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# Technical Reference Manuals (TRMs) for Energy Efficiency Evaluation Measurement and Verification

October 3, 2017

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**Lawrence Berkeley National Laboratory**
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**National Association of State Energy Officials**

# Introduction

- LBNL is supported by the U.S. Department of Energy to conduct non-classified research, operated by the University of California

- Provides technical assistance to states—primarily state energy offices and utility regulatory commissions

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# Technical Assistance

- LBNL's provides technical assistance to state utility regulatory commissions, state energy offices, tribes and regional entities in these areas:
  - Energy efficiency (e.g., EM&V, utility programs, behavior-based approaches, cost-effectiveness, program rules, planning, cost recovery, financing)
  - Renewable energy resources
  - Smart grid and grid modernization
  - Utility regulation and business models (e.g., financial impacts)
  - Transmission and reliability
  - Resource planning
  - Fossil fuel generation
- Assistance is independent and unbiased
- LBNL Tech Assistance website: https://emp.lbl.gov/projects/technical-assistance-states
- US DOE Tech Assistance gateway: http://energy.gov/ta/state-local-and-tribal-technical-assistance-gateway

# Webinar Series

- Webinars designed to support EM&V activities for documenting energy savings and other impacts of energy efficiency programs

- For more information (recorded webinars, EM&V resources) see:
  - https://emp.lbl.gov/emv-webinar-series
  - General Contact: EMVwebinars@lbl.gov

- Unfortunately, as of now, this is our last webinar in this series. Thank you again to our funders and partners at DOE, EPA, NARUC and NASEO

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# Todays Webinar – TRMs

- State and Local Energy Efficiency (SEE) Action Network guide on Technical Reference Manuals (TRMs)
  - Today will present a new guide on TRMs, as well as TRM experiences and approaches from experts working in three diverse states
  - TRM Guide can be found at: https://www4.eere.energy.gov/seeaction/system/files/documents/TRM%20Guide_Final_6.21.17.pdf
- TRMs
  - TRMs are documents, data bases
  - TRMs are valuable resources for estimating energy savings and non-energy factors
  - TRMs used extensively in the planning, implementation, and evaluation of utility customer-funded efficiency programs
  - High quality TRMs with consistent savings values and methods can increase:
    - Confidence in the quantification of impacts associated with efficiency measures
    - Implementation of cost-effective efficiency actions

# Today's Speakers

- **Overview of deemed savings method and TRMs - with focus on recommendations**
  - Steve Schiller, Senior Advisor, Berkeley Lab
- **State experience with TRMS - discussants**
  - Katie Rich, Director, Infrastructure Policy and Homeland Security Coordinator, Public Utility Commission of Texas
  - David Brightwell, Economic Analyst, Illinois Commerce Commission
  - Annette Beitel, Facilitator, California Technical Forum and Principal, Future Energy Enterprises




# Technical Reference Manuals (TRMs) with a Deemed Savings Method Overview

October 3, 2017

Steve Schiller, Senior Advisor

Lawrence Berkeley National Lab

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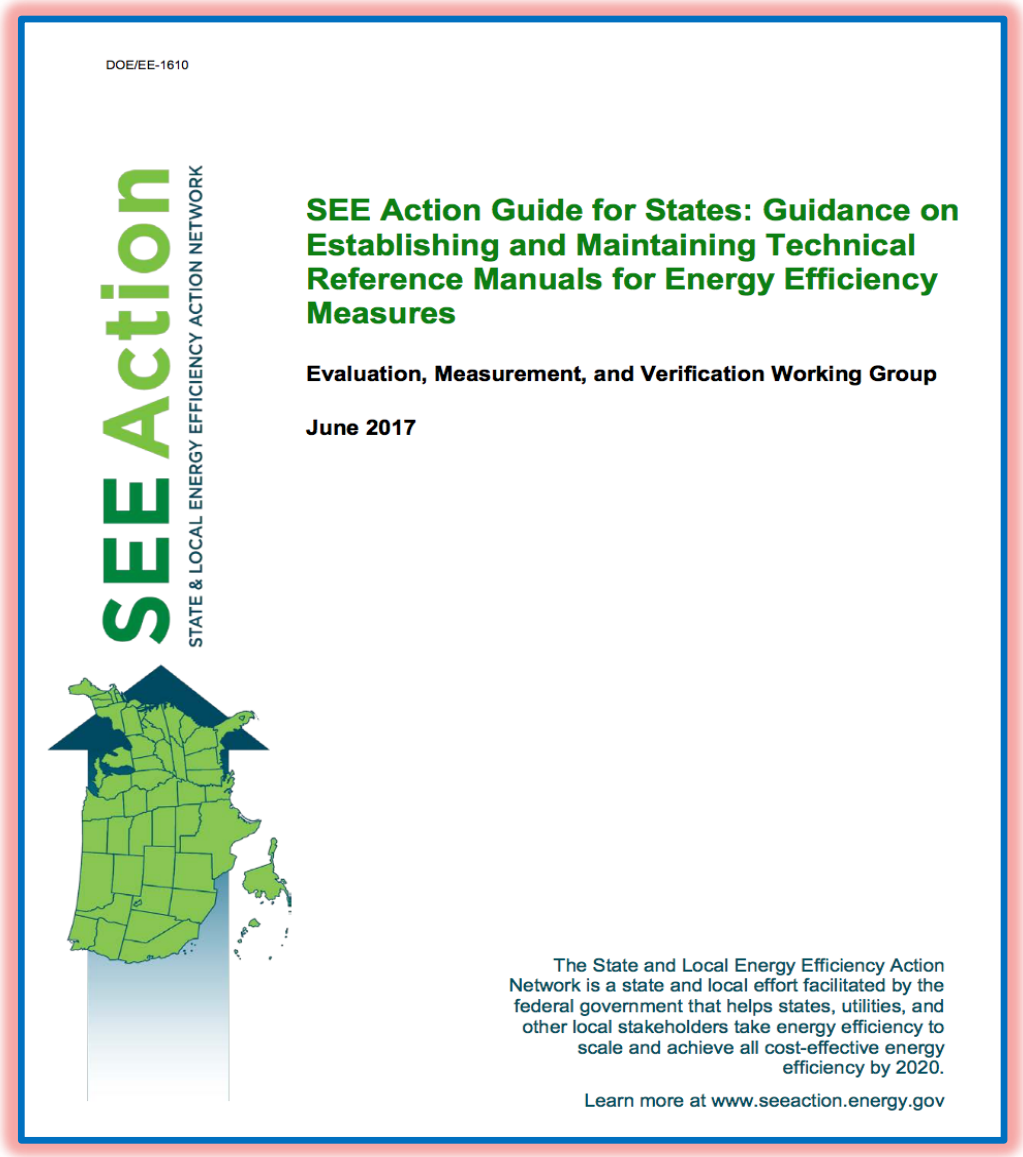
# SEE Action Guide on TRMs




TRM Guide can be found at: https://www4.eere.energy.gov/seeaction/system/files/documents/TRM%20Guide_Final_6.21.17.pdf

Or just search for:

"SEE Action TRM Guide"

# TRM Guide Contents

| Information Category | Chapters | Content |
|---|---|---|
| **1. Summary** | Executive Summary | Overview of guide content and recommendations |
| **2. Background** | Chapter 1: Introduction to TRMs | TRM objectives and benefits, jurisdiction coverage options, and contents |
| | Chapter 2: Savings Taxonomy and Interactions; EM&V Methods; Prescriptive and Custom Measures | Relationship between efficiency measures, projects, and programs; EM&V basics and key definitions of deemed savings related terms; and the differences between prescriptive and custom efficiency measures |
| **3. Current Practices** | Chapter 3: TRM Content, Structure, and Development Options | Descriptions of the content, structure, and development (and updating) processes used in existing TRMs |
| **4. Recommended Practices** | Chapter 4: Suggested Practices for the Deemed Savings Method and Developing and Maintaining TRMs and Recommendations for Further Research | Recommendations associated with the deemed savings method and development and updating of TRMs. Opportunities for improvements through research. |
| **5. Resources** | References | Citations for references listed in the guide |
| | Appendix 1: TRMs in the United States | Summary information on the existing TRMs in the US |
| | Appendix 2: Common Deemed Values, Variables, and Factors Contained in TRMs | Definitions, descriptions, and key issues associated with the most common data types found in TRMs |
| | Appendix 3: Industry Standard Energy Efficiency EM&V Resources and Protocols | Lists of industry standards resources for project- and program-level EM&V |

# Todays Webinar Topics

- Introduction to impact evaluation methods – focus on deemed savings method
- Introduction to TRMs
  - Definitions, TRMs across the U.S.
  - Benefits and constraints
  - Options for content, format, development, updating
- Recommendations
  - Development and use of deemed savings method
  - Development, updating and use of TRMs

# Introduction to Impact Evaluation Methods

Impact evaluation methods for efficiency programs include:

- Measurement and verification (M&V) - applied at the project site level, with results expanded to the program level - See IPMVP Options A, B, C and D (www.evo-world.org)
- Deemed savings - installations and key parameters may be verified by the evaluator, but no direct measurement of performance
- Comparison groups - Analysis of energy consumption data for program participants and a comparison group to determine savings for the program as a whole


***The information in TRMs is typically used for the M&V and deemed savings impact evaluation methods***

# Deemed Savings Method Information (as provided in TRMs)

- **Fully Deemed Savings Values:** Also known as *stipulated savings values* and *unit energy savings (UES),* these are what TRMs are most known for -
  - Documented, numerical values such as per-unit energy and/or demand savings that define the agreed-upon performance of a specific efficiency measure.
  - Example – Annual kWh savings per year for a defined LED lamp type in a defined application
  - Deemed values can also be developed for measure costs, estimated useful lives, avoided environmental impacts, etc.
- *Fully deemed savings values are the the "result" of the deemed savings method*


**Partially deemed savings values** are result of some M&V approaches:

- M&V (IPMVP Option A) results in *partially deemed savings values* using some deemed variables and factors (next slide)
- Fully deemed savings values are not considered an output of M&V, as M&V involves at least some site measurements

# Deemed Savings and M&V Methods Information (as provided in TRMs) continued

- **Deemed Variables:** Values for parameters that determine the performance of an efficiency measure. These parameters are associated with different operating conditions, applications, climates, etc.
  - **Examples –** weather assumptions to be used for heating system savings determinations or operating hours per year for certain types of lighting systems specific applications

- **Deemed Factors:** Attributes of an efficiency measure's impacts that are dependent, i.e., connected, to each measure
  - **Example** - measure costs and effective useful life

- **Deemed Calculations:** These are agreed-to (i.e., stipulated) simple to complex econometric or engineering algorithms (equations) used to calculate the energy and/or demand savings associated with an efficiency measure.
  - **Example** - equations for calculating savings from lighting retrofits are defined with indications of which variables/factors are to be determined with measurements or project-specific data and which are to be *deemed variables/factors*

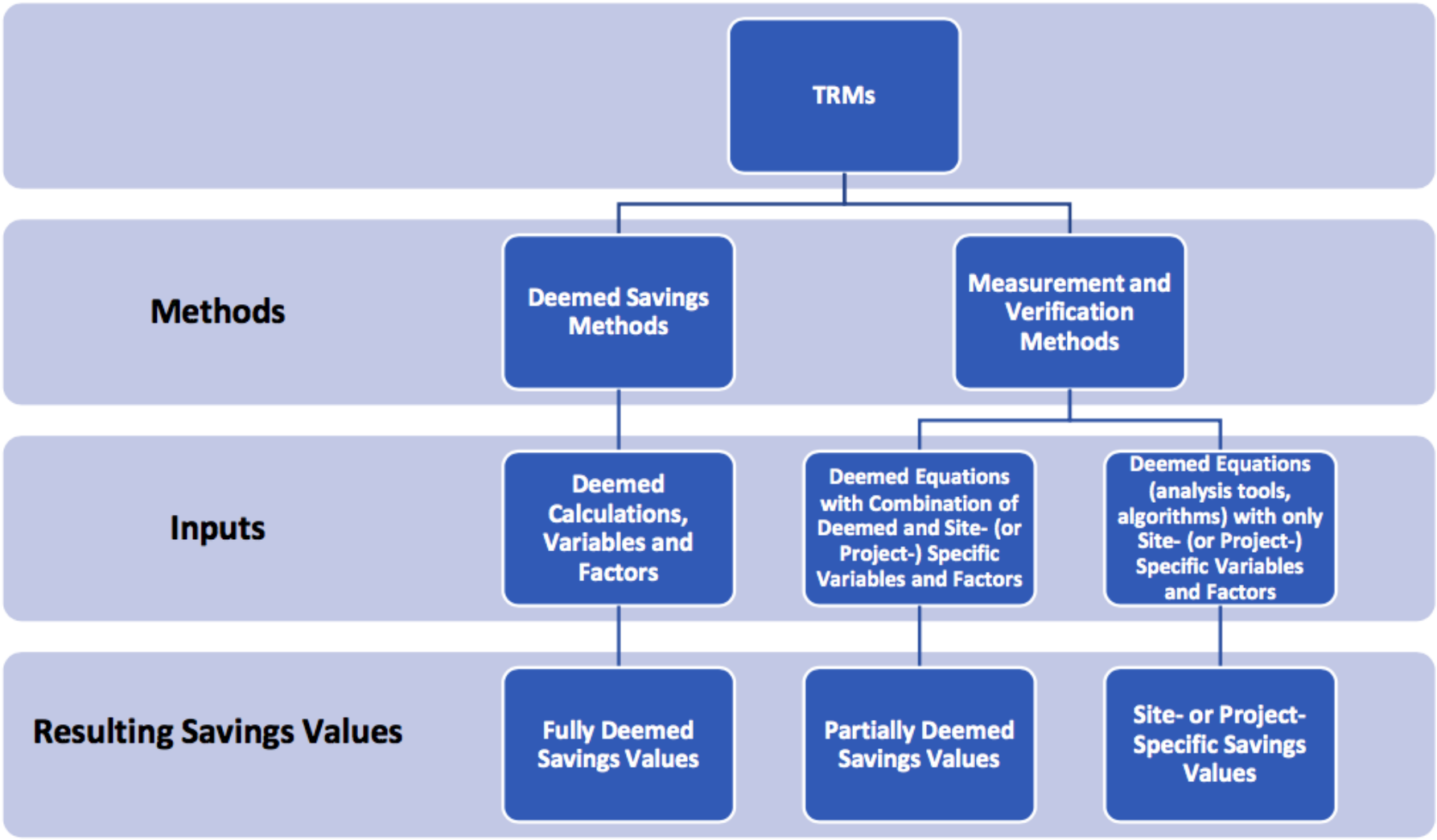
# Deemed Savings Method - application

- Deemed savings values (and variables, factors, and calculations) should be applied to an installed efficiency measure *if the information*:
  - **Has been developed from data sources** (such as prior metering studies) and analytical methods that are widely considered **acceptable for the measure and purpose**
  - **Is applicable to the conditions** (e.g., office building lighting system retrofit, residential refrigerator upgrade) under which the measure is being implemented.

- The deemed savings method is used to stipulate deemed savings values for measures with **well-known and documented savings values** and for which it has been observed that there is **not much variation in savings** across most installations.

- Examples of applications of deemed savings values include:
  - Energy-efficient appliances such as washing machines, computer equipment, and refrigerators
  - Lighting retrofit projects with well-understood operating hours

# Summary of Methods – in Context of TRM Content



# TRMs Introduction

- ✓ "Technical Reference Manual" and "TRM" are terms of art in the efficiency industry for:
  - ✓ Repository of information that documents how efficiency measure impacts are calculated and the sources of information used in these calculations (documentation).
  - ✓ Technical resource that contains efficiency measure information used in program planning, implementation, tracking, and reporting and evaluation.

- ✓ Information can include deemed savings values, factors and variables and calculations

- ✓ Typically available as a document, spreadsheet, or an electronic database, TRMs serve as a common reference, providing transparency and consistency to interested stakeholders.

# TRMs Introduction - continued

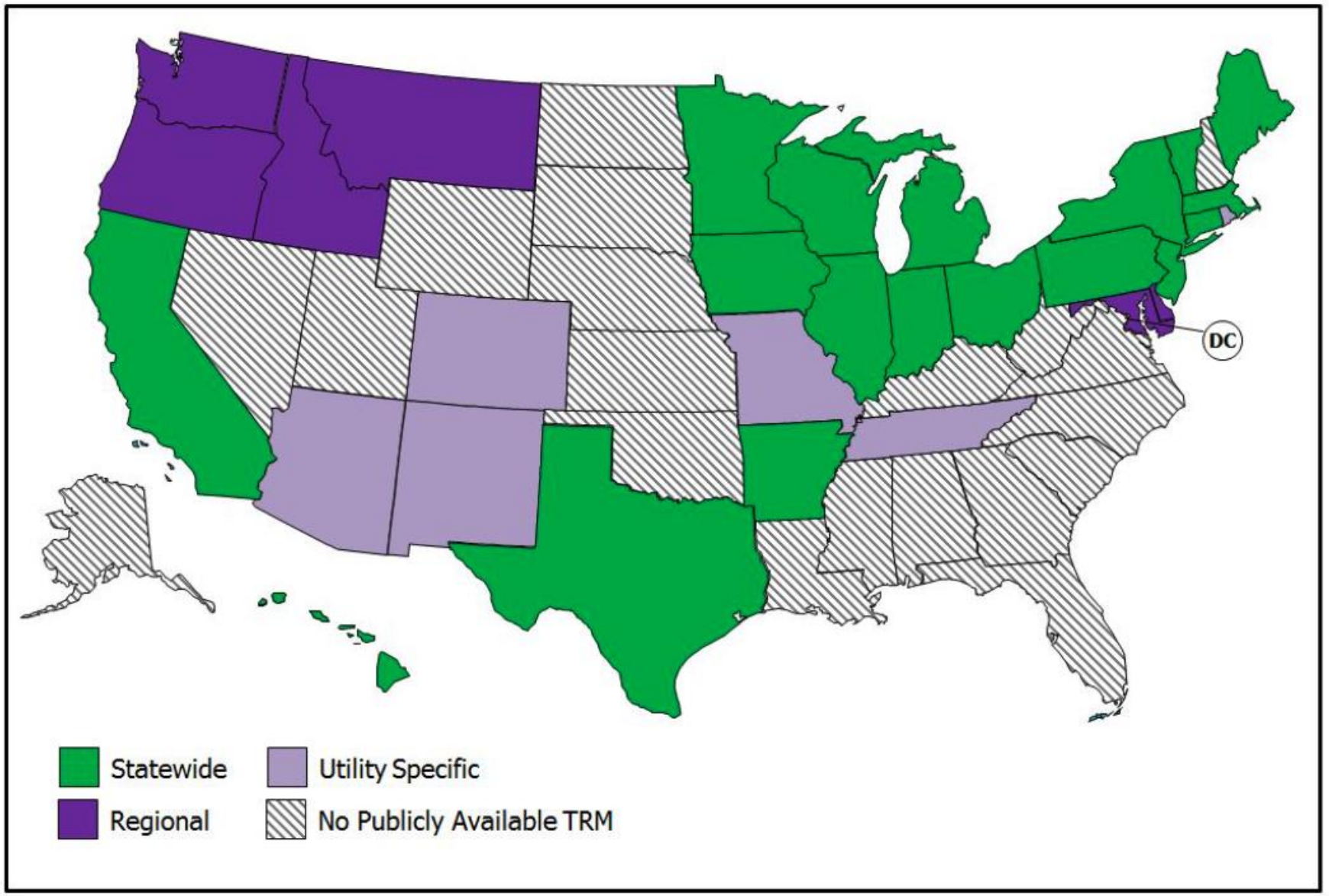
- ✓ TRMs are living documents that should be updated:
  - ✓ As impact analyses and procedures evolve and new data collected about the performance of efficiency measures
  - ✓ To account for changes in codes and standards, the introduction of new EEMs, changes in available product efficiencies of existing efficiency measures

- ✓ TRMs are mostly associated with utility customer-funded efficiency programs and typically cover both natural gas and electricity efficiency measures in all market sectors (residential, commercial, etc.)

- ✓ TRMs tend to be initiated by state utility regulatory commissions and, in some cases, are formally approved by those commissions

- ✓ Most TRMs are prepared by consulting firms with expertise in efficiency measures and the assessment of their performance

# TRMs in the United States



# TRM Objectives and Benefits


TRMs provide a central reference document for regulatory agencies and other stakeholders to consistently, reliably, and transparently calculate electric and natural gas savings from well-understood efficiency measures.

Benefits include:

- Streamlining the planning and reporting functions of programs
- Facilitating savings calculations, standardize reporting processes, and promoting greater transparency and predictability in claimed savings
- Encapsulating what has been cumulatively learned from assessing efficiency activities. *Leveraging existing knowledge*

# TRM Challenges


- TRMs do not eliminate the need for the fundamental research and analyses of the efficiency measures and their impacts, which form the basis for the TRM information

- The TRM challenges tend to be the same as those found when evaluating efficiency programs in general:
  - ❑ Time and funding requirements
  - ❑ Absence of a driving policy (such as an EERS)

- For TRMs, the most specific barriers may be:
  - ❑ Limited access to reliable data sources for developing TRM content
  - ❑ Lack of consensus among stakeholders on key topics

# TRM Jurisdiction Coverage Options

- TRMs are developed for and applicable to:
  - Specific utility or efficiency program administrator service territory
  - Several utilities in a state, typically those under the jurisdiction of a state regulator
  - A region with multiple state agencies, utilities, or program administrators
- For regional and statewide efforts, TRMs share the advantages of other types of statewide or regional efficiency coordination, including:
  - Potential for reduced program administrator and implementer transaction costs
  - Additional resources for creating high quality products and services
  - Consistency in terminology, and consistent reporting format and content

    *Reduced program-related evaluation costs and improvements in consistency and quality can also support higher levels of efficiency activity*
- There are also potential disadvantages to any coordination effort, including:
  - Possible loss of some control by individual program administrators
  - "Lowest common denominator" efforts that do not meet the needs of some TRM users
  - Additional costs and delays due to coordination inefficiencies or failures.

    *Mitigating these issues is discussed in the TRM Guide*

# TRM Content Options


- TRMs generally provide deemed savings values, variables, factors, and calculations, and the associated materials that support the estimation or documentation of the impacts of efficiency measures
- TRM information (typically) reflects agreements between efficiency program administrators and regulatory oversight bodies and is used by administrators in their interactions with implementation contractors and end users
- In practice, the measures that are included are the controlling factor in setting the structure of a TRM

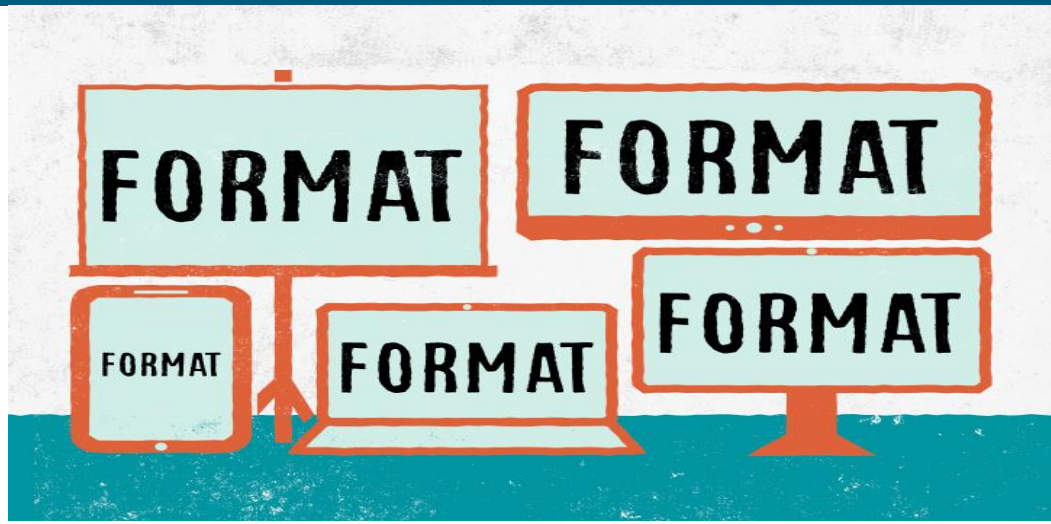
# TRM Structure Options - Example Simplified Outline

| | |
|---|---|
| i | **Document Information**<br>• TRM title<br>• Date<br>• Jurisdiction applicability<br>• Time frame of applicability (e.g., 2016–2017)<br>• Author(s)<br>• Collaborative participants (if any)<br>• Approving entity (if any) and date of approval |
| I | **TRM Purpose** |
| II | **Protocols**<br>• Evaluation protocols used for development of TRM<br>• Guidelines for using the TRM and updating process |
| III | **Glossary** |
| IV | **Residential Energy Efficiency Measure Categories**<br>• Lighting measures<br>• Space heating measures<br>• Space cooling measures<br>• Building envelope measures<br>• Water heating measures<br>• Appliances measures<br>• Plug load measures |
| V | **Nonresidential Energy Efficiency Measure Categories**<br>• Lighting measures<br>• Space heating measures<br>• Space cooling measures<br>• Building envelope measures<br>• Water heating measures<br>• Motor measures<br>• Plug load measures |
| VI | References and Documentation |

- The focus of the content is the sections with measure by measure information
- More guidance and examples are in the TRM Guide

# TRM Format Options

TRMs tend to be published on publicly accessible websites in one of three formats:




- **Documents**
  - PDF documents - for example the Arkansas TRM
  - Word documents - for example the Pennsylvania TRM
- **Downloadable spreadsheets** - for example the Michigan's TRM
- **Online Web portals** accessed through a graphical interface - for example the Minnesota's Energy Savings Platform

# TRM Development and Updating Options

*TRM development and updating is discussed in the TRM Guide*

## Development

- Some elements discussed in the Guide with respect to development are:
  - Using other jurisdictions' TRM data
  - Involving stakeholders – e.g., regulators, administrators, implementers - collaboratives
  - Developing work plans and addressing threshold issues, such as content, approaches to developing data, and approval processes

## Updating

- Current industry practice for maintaining TRMs involves updating with new information, preferably based on current data and analyses, with regard to one or more of the following:
  - Adding additional measures or removing measures
  - Updating existing deemed savings values, variables, calculations
  - Adding new metrics or parameters to the TRM

# Recommendations

In the TRM Guide:

- Nine recommendations for the development and use of deemed savings values, deemed calculations, and deemed variables and factors
- Ten recommendations for technical reference manual content, structure, and development and maintenance

# Recommendations: Suggested Practices for the Deemed Savings Method

1. **Adopt and adhere to clear and transparent deemed savings guidelines, using:**
   - Industry standard assumptions and calculation methods
   - Current information
   - Independent peer-reviewed process with publicly accessible documentation

2. **Deemed savings values should be applied to measures, for which:**
   - Savings are well-understood
   - There is not much variation in savings across most installations
   - Savings or calculations developed from reliable data sources and methods
   - Applicability conditions are well defined
   - Implementation conditions verified through post-installation inspection
   - Savings not highly dependent upon consistent quality control or customer behavior

# Recommendations: Suggested Practices for the Deemed Savings Method - continued

3. **Partially deemed savings values should be applied to measures for which:**
   - These variables and factors are known to vary widely by project site
   - Inputs to site-specific calculations are easily ascertained and verifiable
   - "Reasonableness" ranges for site-specific input variables and factors can be built into the calculation process

4. **Deemed savings values and deemed calculations should be based on input assumptions that are realistic and not necessarily conservative or optimistic**

5. **Deemed savings values, variables, and factors and calculations should account for significant interactions with other measures and end uses**

6. **Conditions and applications for which each deemed savings value or calculation can be applied should be documented**

# Recommendations: Suggested Practices for the Deemed Savings Method - continued

7. **Deemed savings values, calculations, factors, and variables should be based on reliable, traceable, publicly available, and documented sources of information**

8. **When using computer simulation models to develop deemed savings values:**
   - Use experienced practitioners with expertise in building science and simulation
   - Document assumptions and inputs
   - Use documented and vetted industry-standard simulation models
   - Calibrate models to applicable metered or monitored data

9. **Verification activities should confirm that the actual conditions and applications match those defined for use of the deemed savings values**

# Recommendations: Developing and Maintaining Technical Reference Manuals

1. **The roles, responsibilities, and processes for developing, approving, and maintaining a TRM should be clearly defined**
   - While not a consensus opinion, many in the industry believe that state utility commissions should participate in or oversee the development and maintenance of TRMs used for investor-owned utility (IOU) customer-funded programs

2. **It is usually best to develop TRMs with a public, collaborative process**
   - Include program administrators, implementers, evaluators, and independent technical experts, as well as advocates and active regulatory staff participation (for TRMs involving IOU customer-funded programs).
   - TRM development collaborative members should have sufficient technical expertise and time, have defined roles and responsibilities, and agree to adhere to a conflict of interest policy

3. **Regulatory agencies should approve TRMs that will be used by IOUs**

# Recommendations: Developing and Maintaining Technical Reference Manuals – continued

4. **Each TRM should have its own guidance document**
   - Preferably agreed to by those participating in the TRM collaborative
   - Should cover topics such as public accessibility, guidance on balancing rigor of TRM content versus effort, baseline definitions, the process for TRM revisions, the TRM approvals process, and TRM format.

5. **TRMs are most useful when they are (1) well documented with transparent indications of calculations and assumptions, (2) prepared using credible, standardized calculations and data-based assumptions, and (3) designed for ease of operation/compatibility with program tracking and reporting systems**

6. **TRMs should strive to use data and tools that are "best available" (i.e., accurate, relevant, and current)**

# Recommendations: Developing and Maintaining Technical Reference Manuals – page 3

7. **To avoid the potential for undue bias because of financial or other considerations, provisions should be made to have TRM content reviewed by an independent, unbiased body that abides by a transparent conflict of interest policy**
   - Consultants and others that prepare and/or update TRM content should be independent

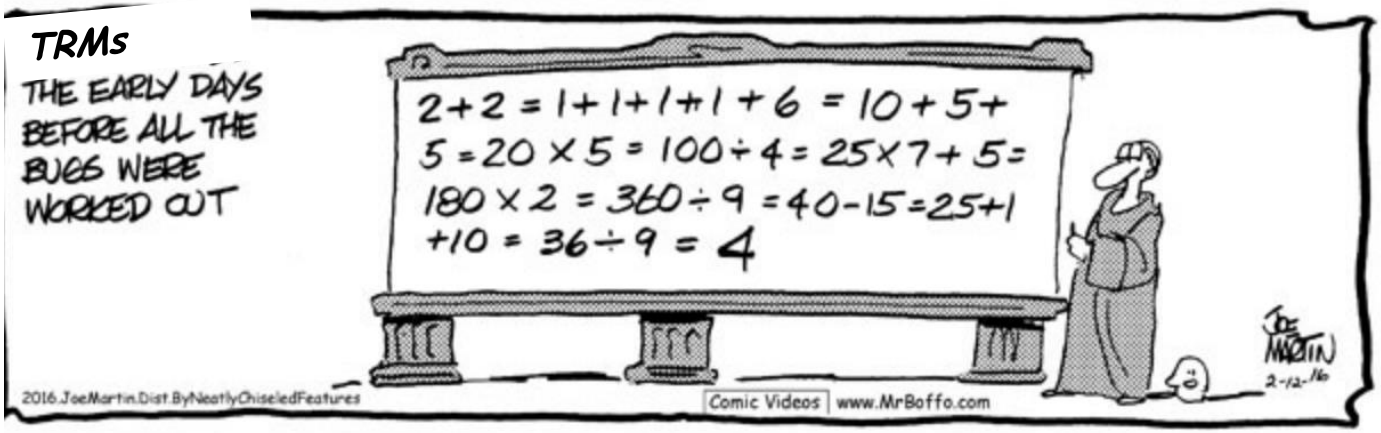
8. **TRMs should have regular, scheduled processes in place for periodically reviewing TRM content**

9. **Searchable, formatted TRMs are preferred, with easily and publicly accessible documentation**
   - Should include measure characterization with narrative measure descriptions, baseline and measure case technical specifications, energy and demand savings algorithms, clearly stated assumptions, and any pertinent program implementation details (i.e., qualification requirements and exclusions)

10. **Regional TRMs can be excellent opportunities for states that do not have their own TRMs or that are contemplating expansions of the coverage of their TRMs**

# Concluding Comments

- TRMs can be very cost-effective and reliable sources of efficiency measure impacts….but they have to be developed and used appropriately
- The guide, with the above recommendations, is intended to provide a basic resource for the appropriate development, maintenance, and use of TRMs.
- The Guide's intent is to support:
  - Reliability of deemed savings values, deemed calculations, and related deemed variables and factors included in TRMs
  - Improving the confidence in the reported impacts of efficiency actions
  - Identifying opportunities for TRM improvements including improved data



# Thank You

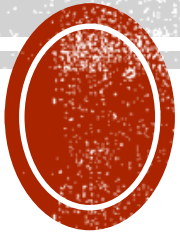
- TRM Guide and other EM&V resources available at SEE Action website:https://www4.eere.energy.gov/seeaction/


- For more information: Steve Schiller, Senior Advisor, Lawrence Berkeley National Lab, srschiller@lbl.gov

# Technical Reference Manuals (TRMs) for Energy Efficiency Evaluation Measurement and Verification

Katie Rich, Public Utility Commission of Texas

October 3, 2017



# TEXAS TRM OVERVIEW

| | |
|---|---|
| Texas' first TRM was developed in 2013 for Program Year (PY) 2014 | • Updated annually for each program year |
| Transparency in energy efficiency measure savings | • Measure description, baseline & efficient condition<br>• Eligibility and effective useful lives<br>• Program tracking and documentation needs |
| Consistency in savings calculations | • Summer and winter peak demand definitions<br>• Commercial load management baseline<br>• Residential demand response calculations |
| Improved savings estimates | • Residential shell measures<br>• Commercial HVAC<br>• Solar PV |
| Supports new measures | • Deemed standard AC tune-ups, pump off controllers, pool pumps, nonresidential evaporative pre-cooling, residential showerhead thermostatic restrictor valve, residential tub spout, showerhead thermostatic restrictor valve<br>• M&V protocols for Ground Source Heat Pumps, Compressed Air, Variable Refrigerant Flow (VRF) |

# 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

# COLLABORATIVE TRM APPROACH

EM&V team reviews TRM for needed updates at least annually (16 TAC §25.181(q) (6) (B)).

Additional updates

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

PUCT staff, PUCT's EM&V team and EUMMOT agree on prioritization

# NEW DEEMED MEASURES

Utilities draft petitions for new deemed savings measures to be filed with the Commission

(16 TAC §25.181(I) (4)).

The PUCT and PUCT's EM&V team reviews prior to filing and integrates into the TRM after Commission approval.

# M&V PROTOCOLS

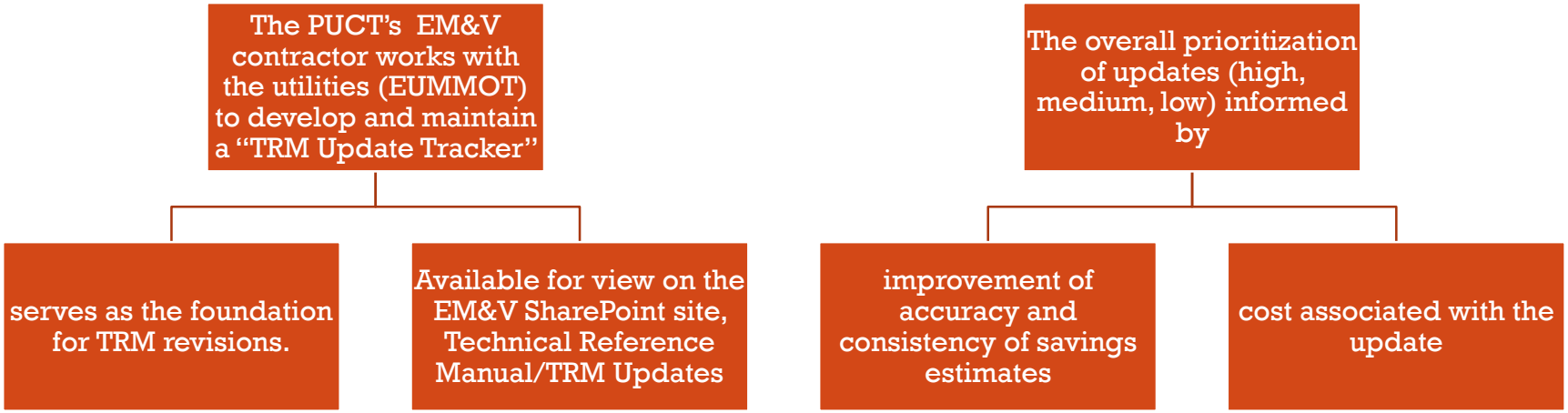
**Utilities or their contractors initiate M&V Protocols**

- new program or technology they plan to offer.

**EM&V team integrates M&V Protocol into TRM**

- after it has been reviewed and agreed upon
- collaborative process

# TRM UPDATE PROCESS



# TRM GUIDE

- Guidance on development and use of TRMs based on lessons learned from other jurisdictions
- Evaluator would have welcomed this guide when setting up the EM&V program in Texas in 2013
- Guidance validates the evaluator's TRM update prioritization process

# QUESTIONS?

- Katie Rich, Public Utility Commission of Texas
- katie.rich@puc.texas.gov

# Technical Reference Manuals (TRMS) For Energy Efficiency Evaluation Measurement and Verification

David Brightwell, Illinois Commerce Commission

October 3, 2017

# Illinois TRM Overview

- Electric EE programs started in 2008 with initial plans filed in 2007.
- Gas EE programs statutorily required in 2011 with plans filed in 2010.
- Stakeholders requested a TRM in 2010 Plan dockets due to wide variation in estimated savings across utilities for similar measures.
- Commission ordered a TRM in response to stakeholder requests.
- In 2015, TRM began including NTG methodologies to standardize across utilities.
- TRM is administered by an independent third party. Commission approves the contract and has the right to hold hearings and fire the administrator if necessary. The utilities pay the administrator.

# Illinois TRM overview, continued

- The TRM applies to both natural gas and electric measures
- A combination of deemed savings values and deemed estimating procedures are included (variations for HDDs/CDDs, measure characteristics, etc.)
- Updated annually

# Update procedures

- Updates due to new measures or new EM&V, or errors, etc.
- Automated emails sent to subscribing parties to alert to change requests.
- Regular meetings occur to discuss new measures/updates to existing measures
- Most changes occur by consensus opinion. Some occur by administrator decision without consensus. Non-consensus issues are resolved in a separate proceeding.
- Updates go into effect at the beginning of the following plan year after the Commission approves a new version of the TRM.

# TRM and Savings

- After a revised TRM is approved by the Commission, deemed measure savings or deemed algorithm is used prospectively.
- No backwards corrections/adjustments are applied except in the case of errata with consensus.

# Pros of the TRM

- It reduces uncertainty of the counted savings associated with measures
- From Commission Staff perspective: it reduces the need to investigate savings values achieved across several utilities in an expedited manner. One TRM for multiple utilities vs. no TRM and multiple savings goals dockets occurring simultaneously.

# Cons of TRMs

- Voluminous, difficult to keep track of everything contained within.
- There is often conflict in updating the savings values/algorithms.
- Imperfect and assymmetric information.  Implementers have the best knowledge and are unlikely to request updates that diminish reported savings.

# Thoughts on SEE Action Recommendations

- In general, good suggestions.
- Under recommendations for content and structure:

> Regional TRMs can be excellent opportunities for states that do not have their own TRMs or that are contemplating expansions of the coverage of their TRMs.

- Not done in Illinois. Not sure how difficult it would be to have multiple state commissions approve a regional TRM.
- TRM development and updating is time intensive. A multistate TRM may benefit from complementarities in expertise across states.

# Questions?

- David Brightwell, Illinois Commerce Commission
- David.Brightwell@illinois.gov

# California eTRM

CALIFORNIA
TECHNICAL FORUM

**ANNETTE BEITEL**
**CAL TF FACILITATOR**

# Overview



- Cal TF Overview
- Current state of deemed values in California
- eTRM project
  - Elements
  - Timing
  - Outcome
- eTRM Vision and Next Steps

# Current State of Deemed Values in CA



- Multiple sources of deemed values in CA
  - DEER ("Database for Energy Efficiency Resources")
  - Non-DEER Workpapers
  - Publicly-owned utility (POU) TRM
- Multiple deemed values and parameters for the same measure
  - Little standardization
- Documentation difficult to identify and understand
- Implementers excluded from process

# eTRM Project - Elements



- Measure Consolidation and Standardization
  - Overlapping measures (DEER, non-DEER WP and POU measures) collapsed into about 225 distinct measures with permutations based on climate zone, vintage, etc.
  - Standardize measure characterization – level of detail, support, measure structure, etc.
- New Software Tool
  - All CA measures – Statewide comprehensive database of measures
    - CPUC staff would continue to develop high-impact measures
  - Relational database
  - Workflow management
  - All documentation supporting values linked to values
  - "Commitments tracking" - data/EM&V needed to refine values tracked
- Engineering Review of Consolidated Measures
  - Systematic review of all consolidated measures
  - Identifies most current data from approved sources (such as costs)
  - Issues with measure to be "flagged" and addressed in Phase 2

# eTRM Project



- Recommended Process changes – New Measures
  - Implementers permitted to propose new measures
  - Collaborative review through Cal TF or staff-led workshops for high impact measures (HIMs)
  - Clear, written technical guidelines, QA/QC and standardization requirements
  - Early input from staff
  - CPUC Staff review and approval
  - Dispute resolution process
- Recommended Process changes – Measure updating
  - Annual open process - updates may be recommended by EM&V, implementers, utilities, CPUC staff; updates result from code changes, new EM&V or program data, changes based on market updates
- Regulators approve updated eTRM on annual basis
  - Provides certainty to implementers about timing of changes

# eTRM Outcomes - Database



- eTRM Database
  - Statewide and consistent set of values, approaches, data
    - Standardization for how measures characterized
    - Centralized repository of values
    - Some variations between POUs/IOUs (different regulatory regime)
  - Well-documented and transparent
    - Documentation linked to values
  - Workflow Management
    - Central tracking of time/resources needed to create/update measures (start to finish)
  - “Commitment” Management
    - Systematic tracking/reporting of follow-up data collection requirements/requests

# eTRM Outcomes - Process

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- Process
  - Open to all
    - Not limited to utilities/CPUC staff
  - Clear standards/requirements
  - Collaborative with broader group of stakeholders
  - Early and ongoing staff input

# eTRM Project – Vision and Next Steps



- Timing
  - Completion December 2018
- Regulatory Path to Approval
  - Discussions ongoing
  - Making eTRM “Database of Record” will require CPUC approval
  - Process changes will also require CPUC approval

# Discussion/Questions

For more EM&V information see:

- Webinars: https://emp.lbl.gov/emv-webinar-series
- For technical assistance to state regulatory commissions, state energy offices, tribes and regional entities, and other public entities see: https://emp.lbl.gov/projects/technical-assistance-states
- Energy efficiency publications and presentations – financing, performance contracting, documenting performance, etc. see: https://emp.lbl.gov/research-areas/energy-efficiency
- The State and Local Energy Efficiency Action Network (SEE Action) Evaluation, Measurement, and Verification (EM&V) Resource Portal: https://www4.eere.energy.gov/seeaction/evaluation-measurement-and-verification-resource-portal

**From Albert Einstein:**

***"Everything should be as simple as it is, but not simpler"***

***"Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted"***