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# Optimizing Low-Income Energy Efficiency Program Eligibility Verification

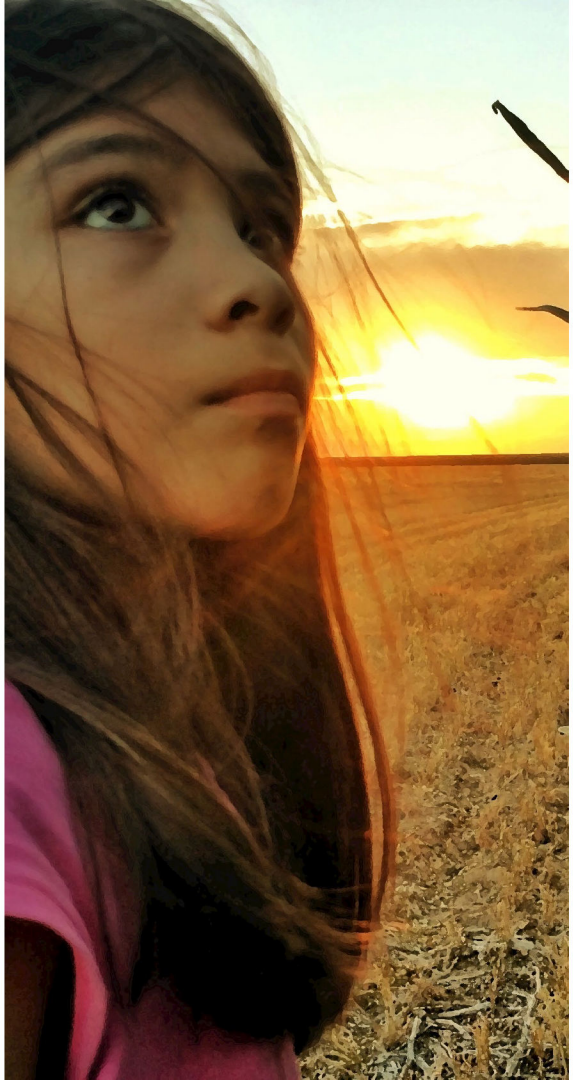
Report | Prepared for Oncor Electric Delivery

By Jacquie Moss with Dana Harmon & Tam Kemabonta

Created May 2021 • Updated September 2021

TEPRI
Texas Energy Poverty Research Institute

# About TEPRI



## Mission

Inspire lasting energy solutions

## Approach

Link community voices with science, data, and innovative partnerships

Deliver best available information to decision-makers

## Outcomes

Energy poverty reduction
Economic development
Community well-being

# Our Work

## RESEARCH & EVALUATION

Advance collective knowledge about low-income consumers and their relationships to energy.

## DECISION TOOLS

Develop tools to stakeholders make more informed decisions about serving energy needs.

## STAKEHOLDER FORUMS

Connect professional peers from power sector, social services, and housing.

## OUTREACH & EDUCATION

Reinvent energy consumer engagement for more effective programs.

# Purpose of this Document

TEPRI conducted a study to research and provide recommendations for revising the low-income program eligibility verification processes. The study is sponsored by Oncor.

The objectives of this study were to develop recommendations that will:

- Provide assurance that the low-income and hard-to-reach energy programs are reaching people they are intended to reach
- Avoid instituting any additional barriers to program participation (and ideally, encourage greater participation)
- Operate within the existing regulatory framework (require no rule change at the commission)

# Background Information

- 16 TAC § 25.181 (Rule) requires that ERCOT TDUs spend no less than **10%** of their annual budget on **targeted low-income programs**.
  - These programs are administered under similar guidance as Federal Weatherization Programs.
  - Program income verification in targeted low-income programs is considered sufficient and is not being addressed in this study.
- Additionally, the Rule requires all regulated Texas electric utilities are required to achieve no less than **5%** of their total portfolio demand reduction goal through programs serving **hard-to-reach** customers.
  - TDUs use certification forms maintained by the PUCT to qualify hard-to-reach program participants.
    - There are separate forms for single family and multifamily participants.
    - Single-family participants self-certify their income and no additional documentation is required.
  - This study addresses alternatives to self-certification in hard-to-reach programs.
- Customers are eligible to participate in either program if their household income is less than **200% of the Federal Poverty Level**.

# Research Questions

At Oncor's request, TEPRI designed this study to explore certification options.

- What are the advantages and disadvantages of different certification methods?
- Since there is strong interest from all stakeholder in using a geography-based eligibility method, how effective is that method in identifying low-income households across the Oncor service area? How many low-income people would be captured by a geo-eligibility model? How many low-income people fall outside of eligible areas?
- What other methods are available and achievable to efficiently qualify eligible households?

# Research Steps

## Discovery

Synthesize materials

Investigate other programs

Collect data

Interview stakeholders

## Analysis

Additional interviews

Data & spatial analysis

Discuss initial findings

## Recommendations

Detailed analysis

Final report

Presentation

# Themes

**Any barriers** that we introduce in eligibility verification are likely to create **more problems** than those that we want to solve. It is already hard to reach and serve these households with plenty of barriers to already overcome.

There is reluctance to assume responsibility in **handling personal information**. We agree that neither contractors, implementors, nor utilities should be responsible nor accountable for verifying the accuracy of customer information.

# Primary Recommendations

| | |
|---|---|
| **Geo-eligibility** | Use an existing data model to verify eligibility using the premise address. |
| **Real-time Verification** | Enable real-time address verification through a secure web-based tool. |
| **Leverage Existing Programs** | Allow retracted documentation as proof of eligibility. |
| **Self-Certification** | Support self-certification be permissible as a last resort. |

# Considerations to Improve Program Eligibility Verification

**Geo-Eligibility** | Real-time Verification | Leverage Existing Programs

- **Geographically-based eligibility** verification is emerging as an innovate approach across the U.S.
- We compared the **LMISD** block group data to the Qualified Census Tracts (**QCTs**). Used together, they would provide a high level of coverage in identifying low-income households by premise address.
- The analysis featured in this report is specific to the **Oncor** service area. We have **statewide** data available for separate analysis.

# Considerations to Improve Program Eligibility Verification

Geo-Eligibility | **Real-time Verification** | Leverage Existing Programs

- It is important that the process be achievable **real-time**. Time delays are a meaningful barrier to customer participation and cost-effective implementation.
- Coordinate with an **agency partner to maintain a database** of customers participating in an income-qualified program (at or less than 200% FPL).
- A **web-based tool** that allows contractors and implementors to verify a customer's eligibility would be a very cost-effective method to improving confidence while avoiding the barrier of time delays.

# Considerations to Improve Program Eligibility Verification

Geo-Eligibility | Real-time Verification | **Leverage Existing Programs**

- This list of **social service programs** that TetraTech outlined covers all the major programs, except Lifeline) that have a relevant income certification process.
- We suggest that the measures be permitted **once the form is completed** and there be no prerequisite documentation verification process.
- We recommend that **self-certification be permissible** as a last resort.
- Conduct a **periodic audit** using a random sampling of customers who relied on self-certification.

# Consideration: List of Category 1 Programs

TEPRI reviewed the list of programs that are listed in the January 2021 TetraTech memo, which we picture here. This list covers all the major programs that have a relevant income certification process. We suggest adding the **Lifeline** program, from which this list was borrowed, as another option.

**Consideration 2: Expand Category 1 qualifying programs and services.** To provide more options to qualify for the program, the eligibility forms should be revised with additional qualifying programs and services for Category 1. For single-family, these could include additional program options already part of the PUCT Lifeline Program as follows:

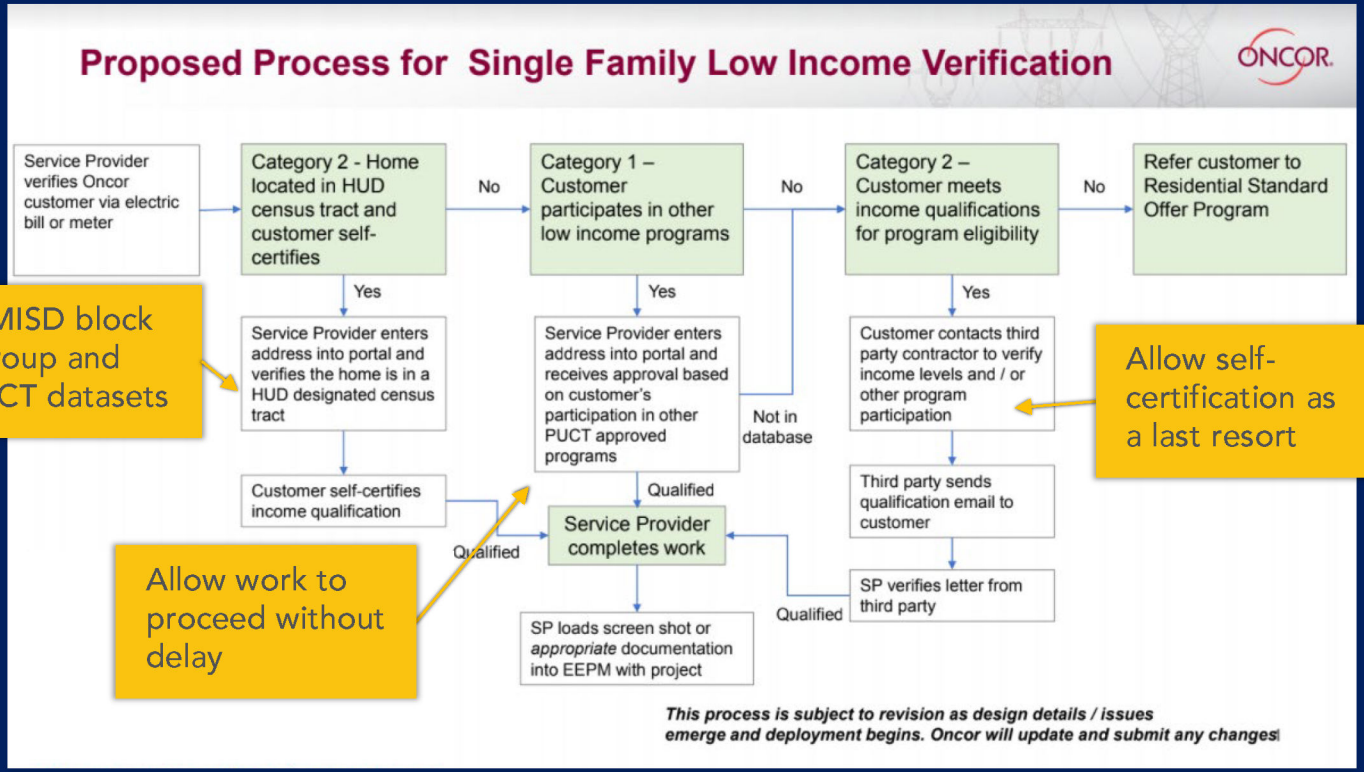
- Supplemental Nutrition Assistance Program (SNAP) (Food Stamps)
- Medicaid
- Supplemental Security Income (SSI)
- Federal Public Housing Assistance (FPHA)
- Health Benefit Coverage under Child Health Plan (CHIP)
- Federal Public Housing Assistance
- Supplemental Security Income-SSI
- Veterans Pension Benefit or Survivors Pension Benefit
- Low-Income Energy Assistance Program - LIHEAP
- National School Lunch Program - Free Lunch Program
- Temporary Assistance for Needy Families (TANF)
- Bureau of Indian Affairs (BIA) General Assistance
- Tribal Temporary Assistance for Needy Families (Tribal TANF)
- Food Distribution Program on Indian Reservations (FDPIR)
- Tribal Head Start (only households that meet the income qualifying standard)

Documentation of participation in the selected program should be submitted for single-family households as required for multi-family Category 1 participants.

This list is from a January 5, 2021, memo from Lark Lee.*

*Lee, Lark, Evaluation Measurement & Verification (EM&V) project manager. "Low-income energy efficiency program eligibility certification." Therese Harris and Keith Rogas, Public Utility Commission of Texas (PUCT) and the Texas electric utilities. December 3, 2020, revised January 5, 2021.

# USER JOURNEY: Oncor Proposed Single-Family Verification Process




TEPRI suggestions based on our research and analysis.

# Geo-Eligiblity Analysis

# Low Mod Income Summary Data (LMISD)

Developed by HUD to show eligibility for Community Development Block Grant (CDBG) funding activities

Block group must have 51% of population with income below 80% of Area Median Income (AMI)

Data comes from population data from the 2011-2015 American Community Survey ACS

Block group resolution, updated once every five years, and there is an online data exploration tool

# Qualified Census Tracts (QCTs)

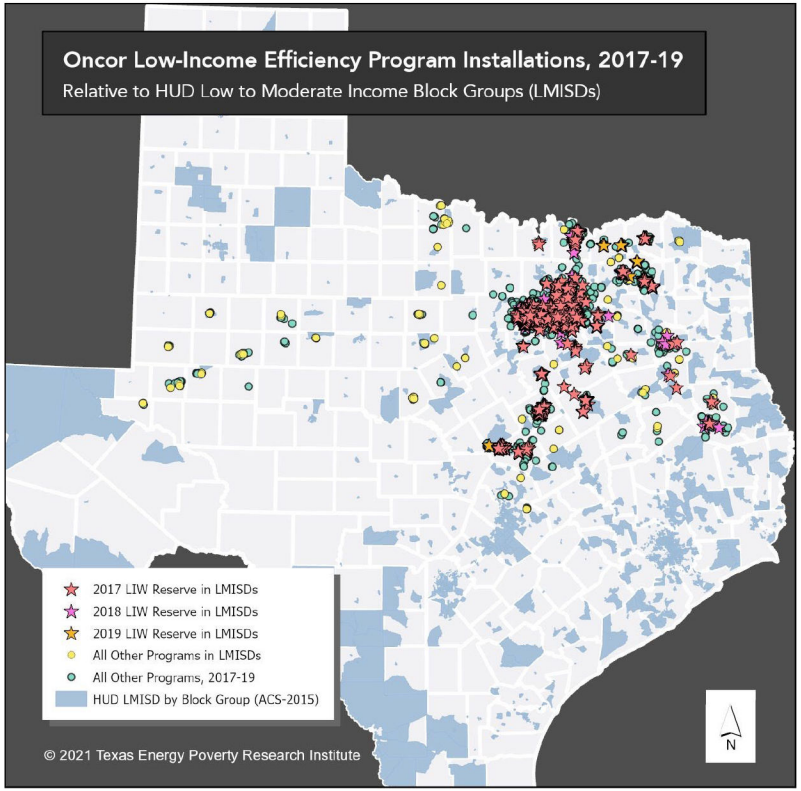
Created by HUD to qualify tracts for the Low-Income Housing Tax Credit (LIHTC)

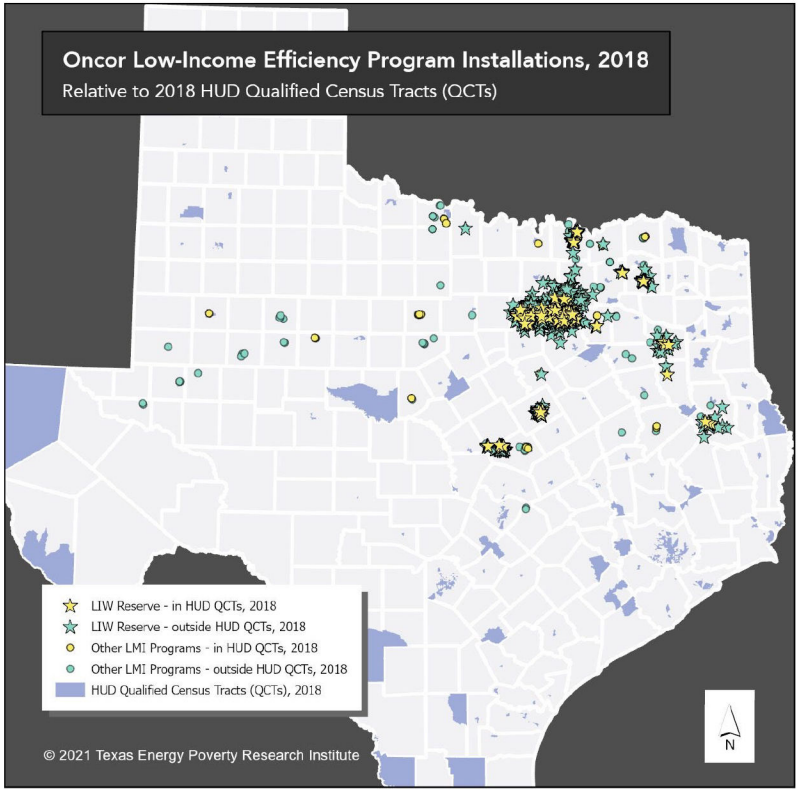
Tract must have 50% of households with incomes below 60% of the Area Median Gross Income (AMGI) or have a poverty rate of 25% or more

Data comes from household count from the 2010 Decennial Census plus three sets of 5-year tabulations of the ACS

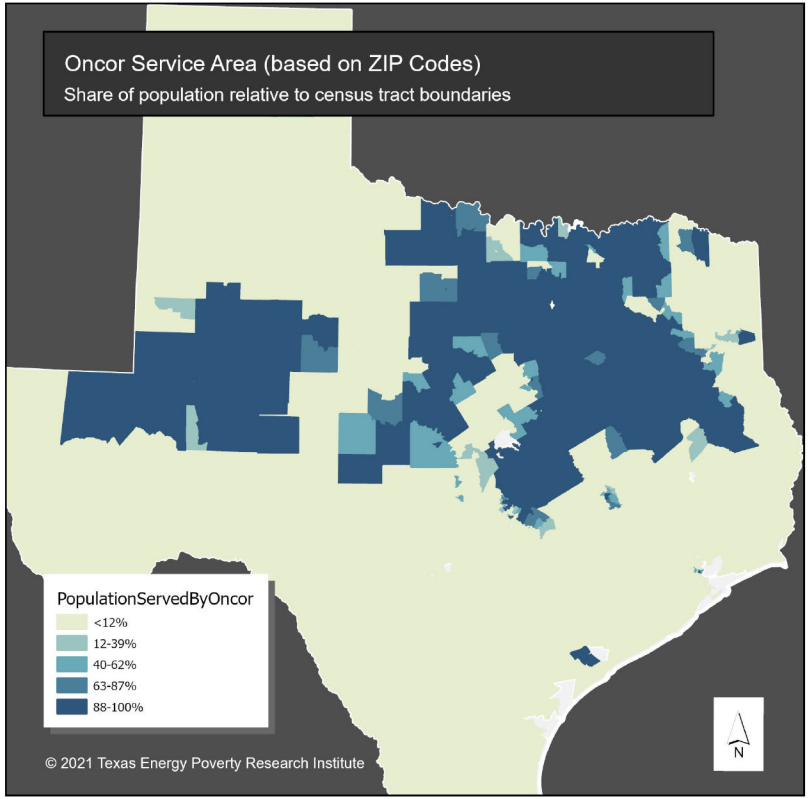
Census tract resolution, changes slightly each year, and there is an online address search tool

# Analysis: Oncor installations from 2017-19 using two geo-eligibility methods, LMISD & QCTs



# Process: Oncor Electric Delivery Service Area




To perform the analysis described on the previous slide, we associated the Oncor service area from ZIP Codes to block groups and census tracts. Briefly, the steps were:

1. We associated block groups to ZIP Codes using a spatial join in ArcGIS. For our purposes, each block group was either in or out of the Oncor service area.
2. Every block group belongs to a census tract. Referring to the block group population data, we determined the share of the census tract population that was in or out of the Oncor service area. *See screenshot from Excel below.*
3. We used the share of population to weight the number of households that are within the Oncor service area, *as shown in the map to the left.*

| BlkGrp GEOID | Tracts GeoID | ZCTA5CE10 | Oncor SA | LMISD BlkGrp | QCT Tract | Total Tract Universe | Block Group Universe | BG Pop Share Tract |
|---|---|---|---|---|---|---|---|---|
| 480019501001 | 48001950100 | 75763 | yes | Non LMI | no | 4,735 | 1,030 | 22% |
| 480019501002 | 48001950100 | 75763 | yes | Non LMI | no | 4,735 | 2,110 | 45% |
| 480019501003 | 48001950100 | 75763 | yes | Non LMI | no | 4,735 | 1,595 | 34% |
| 480019504011 | 48001950401 | 75803 | yes | LMISD | no | 285 | 285 | 100% |
| 480019504021 | 48001950402 | 75861 | yes | Non LMI | no | 140 | 140 | 100% |
| 480019505001 | 48001950500 | 75801 | yes | LMISD | QCT | 4,500 | 585 | 13% |
| 480019505002 | 48001950500 | 75801 | yes | LMISD | QCT | 4,500 | 450 | 10% |
| 480019505003 | 48001950500 | 75801 | yes | LMISD | QCT | 4,500 | 2,320 | 52% |
| 480019505004 | 48001950500 | 75803 | yes | LMISD | QCT | 4,500 | 1,145 | 25% |
| 480019506001 | 48001950600 | 75803 | yes | LMISD | no | 6,565 | 2,025 | 31% |
| 480019506002 | 48001950600 | 75801 | yes | Non LMI | no | 6,565 | 2,060 | 31% |
| 480019506003 | 48001950600 | 75801 | yes | LMISD | no | 6,565 | 980 | 15% |

# Analysis: LMISD & QCTs in reaching low-income population in Oncor service area

| | Qualified Census Tracts (QCTs) | | LMISD Block Groups (BGs) | |
|---|---|---|---|---|
| | Population in QCTs | Population NOT in QCTs | Population in LMISD BGs | Population in non-LMISD BGs |
| Lower income (0-80% AMI) | 31%<br>1,346,815<br>*Only 31% of the low-income population lives in a QCT, but 73% of the QCT population is low-income (0-80% AMI).* | 69%<br>2,952,854<br>*69% of the low-income population lives outside of a QCT and would not qualify using this method.* | 59%<br>2,523,585<br>*59% of the low-income population lives in an LMISD BG, and 70% of the LMISD block group population is low-income (0-80% AMI).* | 41%<br>1,776,084<br>*In non-LMISD block groups, 27% of the population is low-income, and 41% of the low-income population lives outside of the LMISD BGs.* |
| Upper income (<80%) | 9%<br>508,895<br>*Only 9% of the non-low-income population lives in QCTs counting for just 27% of the QCT population.* | 91%<br>5,295,036<br>*Over 90% of non-low-income people live outside QCTs.* | 19%<br>1,089,225<br>*LMISD BGs capture 19% of the non-low-income population.* | 81%<br>4,714,706<br>*Over 80% of non-low-income people live outside LMISD BGs.* |
| Total (Oncor service area) | 1,855,710<br>*Approximately 18% of the population served by Oncor is in a QCT.* | 8,247,890<br>*82% of the population in the Oncor service area is outside QCTs.* | 3,612,810<br>*36% of the population in Oncor service is inside an LMISD BG.* | 6,490,790<br>*64% of the population served by Oncor is outside an LMISD BG.* |

Specific to the Oncor service area, this table compares the population of Qualified Census Tracts (QCTs) to that of LMISD block groups (BGs). This table is meant to answer the question: *If we used an existing geography-based eligibility method, how many low-income people would be included, and how many non-low-income people would be unintentionally eligible?*

While 73% of people in QCTs are low-income, only 31% of low-income individuals are in QCTs. Conversely, 70% of people in LMISD BGs are low-income, and 59% of low-income people are in LMISD BGs. By including both methods, we capture households who may be in only one of the two types of HUD categories.

# Conclusion

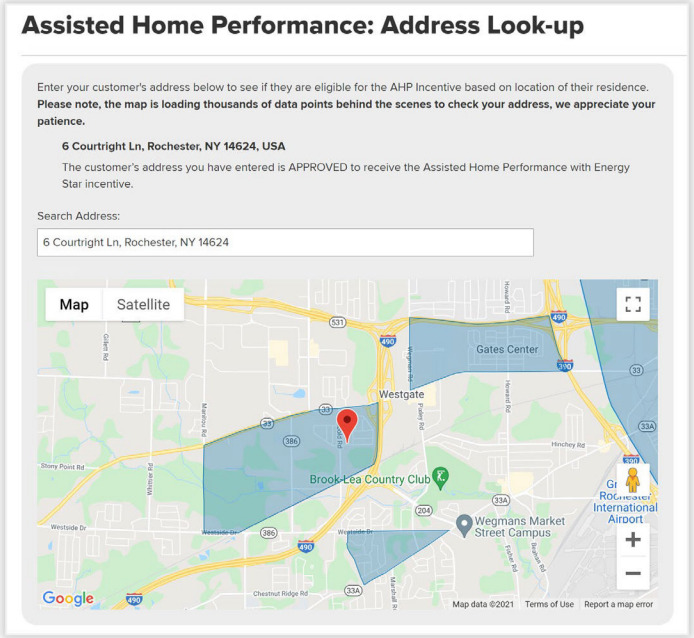
We conclude that the following measures are appropriate solutions to increase confidence, reach the intended customers, and avoid additional barriers.

- Build a geo-eligibility address look-up tool that all utilities can share
- Explore ways to share data from a social service agency to do real-time verification based on participation in another program with the qualification of 200% FPL or less
- Allow redacted documentation showing active participation in income-qualified social service programs
- Self-certification to persist as a last resort method

# Support Materials

# NYSERDA Assisted Home Performance Program Geo-Eligibility

**NYSERDA's Assisted Home Performance with Energy STAR** (AHP) provides up to $5,000 towards eligible energy efficiency upgrades for single family residences with household incomes less than or equal to 80% of the Area Median Income (AMI). To streamline and simplify the application process for consumers, NYSERDA implemented a **geographic eligibility pilot to pre-qualify* consumers for AHP incentives in Designated Areas**. Pictured to the right, its mapping tool is designed to help contractors look up addresses of potential customers in their service areas.




** If an applicant's address is located within a Designated Area, the household is deemed eligible for the AHP incentive and will not have to provide any additional documentation of household income.*

Additional details on this program can be online.

# Duke Energy Neighborhood Energy Saver Program

The purpose of **Duke Energy Neighborhood Energy Saver program** is to reduce energy usage through the direct installation of energy efficiency measures in households of income-qualified residential customers. Using a neighborhood door-to-door "sweep" approach, this program is free to participants. Their goal is to install direct measures in at least 70% of all households in a targeted neighborhood, and they achieve it. Duke Energy identifies a neighborhood as a contiguous geographic area of about 1,000 homes in which more than 50% of households fall under 200% FPL.

- The goal is to serve a minimum of 4,500 households each year. This program complements the weatherization programs that run through CAAs, which prioritizes the elderly, disabled, and children in the home.
- The program administrator, Honeywell, markets the program with door-to-door outreach, hosting community events, and leveraging the reach and influence of local leaders.

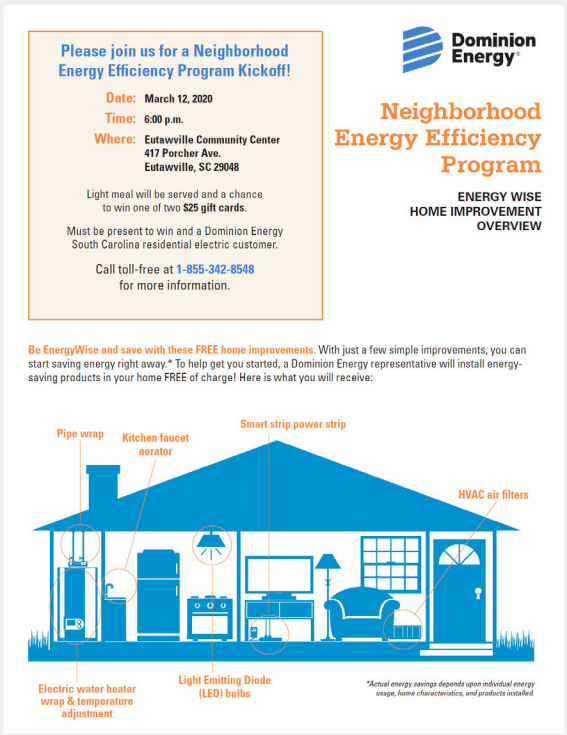
Additional details on this program can be found online.

# Dominion (SC) Residential Neighborhood Energy Efficiency Program

**Dominion (SC)** modeled its neighborhood "sweep" program after the Duke Energy one, and we will note a few differences with its implementation.

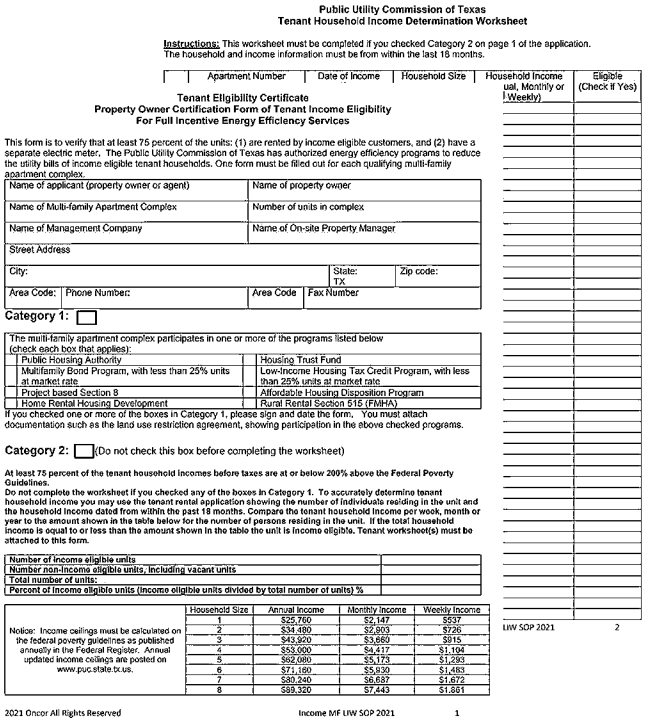
- In addition to using census data, Dominion goes into the community and talks to elected officials to find areas in-need.
- They also physically walk or drive the neighborhood to filter out sections of the neighborhood that appear to be non-low-income.
- While they're in neighborhoods, they identify mobile homes and do deeper weatherization measures, such as repair ductwork, roof insulation, reflective coating on tin roofs, and replace thermostat.

Additional details on this program are available as part of the final report package.



# Addendum

# ADDENDUM: Current Low-Income EE Program Eligibility Certification Forms



**Public Utility Commission of Texas**
**Tenant Household Income Determination Worksheet**

**Instructions:** This worksheet must be completed if you checked Category 2 on page 1 of the application. The household and income information must be from within the last 18 months.

| | Apartment Number | Date of Income | Household Size | Household Income (Annual, Monthly or Weekly) | Eligible (Check if Yes) |
|---|---|---|---|---|---|
| | | | | | |

**Tenant Eligibility Certificate**
**Property Owner Certification Form of Tenant Income Eligibility**
**For Full Incentive Energy Efficiency Services**

This form is to verify that at least 75 percent of the units: (1) are rented by income eligible customers, and (2) have a separate electric meter. The Public Utility Commission of Texas has authorized energy efficiency programs to reduce the utility bills of income eligible tenant households. One form must be filled out for each qualifying multi-family apartment complex.

| | |
|---|---|
| Name of applicant (property owner or agent) | Name of property owner |
| Name of Multi-family Apartment Complex | Number of units in complex |
| Name of Management Company | Name of On-site Property Manager |
| Street Address | |
| City: | State: TX / Zip code: |
| Area Code: / Phone Number: | Area Code / Fax Number |

**Category 1:** ☐

The multi-family apartment complex participates in one or more of the programs listed below (check each box that applies):

| | |
|---|---|
| ☐ Public Housing Authority | ☐ Housing Trust Fund |
| ☐ Multifamily Bond Program, with less than 25% units at market rate | ☐ Low-Income Housing Tax Credit Program, with less than 25% units at market rate |
| ☐ Project based Section 8 | ☐ Affordable Housing Disposition Program |
| ☐ Home Rental Housing Development | ☐ Rural Rental Section 515 (FMHA) |

If you checked one or more of the boxes in Category 1, please sign and date the form. You must attach documentation such as the land use restriction agreement, showing participation in the above checked programs.

**Category 2:** ☐ (Do not check this box before completing the worksheet)

**At least 75 percent of the tenant household incomes before taxes are at or below 200% above the Federal Poverty Guidelines.**
**Do not complete the worksheet if you checked any of the boxes in Category 1. To accurately determine tenant household income you may use the tenant rental application showing the number of individuals residing in the unit and the household income dated from within the past 18 months. Compare the tenant household income per week, month or year to the amount shown in the table below for the number of persons residing in the unit. If the total household income is equal to or less than the amount shown in the table the unit is income eligible. Tenant worksheet(s) must be attached to this form.**

| | |
|---|---|
| Number of income eligible units | |
| Number non-income eligible units, including vacant units | |
| Total number of units: | |
| Percent of income eligible units (income eligible units divided by total number of units) % | |

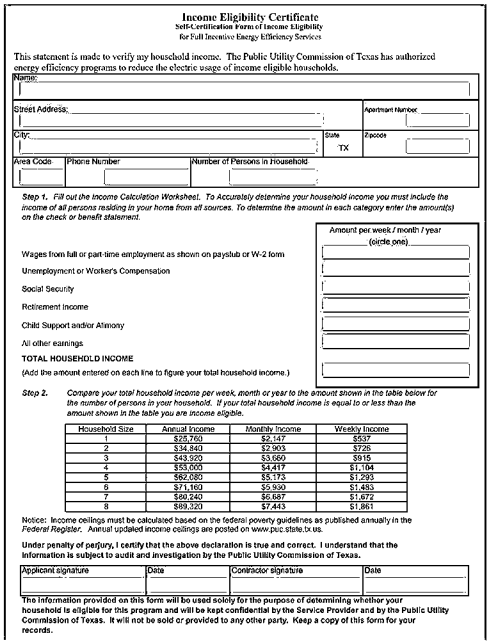
Notice: Income ceilings must be calculated on the federal poverty guidelines as published annually in the Federal Register. Annual updated income ceilings are posted on www.puc.state.tx.us.

| Household Size | Annual Income | Monthly Income | Weekly Income |
|---|---|---|---|
| 1 | $25,760 | $2,147 | $537 |
| 2 | $34,480 | $2,803 | $726 |
| 3 | $43,920 | $3,660 | $915 |
| 4 | $53,000 | $4,417 | $1,104 |
| 5 | $62,080 | $5,173 | $1,293 |
| 6 | $71,160 | $5,930 | $1,483 |
| 7 | $80,240 | $6,687 | $1,672 |
| 8 | $89,320 | $7,443 | $1,861 |





Multi-Family Eligibility Certification Form



**Income Eligibility Certificate**
**Self-Certification Form of Income Eligibility**
**for Full Incentive Energy Efficiency Services**

This statement is made to verify my household income. The Public Utility Commission of Texas has authorized energy efficiency programs to reduce the electric usage of income eligible households.

Name:

Street Address: / Apartment Number:

City: / State: TX / Zipcode:

Area Code / Phone Number / Number of Persons in Household:

*Step 1. Fill out the Income Calculation Worksheet. To Accurately determine your household income you must include the income of all persons residing in your home from all sources. To determine the amount in each category enter the amount(s) on the check or benefit statement.*

| | Amount per week / month / year (circle one) |
|---|---|
| Wages from full or part-time employment as shown on paystub or W-2 form | |
| Unemployment or Worker's Compensation | |
| Social Security | |
| Retirement Income | |
| Child Support and/or Alimony | |
| All other earnings | |
| **TOTAL HOUSEHOLD INCOME** (Add the amount entered on each line to figure your total household income.) | |

*Step 2. Compare your total household income per week, month or year to the amount shown in the table below for the number of persons in your household. If your total household income is equal to or less than the amount shown in the table you are income eligible.*

| Household Size | Annual Income | Monthly Income | Weekly Income |
|---|---|---|---|
| 1 | $25,760 | $2,147 | $537 |
| 2 | $34,840 | $2,903 | $726 |
| 3 | $43,920 | $3,660 | $915 |
| 4 | $53,000 | $4,417 | $1,104 |
| 5 | $62,080 | $5,173 | $1,293 |
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| 7 | $80,240 | $6,687 | $1,672 |
| 8 | $89,320 | $7,443 | $1,861 |

Notice: Income ceilings must be calculated based on the federal poverty guidelines as published annually in the *Federal Register*. Annual updated income ceilings are posted on www.puc.state.tx.us.

**Under penalty of perjury, I certify that the above declaration is true and correct. I understand that the information is subject to audit and investigation by the Public Utility Commission of Texas.**

| Applicant signature | Date | Contractor signature | Date |
|---|---|---|---|
| | | | |

**The information provided on this form will be used solely for the purpose of determining whether your household is eligible for this program and will be kept confidential by the Service Provider and by the Public Utility Commission of Texas. It will not be sold or provided to any other party. Keep a copy of this form for your records.**

LIW Single-Family Reserve Self-Certification Form

# ADDENDUM: Stakeholder Interviews

TEPRI met by video conference and interviewed the following individuals:

- Lark Lee, **TetraTech**, on February 10, 2021
- **Solix** on March 1, 2021 (group meeting)
- Prachi Gupta, Carl Brown, and Joanna Gomez, **Oncor**, on March 10, 2021
- Steve Wiese and Amy Martin, **Frontier Energy**, on March 11, 2021, and again on May 11, 2021
- Cheryl Bowman, **CenterPoint**, on March 11, 2021
- Kim Campbell, Senior Manager Customer Advocacy, **Vistra Corp**., on March 18, 2021
- Cyrus Bhedwar, Director of Policy, **Southeast Energy Efficiency Alliance** (conducted by phone)
- Lynda Sleigher Shafer, Strategy & Collaboration Manager, **Duke Energy** (NC) on March 23, 2021
- Therese A. Griffin, Manager of Energy Conservation, **Dominion Energy** (SC), on March 24, 2021
- Lisa Adams, Hanna Adams, and Victoria Lippman, **Texas Association of Community Action Agencies**, April 22, 2021

OVERVIEW OF

# Oncor Low-Income Energy Efficiency Programs

| Type | Program Name | Verification Approach* | Average Annual Installations (2017-19) |
|---|---|---|---|
| Multi-Family | LIW MF Family Program Option | If complex is not eligible under Category 1, they go through Category 2 verification. Complex manager provides income for all residents, at least 75% of residents need to qualify. | 3,585 |
| | LIW HVAC MF Implementer Program Option | Category 2 verification is required. If complex provides Category 1 documentation, that is considered supplemental as primary requirement is the list of income for the premise. | 953 (1,535 in 2019) |
| | Targeted LIW MF HVAC | Category 2 verification is required. If complex provides Category 1 documentation, that is considered supplemental as primary requirement is the list of income for the premise. | 516 |
| Single-Family | LIW Reserve Program Option (i.e., Hard-to-Reach) | Single-Family. Self Certification | 2,579 |
| | Targeted LIW | Income verification is determined for household members according to the rules established by TDHCA Client's total income must be below 200% of the current year's Federal Poverty Level (FPL) guidelines. Agencies look at 30 days of income prior to the date of application. The amount is annualized to determine if they are at or below the income requirement. | 612 |

LIW = Low-Income Weatherization | * The forms and verification types (Category 1, 2) are pictured in the Addendum on Slide 27.

# Thank you.

FOR MORE INFORMATION PLEASE CONTACT:

Texas Energy Poverty Research Institute
611 South Congress Avenue, Suite 125
Austin, TX 78704

Email: dana@txenergypoverty.org
Website: www.txenergypoverty.org
Tel. (415) 902-9141

FRONTIER energy

# Energy Efficiency Implementation Project (EEIP) Meeting

Austin, Texas
October 12, 2021

EUMMOT ELECTRIC UTILITY MARKETING MANAGERS OF TEXAS

# PY2022 TRM 9.0

*Summary of Key Measure Updates*

# Vol 1 Overview

**Peak Methodology**:

- Claimed peak savings for sites with multiple energy efficiency projects with independent operation are allowed to utilize different peak seasons:
- Example:
  - HVAC retrofit with new building automation controls must claim savings for using the same peak period because they operate as a system

    Note: This also applies when using a combination of deemed savings and measurement and verification (M&V).
  - Lighting retrofit with interior and exterior fixtures may use both summer and winter demand seasons because exterior fixtures they operate independently.

# Vol 1 Overview

**Peak Methodology (Continued)**:

- Peak Probability Analysis (PPA) tables include TMY3 temperatures. Direct readers to Texas Efficiency website for access to TMY3 data files, including other data points eligible for use in custom regressions.

**Texas Efficiency Website:**

- Climate zone mapping
- EUL summary spreadsheet
- Lighting Survey Form (LSF) Fixture Codes – also referred to as Standard Wattage Table
- Reminder: RES HVAC tables are also available in spreadsheet form

# Vol 2-3 General Measure Life Review

**Estimated Useful Life (EUL)**:

- Verify measure life values referencing Database of Energy Efficiency Resources (DEER) reports against new DEER Remote Ex-Ante Database Interface (READI) tool.

**Remaining Useful Life (RUL):**

- Systems that were manufactured after current standard/code are not eligible to use early retirement baseline.
- Increment tables for compliance with minimum age requirement.
- Ineligible RUL values are preserved for use when standards are updated.

# Vol 2 Residential

## 2.1 Lighting:

- Existing methodology is also applicable to LED fixtures with integrated LEDs using equivalent wattage as applicable baseline.
- Update midstream guidance for compliance with EM&V memo (same as TRM 7.0).

# Vol 2 Residential

## 2.2 HVAC:

- 2.2.3 GSHPs: Unit correction on heating energy savings algorithm.
- 2.2.4 Central AC/HPs:
  - Systems with non-compliant EER are still eligible to claim energy and winter demand savings. Summer demand savings ineligible.
  - Heating savings are awarded based on AHRI rated cooling capacity. Deemed savings calculation already account for difference between rated cooling and heating capacities.
- 2.2.5 Mini-Split AC/HPs: Same as previous measure.

# Vol 2 Residential

## 2.2 HVAC:

- 2.2.6 Large Capacity AC/HPs: Add GSHP coincidence factors.
- 2.2.8 Room ACs: Add efficiency condition for units with connected functionality, as these units have a lower minimum efficiency requirement than standard RACs.
  - Units with connected functionality (tested for demand response capabilities) receive a 5% credit toward ENERGY STAR certification.
  - Add efficiency condition for units with connected functionality (5% over federal standard vs. 10% for standard units).
- 2.2.9 Connected Thermostats: Advise against use of emergency heat setting for thermostats installed on HPs. Supplemental heat is already available in freezing conditions using normal settings.

# Vol 2 Residential

## 2.3 Envelope:

- 2.3.2 Ceiling Insulation:
  - Add < R5 baseline category to encourage targeting of homes with lower baseline R-values. Original photo requirements still apply.
  - New baseline is compliant with previous EM&V guidance restricting baseline R-value to R-5+.
- 2.3.3 Attic Encapsulation: Same as previous measure.
- 2.3.7 Low-E Storm Windows: New measure targeting glazing attachments with low-emissivity coating added to existing windows.
- 2.3.9 Cool Roofs: New < R5 baseline pending EM&V review.

# Vol 2 Residential

## 2.4 DHW:

- 2.4.6 HPWHs: Clarify use of ROB baseline for ER projects. No separate ER baseline available at this time.
- 2.4.8 Showerhead TSRVs: Restrict measure eligibility to homes with electric DHW.
- 2.4.9 Tub Spout & Showerhead TSRVs: Same as previous measure.

# Vol 2 Residential

## 2.5 Appliances:

- 2.5.2 Clothes Washers: Update deemed savings to match current ENERG STAR appliance calculator methodology and assumptions.
  - Add < R5 baseline category to encourage targeting of homes with lower baseline R-values. Original photo requirements still apply.
  - New baseline is compliant with previous EM&V guidance restricting baseline R-value to R-5+.
- 2.5.7 Pool Pumps: Unit correction on energy savings algorithm.
- 2.5.9 Advanced Power Strips: Confirm and document derivation of coincidence factors, resulting in minor updates to winter values.
- 2.3.9 Cool Roofs: New < R5 baseline pending EM&V review.

# Vol 3 Non-Residential

## 2.1 Lighting:

- 2.1.1 Lamps and Fixtures:
  - Formalize standard wattage table and make available on Texas Efficiency website.
  - Provide QPL guidance for delisted products, model numbers with slight variances, and fixtures made available in various lengths. Refer to EM&V guidance memo for parent/child products while DLC QPL is being updated.
  - Correct lumen ranges for outdoor athletic new construction baseline
  - Provide citations for peak demand factor development

# Vol 3 Non-Residential

## 2.1 Lighting:

- 2.1.1 Lamps and Fixtures (continued):
  - Update midstream guidance for compliance with EM&V memo:
    1. Use TRM 7.0 as starting point.
    2. Require use of QPL equivalent wattage as baseline for all lamp types in lieu of specifying a separate methodology* for reflector lamps, eliminating need for rounding guidance.
    3. Consolidate < 100 W lamp type categories into GSL and reflector.
    4. Update outdoor hours to match TRM 8.0 update to AOH table.
- 2.1.1 Lighting Controls: Restrict new construction control savings enforce code requirements. Allow savings for control types exceeding code.

* Previous methodology refers to ENERGY STAR Lamp Center Beam Intensity Benchmark Tool

# Vol 3 Non-Residential

## 2.2 HVAC:

- 2.2.2 Split & Packaged AC/HPs:
  - Assume “All Other” heating section type for ACs. HPs already assume “Electric Resistance or None”.
  - For AC to HP conversions, use HP heating savings coefficients as baseline proxy.
  - Incorporate midstream methodology from 2020 EM&V guidance memo.
  - Set default age equal to EUL, consistent with Volume 2.
- 2.2.3 HVAC Chillers: Same as previous measure for midstream and EUL guidance.
- 2.2.4 PTACs, PTHPs, and RACs: Same EUL guidance and unit correction for winter peak savings algorithm.

# Vol 3 Non-Residential

## 2.2 HVAC:

- 2.2.5 CRACs: Add capacity conversion from kW to Btu/hr.
- 2.2.7 HVAC VFDs: Update building type operating schedules and expand list of available building types.
- 2.2.8 Evaporative Pre-Cooling: Reinforce that savings algorithms use units of tons for capacity and kW/ton for efficiency. Add conversions from other unit types.
- 2.2.10 Small Commercial Evaporative Cooling: New measure targeting installation of evaporative coolers in small commercial and converted residence applications. Savings account for offset energy consumption from preventing installation of refrigerated cooling.

# Vol 3 Non-Residential

## 2.3 Envelope:

- 2.3.2 Window Treatments: Update baseline solar heat gain coefficients (SHGC) values to complete transition from shading coefficients (SC) to SHGC.

## 2.4 Food Service

- All ENERGY STAR measures:
  - Update savings algorithms, input assumptions, and deemed savings for compliance with 7/15 amendment to March 2021 update to ENERGY STAR commercial food service calculator.
  - Update terminology and documentation requirements for consistency across measures.

# Vol 3 Non-Residential

## 2.4 Food Service:

- 2.4.1 Combination Ovens: Correct idle rate formulas to match ENERGY STAR specification.
- 2.4.9: Pre-Rinse Spray Valves:
  - Update savings algorithms and ensure proper citations for all input assumptions.
  - Update peak demand coefficients for compliance with current peak definition.

# Vol 3 Non-Residential

## 2.5 Refrigeration:

- All measures:
  - Update savings algorithms and ensure proper citations for all input assumptions.
  - Update for compliance with current peak definition and climate zones.
- 2.5.7 Strip Curtains: Complete measure redesign. Replaced savings derived from M&V study with methodology aligning with other food service measure updates. Vary savings by building type.
- 2.5.8 Zero-Energy Doors: Clarify savings units (per door rather than per linear feet).

# Vol 3 Non-Residential

**2.6 DHW:**

- New section made up of existing measures.
- 2.6.2 Showerhead TSRVs: Restrict measure eligibility to homes with electric DHW.
- 2.6.3 Tub Spout & Showerhead TSRVs: Same as previous measure.

# Vol 3 Non-Residential

## 2.7 Miscellaneous:

- 2.7.1: Vending Machine Controls: General text edits to clarify eligibility criteria, baseline and efficiency conditions, and measure documentation requirements.
- 2.7.4 Pool Pumps: Correct turnovers/day savings inputs; savings not affected.
- 2.7.5 Computer Power Management: Update peak demand coefficients for compliance with current peak definition. Eliminated winter demand, which is already associated with hours of inactivity.
- 2.7.7 Electric Vehicle Supply Equipment: Eliminate documentation requirements related to vehicle type and estimated miles driven per day.

# Vol 3 Non-Residential

## 2.7 Miscellaneous:

- 2.7.8 VFDs for Water Pumping: New measure targeting installation of VFDs for water pumping (e.g., domestic water supply, wastewater treatment, and conveyance).
- 2.7.9 Steam Trap Repair/Replacement: New measure targeting steam trap repair, including the installation of Venturi steam traps. VSTs continuously remove condensate via water pressure rather than using moving parts.
- 2.7.10 Hydraulic Gear Lubricants: New measure targeting improvement of gear efficiency (1% per gear mesh) by reducing friction with lubricants.
- 2.7.11 Hydraulic Oils: New measure similar to previous measure targeting friction reduction for moving parts in gearless applications. Efficiency improvement = 3.2%.
- New measures will target underserved manufacturing and industrial customers.

# Vol 4 M&V protocols

2.1.2 – GSHPs

- Increase EUL from 15 to 20 years to match Volume 2 GSHP measure.

2.2.1 – Residential New Construction

- Add HVAC commissioning and dehumidification system to reference home definition.

2.3.1 – Residential Solar PV; 2.3.2 – Non-Residential Solar PV

- Update PVWatts software modeling instructions, examples, and documentation requirements.

2.3.3 – Solar Shingles

- Establish 20-year where none was previous specified.

2.3.4 – Solar Attic Fans

- Reinstate measure removed from TRM 8.0 requiring M&V data collection.

# Vol 4 M&V protocols

2.4.1 – Behavioral; 2.4.3 – Non-Residential RCx

- Update model requirements to account for pandemic and other non-routine events.

2.5.1 – Residential Load Management

- Define peak demand period and add links to utility program manuals.

2.5.2 – Non-Residential Load Management

- Exclude eligibility of critical load customers without backup generation.
- Replace utility program details tables with links to program manuals.


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# PUBLIC UTILITY COMMISSION OF TEXAS

## Evaluation, Monitoring & Verification (EM&V) of the Texas Investor-Owned Utilities' Energy Efficiency Portfolios

Energy Efficiency Implementation Project

October 12, 2021

TETRA TECH

TEXAS ENERGY ENGINEERING SERVICES, INC. (www.teesi.com)

# AGENDA

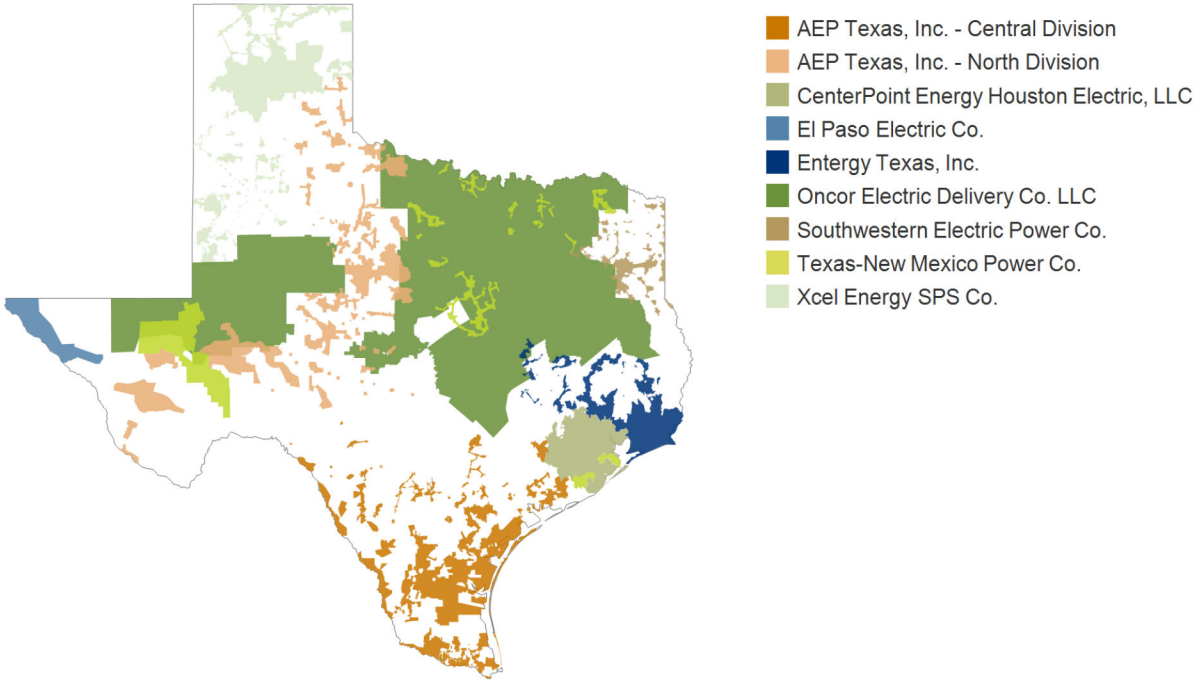
PY2020 KEY FINDINGS AND RECOMMENDATIONS

PY2021 EM&V OVERVIEW

# PY2020 ENERGY EFFICIENCY PROGRAMS

## EM&V Key Findings & Recommendations

Saved
695,012,552 kWh
Reduced demand by
536,770 kW




# LIFETIME SAVINGS COST OF $0.02 KWH AND $11.56 PER KW.

# PY2020 ENERGY EFFICIENCY ACCOMPLISHMENTS


**1 — Responded Effectively to the Pandemic**
All utilities exceeded goals while responding to program challenges and implementing virtual QA/QC.

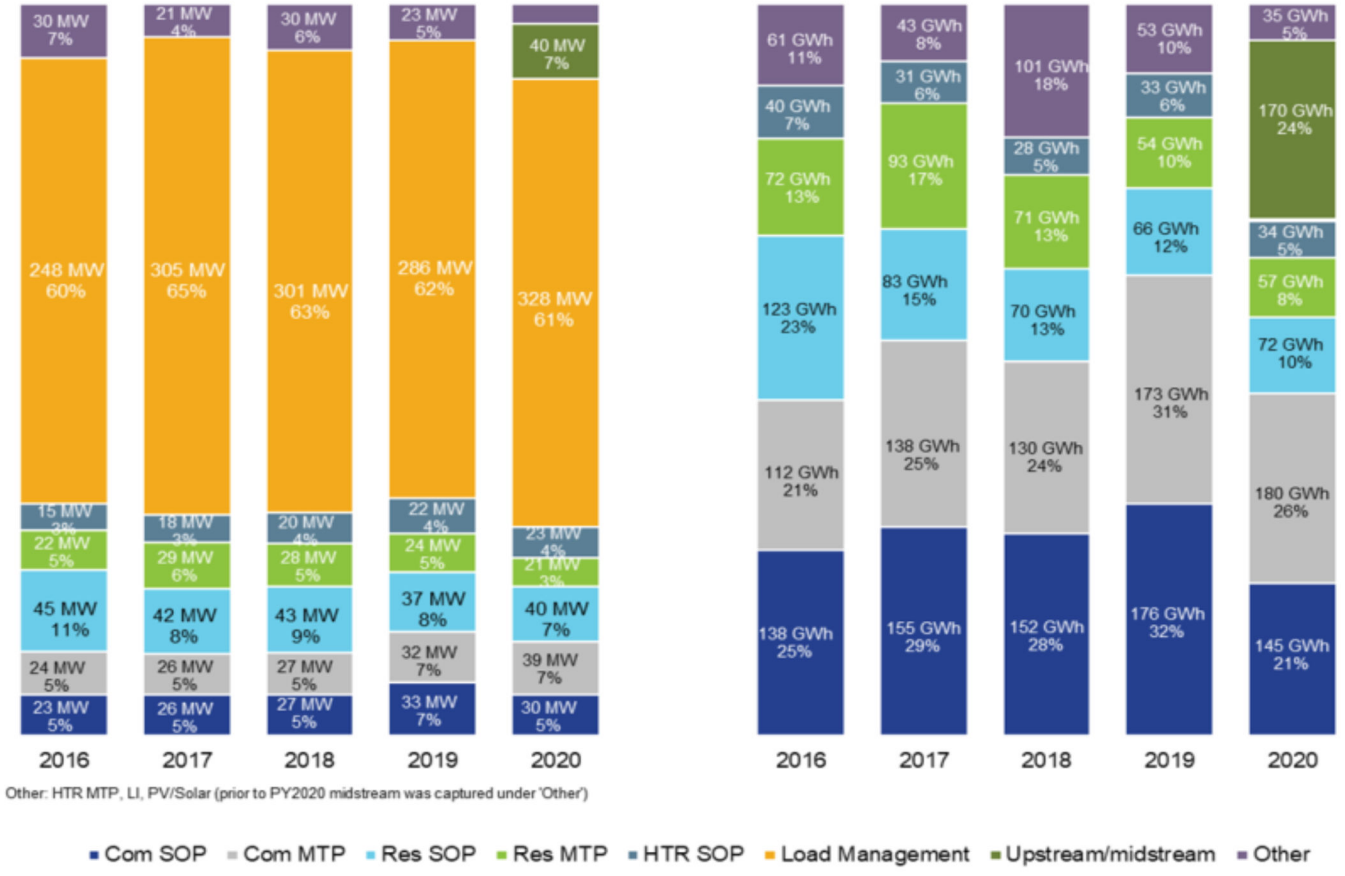
**2 — Expanded Energy Efficiency Offerings**
Increased measures and delivery mechanisms.

**3 — Achieved Highest Cost-Effectiveness to Date**
While primarily driven by high avoided costs, expansion of midstream and upstream programs also increased cost-effectiveness.

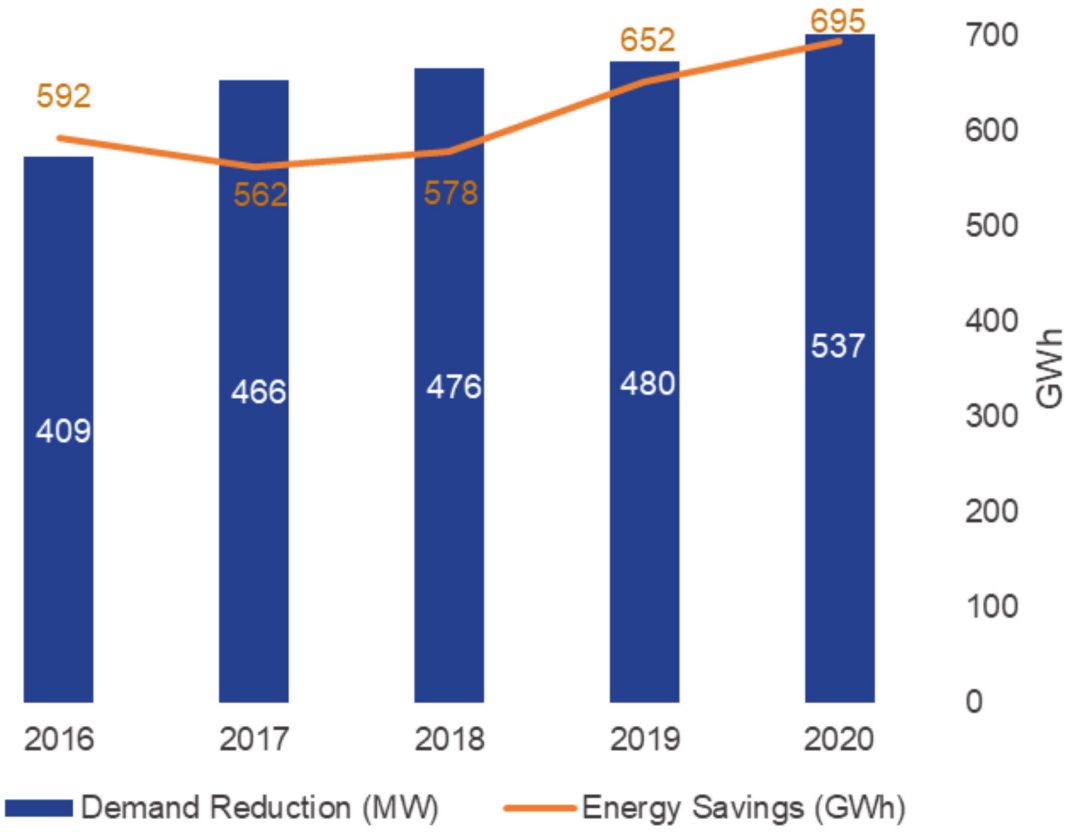
**4 — Increased Savings**
PY2020 saw both the highest demand reductions and energy savings in the last five years.

**5 — Worked Collaboratively on Improvements**
Collaborated to improve low-income and hard-to-reach program outreach and eligibility verification processes.

TETRA TECH




# SAVINGS BY PROGRAM TYPE

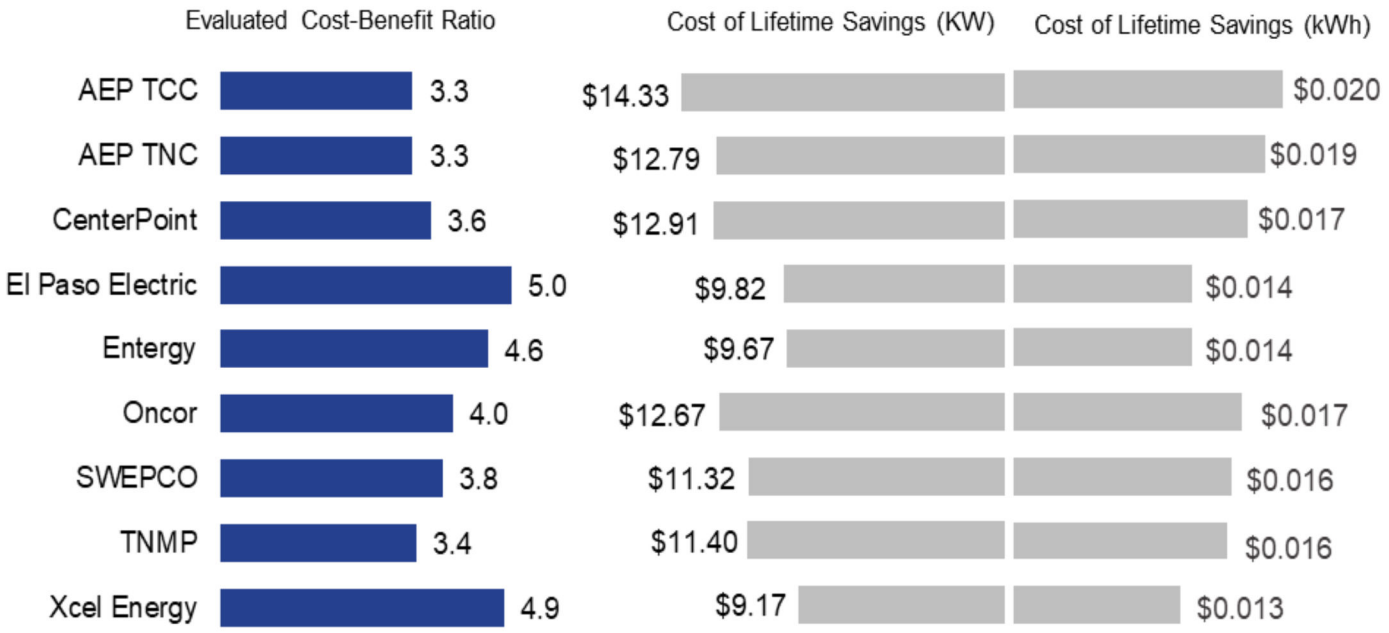



# PY2020 SAW HIGHEST DEMAND REDUCTIONS AND ENERGY SAVINGS.

## DEMAND REDUCTIONS AND ENERGY SAVINGS

2016 – 2020

## 2020 Cost-Benefit Ratio & Cost of Lifetime Savings

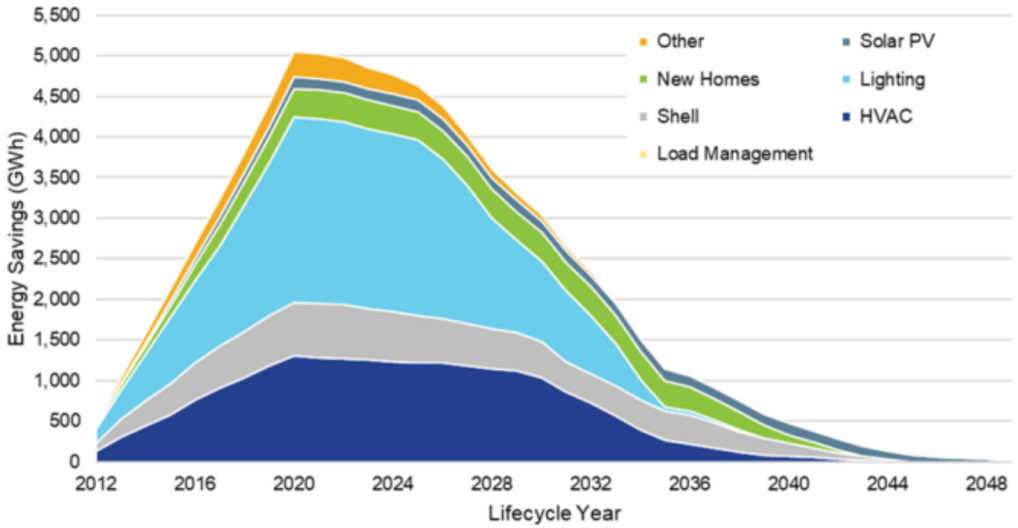



# STATEWIDE COST-EFFECTIVENESS WAS 4.0, RANGING FROM 3.3 TO 5.0 ACROSS UTILITIES

EVALUATED COST-EFFECTIVENESS

# LIGHTING, HVAC, & BUILDING SHELL IMPROVEMENTS ARE DELIVERING THE MOST SAVINGS OVER TIME.

PY2012—2048 Lifecycle Energy Savings by End Use (GWh)



# EM&V INFRASTRUCTURE

Senate Bill 1125 2011

established the requirement for an EM&V framework

Rule-making 2012

Commission Energy Efficiency Rule 25.181

PUCT selects and manages EM&V

Annual EM&V since PY2012

# EM&V SCOPE

**Census tracking system savings verification with additional activities prioritized by program**

- Verify gross energy and demand savings for all energy efficiency and load management programs
- Estimate net savings
- Determine program and portfolio cost-effectiveness
- Prepare and maintain a statewide Technical Reference Manual (TRM)
- Provide information to improve program performance

**Engineering desk reviews, interval meter data analysis, in-depth interviews**

# EVALUATED AND CLAIMED SAVINGS WERE SIMILAR

The utilities have demonstrated a willingness to work with the EM&V team

upfront M&V reviews or additional technical assistance or input can reduce uncertainty in savings estimates

| Utility | kW | kWh |
|---|---|---|
| AEP TCC | -28 | 5,986 |
| AEP TNC | 12 | 17,539 |
| CenterPoint | -310 | -1,337,233 |
| El Paso Electric | -3 | 34,526 |
| Entergy | -212 | -8 |
| Oncor | 5 | 18,316 |
| SWEPCO | -26 | -166,991 |
| TNMP | 3 | 9,508 |
| Xcel Energy | -16 | -21,305 |
| **Overall** | **-577** | **-1,439,663** |


Thirty-one recommendations from the PY2020 EM&V for PY2022 implementation (§ 25.181(o)(9)).

## Commercial Program Recommendations

- custom projects,
- measurement and verification (M&V) projects,
- Recommissioning (RCx) projects,
- lighting projects, and
- consumption analysis

## Residential Program Recommendations

- residential deemed savings
- smart thermostats
- HTR/low-income program process assessment

## Load Management Program Recommendations

- Overall
- Commercial programs
- Residential programs

# Portfolio Recommendations

- program tracking data
- meter data
- project documentation
- solar PV
- COVID-19 QA/QC response

# PY2021 EM&V

# EM&V OVERVIEW

**Verification across all programs**

- Program tracking data verification of claimed savings across all programs
- Census review of residential deemed savings calculations and load management programs

**Increased rigor for medium and high priority programs**

- Residential and commercial desk reviews and on-site M&V
- Targeted consumption analyses
  - Commercial lighting
  - Residential air infiltration
- HVAC contractor interviews
- Residential and commercial participant surveys

| | |
|---|---|
| Residential programs | • comprise a substantial percentage of overall statewide portfolio savings have recently responded to various TRM updates to the envelope measures |
| Commercial programs | • The largest percentage of savings<br>• New types of projects, measures and delivery<br>• EM&V consistently identifies some opportunities for improvement |

# HIGH PRIORITY

| | |
|---|---|
| Load Management | • largest percentage of statewide kW reductions |
| Small business | • Responding to prior EM&V recommendations |

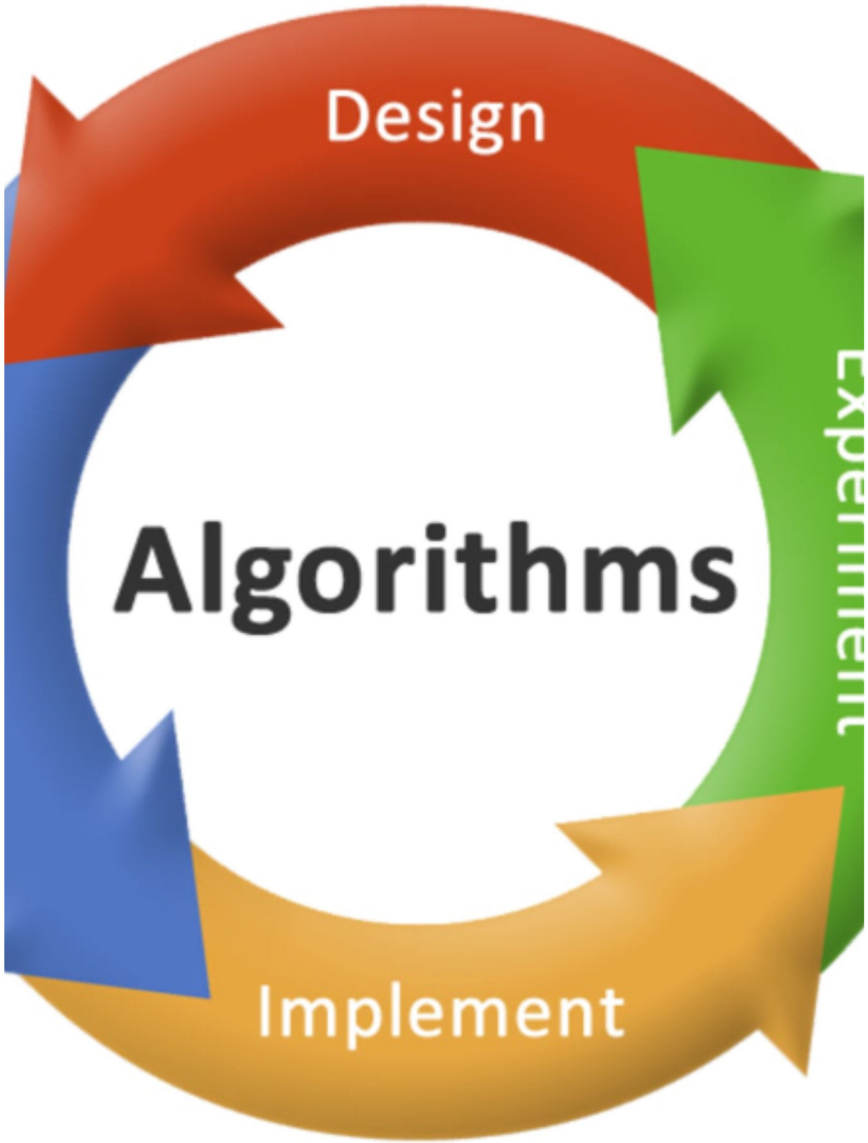
# MEDIUM PRIORITY

# TECHNICAL ASSISTANCE

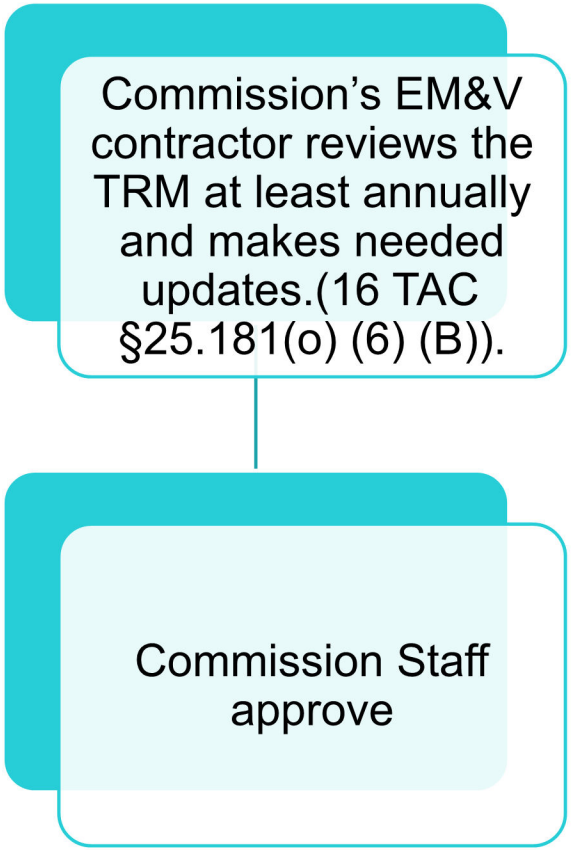
Scope continues to include technical guidance/M&V discussions and review upon utility request

Steady flow of reviews for unique situations, new technologies, new programs

# TECHNICAL REFERENCE MANUAL (TRM) UPDATE PROCESS



# MAINTENANCE AND APPROVAL OF THE TEXAS TRM



# TRM FORMAT

| |
|---|
| **Volume 1: TRM Overview and User Guide** covers the process for TRM updates and version rollouts, weather zones, peak demand definitions, TRM structure and the format of the TRM measures |
| **Volume 2: Residential Deemed Measures** contains the measure descriptions and deemed savings estimates and algorithms for measures installed in residential dwellings. |
| **Volume 3: Nonresidential Deemed Measures** contains the measure descriptions and deemed savings estimates and algorithms for measures installed in nonresidential businesses. |
| **Volume 4: M&V Protocols** contains protocols to estimate claimed savings for measures that are not good candidates for deemed savings across both sectors |
| **Volume 5: Implementation Guidance** contains the PUCT's EM&V team recommendations regarding program implementation that may affect claimed savings |

# COLLABORATIVE UPDATE APPROACH

Commission's EM&V contractor reviews the TRM at least annually and makes needed updates

(16 TAC §25.181(o) (6) (B)).

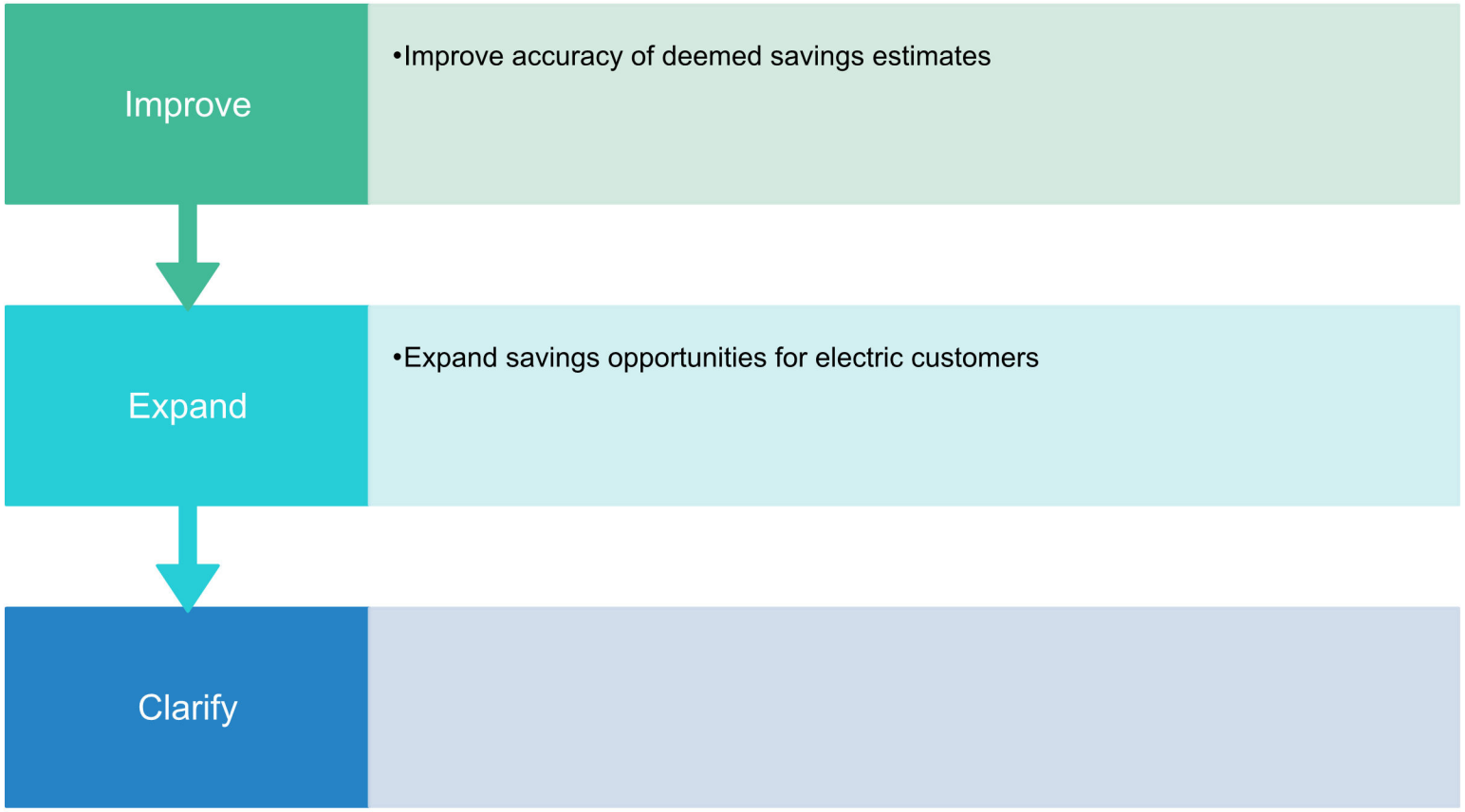
Additional updates

- Utility collaborative group, Electric Utilities Marketing Managers of Texas (EUMMOT)
- Individual utility (ies)
- Energy Efficiency Implementation Project (EEIP)
- EM&V research

TRM Working Group meets at least biweekly and agree on prioritization and updates

PUCT staff, PUCT's EM&V team, EUMMOT contractor, Utilities and utility invited contractors

# GOAL OF UPDATES



Do you have any additional questions for us?

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# Thank you for your time today