

Capturing Energy Efficiency Savings and Implementing Common Practices to Develop a Successful Framework for the EPA's Clean Power Plan

Robert Neumann, Navigant Consulting

Presented at the 2015 ACEEE National Conference on
Energy Efficiency as a Resource, Little Rock, AR

September 21, 2015



Abstract

State Experiences in Ramping-Up EE Savings

Creating Standard Practices for Greater Certainty

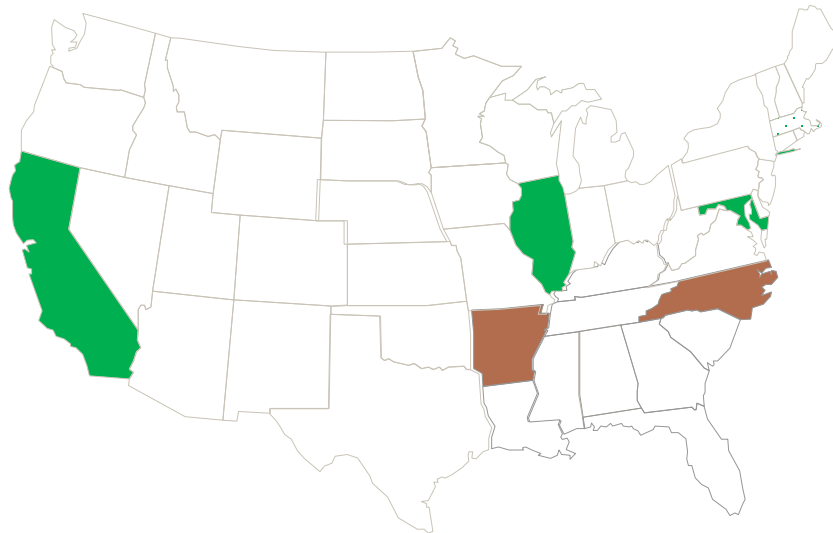
Conclusions and Recommendations

Analysis of how to leverage maturing EE and EM&V knowledge (*across AR, CA, IL, MD and NC*) to develop a framework for complying with EPA's Clean Power Plan (CPP).

- We will review the potential to leverage maturing EE and EM&V knowledge (*across Arkansas, California, Illinois, Maryland and North Carolina*) to develop a framework for complying with EPA's Clean Power Plan (CPP).
- Compare EE and EM&V experiences in 5 states and across other established resources to determine:
 - How can the experiences be leveraged by states and regions to move toward increasing savings, standardizing EM&V and complying with the CPP?
 - What best practices and guidelines can be applied to states' efforts in developing CPP state compliance plans (State Plans)?

The five states used for the discussion are: Arkansas, California, Illinois, Maryland and North Carolina.

- States were chosen based upon geographic diversity and the varied EE regulatory approaches they offer
- The variety of state-specific regulatory regimes across the states provides a natural EE experiment in the state and potentially for the region
- Given available data, we determine if any conclusions could be drawn from analysis of those states' EE initiatives and relative EE performance.



The analysis reveals:

- **Regulatory financial paradigms** are typically designed around cost recovery, lost margin recovery and performance incentives
- **Cost recovery mechanisms or incentives** are put in place by state legislatures and/or state utility commissions and **corresponding positive EE initiatives are witnessed** (*maturing programs and increasing savings*)
- **Key themes in each state include:** *regulatory and stakeholder oversight, standardized independent EM&V, use of TRMs, continually streamline approaches and creating common methods to implement and evaluate EE*
- **The above themes could be leveraged as elements of standardizing EE approaches in states and regions:**
 - *Establish stakeholder groups in states or regions to manage policy issues to streamline the regulatory process*
 - *Adopt a TRM to establish standard savings values and deemed savings – possibly manage established state TRMs across regions to streamline the process*
 - *Adopt concepts used in UMP and ANSI recommendations*

Arkansas is a leader in the southeast with regard to EE frameworks and EM&V.

EE History / Goals

- **EE established in the Energy Conservation Endorsement Act of 1977 (ACA 23-3-401)**
- **Resource planning guidelines**, approved in January 2007, require comparable consideration of supply and demand side resources. The Governor's Commission on Global Warming produced a report in 2008 which included a proposal to meet all new electric load growth in Arkansas through utility EE and DSM programs.
- **Utility-sector energy efficiency initiatives in Arkansas increased significantly since 2007** - in 2010, the APSC further established the importance of energy efficiency as a resource by adopting an energy efficiency resource standard (EERS) for both electricity and natural gas - includes guidelines for efficiency program cost recovery, shareholder performance incentive, and new guidelines for utility resource planning.
- Incremental annual electricity savings of 0.75% of retail sales 2013-2014 and 0.9% in 2015-2016.

EM&V

- **EM&V is integral to AR EE framework** – evaluations are governed by the state and includes an EM&V Advisor
- **AR's TRM is established and leveraged by other states (i.e., LA, MS) and is a model TRM published in 4th ver.** - provides TRM practices, evaluation role, protocols, etc.
- **AR has a working group, Parties Working Collaboratively (PWC)** which is central to moving EE and EM&V forward in AR (e.g., working through difficult EM&V issues, TRM issues and updates, etc.)

California is a leader in the west with regard to EE frameworks and EM&V.

EE History / Goals

- **Legal authority for CPUC includes legislation passed in 2005** that established a loading order for both IOUs and POU's (CA Legislature, SB 1037, 2005). Legislation passed in 2006 established a requirement that all load-serving entities procure all cost-effective EE measures (CA Legislature, AB 2021, 2006).
- **CA utilities are required to develop Long-Term Procurement Plans and transmission needs that incorporate EE plans and targets** (CPUC, Decision 04-01-050). The plans are submitted every 2 years, and plan for a 10-year period.
- **Electric: Long-term goals of ~0.9% incremental savings each year through 2020.** However specific goals have been adjusted upward in recent years, to ~ 1.1% of sales in 2015. Natural Gas: 619 gross MMTh between 2012 and 2020.

EM&V

- **CA's EM&V process is well-developed and thorough for the IOUs.**
- **EM&V protocols developed by the CPUC and stakeholders were issued in 2006** (CPUC, 2006). EM&V guidelines are updated regularly.
- **California's IOU EM&V budget** authorized for 2006 through 2009 was 8% of EE program budgets - California's EM&V budget for 2010-2012 was \$125 million, or 4% of EE program budgets.
- **CA established EE Evaluation Protocols, Evaluation Framework, CPUC EE Policy Manual, CALMAC** (a database of over 800 evaluation reports dating to the 1990s), EE Goals and Potential Studies, Database of EE Resources (DEER)

Illinois is a strong EE state in the midwest with an established EE framework, EM&V process and TRM.

EE History / Goals

- **2007 legislation passed states utilities must meet 0.2% of their delivered load with EE, increasing to 2% in 2015 and thereafter (SB 1592; Public Act 95-0481) .**
- **The law also requires utilities decrease the amount of EE and DSM implemented if necessary to limit estimated average increase in the amounts paid by retail customers.**
- **In 2007, Illinois became a leading Midwest EE state.** Individual electric utilities administer 75% of the total funding for energy efficiency programs – while the Illinois Department of Commerce and Economic Opportunity (DCEO) administers 25% of the utility funding used for EE program’s focused on government facilities, low-income households and market-transformation-oriented information and training programs.
- **Electric: 0.2% incremental savings in 2008, ramping up to 1% in 2012, 2% in 2015 and thereafter.** Natural Gas: 8.5% cumulative savings by 2020 (0.2% incremental savings in 2011, ramping up to 1.5% in 2019). Due to cost cap restrictions, regulators have approved lower targets in recent years.

EM&V

- **EM&V is required for all investor owned utilities and DCEO EE programs**
- **EM&V costs are capped at 3% of EE expenses**
- **A TRM is established currently in the 4th version with a 5th version being updated**
- **An Illinois Stakeholder Advisory Group (SAG) is established which includes all utilities, government agencies and public interest groups**

Maryland is a strong EE state with an established EE framework and EM&V and part of multiple regional alliances.

EE History / Goals

- **Maryland utilities ran EE and DR programs in the 1980s and 1990s, those efforts were discontinued when state removed regulations during utility restructuring**
- **EE implemented again when MD legislature enacted the EmPower Maryland Energy Efficiency Act of 2008 – this created an EERS setting a statewide goal of reducing per capita electricity use by 15% by 2015 (5% targeted reductions by 2011)**
- **Electric utilities have significantly expanded their EE program portfolios**
- **Recent goals set by the PSC require utilities to increase savings by 0.2% per year to reach 2% incremental savings**
- **Utilities can amortize cost recovery over multiple years, but cannot earn shareholder performance incentives**
- **MD is part of RGGI (Regional Greenhouse Gas Initiative), a model CO2 trading group**

EM&V

- **The evaluation EE programs relies on legislative mandates (Empower Statute Public Utilities 7-211) and PSC orders**
- **Evaluations administered by utilities and the Maryland PSC**
- **Maryland has established formal rules and procedures for evaluation and evaluations are conducted statewide**
- **Maryland uses a TRM and all of the five classic benefit-cost tests and implements the Mid-Atlantic TRM (*administered through NEEP*)**

North Carolina is a developing EE state on the Mid-Atlantic with an established EE frameworks and EM&V.

EE History / Goals

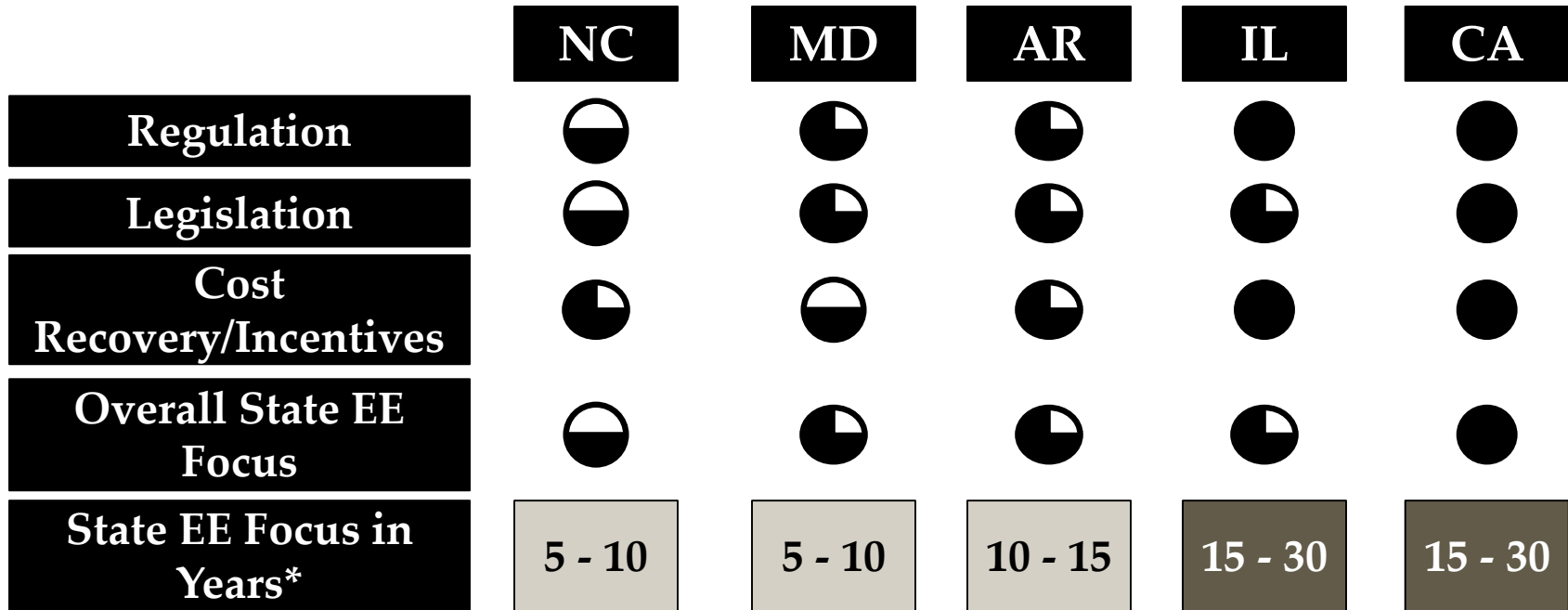
- The NCUC approved Duke Energy Corp.'s Save-A-Watt program in 2007 establishing EE goals and rate recovery
- 2007 also had established the state's first Renewable Energy and Energy Efficiency Portfolio Standard
- NC utilities expanded EE programs since then, but their investment and performance levels are lower than the national average
- **Duke Energy Progress** (formed through merger of Duke Energy Carolinas and Progress Energy Carolinas) reached a settlement agreement in 2011 with clean energy groups that sets an annual energy efficiency savings target of 1% of retail sales starting in 2015 and a 7% cumulative target from 2014 to 2018
- **The energy efficiency portion of the REPS energy savings targets increased to 0.75% of prior-year sales in 2012, rising to 5% of prior-year sales in 2021.**

EM&V

- **Evaluation of EE program relies on commission orders** and evaluations are mostly done by utilities – NC doesn't have any specific legal requirements evaluations
- **NC does specify the TRC to be its primary test for decision making**, but does use four of the five classic benefit-cost tests: TRC, Utility/Program Administrator (UCT), Participant (PCT), and Ratepayer Impact Measure (RIM)
- **North Carolina *does not* use a TRM.**

State Legislative and Regulatory Assessment

Each state's mix of provisions can be summarized in high-level findings comparing "intensity" of effort in each category as follows:



Key:	
	No Activity
	Light Activity
	Moderate Activity
	Strong Activity
	Comprehensive Activity

Increasing EE Oversight Activity

* Years include predecessor state commission energy planning programs (e.g., early demand-side management planning)

Source: Navigant

Legislative and Regulatory Detail - Summary

There are varying degrees of legislative and regulatory oversight within the states – North Carolina has the least, MD is improving and California and Illinois have the most oversight.

All States

All states have some level of legislative and/or regulatory activity, but there are varying degrees of EE regulatory and legislative initiatives underway.

Less Oversight

North Carolina has legislation and limited state commission initiated EE cases – EE programs are established by utilities with commission oversight – a cost recovery rider mechanism is used in North Carolina, but oversight and commission involvement in Maryland and Arkansas are stronger. **Maryland** has legislation and regulation, but it establishes EE structure with less commission oversight than other states, but is part of NEEP and RGGI.

Most Oversight

CA and **IL** are at the opposite end of the EE spectrum with EE goals established by the legislature and those laws are implemented by the commissions. **Arkansas** has a well established TRM.

Creating Standard Practices for Greater Certainty

Next we review various standard approaches developed nationally to determine what can be used for greater certainty.

UMP

- The Uniform Methods Project has been vetted nationally and provides standard, flexible approaches to evaluation

**Stakeholder
Groups**

- CA, AR, IL and MD each are involved with or have a stakeholder group to gather knowledge, gain consensus and develop key tools

TRMs

- AR, CA, IL and MD each have a TRM that has added value and certainty to EM&V

ANSI

- Charts 125 actionable recommendations to advance energy efficiency in the built environment

**EPA EM&V
Guidance**

- EPA EM&V guidance for final CPP Rule

Creating Standard Practices for Greater Certainty: UMP

The point of reviewing the UMP, and potentially adopting some of its standards and approaches, is to create a baseline for other states (*potentially across states*).

- **The UMP has been vetted nationally and provides standard, flexible approaches to evaluation**
- It appears **other jurisdictions are reviewing the UMP at this time** – it is not clear if other regions have adopted the UMP in any fashion (*but it is under review for specific application within those states or regions*)
 - At this point, it is not clear if the UMP has been adopted by other states, but it is clear that numerous states and regions are reviewing the UMP for similar reasons being discussed at the Policy Manual Sub-Committee
- **There are various approaches to consider in adopting portions of the UMP:**
 - Use the UMP as a barometer to outline desired sections of an Illinois Policy Manual, or
 - Adopt specific chapters (sections) as a starting point for the Illinois Policy Manual - Once adopted, amend or specifically alter the language similar to the TRM process.

The UMP is developed by the National Renewable Energy Laboratory (NREL) – the DOE envisions the following specific goals for this project:

- **The current UMP chapters (published by NREL in April 2013) provide a straightforward method for *evaluating gross energy savings* for each of the most common residential and commercial measures.**
- **The UMP also includes a *net savings evaluation* chapter.**
- **The UMP is *not intended to alter or replace* the TRM.**
- **It offers guidelines that help **strengthen the credibility of energy efficiency program savings calculations** – drafted by experts from across the US.**
- **Provides clear, accessible, step-by-step protocols to determine savings for the most common energy efficiency measures.**
- **Supports consistency and transparency in how savings are calculated.**
- **Reduces the development and management costs of EM&V for energy efficiency programs offered by public utility commissions, utilities, and program administrators.**
- **Allows for comparison of savings across similar efficiency programs and measures in different jurisdictions - increase acceptance of reported savings.**

Creating Standard Practices for Greater Certainty: Stakeholder Groups

Stakeholder groups are a key to planning, gather expert knowledge and gaining consensus across a state or a region.

AR

- Parties Working Collaboratively (PWC) developed a model incorporating EE findings into an EM&V process
- Collaborative group dealing with key policy issues and TRM matters, EM&V protocols, etc.

CA

- California has extensive policy groups managed through the California Energy Commission and the California Public Utilities Commission
- The state's stakeholder groups are central to developing policy, regulatory rules, EM&V guidelines and practices, resolving policy matters outside of litigated proceeding

IL

- Stakeholders Advisory Group (SAG) is an Illinois Commerce Commission sanctioned group that works through key policy issues, EM&V matters and develops state TRM
- Policy committees developed to draft EM&V standard protocols and work through difficult EE matters outside of a litigated proceeding

MD

- NEEP (Northeast Energy Efficiency Partnerships) is the primary, regional stakeholder group for Maryland
- NEEP is also a part of RGGI (Regional Greenhouse Gas Initiative) which is model CO2 trading platform among 9 NE and Mid-Atlantic states

NC

- North Carolina has stakeholder public interest groups that engage in litigated proceedings before the state utility commission

Creating Standard Practices for Greater Certainty: TRMs

Technical Resource Manuals (TRMs) are established in 23 states which includes AR, CA, IL and MD.

AR

- Arkansas – v4, working on v5 - describes protocols for verifying, measuring and evaluating energy savings under EE programs funded by public utilities in Arkansas
- Includes "Deemed Savings" values which are estimates of how much energy is saved, on average, by many of the measures implemented through the utility EE programs
- TRM will be periodically updated

CA

- DEER (Database of EE Resources) contains information on selected energy-efficient technologies and measures – sponsored by CPUC and CEC
- DEER provides estimates of the energy-savings potential for these technologies in residential and nonresidential applications
- DEER contains information on typical measures -- those commonly installed in the marketplace -- and data on the costs and benefits of more energy-efficient measures

IL

- Illinois' TRM provides transparent and consistent standards for calculating energy and capacity savings generated by EE programs in Illinois
- TRM was developed to provide deemed savings for standard measures used by utilities
- Approved and drafted by and through the IL SAG (Stakeholder Advisory Group)

MD

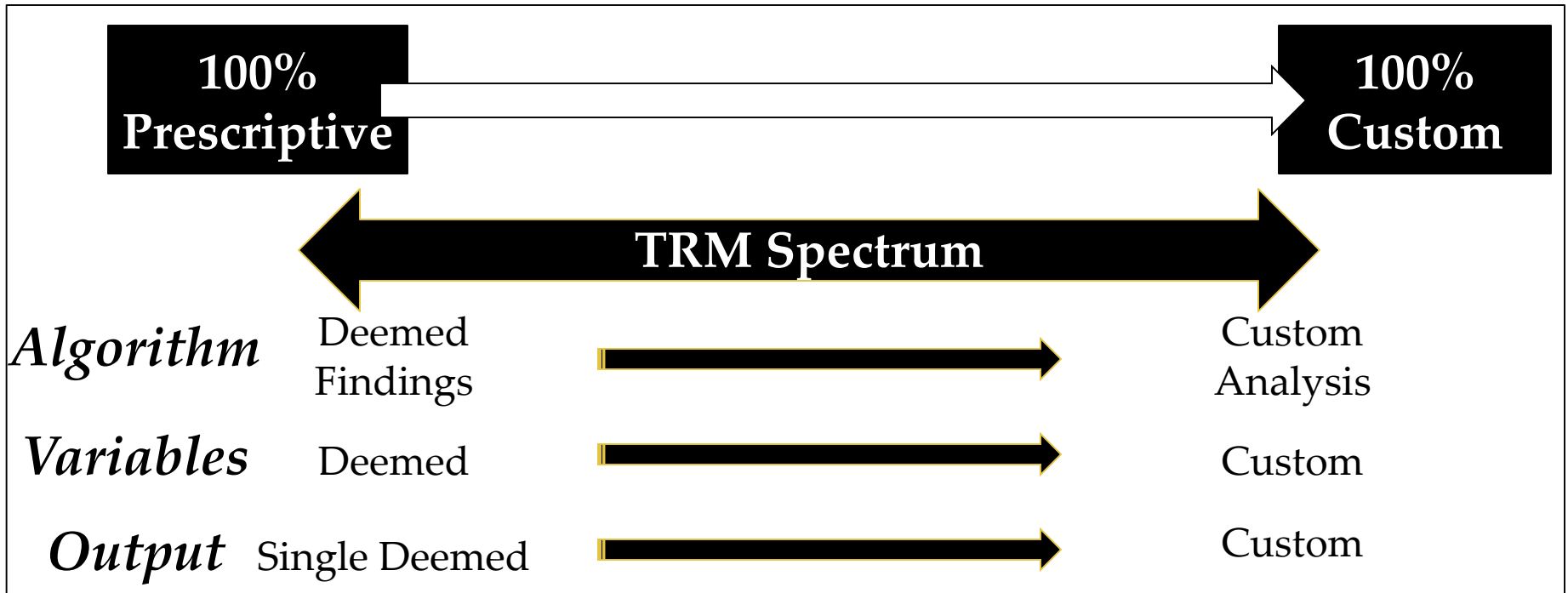
- MD uses the Mid-Atlantic TRM (now in v4) - facilitated by NEEP through the regional EM&V Forum (MD, DE and DC)
- The Forum provides a framework for development of consistent protocols to measure, verify, track and report energy efficiency, costs and emission impacts to support the role

NC

- North Carolina – is reviewing development of a state TRM

Creating Standard Practices for Greater Certainty: TRMs

TRMs are useful for standard (prescriptive) measures which allows for consistent implementation and more certainty of expected savings.



Benefits of Deemed Savings:

- *Standardization*
- *Consistent Use and Implementation*
- *Lower Costs of Assess*

Benefits of Custom Savings:

- *Accuracy*
- *Complexity Requires Variation*
- *Higher Cost to Assess*

ANSI's* roadmap EE Standardization Coordination Collaborative (EESCC) is intended as a national framework for action and coordination on EE standardization.

- **Charts 125 actionable recommendations** to advance energy efficiency in the built environment.
- **Roadmap Goals:** serve as a resource of industry and government, raise awareness and increase standardization, identify standardization gaps, etc.
 - In Scope areas include: water-energy nexus, buildings, lighting, air conditioning, heating, mechanical systems, energy storage water heating, indoor plumbing, alternate water sources, swimming pools and hot tubs, commissioning
 - Out of Scope: appliance & product standards, indoor air quality standards, outside the meter standards, energy generation, T&D and distributed generation
- **Chapters 1-3:** Building Energy and Water Assessment and Performance Standards, System Integration and Communications and Building Energy Rating, Labeling and Simulation (e.g., outlines various gaps)
- **Chapter 4 – EM&V – 32 recommendations to advance EM&V** – focus includes:
 - Methods for determining annual savings (site specific, statistical methods, metered analysis)
 - Duration of savings – effective useful life
 - Technical Reference Manuals (TRMs)
 - Reporting and tracking systems

*American National Standard Institute's (ANSI)

EPA EM&V *draft* Guidance for Demand-Side EE – the EPA is currently accepting public comment on the draft EM&V guidance.

EPA & EE

- EE was removed as a Building Block 4 from the CPP – the EPA has made it very clear that it expects and wants EE to be used as a compliance option
- EPA issued EM&V draft Guidance along with the final CPP Rule draft rule on August 3, 2015 EPA - comment period runs 90 days subsequent to filing of the final CPP in the Federal Register.

EPA EM&V Guidance

- EM&V is required for EE deployed in a rate-based plan, while EM&V isn't required for mass-based plans (e.g., emission reductions are measured at the source for mass-based).
- **Guidance includes:** baseline definitions and applicable EM&V methods, the appropriate use of industry-standard protocols and guidelines, and other topics for successfully quantifying and verifying savings for purposes of generating emission rate credits (ERCs) and adjusting an emission rate.
- **EM&V Guidance:** methods, savings metrics and baselines, reporting timeframes, deemed savings, independent factors affecting consumption and savings, reliability, avoiding double counting, useful life and persistence of savings, T&D savings adders, interactive effects

States can leverage existing protocols and EM&V practices from other states and National standards to develop state or regional EM&V guidelines.

**No Need to
Reinvent
the Wheel**

- States and regions can look to existing and developing EM&V protocols, practices and rules to develop a reliable EM&V framework.
- By thoughtfully leveraging available resources, experiences and detail, EE and EM&V can be incorporated as an admission reduction strategy for CPP purposes.

Conclusions & Recommendations

States can position themselves for using EE for CPP compliance by leveraging elements of the 5 states EE frameworks, creating stakeholder groups and applying key portions of the UMP and ANSI.

State Experiences

- **The 5 states have EE frameworks that provide guidance for developing EE frameworks and using EE savings for CPP compliance**
- **Key EE framework elements include:**
 - **Initiate and develop EE regulatory and legislative structures** to develop a cohesive EE policy framework with increasing savings levels over time
 - **Create stakeholder groups** with utility, regulatory and public interest group involvement to decrease regulatory delay and improve agreement on EE policy
 - **Adopt a TRM and continue developing the TRM** through a structured process
 - **Leverage existing standard guidelines:** UMP, ANSI and EPA's EM&V Guidelines
 - **Use independent evaluation of EE programs** with consistent approaches to EM&V

Conclusions & Recommendations

(con't) States can position themselves for using EE for CPP compliance by leveraging elements of the 5 states EE frameworks, creating stakeholder groups and applying key portions of the UMP and ANSI.

Developing CPP Plans

- **Best practices and guidelines from other states' EE frameworks and existing policy initiatives is key to growing EE savings to be used in CPP State Plans**
- **EE can be a central resource in CPP State Plans by:**
 - Outlining how EE state and regional frameworks will be leveraged during CPP State Plan implementation: state/regional EE structure, EM&V approaches, policy, etc.
 - Detail the expected savings from specific programs, how those programs will be managed and evaluated, include "draft" evaluation plans in State Plans, etc.
 - Outline 3-5 year EE plans at the state/regional level, implement those plans starting in 2016-2017 and map out future EE plans for successive 3 year periods

Key CONTACTS



NAVIGANT
ENERGY

Rob Neumann | Associate Director
Rob.Neumann@navigant.com
312.583.2176 direct