,983	100.0%	N/A
Low-income	3.4%	7,841,539	7,841,539	100.0%	N/A
Load management*	0.4%	845,464	845,465	100.0%	N/A
Pilot	0.9%	2,078,600	2,078,600	100.0%	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.

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

A program documentation score of *good*, *fair*, or *limited* is included in program-level realization rates, as discussed in Section 1.2.1.3. For the overall utility program documentation score, the score of *good* was given if 90 percent or more of the evaluated savings estimates received a score of *good* or *fair* due to program documentation received as indicated in detailed program findings. A score of *fair* was given if 70 percent to 89 percent of the evaluated savings estimates received a score of *good* or *fair*. A score of *limited* was given if less than 70 percent of savings received a score of *good* or *fair*. In general, a score of *good* indicates the utility has established processes to collect sufficient documentation to verify savings. A score of *fair* also indicates established processes with some areas of improvement identified. A score of *limited* indicates program documentation improvements across more individual programs or high savings programs have been identified. CenterPoint received *good* documentation scores for all evaluated programs, except the Commercial High Efficiency Foodservice MTP pilot, which received a *fair* documentation score.

3.1.2 Cost-Effectiveness Results

CenterPoint's overall portfolio had a cost-effectiveness score of 4.2, or 4.6 excluding low-income programs.

The more cost-effective programs were the Advanced Lighting MTP (both commercial and residential) and the Commercial SOP; the less cost-effective programs were the Multi-Family MTP Hard-to-Reach and the Residential Load Management SOP. All of CenterPoint's programs were cost-effective in 2022.

The lifetime cost of claimed savings was $0.012 per kilowatt-hour and $12.41 per kilowatt.

Table 9. CenterPoint Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**4.21**	**4.21**	**3.75**
Total portfolio excluding low-income programs	**4.64**	**4.64**	**4.12**
Commercial	**4.45**	**4.45**	**4.41**
Commercial SOP	6.17	6.17	6.16
Commercial High Efficiency Foodservice MTP (Pilot)	1.95	1.95	1.95
Commercial MTP (SCORE, Healthcare, Data Center)	3.95	3.95	3.95
Retro-Commissioning MTP	2.47	2.47	2.23
REP MTP (Commercial CoolSaver)	3.67	3.67	3.67
Advanced Lighting Commercial MTP	28.17	28.17	25.35
Residential	**5.74**	**5.74**	**4.64**
Residential & Small Commercial SOP	6.00	6.00	5.48
Smart Thermostat Program	2.96	2.96	2.37
Advanced Lighting Residential MTP	28.58	28.58	25.73
Midstream MTP (HVAC and Pool Pump Distributor)	2.74	2.74	2.30
REP MTP (Residential CoolSaver and Efficiency Connection)	2.49	2.49	1.99
Multi-Family MTP Market Rate	3.38	3.38	2.70
CenterPoint Energy High Efficiency Home MTP	4.60	4.60	3.22
Hard-to-Reach SOP	1.65	1.65	1.65
Multi-Family MTP Hard-to-Reach	1.07	1.07	1.07
Low-income	**2.24**	**2.24**	**2.24**
Targeted Low-Income MTP (Agencies in Action)*	2.24	2.24	2.24
Load management	**1.78**	**1.78**	**1.78**
Commercial Load Management SOP	1.90	1.90	1.90
Residential Load Management SOP	1.20	1.20	1.20

* The low-income program is evaluated using the savings-to-investment ratio (SIR).

3.2 CLAIMED SAVINGS ADJUSTMENTS

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 10 summarizes claimed savings adjustments recommended by the EM&V team. Realization rates assume the following adjustments will be included in CenterPoint's June 1 filing. There may be differences between evaluated and claimed savings that did not result in a recommended adjustment because the difference is less than five percent.

Table 10. Evaluation, Measurement, and Verification Claimed Savings Adjustments by Program (Prior to EECRF[7] Filing)

Program	EM&V demand claimed savings adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Commercial MTP (SCORE, Healthcare, Data Center)	-86.38	-571,901
Commercial SOP	-11.93	-318,662
Commercial High Efficiency Foodservice MTP (Pilot)	-1.04	-7,266
Retro-Commissioning MTP	-167.08	-1,574,754
REP MTP (Commercial CoolSaver)	-13.21	-13,977
Targeted Low-Income MTP (Agencies in Action)	1.45	1,275.69
Residential & Small Commercial SOP (Res)	0.80	-3,116
CenterPoint Energy High Efficiency Home MTP	0.01	0.10
Total	**-277.37**	**-2,488,400.21**

3.3 DETAILED FINDINGS—COMMERCIAL

3.3.1 Commercial Market Transformation Program (MTP) (SCORE, Healthcare, Data Center) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.9%	8,395	8,395	100.0%	19.6%	44,480,980	44,480,980	100.0%	Good

[7] Energy efficiency cost recovery factor.

Completed desk reviews*	On-site M&V visit
16	8

* Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial MTP (SCORE, Healthcare, Data Center) evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for ten projects. Six adjusted projects had adjustments of greater than five percent compared to the originally claimed savings, while four projects had minor adjustments of less than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and matched the claimed savings to those of the evaluations for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 42352: A high school installed new energy-efficient *chillers* and completed an upgrade to the *HVAC control system*. The savings were calculated based on an analysis of pre- and post-installation electricity consumption. During the desk review, the EM&V team adjusted the *kilowatt-hour regression variables* to include *school occupancy*. The identified electricity savings were similar to the negative savings values in the submitted calculations. The EM&V team adjusted the energy savings to reflect the negative value, where the claimed savings submitted were *set to equal zero*. In the peak kilowatt regression analysis, the EM&V team adjusted the analysis to depend on *cooling discharge thermostats (CDT)* and *heating discharge thermostats (HDT)* to account for the use of the *PDPF*. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 80 percent. The adjustments also decreased claimed energy (kilowatt-hour) savings below zero. The realization rate is not calculatable when adjusting from zero to below zero. Therefore, the value can not be reported.

Participant ID 42356: A new construction school building installed *interior and exterior LED lighting* and *control measures*. During the desk review and on-site M&V visit, the EM&V team adjusted three different LED *wattages* to match their respective ENERGY STAR® or DesignLights Consortium (DLC) Qualified Product List (QPL). This adjustment slightly decreased peak demand (kilowatt) savings, and the resulting realization rate rounded to 100 percent. The adjustment also slightly decreased energy (kilowatt-hour) savings, but the realization rate also rounded to 100 percent.

Participant ID 44435: A new construction school installed energy-efficient *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *lighted floor area* to match the *area where construction is complete*. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 137 percent. The adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate of 137 percent.

Participant ID 51357: A parking garage installed 1,092 kW of *solar panels* on its upper level. During the desk review, the EM&V team adjusted the *tilt* based on post-inspection photos provided by the utility. The *system losses* in the online calculator were adjusted to the *technical reference manual (TRM) defaults*. These adjustments did not affect peak demand (kilowatt) savings, so the realization rate is 100 percent. The adjustments,

however, slightly increased energy (kilowatt-hour) savings and resulted in a realization rate of 101 percent.

Participant ID 80690: A medical center parking garage installed *LED lighting* to replace existing *fluorescent* and *metal halide fixtures*. During the desk review and on-site M&V visit, the EM&V team adjusted the *facility type* from *interior-parking garage* to the *exterior* for the *lighting* located on the garage roof. One *fixture wattage* was also adjusted to match the DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 80 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 76 percent.

Participant ID 80691: A parking garage installed *LED tubes* and *pole-mounted fixtures* to replace *fluorescent tubes* and *metal halide lamps*. During the desk review and on-site M&V visit, the EM&V team adjusted the facility type from *interior-parking garage* to *exterior* for the *lighting* equipment located on the garage roof. Several *post-retrofit fixture models* were adjusted based on post-inspection photos, which adjusted the *wattages*. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 79 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 78 percent.

Participant ID 80714: A new construction elementary school installed energy-efficient *LED lighting*. During the desk review, the EM&V team adjusted *fixture wattages* based on the ENERGY STAR listings and adjusted the *fixture* to *non-qualifying* because they were not on the DLC QPL or ENERGY STAR listing. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 80 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 80 percent.

Participant ID 80730: A school installed *LED lighting* for a *lighting* retrofit. During the desk review, the EM&V team adjusted one *fixture wattage* to match the DLC QPL. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 110 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 110 percent.

Participant ID 80734: A college installed *LED lighting* in a parking lot retrofit. During the desk review, the EM&V team adjusted one *LED fixture wattage* to match the DLC QPL. This adjustment slightly increased peak demand (kilowatt) savings and resulted in a realization rate that rounded to 100 percent. The adjustment also slightly increased energy (kilowatt-hour) savings and resulted in a realization rate that rounded to 100 percent.

Participant ID 80775: A school installed *LED tubes and fixtures* to replace existing *fluorescent* and *metal halide fixtures* throughout the facility. During the desk review, the EM&V team adjusted several pre-retrofit and one post-retrofit *lighting quantity* based on the inspection reports and adjusted one pre-retrofit *fixture type* based on the pre-inspection photos. One fixture was adjusted from *non-qualifying* to *DLC qualified* because it was on the DLC QPL. These adjustments slightly increased peak demand (kilowatt) savings and resulted in a realization rate of 105 percent. The adjustments also slightly increased energy (kilowatt-hour) savings and resulted in a realization rate of 104 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the 16 projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included M&V plans,

invoices, QPL qualifications, pre- 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. There were a few projects where the pre-inspection photos were missing photos of the high-output lamps. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

3.3.2 Commercial Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
2.7%	5,802	5,802	100%	13.7%	1,017,802	31,017,802	100.0%	Good

Completed desk reviews*	On-site M&V visit
16	8

* Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial SOP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for seven projects. Four projects had adjustments of greater than five percent compared to the originally claimed savings. Three projects had adjustments of less than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and matched the claimed savings to those of the evaluations for the nine projects; therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 39599: A grocery distribution warehouse retrofitted *interior and exterior lighting* with *LED lighting* fixtures. During the desk review, the EM&V team adjusted the *facility type* based on the provided photos. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 94 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 59 percent.

Participant ID 39609: A new construction warehouse installed *LED fixtures* for the interior and exterior of the facility. During the desk review and on-site M&V visit, the EM&V team adjusted one post-retrofit *fixture wattage* to match the DLC QPL. The peak demand (kilowatt) savings were not adjusted, and the realization rate remains at 100 percent. However, the adjustments slightly increased energy (kilowatt-hour) savings and resulted in a realization rate that rounded to 100 percent.

Participant ID 39633: A car dealership installed *LED lighting* to replace *fluorescent lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *post-retrofit quantity* of *LED fixtures* installed and *occupancy sensors* to match the post-inspection

report, photos, and invoice. One *fixture wattage* was updated to match the DLC QPL. These adjustments slightly decreased peak demand (kilowatt) savings and resulted in a realization rate of 96 percent. The adjustments also slightly decreased energy (kilowatt-hour) savings and resulted in a realization rate of 96 percent.

Participant ID 39634: A new construction non-refrigerated warehouse installed *LED lighting* throughout the interior and parking areas. During the desk review, the EM&V team updated the *wattage* for several *interior fixtures* based on the DLC listed to match the DLC QPL and the *exterior area* was slightly reduced. These adjustments slightly decreased peak demand (kilowatt) savings and resulted in a realization rate of 96 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 95 percent.

Participant ID 39643: A warehouse completed a *lighting* retrofit. During the desk review and on-site M&V visit, the EM&V team identified one *lamp* that was adjusted from *non-qualifying* to *qualifying* based on ENERGY STAR listing. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 109 percent. The adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate of 109 percent.

Participant ID 39652: A storage facility installed an *LED lighting* retrofit. During the desk review, the EM&V team adjusted one pre-retrofit *fixture type* and *quantity* based on the pre-inspection photos. These adjustments slightly increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. The adjustments also slightly increased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

Participant ID 39674: A storage facility installed *LED lighting* to replace *fluorescent lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *quantities* of *baseline sensors, fixtures,* and *exit signs* to match the pre-inspection report and invoices. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 76 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 75 percent.

Documentation Score

The EM&V team mostly verified key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the 16 projects that had desk reviews completed because sufficient documentation was provided for the sites. Project documentation at these sites included invoices, QPL qualifications, pre- and post-installation inspection notes, project savings calculators, specification sheets, and photographic documentation of existing and new equipment. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good.*

3.3.3 Retro-Commissioning Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
0.8%	1,812	1,812	100.0%	3.2%	7,176,528	7,176,528	100.0%	Good

Completed desk reviews*	On-site M&V visit
6	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Retro-Commissioning MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above. The EM&V team adjusted the claimed savings for five projects, and all had an adjustment greater than five percent. CenterPoint accepted the evaluated results and matched the claimed savings to those of the evaluations for the five projects; therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 44362: An office building built in 1978 completed a retro-commissioning project which adjusted to the *static pressure reset* for *air handling unit* (*AHU) fans* and *chilled water temperature setpoint resets*. During the desk review, the EM&V team adjusted the *PDPF values* for the peak demand calculation to match the TRM and incorporated the *occupancy of the facility* into the peak demand calculation. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 113 percent. The changes did not result in any energy (kilowatt-hour) saving adjustments, and therefore the realization rate remains at 100 percent.

Participant ID 44382: A combined middle school and high school completed a retro-commissioning project and installed *variable frequency drives* (*VFD)* on *AHU supply fans*. During the desk review and on-site M&V visit, the EM&V team adjusted the *VFD* on *AHU savings* to match the TRM. The remaining savings was determined using the custom calculation method. The EM&V team adjusted the *PDPF values* for the peak demand calculation to match the TRM. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 125 percent. The adjustments also slightly increased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

Participant ID 45732: A religious facility completed a retro-commissioning project that implemented an *HVAC schedule*. During the desk review and on-site M&V visit, the EM&V team determined the *facility hours* do not align with *peak demand hours* during the weekdays. However, savings identified during *peak summer and winter periods* were identified and were still included in the project. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 52 percent. The changes did not result in any energy (kilowatt-hour) saving adjustment. Therefore, the realization rate remains at 100 percent.

Participant ID 80699: A middle school installed *VFD* on *AHU supply fans*. During the desk review and on-site M&V visit, the EM&V team adjusted the *VFD* on *AHU savings* to match the TRM. This adjustment increased peak demand (kilowatt) savings from 0 savings to 1.04 kW. Since the claimed savings was initially zero, a realization rate could not be calculated. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 120 percent.

Participant ID 80702: A retro-commissioning project at a hospital reduced the load on a *central chiller plant*. During the desk review, the EM&V team agreed with the claimed energy savings calculation, although they found that the result for the savings only partially reduced load on the grid because of several *CHP generators* operating on the facility. The EM&V team reduced the energy savings by an estimated amount of increased *CHP plant exported power* post-installation. These adjustments did not affect peak demand (kilowatt) savings. However, the adjustments decreased energy (kilowatt-hour) savings and resulted in a realization rate of 66 percent.

Documentation Score

The EM&V team verified key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the six projects that had desk reviews completed because sufficient documentation was provided for the sites. Project documentation at these sites included M&V plans, drawings, invoices, pre- and post-install inspection notes, project savings calculators, specification sheets, and photographic documentation of existing and new equipment. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

3.4 DETAILED FINDINGS—RESIDENTIAL AND SMALL COMMERCIAL

3.4.1 Residential and Small Commercial Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
0.1%	277	277	100.0%	0.4%	897,261	897,261	100.0%	Good

Completed desk reviews*	Completed On-site M&V
8	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential and Small Commercial SOP evaluation efforts focused on desk reviews and on-site M&V. The sample of completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for three projects. All three projects had adjustments of greater than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and matched the claimed savings for the three projects with significant adjustments; therefore, the final program realization rates are 100 percent. Further details of the EM&V findings are provided below.

Participant ID 44799: The energy efficiency project included the replacement of an old *air conditioner system* with a new *packaged air conditioner system* for a single-family home. During the desk review, the EM&V team found the *cooling capacity* of the new system was *34,000 Btuh* based on the Air Conditioning, Heating, and Refrigeration Institute (AHRI) certificate. However, there was no documentation of the existing equipment to determine the *ex-ante cooling capacity* used for savings, but the *ex-ante savings* appear to use the *deemed savings* for a system capacity range of *27,000 – 32,999 Btuh*. The EM&V team calculated ex-post savings using the *34,000 Btuh* cooling capacity, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 100 percent and 120.1 percent for demand and energy savings, respectively.

Participant ID 42389: The renewable energy project included the installation of a *solar PV* system. During the desk review, the EM&V team found that *custom loss factors* were used to model the *ex-ante savings*. However, there was no documentation to verify the custom loss factors, and the EM&V team reverted to the *default factors* to calculate *ex-post energy savings*. The EM&V team adjusted accordingly, resulting in a decrease in energy savings. Overall, the adjustments resulted in project-level realization rates of 100.0 percent and 92.5 percent for demand and energy savings, respectively.

Participant ID 42419: The renewable energy project included the installation of a *solar PV* system. During the desk review, the EM&V team found that *custom loss factors* were used to model the *ex-ante savings*. However, there was no documentation to verify the custom loss factors, and the EM&V team reverted to the *default factors* to calculate *ex-post energy savings*. The EM&V team adjusted accordingly, resulting in a decrease in energy savings. Overall, the adjustments resulted in project-level realization rates of 100.0 percent and 92.5 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most of the key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, certifications, and field notes. Documentation verifying custom solar inputs was missing. Overall, the EM&V team was mostly satisfied with the project documentation provided and assigned a program documentation score of *good.*

3.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
0.1%	170	170	100.0%	0.1%	274,181	274,181	100.0%	Good

Completed desk reviews*	Completed On-site M&V
3	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team did not have any adjustments from the desk reviews, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and field notes. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

3.4.3 CenterPoint Energy High Efficiency Home Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (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%	11,698	11,698	100.0%	16.4%	37,146,864	37,146,864	100.0%	Good

Completed desk reviews*

10

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 High Efficiency Home MTP evaluation efforts focused on desk reviews. The number of completed desk reviews for this program is listed above. Ten desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for nine projects. All nine projects had adjustments of less than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and matched the claimed savings for all nine projects; therefore, the final program realization rates are 100 percent. Further details of the EM&V findings are provided below.

Participant ID 46124: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Participant ID 40236: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 98.6 percent and 100.0 percent for demand and energy savings, respectively.

Participant ID 48215: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Participant ID 48264: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Participant ID 48355: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent and 100.1 percent for demand and energy savings, respectively.

Participant ID 40563: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level

realization rates of 102.6 percent and 100.0 percent for demand and energy savings, respectively.

Participant ID 40457: The energy efficiency project included *whole-home new construction savings* along with the installation of an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Participant ID 50139: The energy efficiency project included *whole-home new construction savings* along with the installation of an ENERGY STAR thermostat for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Participant ID 50427: The energy efficiency project included whole-home new construction savings along with the installation of an ENERGY STAR thermostat for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 100.0 percent for both demand and energy savings.

Documentation Score

The EM&V team was able to verify most of the key inputs and assumptions, including the project scope, baselines, and equipment specifications for most of the measures of the sampled projects that had desk reviews. However, there was limited documentation for the smart thermostat measures. Overall, the EM&V team was mostly satisfied with the project documentation provided and assigned a program documentation score of good.

3.5 DETAILED FINDINGS—LOW-INCOME

3.5.1 Targeted Low-Income Market Transformation Program (Agencies in Action)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
2.2%	4,820	4,820	100.0%	3.5%	7,841,539	7,841,539	100.0%	Good

Completed desk reviews*	Completed on-site M&V
3	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Targeted Low-Income MTP (Agencies in Action) evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for all three projects. CenterPoint accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 42534: The energy efficiency project included the installation of a new *heat pump system*. During the desk review, the EM&V team found that the ex-ante calculation used the early retirement baseline for equipment *manufactured prior to 2006*. However, the existing equipment was *manufactured in 2007*. The EM&V team calculated ex-post savings using the early retirement baseline for *equipment manufactured between 2006-2015*, resulting in a decrease in energy savings. Overall, the adjustments resulted in project-level realization rates of 100 percent and 78.3 percent for demand and energy savings, respectively.

Participant ID 42435: The energy efficiency project included the implementation of *air infiltration* and *ceiling insulation* measures. During the site visit, the EM&V team tested substantially higher levels of air leakage cubic feet per minute (CFM) than was tracked. The ex-post savings were calculated using the testing methodology in the TRM for *air infiltration* using the *site visit blower door test results*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 89.9 percent and 88.3 percent for demand and energy savings, respectively.

Participant ID 42440: The energy efficiency project included the installation of a new *heat pump system*. During the desk review, the EM&V team found that the ex-ante calculation assumed a *cooling capacity of less than 15,000 Btuh*. However, the EM&V team confirmed the equipment capacity was *22,000 Btuh* during the site visit. The EM&V team calculated ex-post savings using *22,000 Btuh cooling capacity*, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 200.0 percent and 198.3 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, and equipment specifications for some sampled projects that had desk reviews. The EM&V team could not easily match the tracking data to the project documentation for one project. Project documentation included customer agreements, photos, and field notes. Documentation also included low-income certification. Overall, the EM&V team was mostly satisfied with the project documentation provided and assigned a program documentation score of *good.*

3.6 DETAILED FINDINGS—CROSS-SECTOR

3.6.1 Retail Electric Provider Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
1.4%	2,962	2,962	100.0%	1.7%	3,762,783	3,762,783	100.0%	Good

Completed desk reviews*	On-site M&V visit
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Retail Electric Provider (REP) MTP evaluation efforts focused on commercial desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above. The PY2023 REP MTP will include a review of residential impacts and REP interviews.

The EM&V team adjusted the claimed savings for all four projects. Two projects had adjustments greater than five percent, while the other two projects had adjustments less than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and adjusted claimed savings to match the evaluated; therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

Participant ID 5666: A commercial gym tuned up seven *air conditioning units*. During the desk review, the EM&V team adjusted the facility type from *service* to *public assembly* to match the facility operation. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 84 percent. However, the adjustment increased energy (kilowatt-hour) savings and resulted in a realization rate of 117 percent.

Participant ID 5667: *Air conditioning units* were tuned up for various business types. During the desk review, the EM&V team adjusted several *building types* for the facilities receiving the tune-ups. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 92 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 89 percent.

Participant ID 44306: A grocery store tuned up 282 *HVAC units* at 26 locations. During the desk review and on-site M&V visit, the EM&V team adjusted the *cooling capacity* for several units based on the nameplate photos provided. These adjustments slightly decreased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. These adjustments also slightly decreased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

Participant ID 44653: A religious organization tuned up 272 *HVAC units* at 20 locations. During the desk review and on-site M&V visit, the EM&V team adjusted the *nominal capacity* for several units based on the reported model number in the documentation.The *equivalent full load hours* (*EFLH)* and *dual fuel* (*DF)* for the *heat pump tune-ups* were adjusted to match the TRM values for the proper building types. These adjustments slightly decreased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100. The adjustment also slightly decreased energy (kilowatt-hour) savings and resulted in a realization rate of 99 percent.

Documentation Score

The EM&V team verified key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the four projects that had desk reviews completed because sufficient documentation was provided for the sites. Project documentation at these sites included invoices and photos of the equipment nameplate. The spreadsheet calculator included the site measurements collected and the calculation of energy savings for each unit. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

3.7 DETAILED FINDINGS—LOAD MANAGEMENT

3.7.1 Commercial Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
66.4%	143,798	143,798	100.0%	0.4%	786,580	786,580	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 CenterPoint Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. Load management events in PY2022 occurred on the following dates and times:

- July 11, 2022, from 1:00 p.m. to 4:00 p.m. (scheduled); and
- September 8, 2022, from 2:00 p.m. to 5:00 p.m. (scheduled).

The EM&V team received interval meter data and a spreadsheet summarizing the event-level savings for the 29 sponsors across 353 sites. Twenty-two sites did not participate in the first event, 16 sites did not participate in the second event, and 7 sites did not have any load data associated with them as they did not participate in any event. All sponsors had at least one site that curtailed during each event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings CenterPoint provided for all sites, except for 16 sites with partial meter data and a few sites with different baseline calculations. For the latter, a tie occurred between the days used to calculate the baseline. In that case, the TRM recommends selecting the five highest loads closest to the event.

The kilowatt savings for each participating site corresponded to the average of energy reduced across both events. If a site participated in only one event, the kilowatt savings corresponded to the energy reduced during that event. The kilowatt-hour savings for each participating site and event were calculated by multiplying the kilowatt 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 CenterPoint's (claimed) calculated kilowatt and kilowatt-hour savings. Evaluated savings for the CenterPoint Commercial Load Management SOP are 143,798 kW and 786,580 kWh, with realization rates of 100.8 percent kilowatt and 94.3 percent kilowatt-hour. CenterPoint accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

3.7.2 Residential Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
9.1%	19,628	19,628	100.0%	0.0%	58,884	58,885	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 CenterPoint Residential Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. Load management events in PY2022 occurred on the following dates and times:

- July 11, 2022, from 1:00 p.m. to 4:00 p.m. (scheduled), and
- September 8, 2022, from 2:00 p.m. to 5:00 p.m. (scheduled).

The EM&V team received the interval meter data and spreadsheets detailing the CenterPoint calculated baseline load, event load, and savings results for each service provider and meter.

After the EM&V team applied the *High 3 of 5* baseline calculation method, it was found that the evaluated kilowatt savings matched the kilowatt savings CenterPoint provided for most participating meters. Minor differences were a result of calculating the kilowatt savings for meters with partial data (per the TRM), savings may still be calculated for less than two percent of meters that fail to record data sufficient to apply the *High 3 of 5* calculation method). The EM&V team calculated savings for those meters by applying the average savings of each service provider; however, CenterPoint used a different approach. Since the TRM does not have detailed guidance on how to calculate average savings for meters with partial data, it was agreed that CenterPoint's approach is acceptable, especially since it affects a limited number of meters. The EM&V team also recommends the TRM Working Group consider clarifying language in the next TRM update.

The kilowatt savings for each participating meter corresponded to the average of energy reduced across both events. If a meter participated in only one event, the kilowatt savings corresponded to the energy reduced during that event. The kilowatt-hour savings for each participating meter were calculated by multiplying the kilowatt reductions for each event by the total number of event hours. Program-level savings were calculated by adding all meter-level savings.

The table above shows both the EM&V team's (evaluated) and CenterPoint's (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings, as the difference was due to rounding (CenterPoint rounded down the kilowatt-hour savings while the EM&V team rounded to the nearest whole number). Evaluated savings for the CenterPoint Residential Load Management SOP are 19,628 kW and 58,885 kWh. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

3.7.3 Summary of Pilot Evaluated Programs

3.7.4 Commercial High Efficiency Foodservice Market Transformation Program (MTP) (Pilot) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
0.1%	303	303	100.0%	0.9	2,078,600	2,078,600	100.0%	Fair

Completed desk reviews*	On-site M&V visit
6	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial High Efficiency Foodservice MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for two projects. One project had adjustments of greater than five percent compared to the originally claimed savings, while the other project had minor adjustments of less than five percent compared to the originally claimed savings. CenterPoint accepted the evaluated results and matched the claimed savings to those of the evaluations for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 39552: A restaurant purchased two *hot food holding cabinets*, an *energy-efficient reach-in refrigerator*, and *demand-controlled kitchen ventilation*. During the desk review, the EM&V team removed the *food-holding cabinets* since they were not ENERGY STAR-rated. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 89 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 89 percent.

Participant ID 39560: A food bank installed 54 *hot food holding cabinets*. During the desk review, the EM&V team found that the *realized adjustment for peak demand* was due to a difference in rounding. This adjustment slightly increased peak demand (kilowatt) savings and resulted in a realization rate of 102 percent. The adjustment did not affect energy (kilowatt-hour) savings. Therefore, the realization rate is 100 percent for kilowatt-hours.

Documentation Score

The EM&V team was able to partially verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the six projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation was minimal as a result of this being a Midstream program. However, no ENERGY STAR certifications were provided when required by the TRM. Also, some projects were missing specification sheets and photos. Overall, the EM&V team was somewhat satisfied with the project documentation provided and assigned a program documentation score of *fair*.

3.8 SUMMARY OF LOW EVALUATION PRIORITY PROGRAMS

Table 11 summarizes claimed savings for CenterPoint's low evaluation priority programs in PY2022, including the programs' overall contribution to portfolio savings. *Low*-priority programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 11. PY2022 Claimed Savings (Low Evaluation Priority Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Advanced Lighting Residential MTP	3.2%	6,909	6,909	100.0%	25.2%	57,041,742	57,041,742	100.0%
Advanced Lighting Commercial MTP	0.2%	364	364	100.0%	1.3%	3,002,196	3,002,196	100.0%
Residential REP MTP	1.6%	3,485	3,485	100.0%	5.7%	12,987,439	12,987,439	100.0%
Smart Thermostat Program	0.0%	0	0	100.0%	1.4%	3,252,968	3,252,968	100.0%

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Midstream MTP (HVAC and Pool Pump Distributor)	1.3%	2,847	2,847	100.0%	4.8%	10,890,811	10,890,811	100.0%
Multi-Family MTP Market Rate	1.4%	3,068	3,068	100.0%	.7%	1,657,112	1,657,112	100.0%
Multi-Family MTP Hard-to-Reach	0.1%	194	194	100.0%	0.6%	1,287,456	1,287,456	100.0%

4.0 EL PASO ELECTRIC COMPANY IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for El Paso Electric Company's (El Paso Electric) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

4.1 KEY FINDINGS

4.1.1 Evaluated Savings

El Paso Electric's evaluated savings for program year (PY) 2022 (PY2022) were 21,761 in demand (kilowatt, kW) and 22,498,875 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. El Paso Electric was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (see Table 15), supporting healthy realization rates.

Table 12 shows the claimed and evaluated demand savings for El Paso Electric's portfolio and broad customer sector and program categories.

Table 12. El Paso Electric PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**21,761**	**21,761**	**100.0%**	**N/A**
Commercial	15.9%	3,467	3,467	100.0%	N/A
Residential	9.3%	2,015	2,015	100.0%	N/A
Load management*	72.3%	15,732	15,732	100.0%	N/A
Pilot	2.5%	547	547	100.0%	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.

Table 13 shows the claimed and evaluated energy savings for El Paso Electric's portfolio and broad customer sector and program categories for PY2022.

Table 13. El Paso Electric PY2022 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**22,498,875**	**22,498,875**	**100.0%**	**N/A**
Commercial	65.3%	14,701,861	14,701,861	100.0%	N/A
Residential	18.0%	4,050,486	4,050,486	100.0%	N/A
Load management*	2.5%	554,175	554,175	100.0%	N/A
Pilot	14.2%	3,192,352	3,192,352	100.0%	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.

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

In program-level realization rates, we have also included a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility. El Paso Electric received *good* documentation scores for all evaluated programs except the Residential Solutions MTP, which received a *fair* documentation score. Recommendations to improve this documentation score may be found in the program-level results.

4.1.2 Cost-Effectiveness Results

El Paso Electric's overall portfolio had a cost-effectiveness score of 3.8.

The more cost-effective programs were the Large C&I Solutions MTP and the Marketplace Pilot MTP (residential and commercial); the less cost-effective programs were the Residential Load Management MTP and the Commercial Load Management SOP. All of El Paso Electric's programs were cost-effective in 2022 except for Residential Load Management MTP, which had a cost-effectiveness score of 0.91.

The lifetime cost of claimed savings was $0.014 per kilowatt-hour and $13.85 per kilowatt.

Table 14. El Paso Electric Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**3.76**	**3.76**	**3.64**
Commercial	**5.21**	**5.21**	**5.16**
Small Commercial Solutions MTP	3.97	3.97	3.77
Large C&I Solutions MTP	5.76	5.76	5.75
Texas SCORE MTP	5.20	5.20	5.20

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Residential	**2.54**	**2.54**	**2.34**
Residential Solutions MTP	3.59	3.59	3.29
LivingWise® MTP	2.11	2.11	1.69
Texas Appliance Recycling MTP	1.58	1.58	1.25
Hard-to-Reach Solutions MTP	2.30	2.30	2.30
Load management	**1.08**	**1.08**	**1.08**
Residential Load Management MTP	0.91	0.91	0.91
Commercial Load Management SOP	1.38	1.38	1.38
Pilot	**9.68**	**9.68**	**8.71**
Residential Marketplace Pilot MTP	8.97	8.97	8.07
Commercial Marketplace Pilot MTP	44.21	44.21	39.79

4.2 EVALUATED SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 15 summarizes savings differences identified by the EM&V team, which El Paso Electric also used to adjust their claimed savings. The EM&V team requests that utilities make adjustments to projects when evaluated and claimed savings differ by more than five percent. El Paso Electric adjusted claimed savings for all projects with any differences found by the EM&V team and will include these adjustments in their May 1 filing.

Table 15. Evaluated and Claimed Savings Adjustments by Program

Program	EM&V demand claimed savings adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Large C&I Solutions MTP	-53.43	-212,655
Texas SCORE MTP	20.978	126,128
Commercial Load Management SOP	121.87	795.00
Residential Load Management SOP	470.88	13294
Hard-to-Reach Solutions MTP	-0.13	-291
Total	**559.97**	**-72,729**

4.3 DETAILED FINDINGS—COMMERCIAL

4.3.1 Large Commercial and Industrial (C&I) Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimedenergy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
9.1%	1,986	1,986	100.0%	36.4%	8,182,897	8,182,897	100.0%	Good

Completed desk reviews*	On-site M&V visit
7	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Large C&I Solutions MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits 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. El Paso Electric accepted the evaluated results and matched the claimed savings to those of the evaluations for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 4559: A retail drug store replaced *interior fluorescent lighting* with *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *facility type* because it was confirmed the facility ran 24/7. This adjustment did not affect the peak demand (kilowatt) savings and resulted in a realization rate of 100 percent. The adjustments increased energy (kilowatt-hour) savings and resulted in a realization rate of 147 percent.

Participant ID 4562: A grocery store underwent a significant renovation and installed interior and exterior *LED lighting*, new *HVAC units*, and a *high-volume low-speed* (*HVLS) fan*. During the desk review and on-site M&V visit, the EM&V adjusted the *exterior lighting areas* and *parking lot lighting fixture quantities*. The *wattage* for one light fixture was adjusted to match DesignLights Consortium (DLC) Qualified Product Listing (QPL). In addition, one *interior light fixture* was added to the calculator. Overall, these adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate rounded to 100 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate rounded to 100 percent.

Participant ID 4569: An outpatient health clinic installed *LED lighting* that replaced *fluorescent lighting*. During the desk review, the EM&V adjusted the baseline fixtures denoted as *32 W* compact fluorescent lamps to *26 W* based on pre-inspection photos. The adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 98 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 98 percent.

Participant ID 4574: A commercial strip center installed *LED lighting* to replace exterior *metal halide* lighting. During the desk review and on-site M&V visit, the EM&V team adjusted the *wattage* of the removed exterior walkway *metal halide lamps*. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 28 percent. The adjustment also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 28 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications, Air Conditioning, Heating, and Refrigeration Institute (AHRI) certifications) for all seven projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included invoices, QPL qualifications or AHRI certifications, pre- 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*.

4.3.2 Texas SCORE Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.5%	771	771	100.0%	17.6%	3,967,728	3,967,728	100.0%	Good

Completed desk reviews*	Completed On-site M&V
8	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Texas SCORE MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for six projects. Three projects had adjustments of less than five percent compared to the originally claimed savings, and three projects were larger than five percent. El Paso Electric accepted the evaluated results and matched the claimed savings to those of the evaluations for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 4582: A new construction events center installed energy-efficient *packaged air conditioning units*, efficient *heat pumps*, and an efficient *VRF heat pump with heat recovery*. During the desk review, the EM&V team adjusted the *heating seasonal performance factor (HSPF)* of the *heat pump* to match the value of the AHRI certification. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 98 percent. This adjustment also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 95 percent.

Participant ID 4584: A new conference center installed efficient *LED lighting*. During the desk review, the EM&V team adjusted one fixture to be *non-qualified* and adjusted one fixture's *wattage* to match the DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 88 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 88 percent.

Participant ID 51269: An outpatient healthcare building was remodeled into an office space. The retrofit installed new *LED lighting* and replaced the existing roof with an *ENERGY STAR® cool roof*. During the desk review, the EM&V team adjusted the *wattage* of one *LED fixture* to match the DLC QPL and *reduced the area of the cool roof* slightly. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 98 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 99 percent.

Participant ID 74804: A K-12 school installed *LED lighting* and upgraded *controls*, replacing interior *fluorescent lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the primary lighting fixture *input wattages* to the *tested results* from the DLC listing instead of the *reported results*. This adjustment increased the peak demand (kilowatt) savings and resulted in a realization rate of 101 percent. The adjustment also increased the energy (kilowatt-hour) savings and resulted in a realization rate of 101 percent.

Participant ID 74814: A school building installed *LED lighting* to retrofit interior and exterior *fluorescent* and *high-pressure sodium fixtures*. During the desk review and on-site M&V visit, the EM&V team *added baseline fixtures that were removed and not replaced* in the project. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 101 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 101 percent.

Participant ID 74817: A middle school installed *LED lighting* with *occupancy sensors* and *timeclocks* to replace *fluorescent*, *incandescent*, *halogen*, and *high-pressure sodium lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *ex-post calculated savings* to match the *submitted calculator*. The adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 149 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 149 percent.

Documentation Score

The EM&V team verified key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for five projects that had desk reviews completed because sufficient documentation was provided for the sites. Project documentation at these sites included invoices, QPL qualifications, pre- and post-installation inspection notes, project savings calculators, and photographic documentation of existing and new equipment. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

4.4 DETAILED FINDINGS—RESIDENTIAL

4.4.1 Residential Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.9%	852	852	100.0%	6.3%	1,423,945	1,423,945	100.0%	Fair

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential Solutions MTP evaluation efforts focused on desk reviews and on-site M&V. The sample of completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team did not have any adjustments from the desk reviews or the on-site M&V, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, and equipment specifications for most sampled projects that had desk reviews. Project documentation included customer agreements, invoices, certifications, and select photos. However, the TRM requires additional documentation to claim *electric resistance heating* for all *HVAC* and *envelope* measures, which was not included in the documentation for the one project. The EM&V team also found limited documentation for two *duct sealing* projects utilizing the deemed methodology requiring no testing. Since testing is not performed, the TRM requires a description and photos of interventions taken (both pre- and post-condition), such as newly sealed joints, supply vents, and other relevant leaks sealed to validate the claimed leakage category. While the EM&V team was mostly satisfied with the project documentation provided, we assigned a program documentation score of *fair.* Going forward, the EM&V team recommends El Paso Electric conduct quality assurance/quality control (QA/QC) on TRM documentation requirements, including additional documentation if electric resistance heating is claimed and if the *no-testing duct sealing* methodology is used.

4.4.2 Hard-to-Reach Solutions Market Transformation Program (MTP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
4.1%	894	894	100.0%	5.6%	1,249,579	1,249,579	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach Solutions MTP evaluation efforts focused on desk reviews and on-site M&V. The sample of completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for one project. El Paso Electric accepted the evaluated results and matched the claimed savings for the one project with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

- **Participant ID 51751**: The energy efficiency project included the implementation of a *central air conditioner*. During the desk review, the EM&V team found the ex-ante savings were calculated using the deemed methodology for a system with a *capacity between 15,000 and 20,999 Btuh*. However, the AHRI certificate indicated the system capacity was *12,000 Btuh*. The EM&V team calculated the ex-post savings using the deemed methodology for *<15,000 Btuh*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 66.7 percent and 66.7 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, invoices, income eligibility forms, and certifications. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

4.5 DETAILED FINDINGS—LOAD MANAGEMENT

4.5.1 Commercial Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
35.3%	7,676	7,676	100.0%	0.0%	61,479	61,479	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 El Paso Electric Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 30-minute increments. Load management events in PY2022 occurred on the following dates and times:

- June 10, 2022, from 3:00 p.m. to 7:00 p.m. (scheduled),
- July 19, 2022, from 4:00 p.m. to 6:00 p.m. (unscheduled), and
- July 20, 2022, from 4:00 p.m. to 6:00 p.m. (unscheduled).

The EM&V team received the interval meter data and a spreadsheet that summarized the event-level savings for the nine sponsors across 24 sites. Two sites in the scheduled event and three sites in each unscheduled event had negative savings data associated with them. All sponsors had at least one site that curtailed during each event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings provided for all sites except those with negative savings. While reviewing individual meter savings differences, the EM&V team found that El Paso Electric 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 kilowatt savings, the kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 (evaluated) and El Paso Electric's (claimed) calculated kilowatt and kilowatt-hour savings. Evaluated savings for the El Paso Electric Commercial Load Management SOP are 7,676 kW and 61,479 kWh, with realization rates of 101.6 percent kilowatt and 101.3 percent kilowatt-hour. El Paso Electric accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

4.5.2 Residential Load Management Market Transformation Program (MTP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
37.0%	8,056	8,056	100.0%	2.2%	492,696	492,696	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 El Paso Electric Residential Load Management MTP by applying the deemed savings value from the TRM. Load management events in PY2022 occurred on the following dates and times:

- June 10, 2022, from 4:00 p.m. to 7:00 p.m. (unscheduled),
- June 13, 2022, from 3:00 p.m. to 5:00 p.m. (unscheduled),
- July 11, 2022, from 3:00 p.m. to 5:00 p.m. (unscheduled),
- July 18, 2022, from 3:00 p.m. to 5:00 p.m. (unscheduled),
- July 19, 2022, from 3:00 p.m. to 5:00 p.m. (unscheduled), and
- July 20, 2022, from 3:00 p.m. to 5:00 p.m. (unscheduled).

The EM&V team received a list of participants in the program for each device type and event, the PY2022 list of devices purchased through the Marketplace with incentives received, and a savings summary report. The kilowatt savings for each event were calculated by multiplying the deemed savings value from the TRM by the number of participating devices. The kilowatt-hour savings for each event were calculated by multiplying the kilowatt 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 increased the kilowatt and kilowatt-hour savings.

In addition to savings from the load management events, El Paso Electric claimed savings from new thermostat devices purchased through their Marketplace website that enrolled in the load management program at the time of the purchase. Only thermostat devices that 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 (evaluated) and El Paso Electric's (claimed) calculated kilowatt and kilowatt-hour savings. Evaluated savings for the El Paso Electric Residential Load Management MTP are 8,056 kW and 492,696 kWh, with realization rates of 106.2 percent kilowatt and 102.8 percent kilowatt-hour. El Paso Electric accepted the evaluated results and matched the claimed savings to those of the evaluated savings; therefore, the final program realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

4.6 SUMMARY OF TRACKING-SYSTEM-ONLY EVALUATED PROGRAMS

Table 16 summarizes claimed savings for El Paso's programs in PY2022 that only received a tracking system verification of program impacts. The programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 16. PY2022 Claimed Savings (Tracking-System-Only Evaluated Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Small Commercial Solutions MTP	3.3%	710	710	100.0%	11.3%	2,551,236	2,551,236	100.0%
Residential Marketplace Pilot MTP	2.2%	481	481	100.0%	12.8%	2,870,266	2,870,266	100.0%
Commercial Marketplace Pilot MTP	0.0%	66	66	100.0%	1.4%	322,086	322,086	100.0%
Texas Appliance Recycling MTP	0.5%	99	99	100.0%	3.6%	802,053	802,053	00.0%
LivingWise MTP	0.8%	170	170	100.0%	2.6%	574,910	574,910	100.0%
FutureWise MTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.0 ENTERGY TEXAS, INC. IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Entergy Texas, Inc.'s (Entergy) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

5.1 KEY FINDINGS

5.1.1 Evaluated Savings

Entergy's evaluated savings for program year (PY) 2022 (PY2022) were 19,647 in demand (kilowatt, kW) and 46,610,201 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. Entergy was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (see Table 20), supporting healthy realization rates.

Table 17 shows the claimed and evaluated demand savings for Entergy's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 17. Entergy PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**19,647**	**19,647**	**100.0%**	**N/A**
Commercial	37.3%	7,319	7,319	100.0%	N/A
Residential	27.5%	5,409	5,409	100.0%	N/A
Load management*	35.2%	6,919	6,919	100.0%	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.

Table 18 shows the claimed and evaluated energy savings for Entergy's portfolio and broad customer sector and program categories for PY2022.

Table 18. Entergy PY2022 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**46,610,201**	**46,610,201**	**100.0%**	**N/A**
Commercial	69.0%	32,171,140	32,171,140	100.0%	N/A
Residential	31.0%	14,432,142	14,432,142	100.0%	N/A
Load management*	<0.1%	6,919	6,919	100.0%	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.

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

In program-level realization rates, we have also included a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility. Entergy received *good* documentation scores for all evaluated programs.

5.1.2 Cost-Effectiveness Results

Entergy's overall portfolio had a cost-effectiveness score of 4.1.

The more cost-effective programs were the Commercial Solutions MTP and the Residential Solutions MTP; the less cost-effective programs were the Load Management SOP and the Residential SOP. All of Entergy's programs were cost-effective in 2022.

The lifetime cost of claimed savings was $0.012 per kilowatt-hour and $10.82 per kilowatt.

Table 19. Entergy Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**4.09**	**4.09**	**3.91**
Commercial	**6.11**	**6.11**	**6.11**
Commercial Solutions MTP	6.11	6.11	6.11
Residential	**2.84**	**2.84**	**2.54**
Residential SOP	2.19	2.19	2.01
Residential Solutions MTP	5.24	5.24	4.19
Hard-to-Reach SOP	2.21	2.21	2.21
Load management	**1.83**	**1.83**	**1.83**
Load Management SOP	1.83	1.83	1.83

5.2 EVALUATED SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 20 summarizes the evaluated savings differences identified by the EM&V team. The EM&V team requests that utilities make adjustments to projects when evaluated and claimed savings differ by more than five percent. Entergy made adjustments to projects to address all evaluated savings differences prior to their April 1filing.

Table 20. Evaluated Savings Differences by Program

Program	Evaluated demand savings differences (kW)	Evaluated energy savings differences (kWh)
Commercial Solutions MTP	-342.88	-1,610,082
Residential SOP	-0.272	-1,301
Hard-to-Reach SOP	-0.092935	-444
Total	**-343.24**	**-1,611,828**

5.3 DETAILED FINDINGS—COMMERCIAL

5.3.1 Commercial Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
37.3%	7,319	7,319	100.0%	69.0%	32,171,140	32,171,140	100.0%	Good

Completed desk reviews*	Completed On-site M&V
23	10

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial Solutions MTP evaluation efforts focused on desk reviews with on-site M&V visits competed on a subset of the sample. The sample of completed desk reviews and on-site M&V for this program are listed above.

The EM&V team adjusted the claimed savings for fifteen projects. Eleven of those projects had adjustments greater than five percent compared to the claimed energy or demand savings. The remaining four projects had adjustments of less than five percent. Entergy 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 5313: A single *air-cooled chiller* was replaced at a middle school. During the desk review and on-site M&V visit, the EM&V team adjusted the *unit classification* to *replace-on-burnout* from *early retirement*. The adjusted savings methodology decreased peak demand (kilowatt) savings and resulted in a realization rate of 86 percent. The methodology adjustments also decreased peak energy (kilowatt-hour) savings and resulted in a realization rate of 46 percent.

Participant ID 5314: A high school installed exterior *LED lighting fixtures*. During the desk review and on-site M&V visit, the EM&V team adjusted a fixture *wattage* to match the DesignLights Consortium (DLC) Qualified Products Listing (DLC). This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate rounded to 100 percent. The adjustments also decreased annual energy savings (kilowatt-hour) and resulted in a realization rate rounded to 100 percent.

Participant ID 5369: An inpatient hospital installed *ENERGY STAR® solid door and glass door reach-in refrigerators*, an *ENERGY STAR food holding cabinet*, and *ENERGY STAR ice makers*. During the desk review, the EM&V team determined one *ice maker model and refrigerator were not ENERGY STAR-certified*, and the savings were removed from the project. The adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 61 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 56 percent.

Participant ID 5381: A new construction inpatient healthcare facility installed energy-efficient *LED lighting* throughout the interior and exterior of the facility. During the desk review and on-site M&V visit, the EM&V team reduced the *floor area* to match the *construction and lighting installation area*, and the *quantity* of one lighting fixture was adjusted. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 37 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 37 percent.

Participant ID 5390: A renovated school kitchen installed *commercial ice makers*, *ENERGY STAR dishwashers*, *refrigeration door gaskets*, *refrigeration door heater controls*, *evaporator fan controls for walk-in coolers*, and *night covers for open refrigeration cases*. During the desk review, the EM&V team adjusted the *building level water heat fuel type* from *electric water heating* to *gas water heating* and adjusted the *savings calculation methodology* for the *ice makers*. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 57 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 62 percent.

Participant ID 5392: A school gym installed interior and exterior *LED lighting fixtures*. During the desk review, the EM&V team adjusted the interior and exterior *facility area* based on architectural plans and adjusted the *wattages* of one *lighting fixture* to match the DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 49 percent. The adjustment decreased energy (kilowatt-hour) savings and resulted in a realization rate of 51 percent.

Participant ID 5411: A college residence hall installed *in-unit energy-efficient refrigerators* and *communal dishwashers*. During the desk review, the EM&V team determined the *dishwasher did not meet the requirements of the commercial dishwasher* measure. The removed savings decreased peak demand (kilowatt) savings and resulted in a realization rate of 84 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 86 percent.

Participant ID 5412: A retail facility installed *rooftop air conditioning units* to replace existing *rooftop units*. During the desk review, the EM&V team identified some units *did not meet the minimum efficiency requirements*, and the *baseline energy efficiency level* was adjusted on the remaining units. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of eight percent. The adjustment also decreased energy (kilowatt-hour) savings and resulted in a realization rate of six percent.

Participant ID 51612: A K-12 school completed a *lighting* retrofit. During the desk review and on-site M&V visit, the EM&V team adjusted *fixture wattages* to meet the DLC QPL and the inspection findings. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 102 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 102 percent.

Participant ID 51652: A high school tuned up its *HVAC units*. During the desk review, the EM&V team found that the calculator did not properly sum the total claimed savings and the *facility type* was adjusted to *match the secondary school operation*. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 111 percent. The adjustments, however, decreased energy (kilowatt-hour) savings and resulted in a realization rate of 87 percent.

Participant ID 51653: An elementary school tuned up its *HVAC units*. During the desk review, the EM&V team adjusted three units to be *heat pumps* and adjusted the *capacity* of one unit to match the documentation. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate rounded to 100 percent. The adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate rounded to 100 percent.

Participant ID 51678: A middle school installed *LED lighting* to replace the existing *fluorescent lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted a *pre-retrofit fixture code* to match the pre-inspection. This adjustment decreased the peak demand (kilowatt) savings and resulted in a realization rate of 97 percent. The adjustment also decreased the energy (kilowatt-hour) savings and resulted in a realization rate of 97 percent.

Participant ID 52139: An elementary school installed *LED lighting* to replace interior and exterior lighting. During the desk review and on-site M&V visit, the EM&V team adjusted *fixture quantities* and *wattages* to match the DLC QPL and ENERGY STAR listing. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 109 percent. The adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate of 111 percent.

Participant ID 53117: A school facility installed a new *dishwasher*. During the desk review and on-site M&V visit, the EM&V team determined the dishwasher *did not meet the requirements of the commercial dishwasher measure*. This adjustment removed peak demand (kilowatt) savings and resulted in a realization rate of zero percent. The adjustment also removed energy (kilowatt-hour) savings and resulted in a realization rate of zero percent.

Participant ID 79576: A food production facility implemented a *continuous energy improvement* project in year three of the three-year engagement. During the desk review, the EM&V team found that the *wrong savings value* from a project back in PY2021 was used in this project savings determination. The adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 89 percent. The adjustment also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 99 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications, AHRI certifications) for 19 projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included M&V plans, invoices, QPL qualifications or AHRI certifications, equipment specification sheets, pre- 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. However, the *tune-up* measures were missing important documentation, such as some of the photos, the invoices, and the calculation sheets. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

5.4 DETAILED FINDINGS—RESIDENTIAL

5.4.1 Residential Standard Offer Program (SOP) (Medium Evaluation)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
10.1%	1,981	1,981	100.0%	10.7%	49,921,151	49,921,151	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team found discrepancies for three projects and adjusted the claimed savings for two. Entergy provided additional documentation for one project, resulting in no adjustments needed, accepted the evaluated results, and matched the claimed savings for the remaining two projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 12969: The energy efficiency project included the implementation of an *advanced power strip*, *air purifier*, *LEDs*, and *duct sealing*. During the desk review, the EM&V team found that *electric resistance* was the *heating type* used to calculate the ex-ante savings. However, the documentation showed the *heating type* was a *heat pump*. The ex-post savings were calculated using the testing methodology in the TRM for *duct sealing* and deemed methodology for *LEDs* using a *heat pump heating type*, resulting in a decrease in savings for *duct sealing* and an increase in savings for *LEDs*. Overall, the adjustments resulted in project-level realization rates of 101.8 percent and 92.7 percent for demand and energy savings, respectively.

Participant ID 12757: The energy efficiency project included the implementation of an *advanced power strip*, *air purifier*, *LEDs*, and *duct sealing*. During the site visit, the EM&V team found that one of the *air purifiers was not installed* and adjusted the savings accordingly, resulting in a decrease in savings. The site visit also tested substantially higher levels of *duct leakage cubic feet per minute (CFM)* than was tracked. The ex-post savings were calculated using the testing methodology in the TRM for *duct sealing* using the *site visit test results*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 56.2 percent and 66 percent for demand and energy savings, respectively.

Participant ID 13185: The energy efficiency project included the implementation of *ceiling insulation*, *low-flow showerheads*, and *LEDs*. During the desk review, the EM&V team found only *one of two photos required* to *claim the less than R-5 baseline* was included in the documentation. The EM&V team calculated the ex-post savings using the deemed methodology in the TRM for *ceiling insulation* with a *baseline of R-5*, resulting in a decrease in savings. The EM&V team reported this discrepancy during the interim results, and Entergy responded with the additional documentation required. The EM&V team adjusted ex-post savings using the new documentation, resulting in project-level realization rates of 100 percent and 100 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, test results, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, invoices, photos, and specification sheets. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

5.4.2 Residential Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
8.1%	1,592	1,592	100.0%	11.2%	5,241,940	5,241,940	100.0%	Good

Completed desk reviews*
5

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential Solutions MTP evaluation efforts focused on desk reviews for the Entergy High-Performance Homes subprogram. Five desk reviews were completed to check that 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 have any adjustments from the desk reviews, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, inspection photos, and certifications. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

5.4.3 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
9.3%	1,836	1,836	100.0%	9.0%	4,198,051	4,198,051	100.0%	Good

Completed desk reviews*	Completed On-site M&V
5	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The sample of completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for three projects. Entergy accepted the evaluated results and matched the claimed savings for the one project with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 14171: The energy efficiency project included the implementation of an *advanced power strip*, *air infiltration*, *air purifier*, *LEDs*, and *duct sealing*. During the desk review, the EM&V team found that the *heating type* used to calculate the ex-ante savings was *gas heating*. However, the site visit verified the *heating type* was *electric resistance*, and the house had *no gas infrastructure* affecting the *air infiltration, duct sealing*, and *LED* measure savings calculations. The site visit also tested substantially *higher levels of duct leakage CFM* than was tracked. The ex-post savings were calculated using the testing methodology in the TRM for *duct sealing* using the *site visit test results* and *electric resistance heating type*, resulting in a decrease in savings. The ex-post savings were calculated using the deemed methodology in the TRM for *air infiltration* and *LEDs* using *electric resistance heating type*, resulting in a decrease in savings for *LEDs* and an increase in savings for *air infiltration*. Overall, the adjustments resulted in project-level realization rates of 140.6 percent and 107.9 percent for demand and energy savings, respectively.

Participant ID 13862: The energy efficiency project included the implementation of an *advanced power strip*, *air infiltration*, *air purifier*, *LEDs*, and *duct sealing*. During the desk review, the EM&V team found that the *heating type* used to calculate the ex-ante savings was *electric resistance heating*. However, the site visit verified the *heating type* was a *heat pump* affecting the *air infiltration*, *duct sealing*, and *LED* measure savings calculations. The site visit also tested substantially *higher levels of duct leakage and air infiltration CFM* than was tracked. The ex-post savings were calculated using the testing methodology in the TRM for the *duct sealing* and *air infiltration* measures using the *site visit test results* and *heat pump heating type*, resulting in a decrease in savings for both measures. The ex-post savings were calculated using the deemed methodology in the TRM for *LEDs* using the *heat pump heating type*, resulting in an increase in savings for *LEDs*. Overall, the adjustments resulted in project-level realization rates of 65.8 percent and 84.8 percent for demand and energy savings, respectively.

Participant ID 13731: The energy efficiency project included the implementation of *air infiltration*, *LEDs*, and *duct sealing*. During the site visit, the EM&V team tested *substantially higher levels of duct leakage CFM* than was tracked. The ex-post savings were calculated using the testing methodology in the TRM for *duct sealing* using the *site visit test results*, resulting in a decrease in savings. Overall, the adjustments resulted in 96.4 percent and 94.9 percent project realization rates for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, test results, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, invoices, photos, and specification sheets. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

5.5 DETAILED FINDINGS—LOAD MANAGEMENT (MEDIUM EVALUATION PRIORITY)

5.5.1 Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
35.2%	6,919	6,919	100.0%	0.0%	6,919	6,919	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 commercial Entergy Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 5 and 30-minute increments. Load management events in PY2022 occurred on the following dates and times:

- June 15, 2022, from 1:00 p.m. to 2:00 p.m. (scheduled),
- June 16, 2022, from 1:00 p.m. to 2:00 p.m. (scheduled),
- June 17, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled),
- June 20, 2022, from 1:30 p.m. to 2:30 p.m. (scheduled),
- June 21, 2022, from 1:00 p.m. to 2:00 p.m. (scheduled),
- June 28, 2022, from 3:00 p.m. to 4:00 p.m. (scheduled), and
- June 30, 2022, from 1:00 p.m. to 2:00 p.m. (scheduled).

There were no unscheduled events in PY2022. The EM&V team received interval meter data and a spreadsheet that summarized the event-level savings for the eight sponsors across 54 sites. Two sites did not participate in any of the scheduled events.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings provided for all sites. The kilowatt savings for each participating site corresponded to the kilowatt reductions that occurred at the scheduled event (no averaging was necessary because each participating site participated in only one event). The kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 (evaluated) and Entergy's (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings; however, a negligible difference in kilowatt and kilowatt-hour was a result of different rounding practices during calculations. Evaluated savings for the Entergy Load Management SOP are 6,919 for kilowatt and kilowatt-hour. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

6.0 ONCOR ELECTRIC DELIVERY COMPANY, LLC IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Oncor Electric Delivery Company, LLC's (Oncor) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

6.1 KEY FINDINGS

6.1.1 Evaluated Savings

Oncor's evaluated savings for program year (PY) 2022 (PY2022) were 248,698 in demand (kilowatt, kW) and 302,280,922 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. Oncor was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (Table 24), supporting healthy realization rates.

Table 21 shows the claimed and evaluated demand savings for Oncor's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 21. Oncor PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**248,663**	**248,698**	**100.0%**	**N/A**
Commercial	8.8%	21,888	21,887	100.0%	N/A
Residential	26.0%	64,678	64,678	100.0%	N/A
Low-income	1.2%	3,059	3,059	100.0%	N/A
Load management*	49.9%	124,067	124,066	100.0%	N/A
Pilot	14.1%	34,970	35,006	100.1%	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.

Table 22 shows the claimed and evaluated energy savings for Oncor's portfolio and broad customer sector and program categories for PY2022.

Table 22. Oncor PY2020 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**302,293,359**	**302,280,922**	**100.0%**	**N/A**
Commercial	30.9%	93,434,355	93,421,819	100.0%	N/A
Residential	65.2%	197,018,328	197,018,322	100.0%	N/A
Low-income	1.9%	5,627,855	5,627,855	100.0%	N/A
Load management*	0.0 %	372,200	372,198	100.0%	N/A
Pilot	1.9%	5,840,621	5,840,729	100.0%	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.

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

In program-level realization rates, we have also included a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility. Oncor received *good* documentation scores for all evaluated programs except for the Hard-to-Reach SOP program, which received a *fair* documentation score.

6.1.2 Cost-Effectiveness Results

Oncor's overall portfolio had a cost-effectiveness score of 4.8, or 5.3, excluding low-income programs.

The more cost-effective programs were the Retail Products MTP (residential and commercial) and the Commercial SOP; the less cost-effective programs were the Winter Commercial Load Management (Pilot) and the Commercial Midstream MTP. All of Oncor's programs were cost-effective in 2022.

The lifetime cost of claimed savings was $0.011 per kilowatt-hour and $10.38 per kilowatt.

Table 23. Oncor Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**4.79**	**4.79**	**4.52**
Total portfolio excluding low-income programs	**5.26**	**5.26**	**4.96**
Commercial	**6.37**	**6.37**	**6.24**
Commercial SOP	6.18	6.18	6.17

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Solar PV SOP	4.78	4.78	4.82
Small Business Direct Install MTP	1.43	1.43	1.36
Retail Products MTP	45.26	45.26	40.73
Commercial Midstream MTP	1.25	1.25	1.25
Residential	**5.67**	**5.67**	**5.20**
Home Energy Efficiency SOP	6.09	6.09	5.58
Solar PV SOP	2.16	2.16	2.07
Retail Products MTP	9.61	9.61	8.65
Residential New Home Construction MTP	3.09	3.09	2.16
Hard-to-Reach SOP	3.53	3.53	3.53
Low-income	**1.75**	**1.75**	**1.75**
Targeted Weatherization Low-Income SOP*	1.75	1.75	1.75
Load management	**1.58**	**1.58**	**1.58**
Residential Load Management SOP	1.57	1.57	1.57
Commercial Load Management SOP	1.58	1.58	1.58
Pilot	**1.96**	**1.96**	**1.96**
Winter Commercial Load Management (Pilot)	1.18	1.18	1.18
Strategic Energy Management MTP (Pilot)	3.15	3.15	3.15

* The low-income program is evaluated using the savings-to-investment ratio (SIR).

6.2 CLAIMED SAVINGS ADJUSTMENTS

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 24Table 15 summarizes claimed savings adjustments recommended by the EM&V team. Realization rates assume the following adjustments will be included in Oncor's June 1 filing. There may be differences between evaluated and claimed savings that did not result in a recommended adjustment because the difference is less than five percent.

Table 24. Evaluation, Measurement, and Verification Claimed Savings Adjustments by Program (Prior to EECRF[8] Filing)

Program	EM&V demand claimed savings adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Commercial SOP	15.91	-86,107.95
Strategic Energy Management MTP (Pilot)	1.68	0.00
Home Energy Efficiency SOP	0.99	2,011.73
Residential New Home Construction MTP	0	56.25
Targeted Weatherization Low-Income SOP	-1.60	-3,573.00
Total	**16.98**	**-87,612.97**

6.3 DETAILED FINDINGS—COMMERCIAL

6.3.1 Commercial Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.1%	12,645	12,645	100.0%	17.0%	51,451,552	51,441,937	100.0%	Good

Completed desk reviews*	On-site M&V visit
24	12

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial SOP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for 12 projects. Three projects had less than five percent adjustments, and nine had adjustments greater than five percent compared to the originally claimed savings. Oncor accepted the evaluated results and did not match the claimed kilowatt-hour and kilowatt savings for the projects with less than a five percent adjustment. Including the non-adjusted values, the final program realization rate is approximately 100 percent. Further details of the EM&V findings are provided below.

[8] Energy efficiency cost recovery factor.

Participant ID 28309: Retrofit of existing school's *HVAC rooftop units (RTU)* at the end of their useful life with new *RTUs* and *heat pumps*. During the desk review and on-site M&V visit, the EM&V team adjusted the *capacity* of several units based on the Air Conditioning, Heating, and Refrigeration Institute (AHRI) certificates. The evaluation also identified the *heat pumps* as *eligible* and was included in the evaluated savings. The adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 106 percent. The adjustments also slightly increased energy (kilowatt-hour) savings and resulted in a realization rate of 102 percent.

Participant ID 28332: A retail hardware store installed *LED lighting* to replace *fluorescent* and *metal halide fixtures*. During the desk review, the EM&V team adjusted *facility operating hours* to match the *deemed hours of operation* for the *building type* identified in the TRM for both the interior and exterior space. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 81 percent. The adjustments also slightly decreased energy (kilowatt-hour) savings and resulted in a realization rate that rounded to 100 percent.

Participant ID 28345: A large stand-alone retail store installed *LED lighting* to replace interior lighting. During the desk review, the EM&V team adjusted *facility operating hours* to match the *deemed hours of operation* for the *building type* identified in the TRM. Several *fixture quantities* were adjusted to match the post-inspection documentation and the post-retrofit fixture *wattages* to match the DesignLights Consortium (DLC) Qualified Product Listing (QPL). These adjustments slightly increased peak demand (kilowatt) savings and resulted in a realization rate that rounded to 100 percent. However, the adjustments decreased energy (kilowatt-hour) savings and resulted in a realization rate of 78 percent.

Participant ID 28347: A hardware store replaced interior lighting with *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted *facility operating hours* to match the *deemed hours of operation* for the *building type* identified in the TRM. Several *fixture quantity* adjustments were made based on the post-inspection documentation and post-retrofit *fixture wattages* were adjusted to match the DLC QPL. These adjustments decreased peak demand savings and resulted in a realization rate of 88 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 68 percent.

Participant ID 28378: A large stand-alone retail store installed *LED lighting* to replace interior lighting. During the desk review, the EM&V team adjusted *facility operating hours* to match the *deemed hours of operation* for the *building type* identified in the TRM. Several *fixture quantity adjustments* were made based on the post-inspection documentation, and post-retrofit *fixture wattages* were adjusted to match the DLC QPL. These adjustments slightly decreased peak demand (kilowatt) savings and resulted in a realization rate of 98 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 76 percent.

Participant ID 28380: A stand-alone retail store installed *LED lighting* to replace interior *fluorescent* and *metal halide lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted *facility operating hours* to match the *deemed hours of operation* for the *building type* identified in the TRM. This adjustment slightly increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. This adjustment, however, decreased energy (kilowatt-hour) savings and resulted in a realization rate of 78 percent.

Participant ID 52475: A new construction warehouse installed *LED lighting*. During the desk review and on-site M&V visit, the EM&V team included project savings for the *installed controls* since it was determined the controls exceeded building code requirements. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 132 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 132 percent.

Participant ID 55331: A master metered apartment building replaced the existing *centralized* heating and cooling system with *decentralized heat pumps* in each unit. During the desk review, the EM&V team adjusted the *baseline equipment age*, which adjusted *baseline equipment efficiency* and the *remaining useful life* (*RUL)* and *estimated useful life* (*EUL)* of the systems to match the values for varied *cooling system types*. These adjustments did not affect peak demand (kilowatt) savings; therefore, the realization rate was 100 percent for peak demand. The adjustments increased energy (kilowatt-hour) savings and resulted in a realization rate of 109 percent.

Participant ID 56096: A new construction high school installed energy-efficient *HVAC rooftop units* and *LED lighting*. During the desk review, the EM&V team determined several fixtures qualified for savings after identifying the equipment on the DLC QPL and ENERGY STAR® listing, and the *wattages* of qualified fixtures were adjusted to match the DLC QPL and ENERGY STAR listing. The addition of the originally non-qualifying fixtures and wattage adjustments has a secondary impact on the *lighting control* savings. The post-retrofit *rooftop unit model capacities and efficiencies* were adjusted to match AHRI certificates for units based on post-inspection photos. Lastly, adjustments to *cooling capacity, heating capacity,* and *efficiency values* were made to match AHRI certificates. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 120 percent. These adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate of 130 percent.

Participant ID 59165: A new construction warehouse installed energy-efficient exterior *LED lighting*. During the desk review, the EM&V team adjusted the *exterior parking* and *drive area* and *added a loading dock area*. In addition, an *exterior lighting fixture was added* to the lighting inventory. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 98 percent. These adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 98 percent.

Participant ID 60650: A new construction warehouse installed *LED lighting*. During the desk review and on-site M&V visit, the EM&V team included project savings for the installed controls since it was determined the *controls exceeded building code requirements*. There was also a slight adjustment to include a n*on-qualified fixture* in the energy savings calculation. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 114 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 113 percent.

Participant ID 104298: A manufacturing facility replaced *fluorescent lighting* with *LED lighting*. During the desk review, the EM&V team identified a *non-operating fixture* based on the pre-inspection that was not itemized. One pre-retrofit *fixture type* was adjusted to match the pre-inspection site photos. These adjustments slightly increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. The adjustments also slightly increased energy (kilowatt-hour) savings but resulted in a realization that rounded to 100 percent.

Documentation Score

The EM&V team was mostly able to verify key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications, AHRI certifications) for the 26 projects that had desk reviews because sufficient documentation was provided for the sites. However, a few projects had missing documentation, including AHRI certifications, savings calculations, invoices, photos, and limited inspection notes, which made verifying *air conditioning type*, *quantity of lights*, or *energy* and/or *demand savings* difficult. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, however, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

6.4 DETAILED FINDINGS—RESIDENTIAL

6.4.1 Home Energy Efficiency Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (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%	17,549	17,549	100.0%	11.3%	34,095,018	34,095,018	100.0%	Good

Completed desk reviews*	Completed On-site M&V
9	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Home Energy Efficiency SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for eight projects. Four projects had adjustments of less than five percent compared to the originally claimed savings. Four projects had adjustments of greater than five percent compared to the originally claimed savings. Oncor accepted the evaluated results and matched the claimed savings for the four projects with significant adjustments; therefore, the final program realization rates are 100 percent. Further details of the EM&V findings are provided below.

Participant ID 29004: The energy efficiency project included the installation of a new *central heat pump system*. During the desk review, the EM&V team found that the ex-ante savings were calculated using an *early retirement dual baseline*, even though the documentation confirmed the n*ew heat pump capacity* had been *upsized from the existing equipment capacity*. The TRM states the new construction baseline should be used for projects where the new equipment is upsized. EM&V team adjusted the *ex-post savings calculations* to use the *new construction baseline*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 49.4 percent and 64.9 percent for demand and energy savings, respectively.

Participant ID 30638: The energy efficiency project included the installation of a new *ground-source heat pump system*. The EM&V team attempted to recreate the ex-ante savings. However, the EM&V team could not recreate the ex-ante savings or determine the source of the ex-ante savings because a calculator was not provided in the documentation package for comparison. The EM&V team calculated the ex-post savings using the prescribed methodology in the TRM, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 177.4 percent and 141.8 percent for demand and energy savings, respectively.

Participant ID 31078: The energy efficiency project included the installation of two *central air conditioner systems*. During the desk review, the EM&V team found that the ex-ante calculation used *air conditioner early retirement* as the baseline. However, the documentation confirmed the existing equipment was *two dual-fuel heat pumps*. Further investigation confirmed the *heat pumps* were replaced with new *air conditioner systems* along with *gas furnaces*. The EM&V team determined the change in equipment type should use the *replace-on-burnout* or *new construction baselines* rather than the *early retirement baseline*. After discussion with the utility, the EM&V team adjusted the ex-post savings calculations to use the *replace-on-burnout baseline*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 66.6 percent and 76.2 percent for demand and energy savings, respectively.

Participant ID 29371: The energy efficiency project included the installation of a new *central air conditioner system*. The EM&V team found that the ex-ante savings had been calculated assuming a *like-for-like capacity* installation. However, the documentation confirmed the system had been downsized from a *3.5-ton system* to a *2.5-ton system*. The EM&V team calculated ex-post savings using the downsizing methodology in the TRM for a *2.5-ton system*, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 260.9 percent and 261.1 percent for demand and energy savings, respectively.

Participant IDs 30241, 29365, 29024, and 31053: These energy efficiency projects included the installation of *new central air conditioner* or *heat pump systems*. The EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments were below the threshold for utility adjustments, resulting in near 100 percent realization rates for demand and energy savings.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, and certifications. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

6.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
6.0%	15,023	15,023	100.0%	6.6%	19,963,263	19,963,263	100.0%	Fair

Completed desk reviews*	Completed On-site M&V
5	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team did not have any adjustments from the desk reviews or the on-site M&V, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and test results for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and pre- and post-test results. However, for two projects, the *electric resistance furnace* documentation was missing. Overall, the EM&V team was somewhat satisfied with the project documentation provided and assigned a program documentation score of *fair.*

6.4.3 Residential New Home Construction Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
1.3%	3,329	3,329	100.0%	1.5%	4,381,063	4,381,058	100.0%	Good

Completed desk reviews*
5

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential New Home Construction MTP evaluation efforts focused on desk reviews. The number of completed desk reviews for this program is listed above. Five desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.

The EM&V team adjusted the claimed savings for three projects. Two projects had adjustments of less than five percent compared to the originally claimed savings. One project had adjustments of greater than five percent compared to the originally claimed savings. Oncor accepted the evaluated results and matched the claimed savings for the one project with significant adjustments; therefore, the final program realization rates are 100 percent and 100 percent for demand and energy savings, respectively. Further details of the EM&V findings are provided below.

Participant ID 52487: The energy efficiency project included *whole-home new construction savings* along with the installation of a *central air conditioner* and an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found the *cooling capacity* of the new system was *5 tons* rather than the reported *4 tons* based on the AHRI certificate provided. The EM&V team calculated ex-post savings using the *5-ton capacity*, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 100 percent and 101.7 percent for demand and energy savings, respectively.

Participant ID 52616: The energy efficiency project included *whole-home new construction savings* along with the installation of a *central air conditioner* and an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 99.8 percent and 99.9 percent for demand and energy savings, respectively. Because the project was within the adjustment threshold, the utility did not adjust ex-ante savings to match the ex-post savings.

Participant ID 59905: The energy efficiency project included *whole-home new construction savings* along with the installation of a *central air conditioner* and an *ENERGY STAR thermostat* for a single-family home. During the desk review, the EM&V team found slight discrepancies compared to the ex-ante savings, likely due to rounding. Overall, the adjustments resulted in project-level realization rates of 99.8 percent and 100.0 percent for demand and energy savings, respectively. Because the project was within the adjustment threshold, the utility did not adjust ex-ante savings to match the ex-post savings.

Documentation Score

The EM&V team was able to verify most of the key inputs and assumptions, including the project scope, baselines, and equipment specifications for most of the measures of the sampled projects that had desk reviews. However, there was limited documentation for the *smart thermostat* measures. Overall, the EM&V team was mostly satisfied with the project documentation provided and assigned a program documentation score of *good.*

6.5 DETAILED FINDINGS—LOW-INCOME

6.5.1 Targeted Weatherization Low-Income Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
1.2%	3,059	3,059	100.0%	1.9%	5,627,855	5,627,855	100.0%	Good

Completed desk reviews*	Completed on-site M&V
3	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Targeted Weatherization Low-Income SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for three projects. One project had adjustments of less than five percent compared to the originally claimed savings. Two projects had adjustments of greater than five percent compared to the originally claimed savings. Oncor accepted the evaluated results and matched the claimed savings for the two projects with significant adjustments; therefore, the final program realization rates are 100 percent and 100 percent for demand and energy savings, respectively. Further details of the EM&V findings are provided below.

Participant ID 39183: The energy efficiency project included the installation of a new *central heat pump system*. During the desk review and on-site inspection, the EM&V team found that the installed system was *upsized* compared to the existing system. Generally, upsized systems should use the *new construction baseline* for *heating and cooling savings* and the *installed capacity* of *2 tons*. However, per the TRM, in scenarios where the home is low-income, and the project is upsized, the *early retirement electric resistance baseline* may be used to claim heating savings if calculated using the lower tonnage, *1.5 tons*. *Cooling savings* should be calculated using the *new construction baseline* and *installed capacity of 2 tons*. Adjusting the heating savings to the lower capacity accounted for the deviation in demand savings but not all of the deviation in energy savings. The remaining difference in kilowatt-hour savings could not be determined by the provided information. The EM&V team adjusted the *heating savings* to use the *lower capacity*. Overall, the adjustments resulted in project-level realization rates of 75.2 percent and 71.7 percent for demand and energy savings, respectively.

Participant ID 39179: The energy efficiency project included the installation of a new *central heat pump system*. During the desk review and on-site inspection, the EM&V team found that the installed system was *upsized* compared to the existing system. Generally, upsized systems should use the *new construction baseline* for *heating and cooling savings* and the *installed capacity* of *2 tons*. However, per the TRM, in scenarios where the home is low-income, and the project is upsized, the *early retirement electric resistance* baseline may be used to claim heating savings if calculated using the lower tonnage, *1.5 tons*. *Cooling savings* should be calculated using the *new construction baseline* and *installed capacity, 2 tons*. Adjusting the heating savings to the lower capacity accounted for the deviation in demand savings but not all of the deviation in energy savings. The remaining difference in kilowatt-hour savings could not be determined by the provided information. The EM&V team adjusted the *heating savings* to use the *lower capacity*. Overall, the adjustments resulted in project-level realization rates of 75.2 percent and 71.7 percent for demand and energy savings, respectively.

Participant ID 39233: The energy efficiency project included the installation of a new *heat pump system*. During the desk review, the EM&V team found that the ex-ante energy savings were calculated as *early retirement savings*. However, the existing system was manufactured in *2017*, and the TRM states that systems *manufactured after the 2015 federal standard* are not eligible for early retirement savings. The EM&V team calculated *cooling ex-post savings* using the *new construction baseline*. Overall, the adjustments resulted in project-level realization rates of 100.0 percent and 97.7 percent for demand and energy savings, respectively. Because the project was within the adjustment threshold, the utility did not adjust ex-ante savings to match the ex-post savings.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, specification sheets, AHRI certifications, and field notes. However, the documentation did not include low-income certification. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

6.6 DETAILED FINDINGS—LOAD MANAGEMENT

6.6.1 Commercial Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
32.2%	80,000	80,000	100.0%	0.1%	240,000	240,000	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. Claimed savings are conservative as they only include the amount of demand reduction in participation contracts.

The EM&V team evaluated the Oncor Commercial Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. A single load management event occurred in PY2022 on June 15, 2022, from 3:00 p.m. to 6:00 p.m. (scheduled). There were no unscheduled events in PY2022.

The EM&V team received the interval meter data and spreadsheets detailing the Oncor calculated baseline load, event load, and savings results for the 14 sponsors across 488 sites. Sixty-three sites did not participate in the scheduled event. All sponsors had at least one site that curtailed during the scheduled event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated kilowatt savings matched the kilowatt savings Oncor provided for all sites except those with negative savings. While reviewing individual meter savings differences, the EM&V team found that Oncor uses 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 kilowatt savings, the kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 (evaluated) and Oncor's calculated kilowatt and kilowatt-hour savings. **Evaluated savings for the Oncor Commercial Load Management**

SOP reflect Oncor's contracted savings claimed in their Energy Efficiency Plan and Report (80,000 kW and 240,000 kWh), which are conservative compared to their calculated kilowatt and kilowatt-hour savings. Beyond the contracted savings, the EM&V team calculated additional achieved savings of 10,146 kW and 30,438 kWh. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

6.6.2 Residential Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
17.7%	44,067	44,066	100.0%	0.0%	132,200	132,198	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 Oncor Residential Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. A single load management event occurred in PY2022 on June 15, 2022, from 3:00 p.m. to 6:00 p.m. (scheduled). There were no unscheduled events in PY2022.

The EM&V team received the interval meter data and spreadsheets detailing the Oncor calculated baseline load, event load, and savings results for each service provider and meter. Additionally, Oncor provided documentation for meters that received zero savings from the calculation or had no meter data available during the event but were confirmed as having participated by the service provider. These meters totaled 0.5 percent of the program population and were included for each service provider by applying the average savings (per the TRM, savings may still be calculated for less than two percent of meters that fail to record data sufficient to apply the *High 3 of 5* calculation method).

After the EM&V team applied the *High 3 of 5* baseline calculation method, it was found that the evaluated kilowatt savings matched the kilowatt savings Oncor provided for all participating meters. The kilowatt-hour savings for each participating meter were calculated by multiplying the kilowatt reductions by the total number of event hours. Program-level savings were calculated by adding all meter-level savings.

The table above shows both the EM&V team's (evaluated) and Oncor's (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings; however, a negligible difference in kilowatt and kilowatt-hour was a result of different rounding practices during calculations. Evaluated savings for the Oncor Residential Load Management SOP are 44,066 kW and 132,198 kWh. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

6.7 DETAILED FINDINGS—CROSS-SECTOR PROGRAMS

6.7.1 Solar Photovoltaic Standard Offer Program (SOP) (Medium Evaluation Priority)

Sector	Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
Residential	0.5%	1,320	1,320	100.0%	1.5%	4,528,709	4,528,709	100.0%	Good
Commercial	0.5%	1,296	1,296	100.0%	1.3%	4,033,138	4,030,216	100.0%	Good

Completed desk reviews*	Completed On-site M&V
8	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Solar Photovoltaic SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for one commercial project and did not have any adjustments to residential projects. The one commercial project adjustment was less than five percent compared to the originally claimed savings and residential projects had no adjustments. Oncor accepted the evaluated results and did not match the claimed savings for the commercial projects; therefore, the final program realization rates round to 100 percent for the residential program and 100 percent and 100 percent for demand and energy savings, respectively, for the commercial program. Further details of the EM&V findings are provided below.

Participant ID 60255: An apartment complex installed *solar panels* on the rooftops of apartment buildings. During the desk review and on-site M&V visit, the EM&V team found slight variations in the installed *tilt angles*. These adjustments did not affect peak demand (kilowatt) savings. However, the adjustments slightly decreased energy (kilowatt-hour) savings and resulted in a realization rate of 100 percent.

Documentation Score

The EM&V team was mostly able to verify key inputs and assumptions (e.g., equipment quantity, equipment capacity) for the projects that had desk reviews because sufficient documentation was provided for the sites. However, one project had missing documentation, including specification sheets, invoices, and post-installation photos, which made verifying the solar panel equipment and specifications difficult. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, however, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

6.8 DETAILED FINDINGS—PILOT PROGRAMS

6.8.1 Winter Commercial Load Management Market Transformation Program (MTP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
14.0%	34,722	34,758	100.1%	0.0%	104,166	104,274	100.1%	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. Claimed savings are conservative as they only include the amount of demand reduction in participation contracts.

The EM&V team evaluated the Winter Commercial Load Management MTP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. A single load management event occurred on December 15, 2021, from 7:00 a.m. to 10:00 a.m. (scheduled).

The EM&V team received the interval meter data and spreadsheets detailing the Oncor calculated baseline load, event load, and savings results for the four sponsors across 34 sites. Three sites did not participate in the scheduled event. All sponsors had at least one site that curtailed during the scheduled event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated kilowatt savings matched the kilowatt savings Oncor provided for all sites except those with negative savings. While reviewing individual meter savings differences, the EM&V team found that Oncor uses 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 kilowatt savings, the kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 (evaluated) and Oncor's calculated kilowatt and kilowatt-hour savings. Evaluated savings for the Oncor Winter Commercial Load Management MTP are 34,758 kW and 104,274 kWh. The realization rate for both kilowatt and kilowatt-hour is just over 100 percent, with a documentation score of *good*.

6.8.2 Strategic Energy Management Market Transformation Program (Pilot) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
0.1%	248	248	100.0%	1.9%	5,736,455	5,736,455	100.0%	Good

Completed desk reviews*	Completed On-site M&V
2	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Strategic Energy Management MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for one project that had an adjustment less than five percent. Oncor accepted the evaluated results and matched the claimed kilowatt-hour and kilowatt savings. The final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 104325: The project developed and implemented a standard operating procedure to shut down the dust collectors during nonproductive hours. During the desk review and on-site M&V visit, the EM&V team found that the *PDPF table* used in the calculation had *incorrect PDPF fractions* for identified hours. These adjustments slightly increased peak demand (kilowatt) savings and resulted in a realization rate of 104 percent. However, the adjustments did not affect energy (kilowatt-hour) savings; therefore, the realization rate is 100 percent for kilowatt-hour.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., calculation methodology, equipment capacity) for the two projects that had desk reviews because sufficient documentation was provided for the sites. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

6.9 SUMMARY OF LOW EVALUATION PRIORITY PROGRAMS

Table 25 summarizes claimed savings for Oncor's *low* evaluation priority programs in PY2022, including the programs' overall contribution to portfolio savings. *Low*-priority programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 25. PY2022 Claimed Savings (Low Evaluation Priority Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Commercial Midstream MTP	0.4%	948	948	100.0%	0.7%	2,027,252	2,027,252	100.0%
Commercial Retail Products MTP	2.7%	6,768	6,768	100.0%	11.6%	34,919,279	34,919,279	100.0%
Residential Retail Products MTP	11.0%	27,458	27,458	100.0%	44.3%	134,050,274	134,050,274	100.0%
Small Business Direct Install MTP	0.1%	230	230	100.0%	0.0%	1,003,135	1,003,135	100.0%

7.0 SOUTHWESTERN ELECTRIC POWER COMPANY IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Southwestern Electric Power Company's (SWEPCO) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

7.1 KEY FINDINGS

7.1.1 Evaluated Savings

SWEPCO's evaluated savings for program year (PY) 2022 (PY2022) were 9,868 in demand (kilowatt, kW) and 14,012,207 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. SWEPCO was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (Table 29), supporting healthy realization rates.

Table 26 shows the claimed and evaluated demand savings for SWEPCO's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 26. SWEPCO PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**9,868**	**9,868**	**100.0%**	**N/A**
Commercial	24.9%	2,459	2,459	100.0%	N/A
Residential	21.8%	2,149	2,149	100.0%	N/A
Load management*	53.3%	5,261	5,261	100.0%	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.

Table 27 shows the claimed and evaluated energy savings for SWEPCO's portfolio and broad customer sector and program categories for PY2022.

Table 27. SWEPCO PY2022 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**14,012,207**	**14,012,207**	**100.0%**	**N/A**
Commercial	66.9%	9,380,523	9,380,523	100.0%	N/A
Residential	32.4%	4,544,746	4,544,746	100.0%	N/A
Load management*	0.6%	86,938	86,938	100.0%	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.

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

In program-level realization rates, we have also included 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 four of its evaluated programs; however, three programs have an opportunity for improvement in documentation: Commercial SOP, Residential SOP, and Hard-to-Reach SOP, which received a *fair* documentation score.

7.1.2 Cost-Effectiveness Results

SWEPCO's overall portfolio had a cost-effectiveness score of 3.2.

The more cost-effective programs were the SCORE MTP and the Commercial SOP; the less cost-effective programs were the Load Management SOP and the Residential SOP. All of SWEPCO's programs were cost-effective in 2022.

The lifetime cost of claimed savings was $0.016 per kilowatt-hour and $14.60 per kilowatt.

Table 28. SWEPCO Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**3.22**	**3.22**	**3.13**
Commercial	**4.67**	**4.67**	**4.63**
Commercial Solutions MTP	4.43	4.43	4.43
Commercial SOP	5.20	5.20	5.19
Open MTP	2.79	2.79	2.65
SCORE MTP	5.46	5.46	5.46

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Residential	**2.34**	**2.34**	**2.20**
Residential SOP	2.29	2.29	2.10
Hard-to-Reach SOP	2.44	2.44	2.44
Load management	**1.81**	**1.81**	**1.81**
Load Management SOP	1.81	1.81	1.81

7.2 EVALUATED SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 29 summarizes savings differences identified by the EM&V team, which SWEPCO also used to adjust their claimed savings. The EM&V team requests that utilities make adjustments to 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 will include these adjustments in their May 1 filing.

Table 29. Evaluated and Claimed Savings Adjustments by Program

Program	Evaluated demand savings differences (kW)	Evaluated energy savings differences (kWh)
Commercial Solutions MTP	-15.50	-135,644
Commercial SOP	-97.69	-408,327
SCORE MTP	101.51	167,501
Hard-to-Reach SOP*	-0.69	-414
Residential SOP*	-0.27	-724
Total	**-12.64**	**-377,608**

* Adjustment included in April 1, 2023 EEPRs filing

7.3 DETAILED FINDINGS—COMMERCIAL

7.3.1 Commercial Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
2.7%	270	270	100.0%	9.9%	1,389,785	1,389,785	100.0%	Good

Completed desk reviews*	On-site M&V visit
4	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial Solutions MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for two projects. One of these projects had adjustments of greater than five percent compared to the originally claimed savings, and the other was very small. SWEPCO accepted the evaluated results and matched the claimed savings to those of the evaluations for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 5423: The site is a warehouse that installed *LED lighting* to replace *metal halide* and *fluorescent lighting*. During the desk review, the EM&V team *added two additional light fixtures* in the entry. These adjustments decreased peak demand (kilowatt) savings and energy (kilowatt-hour) savings slightly and resulted in a realization rate equal to 100 percent.

Participant ID 79632: The project consists of a grocery store that installed new *zero-energy doors* in place of *open cases*. During the desk review, the EM&V team adjusted the savings calculation to match the technical reference manual (TRM) by multiplying the deemed savings by the number of doors. These adjustments decreased peak demand (kilowatt) savings to 40 percent. The adjustments also decreased energy (kilowatt-hour) savings to 40 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., equipment quantity, wattage, Qualified Products Listing (QPL) qualifications) for the four projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included invoices, QPL qualifications, pre- and post-inspection notes, project savings calculators, and photographic documentation of existing and new lighting, HVAC, and refrigeration 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*.

7.3.2 Commercial Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
7.7%	765	765	100.0%	26.9%	3,768,736	3,768,736	100.0%	Fair

Completed desk reviews*	Completed On-site M&V
6	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial SOP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for four projects. One project had an adjustment of less than five percent, and three projects had adjustments 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 73295: A new construction warehouse installed *LED lighting* that exceeded code requirements. During the desk review and on-site M&V visit, the EM&V team decreased the *floor area* of the project and several lighting *fixture wattages* were adjusted to match the DLC listing. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 86 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 86 percent.

Participant ID 73299: The exterior lighting retrofit installed LED *lighting* to replace *metal halide* at a commercial facility. During the desk review and on-site M&V visit, the EM&V team reduced the *exterior pole-mounted lights* from *38* units to *12*. The adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 108 percent. The adjustments also increased energy (kilowatt-hour) savings, resulting in a realization rate of 108 percent.

Participant ID 73305: A new construction warehouse installed *LED lighting* that exceeded code requirements. During the desk review, the EM&V team decreased the *floor area* of the project. This adjustment decreased peak demand (kilowatt) savings and resulted in a realization rate of 59 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 59 percent.

Participant ID 73306: The *LED lighting* retrofit for an outpatient healthcare facility replaced *fluorescent lamps*. During the desk review, the EM&V team adjusted the *wattages* of one light fixture to match the wattages in the ENERGY STAR® Products List. This adjustment increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. The adjustments also increased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

Documentation Score

The EM&V team could not easily verify key inputs and assumptions (e.g., lighting quantity, lighting wattage, QPL qualifications) for the six projects that had desk reviews because documentation was limited for four sites. Project documentation typically included invoices, QPL qualifications, 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 new construction sites did not include a verification of floor area constructed or

COMcheck[9] documentation, and other sites were missing invoices and photo documentation or inspection notes of key pre-installation equipment. Overall, the EM&V team was partially satisfied with the project documentation provided and assigned a program documentation score of *fair*.

7.3.3 SCORE Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
11.8%	1,164	1,164	100.0%	22.5%	3,152,396	3,152,396	100.0%	Good

Completed desk reviews*	Completed On-site M&V
6	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2021 SCORE MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for four projects. One project had an adjustment of less than five percent, and three projects had adjustments 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 5454: A school district upgraded the *HVAC controls* and retro-commissioning for existing equipment, including installing new *thermostats with a web-based operating system* to optimize energy consumption for 139 HVAC zones. This project was submitted for technical review by the evaluation team before claiming savings, resulting in an agreed savings value. The evaluated savings were adjusted to the expected value. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 988 percent. The adjustment also increased energy (kilowatt-hour) savings and resulted in a realization rate of 338 percent.

Participant ID 61243: A junior high school tuned up 36 *air conditioning units*. During the desk review and M&V site visit, the EM&V team slightly adjusted the units' *capacity*. These adjustments increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. The adjustments also increased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

[9] ComCheck software makes it is to determine whether new commercial or high-rise residential buildings, additions, and alterations meet the requirements of the IECC and ASHRAE Standard 90.1, as well as several state-specific codes, COMcheck-Web: Home Page (pnl.gov).

Participant ID 61953: A high school tuned up 48 *air conditioning units*. During the desk review, the EM&V team adjusted the *equivalent full load hours* (*EFLH) cooling hours* from *1,208 hours* (which corresponded with *TRM Zone 2, primary school*) to *1,084 hours* (which corresponds with *TRM Zone 2, secondary school*), as the address is a high school. Similarly, the peak demand factor was adjusted from 0.88 to 1.02. The adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 115 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 90 percent.

Participant ID 79657: A primary school installed energy-efficient *air conditioning units* to replace existing units. During the desk review, the EM&V team used the equipment nameplate photos to adjust the *quantities*, *capacities*, and *efficiencies* to the installed units. This adjustment increased peak demand (kilowatt) savings and resulted in a realization rate of 125 percent. The adjustments also increased energy (kilowatt-hour) savings from 0 to 2,113 kWh.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., lighting quantity, lighting wattage, QPL qualifications) for the four projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included invoices, QPL qualifications, pre- and post-inspection notes, project savings calculators, and photographic documentation of existing and new lighting, 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*.

7.4 DETAILED FINDINGS—RESIDENTIAL

7.4.1 Residential Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
13.9%	1,375	1,375	100.0%	21.4%	3,001,048	3,001,048	100.0%	Fair

Completed desk reviews*	Completed On-site M&V
7	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for three projects. SWEPCO accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

- **Participant ID 14721:** The energy efficiency project included the implementation of a *central heat pump*, *ceiling fan*, *dishwasher*, *LEDs*, and a *smart thermostat*. During the desk review, the EM&V team found that the *smart thermostat ex-ante savings* were calculated based on an *8.5 HSPF*, but the documentation showed the installed unit had an *HSPF of 9.0*. The EM&V team could not reconcile the ex-ante savings and ex-post savings for the *LED* measure. Since an ex-ante calculator was not included in the documentation, the EM&V team could not verify the reasons for the savings gap. The *ex-post savings* were calculated using the *deemed methodology* in the TRM for *LEDs,* resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 99.5 percent and 98.1 percent for demand and energy savings, respectively.

- **Participant ID 14248:** The energy efficiency project included the implementation of a *central heat pump*, *ceiling* fan*, dishwasher*, *LEDs*, and a *smart thermostat*. During the desk review, the EM&V team found that the *LED ex-ante savings* were calculated based on an *8.7 W LED*, but the documentation showed the *LEDs* were 8 W. The EM&V team could not reconcile the ex-ante savings and ex-post savings for the *smart thermostat* measure. Since an ex-ante calculator was not included in the documentation, the EM&V team could not verify the reasons for the savings gap. The *ex-post savings* were calculated using the *deemed methodology* in the TRM for *smart thermostats*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 100.0 percent and 98.5 percent for demand and energy savings, respectively.

- **Participant ID 14688:** The energy efficiency project included the implementation of *ceiling insulation*, *duct sealing*, and *LEDs*. During the desk review, the EM&V team found *only one* of two photos required to claim the *less than R-5 baseline* was included in the documentation. The EM&V team calculated the *ex-post savings* using the *deemed methodology* in the TRM for *ceiling insulation* with a baseline of *R-5*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 83.8 percent and 81.9 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and field notes. However, the TRM requires additional documentation to claim *electric resistance heating* for all *HVAC* and *envelope* measures, which was not included in the documentation for the two projects. The TRM also requires additional photo documentation to claim a *ceiling insulation* baseline less

than R-5, which was not included in the documentation for one project. While the EM&V team was mostly satisfied with the project documentation provided, we assigned a program documentation score of *fair* as SWEPCO does need to meet the required photo documentation for *ceiling insulation* for all projects going forward.

7.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
7.8%	774	774	100.0%	11.0%	1,543,698	1,543,698	100.0%	Fair

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The sample of completed desk reviews and on-site M&V projects for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for one project. SWEPCO accepted the evaluated results and matched the claimed savings for the one project with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

- **Participant ID 14688:** The energy efficiency project included the implementation of *ceiling insulation*. During the desk review, the EM&V team found *only one* of two photos required to claim the *less than R-5 baseline* was included in the documentation. The EM&V team calculated the *ex-post savings* using the *deemed methodology* in the TRM for *ceiling insulation* with a baseline of *R-5*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 57.4 percent and 68.9 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify most key inputs and assumptions, including the project scope, baselines, and equipment specifications for all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and field notes. However, the TRM requires additional documentation to claim *electric resistance heating* for all *envelope* measures, which was not included in the documentation for the two projects. The TRM also requires additional photo documentation to claim a *ceiling insulation baseline* less than *R-5*, which was not included in the documentation for one project. While the EM&V team was mostly satisfied with the project documentation provided, we assigned a program documentation score of *fair* as SWEPCO does need to meet the required photo documentation for *ceiling insulation* for all projects going forward.

7.5 DETAILED FINDINGS—LOAD MANAGEMENT (MEDIUM EVALUATION PRIORITY)

7.5.1 Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
53.3%	5,261	5,261	100.0%	0.%	86,938	86,938	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 commercial SWEPCO Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data were supplied in 15-minute increments. Load management events in PY2022 occurred on the following dates and times:

- May 24, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled),
- May 25, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled),
- May 26, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled),
- May 26, 2022, from 3:00 p.m. to 4:00 p.m. (scheduled),
- May 27, 2022, from 5:00 p.m. to 6:00 p.m. (scheduled),
- June 24, 2022, from 2:00 p.m. to 6:00 p.m. (unscheduled),
- July 7, 2022, from 2:00 p.m. to 6:00 p.m. (unscheduled),
- July 20, 2022, from 2:00 p.m. to 6:00 p.m. (unscheduled), and
- July 26, 2022, from 2:00 p.m. to 6:00 p.m. (unscheduled).

The EM&V team received interval meter data and a spreadsheet that summarized the event-level savings for the six sponsors across eight sites. All sites but one participated in their associated scheduled event (used as a test event) and unscheduled events.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings provided for all sites. The kilowatt savings for each participating site corresponded to the weighted average across the four unscheduled events. The kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 both the EM&V team (evaluated) and SWEPCO's (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings; however, a negligible difference in kilowatt and kilowatt-hour was a result of different rounding practices during calculations. Evaluated savings for the commercial SWEPCO Load Management SOP are 5,261 kW and 86,938 kWh. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

7.6 SUMMARY OF TRACKING-SYSTEM-ONLY EVALUATED PROGRAMS

Table 30 summarizes claimed savings for SWEPCO's programs in PY2022 that only received a tracking system review for program impacts. The programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 30. PY2021 Claimed Savings (Tracking-System-Only Evaluated Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Open MTP	2.6%	260	260	100.00%	7.6%	1,069,607	1,069,607	100.00%

8.0 TEXAS-NEW MEXICO POWER COMPANY IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Texas-New Mexico Power Company's (TNMP) 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 the *low* evaluation priorities for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

8.1 KEY FINDINGS

8.1.1 Evaluated Savings

TNMP's evaluated savings for program year (PY) 2022 (PY2022) were 13,689 in demand (kilowatt, kW) and 18,056,658 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. TNMP was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (Table 34), supporting healthy realization rates.

Table 31 shows the claimed and evaluated demand savings for TNMP's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 31. TNMP PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**13,689**	**13,689**	**100.0%**	**N/A**
Commercial	21.0%	2,877	2,877	100.0%	N/A
Residential	21.9%	2,993	2,993	100.0%	N/A
Low-income	3.7%	512	512	100.0%	N/A
Load management*	53.4%	7,306	7,306	100.0%	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.

Table 32 shows the claimed and evaluated energy savings for TNMP's portfolio and broad customer sector and program categories for PY2022.

Table 32. TNMP PY2022 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	100.0%	18,056,658	18,056,658	100.0 %	N/A
Commercial	53.7%	9,698,134	9,698,134	100.0%	N/A
Residential	41.4%	7,476,160	7,476,160	100.0%	N/A
Low-income	4.8%	875,058	875,058	100.0%	N/A
Load management*	0.0%	7,306	7,306	100.0%	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.

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

In program-level realization rates, we have also included a qualitative rating of *good*, *fair*, and *limited* associated with the level of program documentation received from the utility. TNMP received *good* documentation scores for all evaluated programs, except the High-Performance Homes MTP, which received a *fair* documentation score.

8.1.2 Cost-Effectiveness Results

TNMP's overall portfolio had a cost-effectiveness score of 2.7, or 2.9, excluding low-income programs.

The more cost-effective programs were the Commercial Solutions MTP and the SCORE/CitySmart MTP; the less cost-effective programs were the Load Management SOP and the Open for Small Business MTP. All of TNMP's programs were cost-effective in 2022.

The lifetime cost of claimed savings was $0.017 per kilowatt-hour and $16.12 per kilowatt.

Table 33. TNMP Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**2.71**	**2.71**	**2.54**
Total portfolio excluding low-income programs	**2.90**	**2.90**	**2.72**
Commercial	**3.33**	**3.33**	**3.30**
Open for Small Business MTP	2.37	2.37	2.25
SCORE/CitySmart MTP	3.24	3.24	3.24
Commercial Solutions MTP	3.89	3.89	3.89

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Residential	**2.70**	**2.70**	**2.38**
High-Performance Homes MTP	3.40	3.40	2.38
Residential SOP	2.59	2.59	2.37
Hard-to-Reach SOP	2.39	2.39	2.39
Low-income	**2.58**	**2.58**	**2.58**
Low-Income Weatherization*	2.58	2.58	2.58
Load management	**1.70**	**1.70**	**1.70**
Load Management SOP	1.70	1.70	1.70

* The low-income program is evaluated using the savings-to-investment ratio (SIR).

8.2 CLAIMED SAVINGS ADJUSTMENTS

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 34 summarizes claimed savings adjustments recommended by the EM&V team where project-level evaluated savings differed from claimed savings by five percent or more. Realization rates assume the following adjustments will be included in TNMP's June 1 filing. There may be differences between evaluated and claimed savings that did not result in a recommended adjustment because the difference is less than five percent.

Table 34. Evaluation, Measurement, and Verification Claimed Savings Adjustments by Program (Prior to EECRF[10] Filing)

Program	EM&V demand claimed savings adjustments (kW)	EM&V energy claimed savings adjustments (kWh)
Commercial Solutions MTP	-26.37	-82,524.00
SCORE/CitySmart MTP	1.60	720.00
Hard-to-Reach SOP	-0.43	-936.89
Residential SOP	-1.14	-2,025.32
High-Performance Homes MTP	101.64	353,396.19
Total	**75.30**	**268,629.98**

[10] Energy efficiency cost recovery factor.

8.3 DETAILED FINDINGS—COMMERCIAL

8.3.1 Commercial Solutions Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
8.14%	1,115	1,115	100.0%	28.8%	5,208,748	5,208,748	100.0%	Good

Completed desk reviews*	On-site M&V visit
8	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial Solutions MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for three projects. All three projects had an adjustment of greater than five percent compared to the originally claimed savings. TNMP accepted the evaluated results and adjusted savings for all measures to match the claimed kilowatt-hour and kilowatt savings. The final program realization rate rounds to 100 percent. Further details of the EM&V findings are provided below.

Participant ID 5551: A hotel installed *solar panels* on the roof. During the desk review, the EM&V team adjusted the *tilt angle* based on communications in the documentation. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 91 percent. However, the adjustments slightly increased energy (kilowatt-hour) savings and resulted in a realization rate of 101 percent.

Participant ID 62461: A retail grocery had two projects completed, which were both sampled: a *lighting* retrofit and a *refrigeration display* renovation. The *lighting* retrofit project had an on-site verification, but the *refrigeration display* upgrades did not. The *lighting* project had a slight adjustment for one *fixture wattage* based on the DesignLights Consortium (DLC) Qualified Product List (QPL). The *lighting* retrofit project resulted in a realization rate that rounded to 100 percent. The *refrigeration display* case renovation installed doors on previously open display cases and claimed energy savings for the *door gaskets*, *evaporative fan controls*, and *zero-energy doors* for the medium and low-temperature coolers. During the desk review, the EM&V team adjusted the *zero-energy door quantities*, *storage temperatures*, and the *units* from *linear feet* to the *number of doors* to match the calculation requirements. The *gasket length* was adjusted for medium and low-temperature doors, and the *evaporator fan* savings were deemed by multiplying the deemed value by the number of fans installed. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 57 percent. The adjustments decreased energy (kilowatt-hour) savings and resulted in a realization rate of 72 percent.

Participant ID 79672: A retail facility installed *LED lighting* with network *lighting controls* to replace the existing *LED lighting* system. During the desk review and on-site M&V visit, the EM&V team adjusted the post-retrofit fixture *wattage* for one fixture based on a more accurate DLC listing. Also, one fixture was determined not to be in operation. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 92 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 92 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions (e.g., equipment quantity; equipment capacity; QPL qualifications; Air Conditioning, Heating, and Refrigeration Institute (AHRI) certifications) for the seven projects that had desk reviews because sufficient documentation was provided for the sites. Project documentation included invoices, QPL qualifications or AHRI certifications, pre- 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*.

8.3.2 SCORE/CitySmart Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.9%	537	537	100.0%	11.7%	2,108,367	2,108,367	100.0%	Good

Completed desk reviews*	On-site M&V visit
6	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 SCORE/CitySmart MTP evaluation efforts focused on desk reviews and on-site M&V visits. The sample of completed desk reviews and on-site M&V visits for this program is listed above.

The EM&V team adjusted the claimed savings for four projects. One project had an adjustment of greater than five percent compared to the originally claimed savings, while three projects had minor adjustments of less than five percent compared to the originally claimed savings. TNMP accepted the evaluated results and adjusted savings to match the claimed kilowatt-hour and kilowatt savings for all projects. The final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 64341: A new construction elementary school installed energy-efficient *air-cooled chillers*, *heat pumps*, and interior and exterior *LED lighting*. During the desk review, the EM&V team was able to identify the specifications for one of the *HVAC* units installed, so the additional *direct expansion (DX) air-cooled unit* was included in the savings calculations. In the *lighting* calculation, some fixtures were determined not to qualify because they did not have a DLC QPL or ENERGY STAR® listing. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate of 106 percent. The adjustments also slightly increased energy (kilowatt-hour) savings and resulted in a realization rate of 103 percent.

Participant ID 64351: An elementary school completed an energy-efficient *lighting* and *HVAC* retrofit. During the desk review and on-site M&V visit, the EM&V team adjusted *fixture quantities* and one *fixture type* based on the post-inspection photos. The *HVAC units* were adjusted from *replace-on-burnout* (*ROB)* to *early replacement (ER)* based on the equipment's age and the units' conditions based on the photos, and the *unit types* were adjusted from *split systems* to *packaged units* based on the photos. The pre-retrofit *model number* was adjusted based on the specification sheets found, and the *unit capacities* were adjusted based on the AHRI certificates. These adjustments slightly decreased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. The adjustments also slightly decreased energy (kilowatt-hour) savings but resulted in a realization rate that rounded to 100 percent.

Participant ID 65061: A new construction school installed *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted two post-retrofit fixtures from *non-qualifying* to *qualifying* based on DLC QPL or ENERGY STAR listings. The exterior *lighted area* was adjusted from *Zone 3* to *Zone 2* based on facility location. These adjustments slightly increased peak demand (kilowatt) savings but resulted in a realization rate that rounded to 100 percent. However, the adjustments slightly decreased energy (kilowatt-hour) savings and resulted in a realization rate of 99 percent.

Documentation Score

The EM&V team verified key inputs and assumptions (e.g., equipment quantity, equipment capacity, QPL qualifications) for the six projects that had desk reviews completed because sufficient documentation was provided for the sites. Project documentation at these sites included invoices, QPL qualifications, pre- and post-install inspection notes, project savings calculators, and photographic documentation of existing and new equipment. However, several sites were found to be missing invoices. Complete documentation enhances the accuracy and transparency of project savings and ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

8.4 DETAILED FINDINGS—RESIDENTIAL

8.4.1 Residential Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
13.6%	1,896	1,896	100.0%	26.2%	4,746,288	4,746,288	100.0%	Good

Completed desk reviews*	Completed On-site M&V
7	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential SOP evaluation efforts focused on desk reviews and on-site M&V. The number of completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for two projects. TNMP accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 15873: The energy efficiency project included the installation of two *air conditioning units*. During the desk review, the EM&V team found that the ex-ante calculation tracked an incorrect *cooling capacity* based on the nameplate photos provided for the installed unit. The EM&V team adjusted the *cooling capacity*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 67.0 percent and 79.8 percent for demand and energy savings, respectively.

Participant ID 15851: The energy efficiency project included the implementation of an *advanced power strip*, *ceiling insulation*, *LEDs*, and *duct sealing*. During the site visit, the EM&V team tested substantially *higher levels of duct leakage CFM* than was tracked. The *ex-post savings* were calculated using the *testing methodology* in the TRM for *duct sealing* using the *site visit test results*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 87.6 percent and 88.4 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify key inputs and assumptions for the four projects that had desk reviews. Project documentation at these sites included customer agreements, test results, certifications, equipment specification sheets, and photographic documentation of pre- and post-conditions. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

8.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
3.5%	479	479	100.0%	6.4%	1,154,512	1,154,512	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The number of completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for two projects. TNMP accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 16020: The energy efficiency project included the installation of *ceiling insulation* in a multifamily building. During the desk review, the EM&V team found that the *insulation level* installed at this home was misclassified as *R-4*, as based on comparisons to other projects in the building, an *insulation level* of *R5-8* was more appropriate. The EM&V team adjusted the *insulation level* installed, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 76.9 percent and 71.6 percent for demand and energy savings, respectively.

Participant ID 16243: The energy efficiency project included the implementation of an *advanced power strip*, *ceiling insulation*, *LEDs*, and *duct sealing*. During the site visit, the EM&V team tested substantially *higher levels of duct leakage CFM* than was tracked. The *ex-post savings* were calculated using the *testing methodology* in the TRM for *duct sealing* using the *site visit test results*, resulting in a decrease in savings. Overall, the adjustments resulted in project-level realization rates of 83.4 percent and 85.4 percent for demand and energy savings, respectively.

Documentation Score

The EM&V team was able to verify key inputs and assumptions for the four projects that had desk reviews. Project documentation at these sites included customer agreements, test results, certifications, equipment specification sheets, and photographic documentation of pre- and post-conditions. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good*.

8.4.3 High-Performance Homes Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate(kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
4.5%	618	618	100.0%	8.8%	1,575,360	1,575,360	100.0%	Fair

Completed desk reviews*
5

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 High-Performance Homes MTP evaluation efforts focused on desk reviews. The number of completed desk reviews for this program is listed above. Five desk reviews were completed to check that the measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.

The EM&V team adjusted the total claimed savings for the program. TNMP accepted the evaluated results and matched the claimed savings to those of the evaluation. Therefore, the final program realization rate is 100 percent for kilowatt and kilowatt-hour. Further details of the EM&V findings are provided below.

During the desk review process, the EM&V team identified an issue with the modeled savings reported in the documentation submitted by the HERs raters not matching the ex-ante savings reported by the utility for all five of the sampled projects. Upon further review, the implementer identified a programming error in their system, causing the tracking system to report different ex-ante savings than calculated in the project models, affecting all projects reported in the High-Performance Homes program for PY2022. The EM&V team reviewed additional documentation

provided by the implementer and the modeling software to determine the program-wide adjustment.

Documentation Score

The EM&V team met with the utility and implementer on multiple occasions to review the documentation requirements and ensure all required documentation was made available for the evaluation. Once documentation was received, the EM&V team was able to verify key inputs and assumptions for the five projects that had desk reviews. Project documentation at these sites included HERs certificates, fuel summary reports, and new equipment specifications. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. However, overall, the EM&V team assigned a program documentation score of *fair.*

8.5 DETAILED FINDINGS—LOW-INCOME

8.5.1 Low-Income Weatherization Program

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (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%	512	512	100.0%	4.8%	875,058	875,058	100.0%	Good

Completed desk reviews*	Completed on-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Low-Income Weatherization evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.
- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team did not have any adjustments from the desk reviews, resulting in 100 percent realization rates.

Documentation Score

The EM&V team was able to verify key inputs and assumptions for the three projects that had desk reviews. Project documentation at these sites included customer agreements, equipment specification sheets, and photographic documentation of pre- and post-conditions. Complete documentation enhances the accuracy and transparency of project savings along with ease of evaluation. Overall, the EM&V team assigned a program documentation score of *good.*

8.6 DETAILED FINDINGS—LOAD MANAGEMENT (MEDIUM EVALUATION PRIORITY)

8.6.1 Load Management Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
53.4%	7,306	7,306	100.0%	0.0%	7,306	7,306	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 commercial TNMP Load Management SOP by applying the TRM calculation methodology to interval meter data. The meter data was supplied in 30-minute increments. Load management events in PY2022 occurred on the following dates and times:

- June 1, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled),
- June 2, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled), and
- June 3, 2022, from 2:00 p.m. to 3:00 p.m. (scheduled).

There were no unscheduled events in PY2022. The EM&V team received interval meter data and a spreadsheet that summarized the event-level savings for the nine sponsors across 80 sites. Twenty-one sites did not participate in any of the scheduled events. All sponsors had at least one site that curtailed during each event.

After the EM&V team applied the *High 5 of 10* baseline calculation method, it was found that the evaluated savings matched the savings provided for all sites. The kilowatt savings for each participating site corresponded to the kilowatt reductions that occurred at the scheduled event (no averaging was necessary because each participating site participated in only one event). The kilowatt-hour savings for each participating site were calculated by multiplying the kilowatt 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 TNMP's (claimed) calculated kilowatt and kilowatt-hour savings. No adjustments were made to the program savings. Evaluated savings for the commercial TNMP Load Management SOP are 7,306 for both kilowatt and kilowatt-hour, since each site participated in only one hour-long event. The realization rate for both kilowatt and kilowatt-hour is 100 percent, with a documentation score of *good*.

8.7 SUMMARY OF LOW EVALUATION PRIORITY PROGRAMS

Table 35 summarizes claimed savings for TNMP's *low* evaluation priority programs in PY2022, including the programs' overall contribution to portfolio savings. *Low*-priority programs' claimed savings were verified against the final PY2022 tracking data provided to the EM&V team for the EM&V database.

Table 35. PY2022 Claimed Savings (Low Evaluation Priority Programs)

Program	Contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)
Open for Small Business MTP	9.0%	1,225	1,225	100.0%	13.2%	2,381,019	2,381,019	100.0%

9.0 XCEL ENERGY SOUTHWESTERN PUBLIC SERVICE COMPANY IMPACT EVALUATION RESULTS

This section presents the evaluated savings and cost-effectiveness results for Xcel Southwestern Public Service Company's (Xcel SPS) 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 the *low* evaluation priority for which claimed savings were verified through the evaluation, measurement, and verification (EM&V) database is included.

9.1 KEY FINDINGS

9.1.1 Evaluated Savings

Xcel SPS's evaluated savings for program year (PY) 2022 (PY2022) were 8,431 in demand (kilowatt, kW) and 18,881,682 in energy (kilowatt-hour, kWh) savings. The overall kilowatt and kilowatt-hour portfolio realization rates are approximately 100 percent. Xcel SPS was responsive to all EM&V recommendations to adjust claimed savings based on EM&V results (Table 39), supporting healthy realization rates.

Table 36 shows the claimed and evaluated demand savings for Xcel SPS's portfolio and broad customer sector and program categories. Residential and load management results are based on census reviews, and therefore, precision calculations are not applicable (N/A).

Table 36. Xcel SPS PY2022 Claimed and Evaluated Demand Savings

Level of analysis	Percentage portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Precision at 90% confidence
Total portfolio	**100.0%**	**8,431**	**8,431**	**100.0%**	**N/A**
Commercial	15.2%	1,285	1,285	99.9%	N/A
Residential	41.7%	3,516	3,516	100.0%	N/A
Low-income	4.1%	348	348	100.0%	N/A
Load management*	38.9%	3,282	3,282	100.0%	N/A
Pilot	0%	0	0	100.0%	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.

Table 37 shows the claimed and evaluated energy savings for Xcel SPS's portfolio and broad customer sector and program categories for PY2022.

Table 37. Xcel SPS PY2020 Claimed and Evaluated Energy Savings

Level of analysis	Percentage portfolio savings (kWh)	Claimed energy savings(kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Precision at 90% confidence
Total portfolio	**100.0%**	**18,881,682**	**18,881,682**	**100.0%**	**N/A**
Commercial	33.3%	6,293,867	6,293,867	100.0%	N/A
Residential	59.9%	11,301,400	11,301,400	100.0%	N/A
Low-income	5.5%	1,042,850	1,042,850	100.0%	N/A
Load management*	0.0%	3,282	3,282	100.0%	N/A
Pilot	1.3%	240,284	240,284	100.0%	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.

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

In program-level realization rates, we have also included 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 evaluated programs except the Commercial SOP, which received a *fair* documentation score.

9.1.2 Cost-Effectiveness Results

Xcel SPS's overall portfolio had a cost-effectiveness score of 3.5, or 3.8 excluding low-income programs.

The more cost-effective programs were the Home Lighting MTP (residential and commercial) and the Smart Thermostat MTP Pilot; the less cost-effective programs were the Refrigerator Recycling MTP and the Load Management SOP. All of Xcel SPS's programs were cost-effective, except the Load Management SOP program, with a 0.86 cost-effectiveness score in 2022.

The lifetime cost of claimed savings was $0.015 per kilowatt-hour and $13.75 per kilowatt.

Table 38. Xcel SPS Cost-Effectiveness Results

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Total portfolio	**3.50**	**3.50**	**3.29**
Total portfolio excluding low-income programs	**3.76**	**3.76**	**3.51**
Commercial	**3.39**	**3.39**	**3.15**
Commercial SOP	3.49	3.49	3.49

Level of analysis	Claimed savings results	Evaluated savings results	Net savings results
Retro-Commissioning MTP	2.38	2.38	2.14
Small Commercial MTP	2.08	2.08	1.98
Home Lighting MTP	50.58	50.58	45.53
Residential	**4.39**	**4.39**	**4.11**
Residential SOP	2.49	2.49	2.28
Home Lighting MTP	9.56	9.56	8.61
Refrigerator Recycling MTP	1.18	1.18	0.93
Hard-to-Reach SOP	3.20	3.20	3.20
Low-income	**2.46**	**2.46**	**2.46**
Low-Income Weatherization*	2.46	2.46	2.46
Load management	**0.86**	**0.86**	**0.86**
Load Management SOP	0.86	0.86	0.86
Pilot	**10.67**	**10.67**	**8.53**
Smart Thermostat MTP Pilot	10.67	10.67	8.53

* The low-income program is evaluated using the savings-to-investment ratio (SIR).

9.2 EVALUATED SAVINGS DIFFERENCES

As discussed above, utilities are provided the opportunity to adjust savings at the project level based on interim EM&V findings. Table 39 summarizes evaluated savings differences identified by the EM&V team, which Xcel SPS also used to adjust their claimed savings. The EM&V team requests that utilities make adjustments to projects when evaluated, and claimed savings differ by more than five percent. Xcel SPS adjusted claimed savings for all projects with any differences found by the EM&V team and will include these adjustments in their May 1 filing.

Table 39. Evaluated Savings Differences by Program

Program	Evaluated demand savings differences (kW)	Evaluated energy savings differences (kWh)
Commercial SOP	-243.45	-1,506,436
Retro-Commissioning MTP	-139.98	-584,784
Hard-to-Reach SOP	0.065	62
Residential SOP	0.247	115
Total	**-383.118**	**-2,091,042**

9.3 DETAILED FINDINGS—COMMERCIAL

9.3.1 Commercial Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (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%	308	308	100.0%	7.7%	1,446,793	1,446,793	100.0%	Fair

Completed desk reviews*	On-site M&V visit
8	3

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Commercial SOP evaluation efforts focused on desk reviews with on-site EM&V visits. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for six projects. Two projects had an adjustment of less than five percent, while the four remaining projects had adjustments greater than five percent. Three of the projects, in particular, had major decreases in savings, as each of the projects was for a new construction gas station's lighting. Xcel SPS accepted the evaluated results and matched the claimed savings to the evaluated savings. The final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 16496: A public assembly event center installed interior *LED lighting,* replacing *fluorescent fixtures* with *LED tubes* and various *screw-in lamps with LED lamps*. During the desk review, the EM&V team adjusted the *wattage* of *lighting* equipment to match the wattages in the DesignLights Consortium (DLC) Qualified Products List (QPL). Line item 8 on the *interior lighting* calculation sheet had a wattage adjustment from *10 W* to *9.5 W* based on the DLC certificate. These adjustments increased peak demand (kilowatt) savings and resulted in a realization rate that rounded to 100 percent. The adjustments also increased energy (kilowatt-hour) savings and resulted in a realization rate that rounded to 100 percent.

Participant ID 16497: A grocery store replaced *fluorescent* and *incandescent interior lighting* and *metal halide* exterior lighting with new *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *wattage* of the *lighting equipment* to match the wattages in the DLC QPL. Also, the calculator had a pre-retrofit fixture *blank*, which left savings zero despite a post-retrofit fixture line item. The pre-retrofit values were filled in to adjust savings for the line item. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 87 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 87 percent.

Participant ID 69873: An office that installed *LED lighting* to replace *fluorescent* and *metal halide* lighting. During the desk review, the EM&V team adjusted the *wattage* of a fixture to match the wattage in the DLC QPL and the *lighting equipment quantity* in the calculator to ensure the calculation worked properly. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 99 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 99 percent.

Participant ID 69875: A new construction gas station installed *LED lighting* in the gas canopy and driveway/parking lot area. During the desk review, the EM&V team adjusted the exterior *building zone* from *Zone 4* to *Zone 3* and adjusted the *gross exterior lighting area classifications*. These adjustments significantly reduced the energy efficiency, which exceeded the code, resulting in a realization rate of four percent for demand (kilowatt) savings. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of four percent.

Participant ID 69877: A new construction gas station installed exterior *LED lighting* under gas canopies and in the parking lot. During the desk review, the EM&V team adjusted the *exterior building zone* from *Zone 4* to *Zone 3* and adjusted the *gross exterior lighting area classifications*. These adjustments eliminated the energy efficiency, which exceeded the code. Therefore, the adjustments decreased the peak demand (kilowatt) savings and resulted in a realization rate of zero percent. The adjustments also decreased energy (kilowatt-hour) savings, which resulted in a realization rate of zero percent.

Participant ID 69878: A new construction gas station installed exterior *LED lighting* in the parking lot/drive, building entry canopy, and gas pump canopies. During the desk review, the EM&V team adjusted the *exterior building zone* from *Zone 4* to *Zone 3* and adjusted the *gross exterior lighting area classifications*. These adjustments significantly decreased the energy efficiency, which exceeded the code. The adjustments decreased the peak demand (kilowatt) savings and resulted in a realization rate of three percent. The adjustments also decreased energy (kilowatt-hour) savings, which resulted in a realization rate of three percent.

Documentation Score

The EM&V team was partly able to verify key inputs and assumptions (e.g., equipment quantity, QPL qualifications) for the eight projects that had desk reviews because sufficient documentation was provided for the sites. Six of the eight projects were missing key documentation, such as itemized invoices, DLC and ENERGY STAR® certifications, and photos, while two projects provided sufficient documentation. Overall, the EM&V team was somewhat satisfied with the project documentation provided and assigned a program documentation score of *fair.* In the future, the EM&V team would like to see the missing items listed above for the six projects.

9.3.2 Retro-Commissioning Market Transformation Program (MTP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.7%	483	483	100.0%	12.8%	2,411,457	2,411,457	100.0%	Good

Completed desk reviews*	Completed On-site M&V
6	4

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Retro-Commissioning MTP evaluation efforts focused on desk reviews with on-site M&V visits. The sample of completed desk reviews for this program is listed above.

The EM&V team adjusted the claimed savings for four projects. The four projects 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 significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings are provided below.

Participant ID 130003: An airport terminal installed *LED lighting* to replace *fluorescent lighting*. During the desk review, the EM&V team adjusted the *building type* to *public assembly* and adjusted the *quantity* of installed *LED tubes* and *fixtures*. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 73 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 78 percent.

Participant ID 130004: A new construction eye clinic and parking garage installed energy-efficient *LED lighting*. During the desk review and on-site M&V visit, the EM&V team adjusted the *gross lighted area* for the building interior and parking garage, adjusted the *building type* to *health care/clinic*, and adjusted the *wattage* of one *lighting fixture* to match DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of six percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of five percent.

Participant ID 130005: A middle school added an addition and renovated a portion of the existing building with energy-efficient *LED lighting*, *air conditioners*, and *heat pumps*. During the desk review and on-site M&V visit, the EM&V team adjusted the *gross lighted area* and adjusted the *wattage* of two *lighting fixtures* to match DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 17 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 17 percent.

Participant ID 130006: A new construction high school installed *LED lighting* and energy-efficient *HVAC units* that exceeded code requirements. During the desk review, the EM&V team adjusted the *make* and *model* of one *rooftop unit* and adjusted the *capacity* of two other units to match the AHRI-tested results. The *building area* was adjusted to match the actual construction and remove the *auditorium area* and *lighting fixtures* from the calculated savings. Two *lighting fixtures* were adjusted to match DLC QPL. These adjustments decreased peak demand (kilowatt) savings and resulted in a realization rate of 70 percent. The adjustments also decreased energy (kilowatt-hour) savings and resulted in a realization rate of 62 percent.

Documentation Score

The EM&V team was able to verify key inputs and assumptions, including the project scope, completed adjustments, equipment efficiencies, and operating parameters for all six projects that had desk reviews. Project documentation included calculations, EM&V plans, engineering drawings, DLC and ENERGY STAR certifications, specification sheets, invoices, post-inspection notes, and photos. Although invoices and post-inspections photos were missing for several projects. Generally, the documentation contained all the key parameters and required additional effort to determine the project scope and impact. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good*.

9.4 DETAILED FINDINGS—RESIDENTIAL

9.4.1 Residential Standard Offer Program (SOP) (Medium Evaluation Priority)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
5.2%	436	436	100.0%	6.2%	1,175,830	1,175,830	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Residential SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.

Overall, the EM&V team assessed ex-ante claimed energy and demand savings across the following two activities:

- For a sample of projects, desk reviews were completed to check that measure data and documentation collected by contractors aligned correctly with that in the tracking system, and savings were calculated in accordance with the TRM.

- On-site M&V was completed for a sample of projects to verify that measures remained installed and matched project documentation.

The EM&V team adjusted the claimed savings for one project. Xcel SPS accepted the evaluated results and matched the claimed savings for the projects with significant adjustments; therefore, the final program realization rate is 100 percent. Further details of the EM&V findings and adjustments are provided below.

Participant ID 16524: The energy efficiency project included the implementation of *ceiling insulation*. During the desk review, the EM&V team found the tracking system reported the *baseline* as *R-4*. While *only one* of two photos required to claim the *less than R-5 baseline* was included in the documentation, the *ex-ante savings* do not appear to use the *less than R-5 baseline deemed savings*. The EM&V team also found a discrepancy in the *tracked square footage* compared to the documentation and calculated the ex-post savings using the deemed methodology in the TRM for *ceiling insulation* defaulting to a baseline of *R-5* and the *documented square footage*, resulting in an increase in savings. Overall, the adjustments resulted in project-level realization rates of 142.2 percent and 105.5 percent for demand and energy 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 all sampled projects that had desk reviews. Project documentation included customer agreements, photos, and certifications. Overall, the EM&V team was satisfied with the project documentation provided and assigned a program documentation score of *good.*

9.4.2 Hard-to-Reach Standard Offer Program (SOP)

Program contribution to portfolio savings (kW)	Claimed demand savings (kW)	Evaluated demand savings (kW)	Realization rate (kW)	Program contribution to portfolio savings (kWh)	Claimed energy savings (kWh)	Evaluated energy savings (kWh)	Realization rate (kWh)	Program documentation score
14.4%	1,211	1,211	100.0%	19.9%	3,757,859	3,757,859	100.0%	Good

Completed desk reviews*	Completed On-site M&V
4	2

*Confidence intervals are not reported at the utility program level as these results should only be viewed qualitatively due to the small sample sizes.

The PY2022 Hard-to-Reach SOP evaluation efforts focused on desk reviews and on-site M&V. The number of sampled and completed desk reviews and site visits for this program are listed above.