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TETRA TECH

Energy Efficiency Implementation Project (EEIP) Meeting Texas Technical Reference Manual (TRM) Updates

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Purpose of Technical Reference Manuals (TRMs)

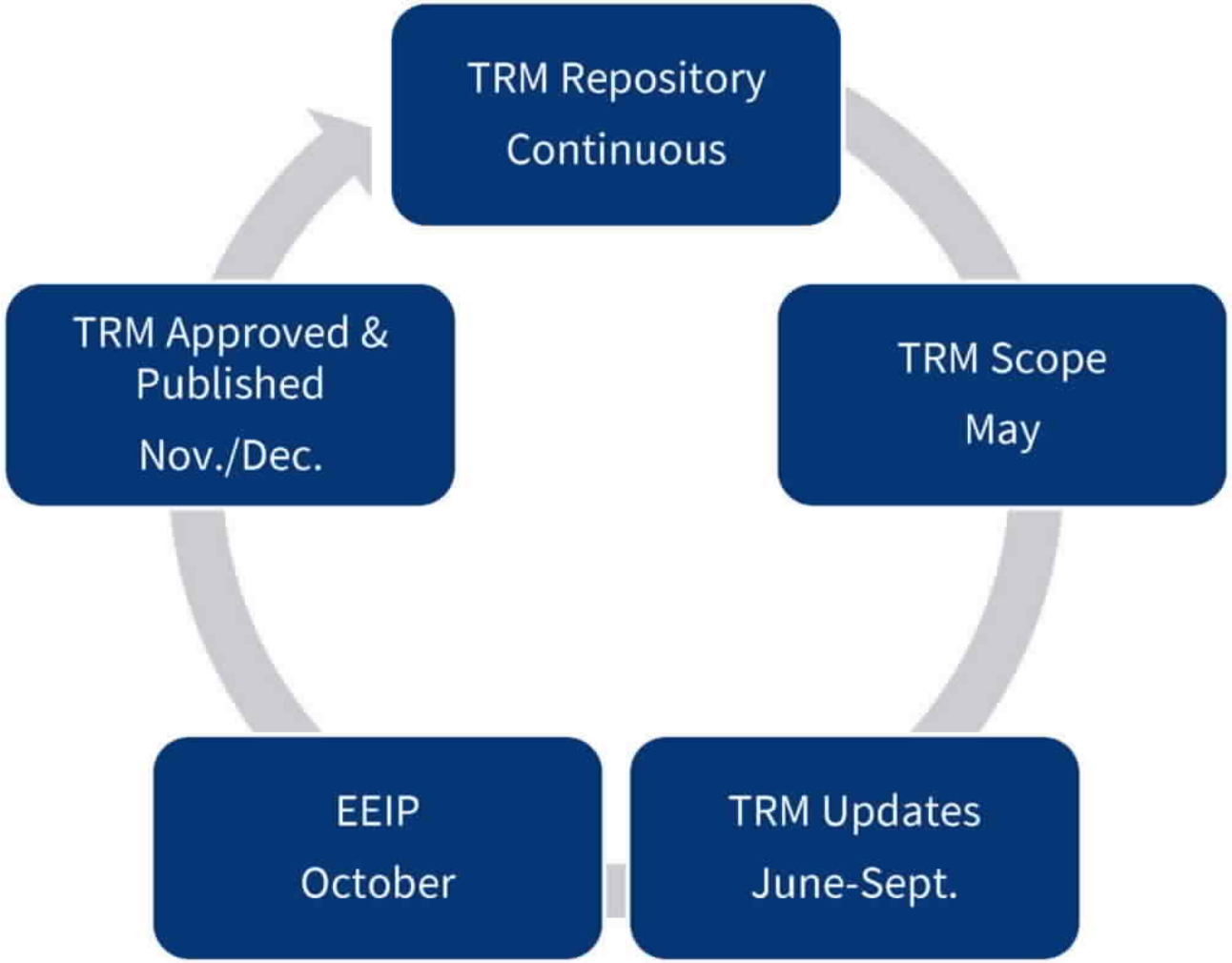
TETRA TECH

TRMs allow prospective deemed savings estimates that support a streamlined and stable environment for program planning, design and delivery.

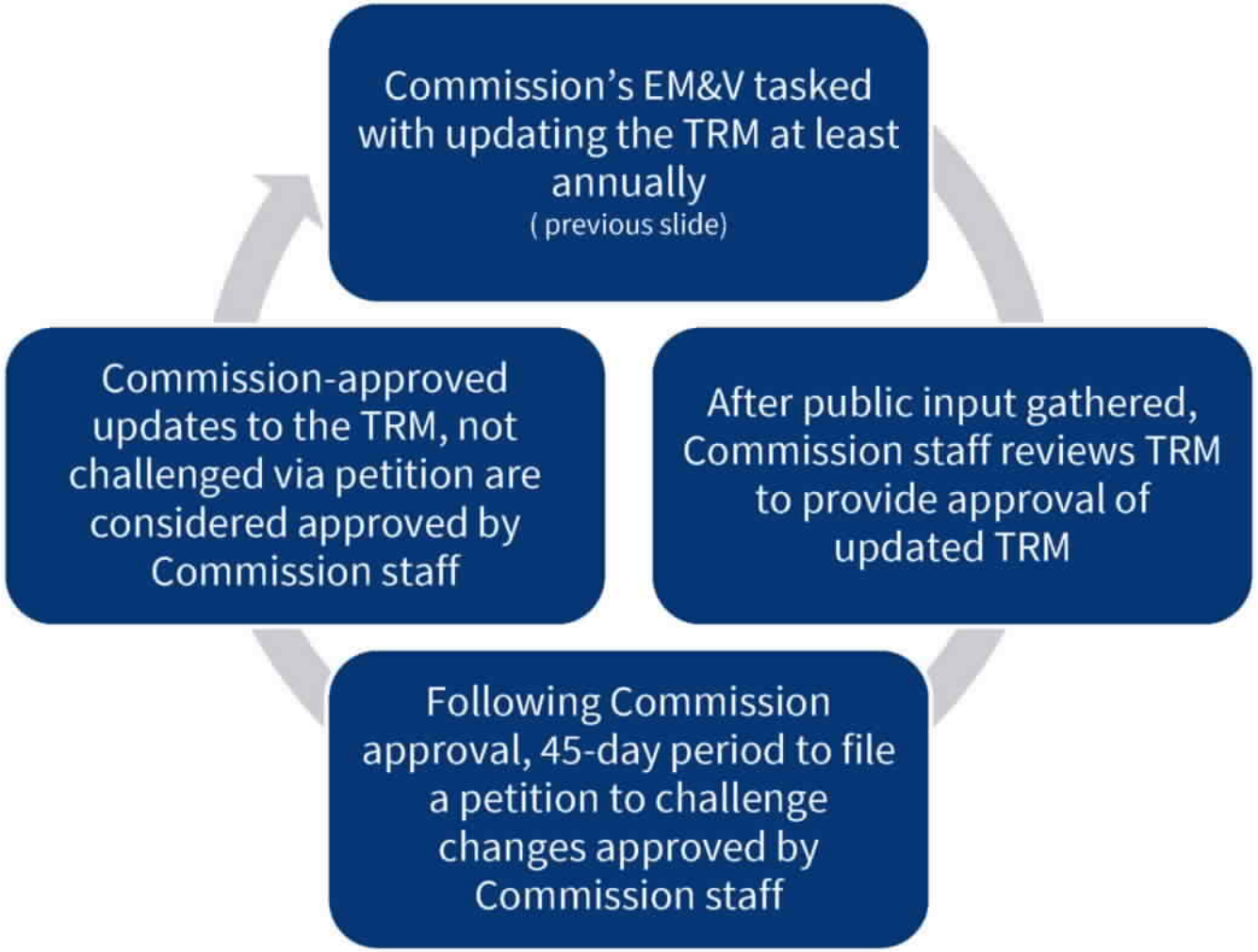
Many energy efficiency measures can be reliably estimated with TRM deemed savings

- TRM deemed savings are engineering algorithms based on averages
  - Deemed savings need to be updated based on changing markets and data to do a good job of estimating realized savings
  - AMI data analysis can assure close alignment between TRM deemed savings and realized savings
    - AMI data has been used effectively in Texas to "calibrate" the TRM
- TRM deemed savings remain the primary savings approach across the country even in states like Texas where AMI data has been available for years
  - At least 33 statewide or regional TRMs have been adopted and are in use.
- Since not all measures are suited to deemed savings, the Texas TRM also includes M&V protocols for consistent savings calculations for more varied or complex projects

Texas TRM Annual Update Process



Texas TRM Annual Approval Process



Texas Program Year (PY) 2025 TRM v12.0 Updates

TETRA TECH

- The measure updates highlighted in the Tetra Tech and Frontier presentations are not inclusive of all updates.
- Please refer to the consolidated redlines for a complete account of all changes to measures included in PY2025 TRM v12. Filed in Docket No. 56768.
- For example, many measures included minor updates to text, references, documentation requirements, and formatting. Those types of updates are not identified in the following slides.

PY2025 TRM v12.0 - Volume 1 Overview

TETRA TECH

Volume 1 TRM Overview and User Guide covers the process for TRM updates and version roll-outs, weather zones, peak demand savings definitions, TRM structure, and the format of the TRM measure overviews.

- Weather files: Now allowing TMY2022, in addition to the TMY3 for custom and M&V projects
- New section: 4.7 - Savings Consistency in Measure Implementation
  - Each measure in a program/subprogram needs consistent savings calculation.

* TMY stands for typical meteorological year

PY2025 TRM v12.0 – Volume 4 M&V Protocols

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Volume 4 M&V Protocols has standardized measurement and verification (M&V) protocols for technologies and new program types.

- Existing Measure Updates
  - 2.1.2 Air Conditioner (AC)/Heat Pump (HP) Tune-Ups
    - —Updated measure to meet Section 3.2.1 of the PY2023 IOU Energy Efficiency Report
      - Service & Contractor requirements
      - M&V plan for implementation required
      - Efficiency Loss (EL) factor determination for new contractors and required direct measurement of airflow
      - Updated metering equipment and measurement resolution and accuracy requirements
  - 2.1.4 Variable Refrigerant Flow Systems (VRF)
    - —Clarified language about federal standard

PY2025 TRM v12.0 – Volume 4 M&V Protocols

TETRA TECH

- Existing Measure Updates (Cont.)
  - 2.2.1 Residential New Construction
    - —Updated baseline to IECC 2018 or 2021 as applicable.
    - —Added pilot option for Home Energy Rating System (HERS) index compliance path.
  - 2.2.2 Smart Home Energy Management System
    - —Added additional in-service rates (ISR) depending on delivery, to match TRM Vol. 2 Residential lighting.
  - 2.5.3 Nonresidential Custom
    - —Added expected useful life (EUL) for variable frequency drives in non-HVAC applications
  - 2.5.4 Nonresidential Measurement and Verification
    - —Adjusted fit metrics for peak demand calculations
  - 2.6.1 Residential Load Curtailment & 2.6.2 Nonresidential Load Curtailment (Load Management)
    - —Added “water heating equipment” as an eligible end use for residential.
    - —Added guidance for tracking and reporting

PY2025 TRM v12.0 – Volume 4 M&V Protocols

TETRA TECH

- New Measure Updates
  - 2.1.1 Variable Speed Heat Pump
    - —Based on recommendation from the Heat Pump Working Group (HPWG)
  - 2.1.4 Dedicated Outdoor Air Systems (DOAS)
    - —Cooling equipment on fresh air intake for HVAC
  - 2.5.7 Low Pressure Irrigation Systems
    - —Retrofit irrigation systems to use lower pressure in system
  - 2.5.8 Irrigation Pump Variable Frequency Drive (VFD)
    - —Retrofit for irrigation system pumps to better meet loads

Heat Pump Working Group (HPWG)

- In 2024, the HPWG met from April –September to solicit input and information from the industry; including manufacturers, contractors, utilities, regulators, and state/regional/federal EE groups.
- Goal: Supported the development of a variable speed heat pump measure in the TRM v12.0 for program year 2025.
- Outcome: Measure included in TRM v12.0: Volume 4 (Measure 2.1.1)
  - Eligibility of variable speed heat pump
  - Significantly adjusts the Winter Peak Demand based on equipment heating performance and Climate Zone
- Next Steps:
  - Identify research and data sharing opportunities
  - Meet in Spring/Summer 2025 to assess initial progress
  - Propose future updates to measure in TRM process

PY2025 TRM v12.0 – Volume 5 Implementation Guidance

- Existing Guidance Updates
  - 2.1.2 Project documentation
    - —Updated project documentation to include M&V plans for programs as well as projects.
  - 2.3.1 New Construction
    - —Updated code reference to match Volume 4
  - Appendix A: Low-Income Income-eligible Verification forms
    - —To be updated in January 2025 once federal poverty income levels are released for 2/1/2025–1/31/2026

FRONTIER energy

Energy Efficiency Implementation Project (EEIP) Meeting

Derek Neumann, Frontier Energy

October 2024

EUMMOT ELECTRIC UTILITY MARKETING MANAGERS OF TEXAS

TRM v12.0 for Program Year 2025

Summary of Key Measure Updates
for Volume 2 Residential and
Volume 3 Nonresidential

TRM v12.0 Updates

- The measure updates highlighted in this presentation are not inclusive of all updates.
- Please refer to the consolidated redlines for a complete account of all changes to measures included in TRM v12. Filed in Docket No. 56768.
- For example, many measures included minor updates to text, references, documentation requirements, and formatting. Those types of updates are not identified in the following slides.

Volume 2 Residential

2.1 Lighting:

- 2.1.1 General Service Lamp LEDs; 2.1.2 Specialty LEDs
  - Increased new construction baseline to require 90% high-efficacy lamps, corresponding to IECC 2018 code requirement (up from 75% in IECC 2015).
  - This means savings are only awarded for 10% of installed lamps in new construction prescriptive applications.

- 2.1.3 LED Nightlights
  - Decreased baseline wattage from seven to four watts.

Volume 2 Residential

2.2 Heating, Ventilation, and Air Conditioning (HVAC):

- 2.2.1 Air Conditioner and Heat Pump (AC/HPs) Tune-ups
  - Updated maintenance checklist to match current ENERGY STAR version.
  - Developed tentative plan to incorporate Season Energy Efficiency Ratio 2 (SEER2), Energy Efficiency Ratio 2 (EER2), and Heating Seasonal Performance Factor 2 (HSPF2) baseline beginning in TRM v15 for PY 2028 implementation. This is consistent with period of time equal to the current federal standard effective date plus the measure lifetime.

- 2.2.2 Central and Mini-Split AC/HPs
  - Incorporated an electric resistance heat documentation adjustment factor (see envelope section).
  - Increased measure life to 20 years for both ACs and HPs.
  - Updated remaining useful life (RUL) tables to reflect updated measure life.

Volume 2 Residential

2.2 HVAC (Continued):

- 2.2.6 Large Capacity Split and Packaged AC/HPs
  - Incorporated updated commercial HVAC baseline efficiency requirements from current federal standard.

- 2.2.8 Connected Thermostats
  - Defined cooling capacity as a proxy for heating capacity when thermostat is installed with an electric resistance furnace. Defined heating efficiency as 3.412 HSPF in these scenarios.
  - Incorporated an electric resistance heat documentation adjustment factor (see envelope section).
  - Updated midstream assumptions to reflect most recent consumption survey data.

Volume 2 Residential

2.2 HVAC (Continued):

- 2.2.9 Smart Thermostat Load Management
  - Added guidance for utilities with fully and nearly-fully deployed advanced metering infrastructure (AMI). Deemed approach is only applicable for participants without AMI meters.
  - Added guidance to track and report load management separate from energy efficiency.

Volume 2 Residential

2.3 Building Envelope:

- Multiple
  - Incorporated an electric resistance heat documentation adjustment factor.
  - Guidance was originally provided in TRM v11, but it was moved from documentation requirements to savings algorithms to demonstrate how it may be used to adjust savings.
  - Cool Roofs and Solar Screens are not affected. Savings are negative for homes with electric resistance heating, so reporting an electric resistance heating type is conservative.

- 2.3.1 Air Infiltration
  - Extended measure eligibility to all residential applications for utilities whose consumption analysis results demonstrated measurable savings.

Volume 2 Residential

2.4 Domestic Hot Water:

- 2.4.2 Heat Pump Water Heaters
  - Addressed forthcoming federal standard and compliance dates. Early retirement baseline will be added at that time.

- 2.4.3 Solar Water Heaters
  - Clarified use of high efficiency ratings (99 Solar Uniform Energy Factor, or SUEF) for units that use no energy under rating conditions.

- 2.4.4 Water Heater Tank Insulation & 2.4.5 Water Heater Pipe Insulation
  - Updated temperature assumptions to reflect most recent consumption survey data.

Volume 2 Residential

2.4 Domestic Hot Water (Continued):

- 2.4.6 Faucet Aerators
  - Updated faucets per home assumption to reflect most recent consumption survey data.

- 2.4.7 Low-Flow Showerheads (LFSHs)
  - Updated showerhead per home assumption to reflect most recent consumption survey data.

- 2.4.8/2.4.9 Showerhead and Tub Spout Temperature Sensitive Restrictor Valves
  - Extended updated showerhead assumption from LFSHs measure.
  - Updated behavioral waste and hot water saved assumptions.

Volume 2 Residential

2.5 Appliances:

- 2.5.2 Clothes Washers
  - Addressed forthcoming federal standard and compliance dates.
- 2.5.3 Clothes Dryers
  - Addressed forthcoming federal standard and compliance dates.
  - Added savings tier for heat pump dryers.
- 2.5.4 Dishwashers
  - Addressed forthcoming federal standard and compliance dates.
  - Incorporated updated ENERGY STAR specification.

Volume 2 Residential

2.5 Appliances (Continued):

- 2.5.5 Refrigerators & 2.5.6 Freezers
  - Addressed forthcoming federal standard and compliance dates.
  - Updated early retirement energy consumption and product class assumptions to reflect most recent consumption survey data.
  - Updated early retirement deemed savings tables.

- 2.5.14 Electric Vehicle Supply Equipment
  - Incorporate results of AEP Texas and SWEPCO research and development study.
  - Updated from an ENERGY STAR Level 2 baseline to a weighted Level 1/2 baseline.

Volume 2 Residential

2.5 Appliances (New):

- 2.5.9 Dehumidifiers
  - Applies to ENERGY STAR-certified portable and whole-home products.
- 2.5.10 Ventilation Fans
  - Applies to ENERGY STAR-certified bathroom and utility room ventilation fan products.
- 2.5.11 Water Coolers
  - Applies to ENERGY STAR-certified bottled and point-of-use water cooler products.

Volume 3 Nonresidential

2.1 Lighting:

- 2.1.1 Lamps and Fixtures & 2.1.2 Lighting Controls
  - Added guidance for combination lighting fixtures and controls projects pertaining to savings calculation order of operations.
  - Clarified adjustment to building-specific equivalent full-load hours (EFLH) and coincidence factor (CF) assumptions to account for pre and post lighting controls.
  - Clarified guidance for field adjustable light output fixtures, treating reduced setpoint as a rated wattage rather than institutional lighting controls.
  - Defined a new adjustment for projects exceeding the 10 percent cap on non-operational fixtures. Penalty is now applied to pre- and post-fixture count.
  - Clarified guidance for building type selection.
  - Updated midstream assumptions to reflect most recent consumption survey data.

Volume 3 Nonresidential

2.2 HVAC:

- 2.2.1 AC/HP Tune-ups
  - Updated maintenance checklist to match current ENERGY STAR version.
  - Developed tentative plan to incorporate SEER2, EER2, and HSPF2 baseline beginning in TRM v15 for PY 2028 implementation. This is consistent with period of time equal to the current federal standard effective date plus the measure lifetime.

- 2.2.2 Split & Packaged AC/HPs
  - Removed pre-2005 early retirement baseline efficiencies
  - Addressed forthcoming federal standard and compliance dates, including new integrated ventilation, economizer, and cooling (IVEC) and integrated ventilation and heating efficiency (IVHE) efficiency metrics.

Volume 3 Nonresidential

2.2 HVAC (Continued):

- 2.2.3 Computer Room ACs (CRACs)
  - Incorporated updated federal standard.
  - Added early federal baseline reflecting previous federal standard.

- Multiple (Split & Packaged AC/HPs, Chillers, Packaged Terminal AC/HPs, Room Air Conditioners, CRACs)
  - Clarified downsizing eligibility and capacity adjustments.
  - Clarified guidance for building type selection.
  - Updated midstream assumptions to reflect most recent consumption survey data.

Volume 3 Nonresidential

2.2 HVAC (Continued):

- 2.2.7 HVAC Variable Frequency Drives
  - Minor adjustments to better align savings methodology and input assumptions with resulting deemed savings tables.
  - Restructured source documentation to allow for improved flexibility in future updates and ease of quality control.

- 2.2.9 High-Volume Low-Speed Fans
  - Expanded measure to apply to non-agricultural end uses.
  - Incorporated new efficiency metric for large-diameter fans (Ceiling Fan Energy Index, or CFEI).

Volume 3 Nonresidential

2.3 Building Envelope:

- 2.3.2 Window Treatments
  - Clarified that eligible window treatments include films and fixed interior or exterior screens.

- 2.3.3 Entrance and Exit Door Air Infiltration
  - Adjusted savings normalization from per linear foot to per standard door.
  - Updated resulting deemed savings tables.

Volume 3 Nonresidential

2.4 Food Service:

- All measures (existing and new)
  - Specified reduced operating schedule for education applications.

- 2.4.1 Combination Ovens
  - Aligned savings assumptions with latest ENERGY STAR food service equipment calculator.

- 2.4.4 Dishwashers
  - Clarified savings assumptions for dual sanitizing products with high- and low-temperature setpoints.

Volume 3 Nonresidential

2.4 Food Service (Continued):

- 2.4.5 Griddles
  - Updated deemed savings tiers to apply to a range of griddle sizes rather than discrete values.

- 2.4.15 Demand-Controlled Kitchen Ventilation
  - Limited new construction eligibility to kitchens with a total hood exhaust airflow rate of less than or equal to 5,000 CFM to reflect current code requirements.
  - Updated heating type distribution and heating interactive effects assumptions.

Volume 3 Nonresidential

2.4 Food Service (New):

- 2.4.3 Deck Ovens
  - Extends eligibility to new cooking applications, supplementing existing combination and convection oven measures.

- 2.4.8 Contact Conveyor Toasters & 2.4.9 Radiant Conveyor Toasters
  - Applies to products that toast baked goods using a conveyor belt to move food through a cooking cavity.

- 2.4.11 Refrigerated Chef Bases
  - Applies to ENERGY STAR-certified appliances used to keep ingredients or prepared meals close to the cooking station, making food preparation more efficient.

Volume 3 Nonresidential

2.4 Food Service (New):

- 2.4.13 Induction Cooktops
  - Applies to ENERGY STAR-certified cooking surfaces utilizing a magnetic field to excite the molecules of specially-designed cookware.

- 2.4.14 Induction Soup Wells
  - Applies to products used to maintain heated soups at an appropriate service temperature.

- 2.4.18 Hand Wrap Machines
  - Applies to on-demand products used to wrap and seal food items.
  - Measure savings result from eliminating standby losses experienced by always-on machines.

Volume 3 Nonresidential

2.5 Refrigeration:

- 2.5.2 ECM Evaporator Fan Motors
  - Clarified baseline condition extends to both shaded pole and permanent split capacitor motors.
  - No impact on deemed savings values.

- 2.5.6 Solid and Glass Door Reach-ins
  - Corrected typos in deemed savings values.

- 2.5.10 High Speed Doors for Cold Storage
  - Increased measure life to 16 years.

Volume 3 Nonresidential

2.7 Miscellaneous:

- 2.7.2 Water Pumps (New)
  - Applies to clean water pumps installed in agricultural, commercial, or industrial applications with a qualifying pump energy index (PEI).

- 2.7.5 Pool Pumps
  - Updated baseline and deemed saving tables to reflect current federal standard.

- 2.7.14 Hand Dryers
  - Updated peak demand savings calculation methodology, input assumptions, and deemed savings tables.

TRM Comment Period

- Opportunity for Public to provide input
- File your comments in Docket Number 56768 at Filer Home (texas.gov)
  PUC Interchange Filer E-Filing Instructions (texas.gov)
- Comment period closes October 29, 2024

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TRM updates are shared via the Texas PUC Energy Efficiency Implementation Project (EEIP) Listserv and TRM Docket No. 56768. Sign up for updates at puclistserv.puc.texas.gov/scripts/wa.exe?HOME.

Once published, the Texas TRM will also be available at Texasefficiency.com under TRM > TRM Documents