INNOVATION SERIES

PART 1

Driving Energy Efficiency Markets: The Conventional Approach

9.8.16

States have long played an important role in driving energy efficiency markets. The more conventional approach to driving these markets has been the adoption of Energy Efficiency Resource Standards (EERS). This paper describes the historical adoption of EERS policies, the extent of existing market certainty associated with these policies, the outlook for future market certainty, and concludes with policy considerations for improving market certainty via EERS policy revisions. The second paper in this four-part series, ***State Policies to Expand Market Certainty for Energy Efficiency without an Energy Efficiency Resource Standard,*** addresses alternative approaches to foster energy efficiency markets either in place of, or in tandem with, an EERS.

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CENTER FOR THE NEW ENERGY ECONOMY

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About This Series

Since the late 1990s, state Renewable Portfolio Standards (RPS) and Energy Efficiency Resource Standards (EERS) have been the largest drivers of the renewable energy and energy efficiency sectors. However, state target dates are quickly approaching: by 2026, 29 RPS and 11 EERS policies will need to be extended or replaced in order to maintain market certainty for continued investment and business growth. In this paper series, the Center for the New Energy Economy analyzes energy efficiency policies (Parts 1 and 2) and renewable energy policies (Parts 3 and 4). Parts 1 and 3 discuss the prospects for extending and enhancing established policies and Parts 2 and 4 propose innovative options that could work with or without an EERS and RPS.

Introduction

Energy efficiency is widely recognized as a least cost resource. It is also increasingly viewed as a least risk resource. Figure 1 (below) compares generation resources in terms of a single numerical measure of their respective costs. This measure, the levelized cost of energy (LCOE), represents the cost per megawatt hour (MWh) of energy over the life of a power plant and encompasses all expected costs during that lifetime including capital costs, fuel costs, as well as operations and maintenance.[1] Among every other common generation resource, energy efficiency is virtually always the least cost.

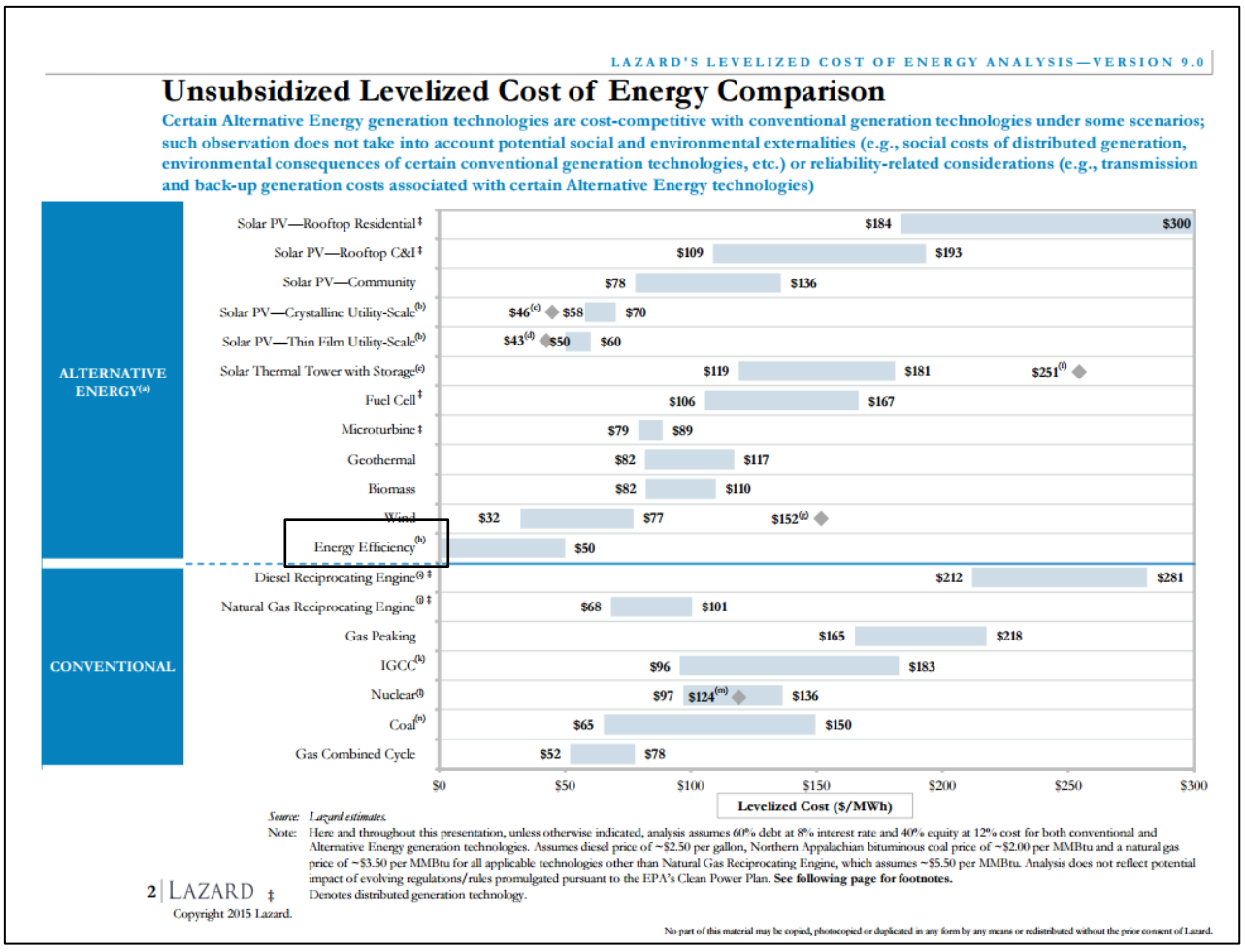

Figure 1. Levelized Cost of Energy Comparison, Version 9.0 (Lazard, 2015)

[1] Lazard's Levelized Cost of Energy Analysis—Version 9.0 (Lazard, November 2015) https://www.lazard.com/media/2390/lazards-levelized-cost-of-energy-analysis-90.pdf.

There are many different types of risks associated with investment in electricity generation assets including cost-related risk and time-related risk. Cost-related risk reflects the risk that investments will cost more than originally expected, or that cost recovery for those investments will be different from original expectations. Examples of cost-related risks include higher than expected construction costs, or fuel price fluctuations. Time-related risks reflect the possibility that circumstances will change over time and will do so in a manner that affects the cost-benefit calculation for the investment.[2] Examples of time-related risks include new environmental regulations or longer than expected construction times.

Energy efficiency also carries the least amount of financial risk compared to other investments in electricity generation. A recent analysis, *Practicing Risk Aware Regulation*, explores the inherent risk of utility and regulator asset decisions. Figure 2 (below) depicts utility generation options plotted in relation to their LCOE and relative risk. Energy efficiency has both the lowest LCOE and lowest risk. This is especially true compared to investment in conventional generation assets, which

Figure 2. Projected Utility Generation Resources in 2015: Relative Costs and Relative Risk (Binz et al. 2012)

[2] Ibid.

may experience fuel price fluctuations or long, complex construction timelines that cause unexpected increases in cost.

While there is a strong argument for energy efficiency as a least cost, least risk resource, policy barriers exist in every state. Furthering a public policy objective of using electricity more efficiently requires deliberate policy and, often, ongoing policy maintenance. In the sections that follow, CNEE explores future market certainty for this least cost, least risk resource.

One of the conventional approaches for states to capture this resource is by adopting an Energy Efficiency Resource Standard (EERS). EERS policies require or encourage utilities to save an annual percentage of future retail electric and gas sales by a certain date. For example, a policy may require certain types of utilities to achieve a 1% reduction of retail electric sales annually from 2016 through 2025. State adoption of EERS policies is not universal and the policies are generally not standardized in terms of stringency or target years. To date, 30 states have an EERS (See below).

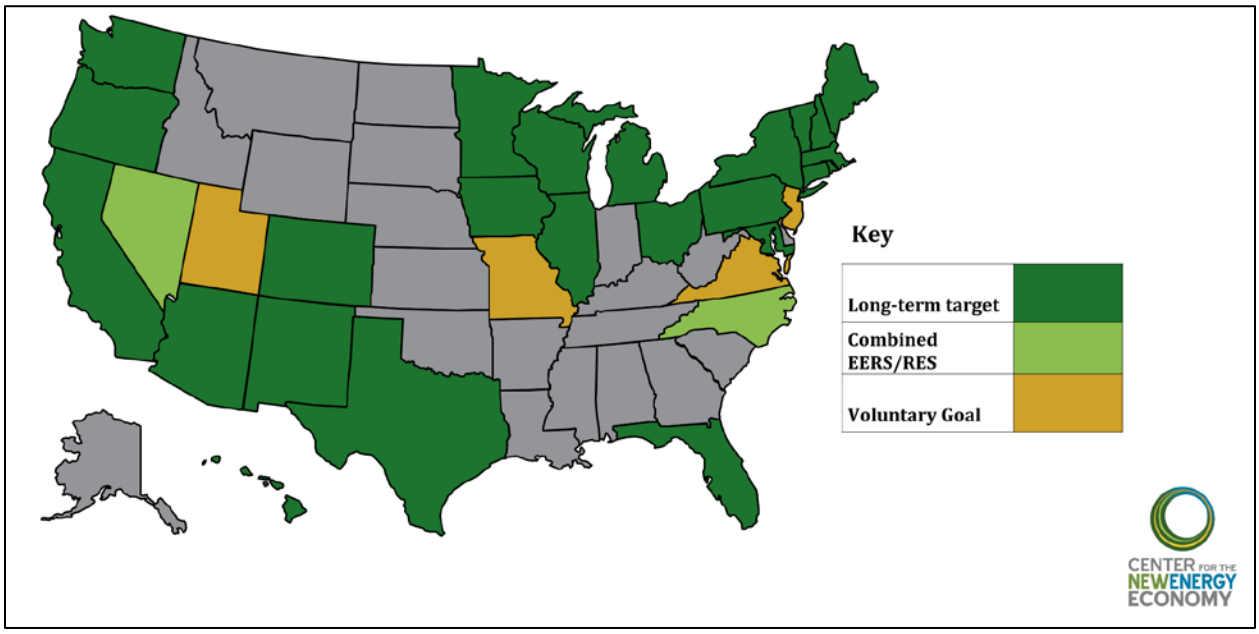

Figure 3. States with an EERS by Policy Type

The stringency of these policies varies somewhat significantly from state to state. This variation impacts the market certainty created by the EERS within each state, which influences energy efficiency investment decisions. In addition, seven states will reach their target dates by 2020, with another seven by 2030. If these states do not act to update their EERSs, market certainty may erode. The overall extent of the decline depends upon the existing variation in the applicable statutory and/or regulatory language associated with each state's target date. This paper documents this variation and offers policy solutions for increasing market certainty within an EERS context.

Current Landscape for EERS Policies

In 1999, Texas became the first state to mandate specific energy efficiency savings. Subsequent EERS adoption was initially slow but then increased significantly from 2006 – 2010, a period when 25 states enacted a policy (See Figure 4). Outside of New Hampshire, EERS adoptions have stagnated since 2010.

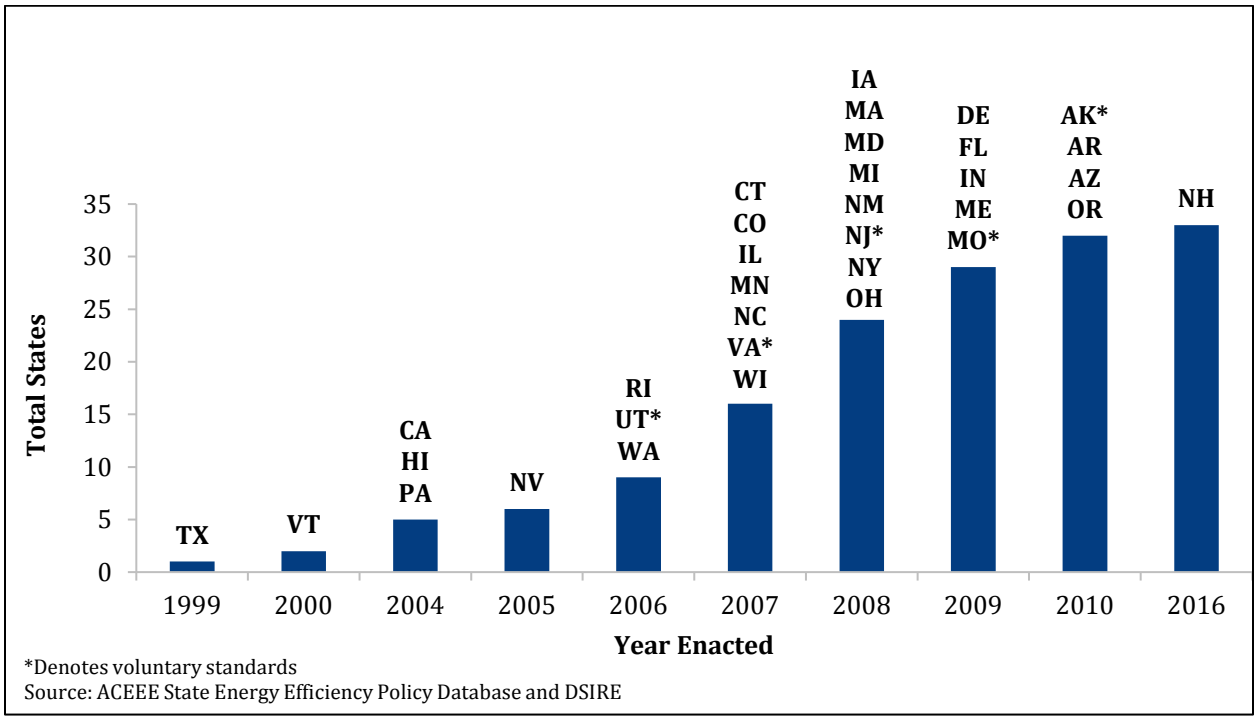

Figure 4. States with EERS Policies and Initial Adoption Dates

The implementation of these policies has resulted in significant energy efficiency market expansion and consumer savings. Downs and Cui conclude that EERS policies accounted for 18,000 gigawatt hours (GWh) of avoided generation in 2012 nationwide.[3] This avoided generation directly benefits utility customers who might have otherwise paid for that electricity, and in vertical regulatory markets, the broader rate base that shares the cost of energy generation infrastructure. Steinberg and Zinaman go on to suggest that if these EERS policies are fully implemented they could reduce electricity demand by 3% in 2015 and 4-6% nationally by 2020.[4]

[3] Downs, A. and Cui. C. (2014). *Energy Efficiency Resource Standards: A New Progress Report on State Experience*. http://aceee.org/research-report/u1403.

[4] Steinberg, D. and Zinaman, O. *State Energy Efficiency Resource Standards: Design, Status, and Impacts*. http://www.nrel.gov/docs/fy14osti/61023.pdf.

Why is Market Certainty Important?

Uncertainty is bad business. When it comes to whether an energy efficiency program will be offered year to year, market uncertainty can directly impact utility and regulatory planning; long-term investments and hiring by private sector efficiency firms; and investor return on investment. In addition, market uncertainty can leave consumers unsure as to whether programs are still offered, and impact their rates. Each of these stakeholders, and others, are directly or indirectly impacted when policies become uncertain. In this paper, CNEE attempts to evaluate the target dates and statutory language of state EERS policies on a spectrum of certainty, and identify what improvements can improve uncertain policies.

Future Market Certainty for Energy Efficiency

The American Council for an Energy-Efficient Economy (ACEEE) tracks changes to EERS policies on an annual basis.[5] No comprehensive analysis exists of the potential impact on energy efficiency market certainty as a result of upcoming target dates, however. Attention to target dates may be changing as these dates approach.

The year 2020 is particularly significant for EERS policies as seven states: Arizona, Colorado, New Hampshire, New Mexico, Maine, New Jersey, and Missouri reach their target dates (Figure 5). By 2030, 14 states will reach their target dates.[6] Another sixteen states do not have a target year because either statute dictates they are ongoing standards or regulators are required to set targets, typically on three-year schedules.[7]

[5] Berg, W., Gilleo, A., Molina, M. (2016). *State Energy Efficiency Resource Standards (EERS) May 2016*. http://aceee.org/sites/default/files/eers-052016.pdf.

[6] Delaware and Arkansas passed their target dates in 2015.

[7] Links to relevant statutory or regulatory language relating to these target dates are listed in the Appendix.

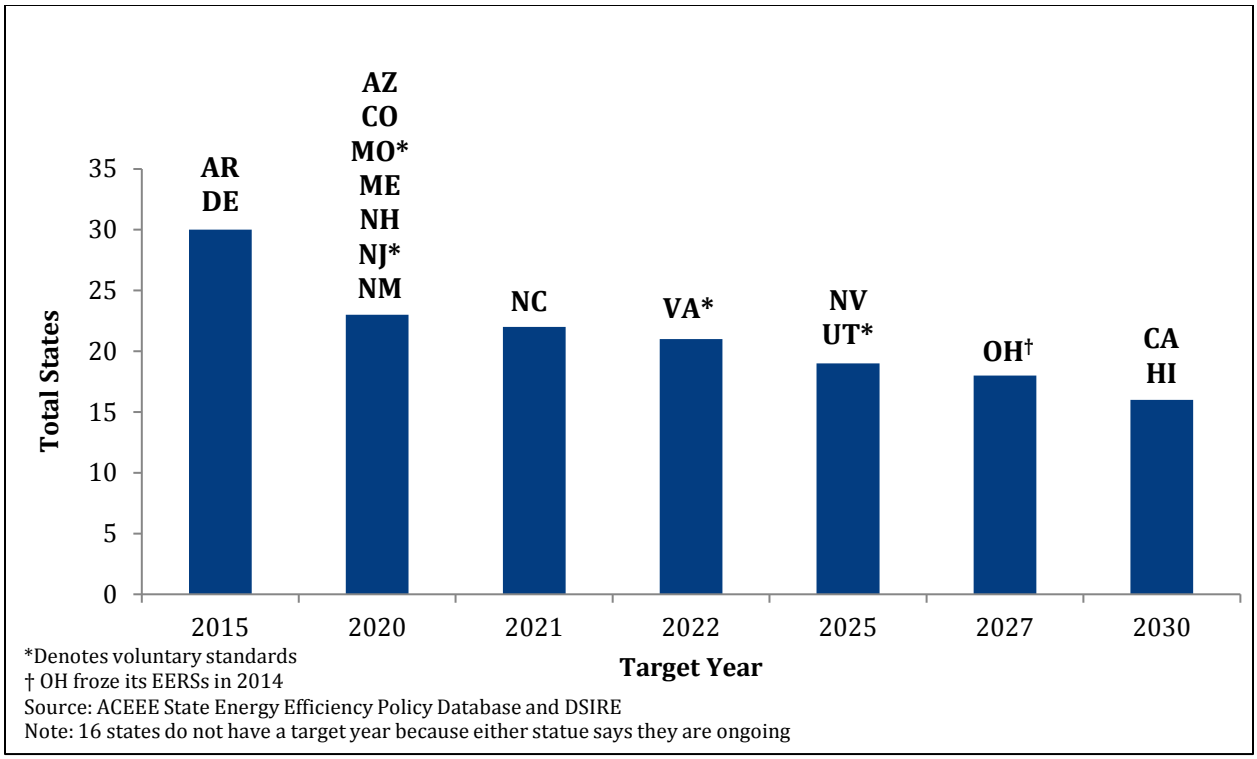

Figure 5. State EERS Target Dates

Recent Legislative Trends

CNEE has tracked EERS-related policy changes in our database called the Advanced Energy Legislation Tracker (AEL Tracker) since 2013.[8] In the last three years, 39 EERS-related bills have been introduced, yet only four bills were enacted that significantly impacted savings targets. California is the only state to increase their EERS under SB 350 enacted in 2015, which required regulators to establish new efficiency targets through 2030. Two states have rolled back their standards including Indiana and Nevada, while Ohio froze their standard for two years.[9] As noted, New Hampshire adopted an EERS in 2016, but it was established via the regulatory pathway.[10] Overall, the majority of states have not adopted policies to extend or modify their EERS in recent years.

[8] See Advanced Energy Legislation Tracker: www.aeltracker.org.

[9] Unlike Indiana, which repealed its standard entirely (SB 340), Nevada enacted SB 252 in 2013 that phases out energy efficiency requirements through 2025. For this, and other links to applicable statute see the Appendix.

[10] See New Hampshire Public Utilities Commission Order Number 25,932.

Existing Market Certainty

The extent to which approaching targets will impact market certainty in any given state is largely dependent upon the underlying statute or regulation. For example, a state with a mandatory EERS with defined interim and final savings targets arguably creates more market certainty than a state with a voluntary EERS with only a savings goal. To more clearly demonstrate the wide range in market certainty in EERS policies, Figure 6 orders EERS states across 6 market certainty categories and denotes the stringency of each standard.

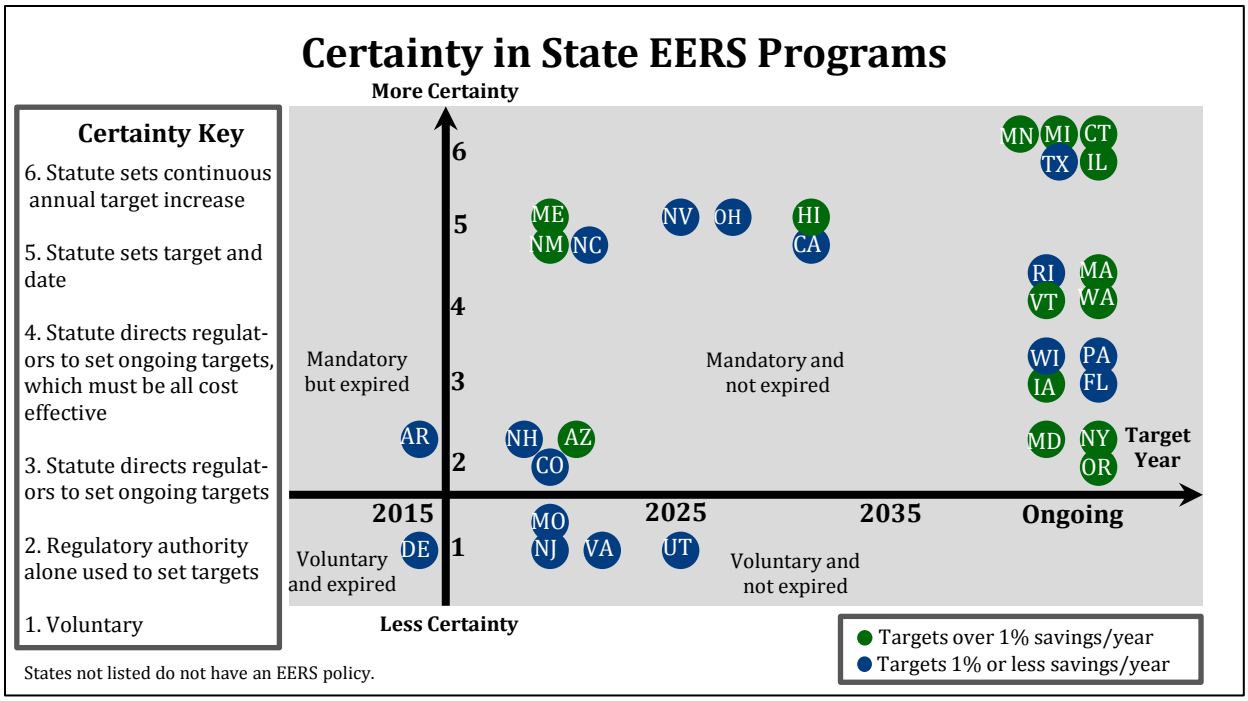

Figure 6. Market Certainty across State EERS Policies

Certainty level 6. Statute sets continuous annual target increase

Five states' have an EERS that requires continuous annual improvement in energy efficiency targets. Those states within this category that are highlighted in green (more than 1% retail electric sales saved per year) represent the current gold standard for market certainty. This structure instills the strongest certainty by confirming that a market will continue in perpetuity, because future targets will be set on a regular basis.

Certainty level 5. Statute sets target and date

Seven states' statutes include a final target and end date.[11] Five states – California, Hawaii, Maine, Nevada, and Ohio – do not require subsequent improvement after the target date. This structure carries strong market certainty until the EERS target date, at which point market certainty may decline. Two of the seven states – New Mexico and North Carolina – include a "thereafter clause", in which the annual percentage of savings is required to continue after the target date. This policy design offers somewhat more certainty than the aforementioned structure, though not as much as requiring continuous improvement.

Certainty level 4. Statute directs regulators to set ongoing targets, which must be all cost effective

Four states' statutes require that regulators, typically public utility commissions (PUCs), adopt energy efficiency targets on an ongoing basis. In addition, PUCs must set these targets to capture all cost-effective energy efficiency (Massachusetts, Rhode Island, Vermont, and Washington).[12] These states' programs offer more market certainty than do the other states where PUCs have discretion to set the standards.[13]

Certainty level 3. Statute directs regulators to set ongoing targets

Four other states' statutes require PUCs to establish energy efficiency targets on an ongoing basis, but do not include an all cost-effective requirement (Florida, Iowa, Pennsylvania, and Wisconsin). Targets set via PUC discretion may increase markets, but it can also result in eliminating the market, as was the case in Florida.[14]

Certainty level 2. Regulatory authority alone used to set targets

In Six states, PUCs have leveraged their own regulatory authority to set EERS policies. This construct may cause market volatility due to shifting PUC priorities that can hinder energy

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[11] Two of these states (Nevada and North Carolina) allow energy efficiency savings to serve a portion of renewable portfolio standard requirements. See the Appendix for links to these states' policies.

[12] Maine, California, and Connecticut also have all cost-effective components associated with their legislatively-driven EERS targets. See: Gilleo, A. (2014). *Picking All The Fruit: All Cost-effective Energy Efficiency Mandates*. http://aceee.org/files/proceedings/2014/data/papers/8-377.pdf.

[13] Note that the cost tests used for determining cost-effectiveness vary by state. These criteria play a critical role in the relative success and stringency of a state's EERS. For more information on these tests, see ACEEE's State and Local Policy Database here: http://database.aceee.org/state/evaluation-measurement-verification.

Gilleo, A. (2014). *Picking All The Fruit: All Cost-effective Energy Efficiency Mandates*. http://aceee.org/files/proceedings/2014/data/papers/8-377.pdf.

[14] See: Florida Public Service Commission (2014). *Commission review of numeric conservation goals (Florida Public Utilities Company.* Docket No. 13205-E1. http://www.floridapsc.com/library/FILINGS/14/06888-14/06888-14.pdf and *ACEEE* (2016). *Energy Efficiency Resource Standards*. http://database.aceee.org/state/energy-efficiency-resource-standards.

efficiency investment. For example, in 2011, the Colorado PUC set an overall savings target of 2,915 GWh by 2020 and reduced that target to 2,400 GWh in 2014.[15]

Certainty level 1. Voluntary

Four states have established voluntary, non-binding energy efficiency targets. It is worth noting that while these states are given the lowest score, their policies are however more certain than those states that have never had any sort of EERS policy.

Ways to Strengthen Market Certainty within an EERS

State EERS policies fall on a spectrum of market certainty. Market certainty for an EERS policy can be influenced by a handful of key policy components that we describe above. To increase market certainty for energy efficiency investments in their state, policy makers should consider the following list of policy options in no particular order.

- Mandate achievement of existing, or new goals (for voluntary and non-EERS policy states).
- Increase savings requirements prior to reaching target dates.
- Change existing statute to include a "thereafter clause" following the target year.
- Direct regulators to set ongoing savings requirements that extend beyond existing target years.
- Direct regulators to add an appropriate all cost-effective requirement when establishing savings requirements
- Direct regulators to include "bonus" earnings or other incentives for utilities that are able to exceed efficiency targets early.

Adopting, or implementing an EERS policy is not the only way to advance energy efficiency market certainty within a state. Paper 2 in this series (*State Policies to Expand Market Certainty for Energy Efficiency without an Energy Efficiency Resource Standard)* documents 21 other policies that can be adopted in conjunction with or in the absence of an EERS that can also drive energy efficiency markets. Policymakers should also consider these policies when evaluating energy efficiency market certainty in their state.

[15] See: DSIRE (2016). *Energy Efficiency Resource Standard*. http://programs.dsireusa.org/system/program/detail/4489.

Appendix: Enabling State EERS Policies

State	Year Enacted	Enabling Authority	Target Date
AR	2010	AR PSC Order No. 7, Docket 13-002-U	2015
AZ	2010	AAC R14-2-2401 et seq.	2020
CA	2004	CA Public Resources Code § 25310	2030
CO	2007	CRS 40-3.2-101, et seq.	2020
CT	2007	CT Gen. Stat. § 16-245m et seq.	Continuous
DE	2009	26 Del. C. § 1500 et seq.	2015
FL	2009	FL Statutes § 366.82	Ongoing
HI	2004	HRS § 269-96 et seq.	2030
IA	2008	IA Code § 476.17	Ongoing
IL	2007	220 ILCS 5/8-103	Continuous
IN	2009	IC 8-1-8.5-10	Repealed
MA	2008	M.G.L Ch. 25 § 21	Ongoing
MD	2008	MD PSC Order 87082	Ongoing
ME	2009	35-A M.R.S. § 10104 et seq.	2020
MI	2008	MCL § 460.1071 et seq.	Continuous
MN	2007	MN Stat. § 216B.241	Continuous
MO	2009	R.S.M.O. § 393.1075	2020
NC	2007	NC Gen. Stat. § 62-133.8	2021
NH	2016	NH PUC Order No. 25,932	2020
NJ	2008	NJ Energy Master Plan	2020
NM	2008	NM Statute § 62-17-1 et seq.	2020
NV	2005	NRS 704.7801 et seq.	2025
NY	2008	NY PSC Order in Case No. 07-M-0548	Ongoing
OH	2008	ORC 4928.66 et seq.	2027
OR	2010	Energy Trust of Oregon 2015 - 2019 Strategic Plan	Ongoing
PA	2004	66 PA C.S. § 2806.1	Ongoing
RI	2006	RI General Laws § 39-1-27.7	Ongoing
TX	1999	TX Utilities Code § 39.905	Continuous
UT	2006	UT Code § 54-17-601 et seq.	2025
VA	2007	VA Acts of the Assembly, Chapter 933	2022
VT	2000	30 V.S.A. § 209	Ongoing
WA	2006	RCW 19.285	Ongoing
WI	2007	WI Statutes § 196.374	Ongoing