How Ratepayer-Funded Efficiency Can Support State Climate and Energy Planning

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U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

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This short presentation is intended give states and their stakeholders a vision for what it would look like to include ratepayer-funded energy efficiency in their climate and energy plans.

Ratepayer-Funded Efficiency as an Emission Reduction Approach

Possible Leads

- Utilities (investor-owned, municipal, cooperative)
- Non-utility program administrators

E-Savings

- Savings at end of each year, as determined through EM&V, relative to prior year

Potential Program Components

- New and existing residential buildings (single family, multi-family, low income)
- Small, medium & large commercial buildings
- Industrial facilities

Potential Savings in 2030
645-895 million MWh
368-510 million short tons CO_2

Activity	EM&V
Energy Savings Approaches	
• Program administrators generate energy savings from: - EE programs that support improvements to residential, commercial, industrial buildings	Recent resources provide guidance, including: - *SEE Action Energy Efficiency Program Impact Evaluation Guide* - *SEE Action EM&V Resource Portal* - *DOE Uniform Methods Project* - *NEEP EM&V Forum* - *Regional Technical Forum of the Northwest Power and Conservation Council*
State Policy Options	
• Could include - Requiring a specified level of EE savings (e.g., EERS) - Requiring inclusion of EE as a resource in capacity planning (e.g., Integrated Resource Planning) - Regulatory policies to incentivize successful utility delivery of EE - Consider options for energy efficiency delivery agent	
Low Income Opportunities	
• EE programs in low income neighborhoods	

Why Ratepayer-Funded Energy Efficiency?

Purpose of Ratepayer-Funded Energy Efficiency

- Meet state clean energy goals
- Use energy efficiency as an energy resource to serve electric utility customers' needs
- Reduce unnecessary utility and system costs
- Lower customer bills by saving energy in thousands of ways, including through:
  - Retrofitting commercial buildings with energy efficient equipment and lighting
  - Installing high-efficiency A/C, reducing infiltration losses, and installing additional insulation in wall, floor and attic
  - Embedding professional energy managers in industrial facilities

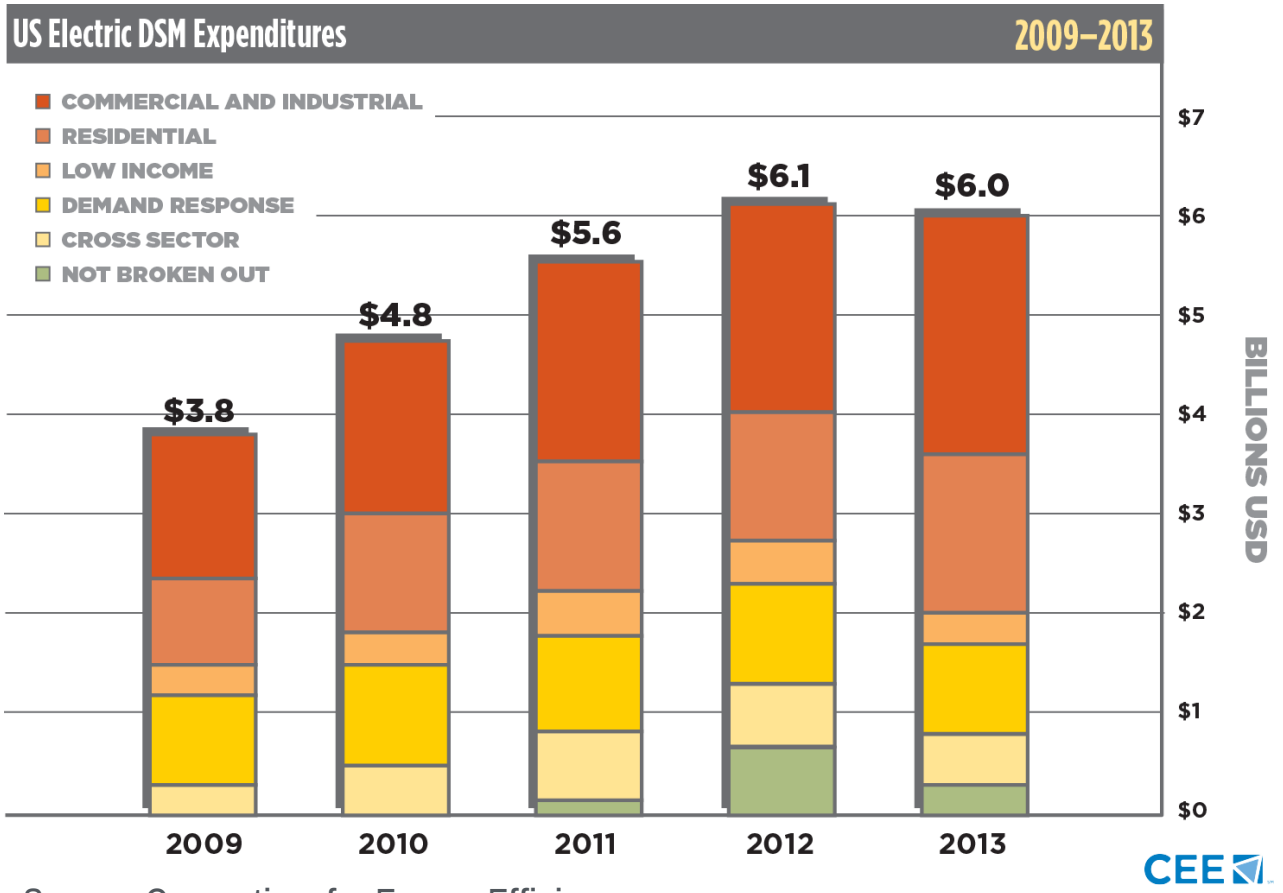
Benefits of Ratepayer-Funded Energy Efficiency

- Programs typically generate a significant portion of statewide electricity savings; have been refined over decades
- Can be offered in all market sectors; opportunities in nearly every building / facility
- Can be readily incorporated into state power planning
- Increases grid reliability, reduces grid congestion and need for new costly infrastructure (i.e. power plants, lines)
- States determine energy savings goals and cost-effectiveness threshold for programs

Current Status of Ratepayer-Funded Energy Efficiency

Programs exist in all 50 states and DC

In 2013, program administrators* spent $6B on electric demand side management programs



Source: Consortium for Energy Efficiency

***Utilities, state or local governments, and third-party entities contracted to administer, design and manage delivery of energy efficiency programs**

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State and Local Role in Ratepayer-Funded EE

Policy Actions

- State legislatures and public utility commissions can:
  - Set EE targets for program administrators to meet (e.g., EE resource standard)
  - Require that a utility plan to meet forecasted demand include EE (e.g., integrated resource plan [IRP])
  - Designate an EE program administrator if not utility
- Public utility commissions can independently:
  - Require utilities to offer energy efficiency programs
  - Incentivize utilities to deliver energy efficiency (i.e., program and administrative cost recovery, recovery of lost revenues, and incentive payments)

Implementation Actions

- Energy savings are generated when customers install EE measures or change behavior to save energy, as encouraged by ratepayer-funded EE programs

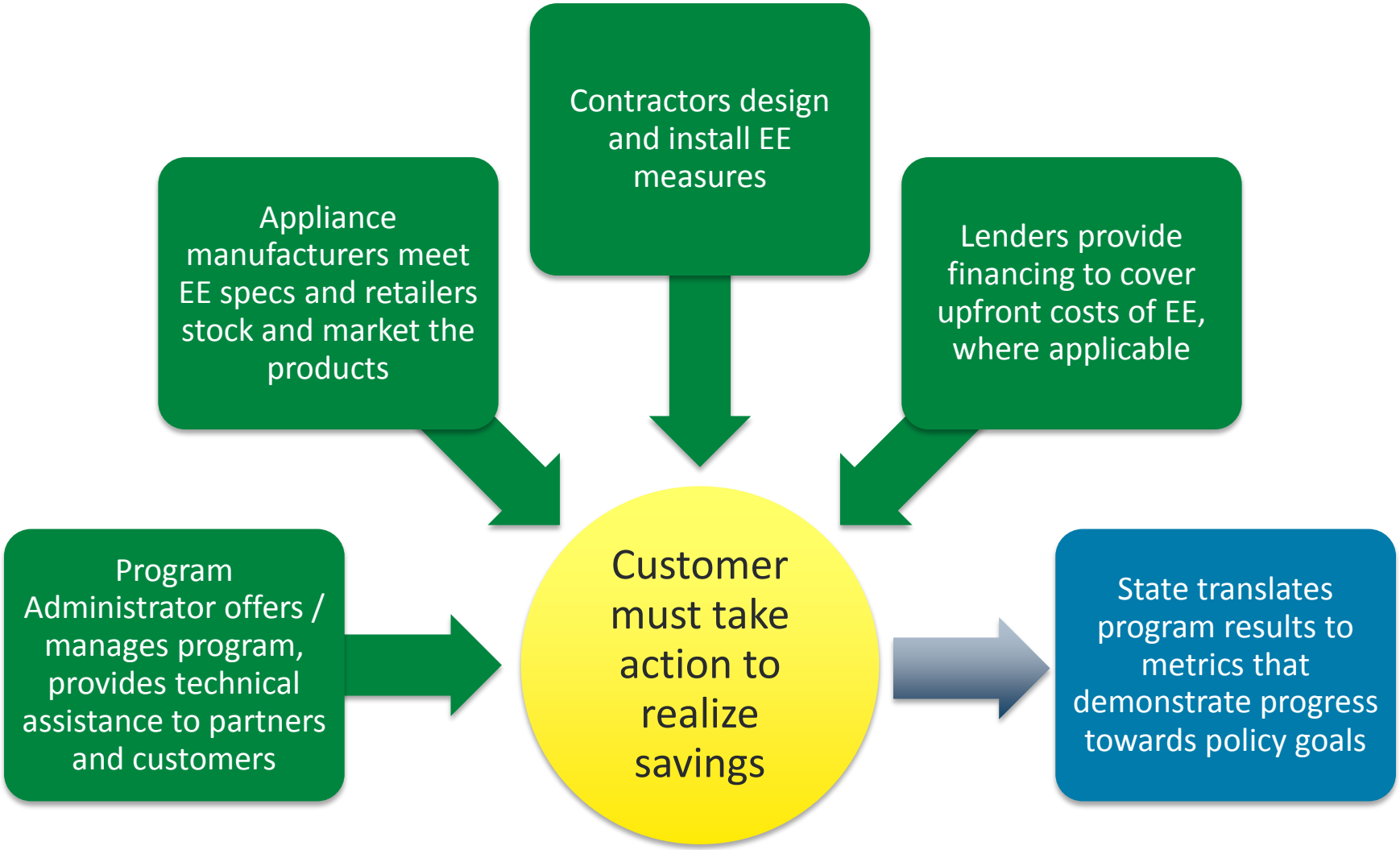
States employ a variety of accountability and oversight structures to ensure savings

- Investor-owned utilities (IOUs): are regulated by state public utility commissions (PUC)
- Independent administrators: can be overseen by PUC, state energy office, or other agency
- Non-profit and public power: rural electric co-ops and municipal utilities are overseen by co-op boards and municipal governments, respectively, or by PUCs in some states

Program Types: Quick Start and Deep Savings

	Quick Start	Deep Savings
Summary	Proven, high-impact, programs that can be deployed quickly, are easy to operate, and build infrastructure for comprehensive programs to follow	Long-term initiatives that target significant energy savings through multi-measure approaches and outreach to customer segments that are more challenging to engage
Example program 1	Incentives to homeowners for purchasing high efficiency appliances, equipment and lighting	Home Performance with ENERGY STAR® - Comprehensive home energy retrofit program
Example program 2	Rebate incentives for high efficiency lighting, equipment, motors and refrigeration in commercial/institutional buildings	Custom programs for industrial or large commercial customers to make site-specific energy improvements

Partners Needed for Implementation



Best Practices in Ratepayer-Funded EE

States with successful track records have:

- Set aggressive yet achievable EE targets that ramp-up over time
- Included energy efficiency in an energy resource planning process (IRP)
- Established EE stakeholder collaborative* to work through issues
- Done their homework when developing energy efficiency programs
  - Offer programs in all economic sectors
  - Research the market and customer desires to design effective programs
  - Evolve in response to changing state electricity use baseline as building codes and appliance standards get deeper savings
  - Account for EE's full range of benefits in cost-effectiveness testing
  - Provide sufficient, timely, and stable program funding
  - Align utility business incentives with the delivery of EE

Good models:

- Quick Start - AR, MS, LA, GA
- Deep Savings – OR, MN, CO, MA

* PUC-convened stakeholder collaborative could include: regulated utilities, large utility customers, state's consumer advocate, environmental organizations, other relevant state/local government agencies, etc.

Complementary / Related Efforts

Set energy efficiency target: Drive programs through goal setting; half of states have targets.	SEE Action Setting Energy Savings Targets for Utilities
Do Integrated Resource Plan: Allow cost-effective EE as a demand-side energy resource to compete with supply-side resources.	SEE Action Using Integrated Resource Planning to Encourage Investment in Cost-Effective Energy Efficiency
Align utility and customer incentives: Allow program cost recovery, address disincentives, and provide incentives.	National Action Plan for Energy Efficiency Aligning Utility Incentives with Investment in Energy Efficiency
Consider options for energy efficiency program administrator: Successful models for EE administration and delivery range from utility, independent, government, or hybrid administrator.	Regulatory Assistance Project Who Should Deliver Ratepayer-Funded Energy Efficiency?

National Savings Estimates

Current: In 2014, ratepayer-funded energy efficiency programs produced approximately 26 million MWh of savings from:

- Nationwide reported net savings from utility and public benefits electric energy efficiency programs, equivalent to an annual incremental savings of 0.7% of retail electricity sales from 2013.
- Approx. equivalent to 2013 retail MWh sales of New Mexico

Future: In 2030, ratepayer-funded energy efficiency programs could produce 645 to 895 million MWh and 368-510 million short tons CO_2 of savings if states reduced electricity load growth rates due to customer-funded energy efficiency programs achieving annual incremental savings of 1.1 - 1.5% from 2012 baseline.

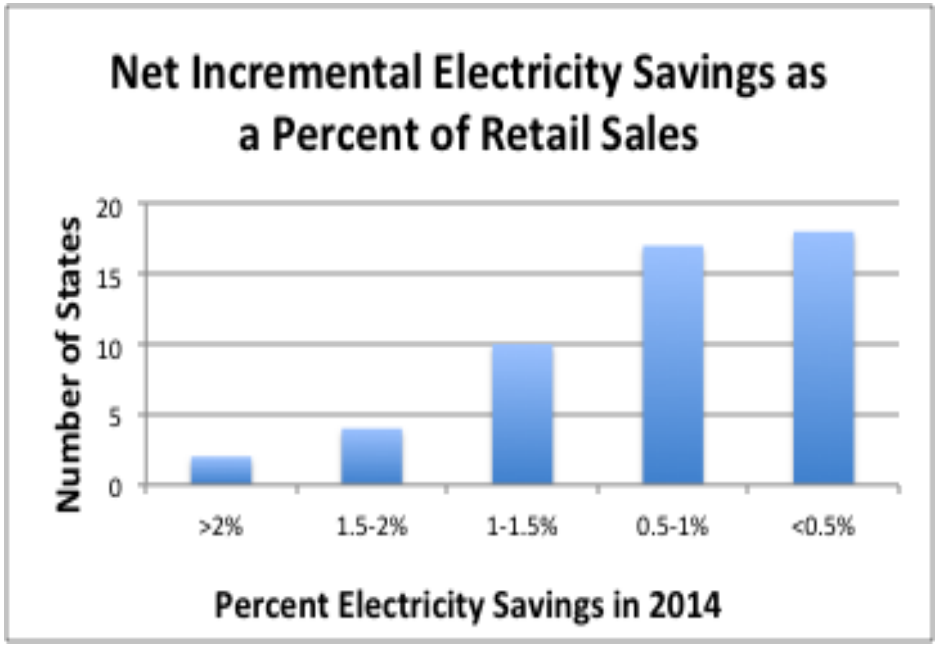
- Low end = 2013 retail MWh sales of New Mexico + California + Texas
- High end = all of the above + New York + Michigan

Sources: ACEEE State Scorecard 2015; Extrapolated from LBNL, 2013, The Future of Utility Customer-Funded Energy Efficiency Programs in the U.S.; EPA eGRID 2012; EIA State Electricity Profiles

Savings Examples from Select States

Ratepayer-funded efficiency is producing results across states:

- 1/3 states achieving ≥1% annual incremental electricity savings
- 2/3 states achieving ≥0.5%



Top 10 States

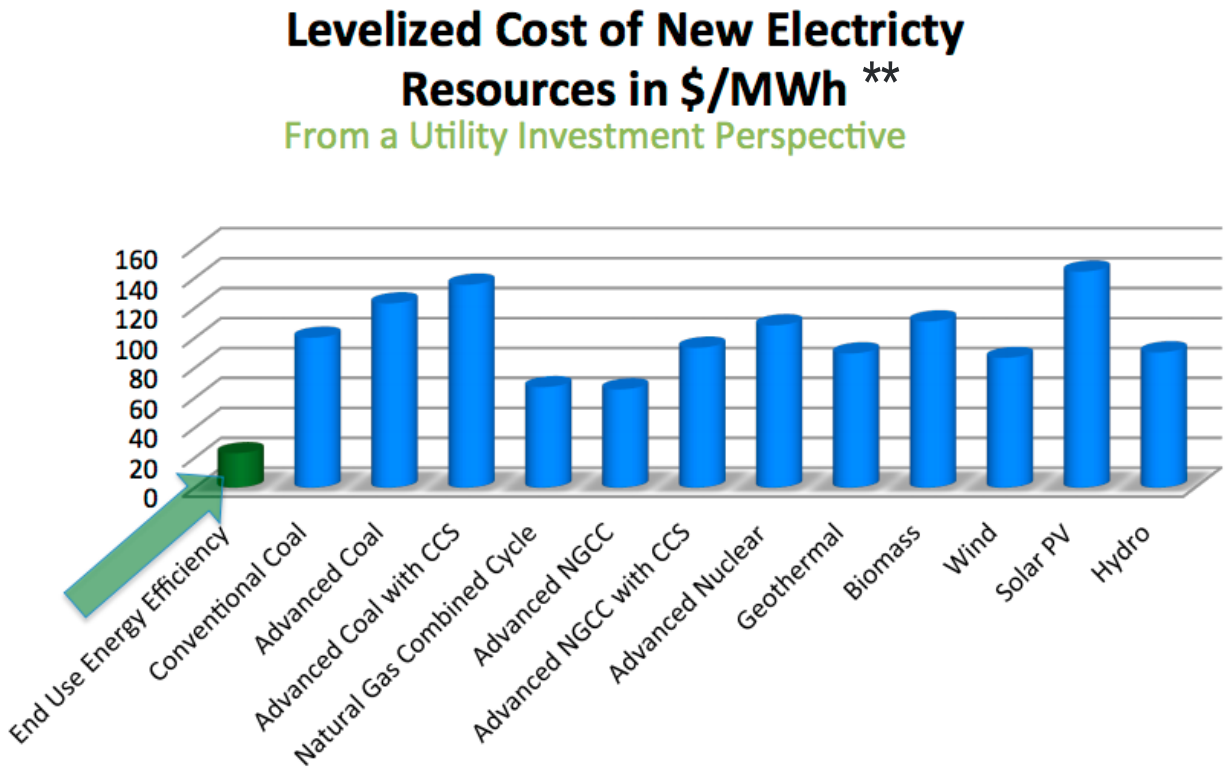
State	2014 net incremental savings (MWh)	% of 2014 retail sales
Rhode Island	268,468	3.51%
Massachusetts	1,339,026	2.50%
Vermont	102,770	1.85%
California	4,082,256	1.58%
Arizona	1,190,123	1.57%
Hawaii	144,240	1.53%
Michigan	1,386,912	1.35%
Connecticut	387,863	1.32%
Maryland	792,354	1.29%
Oregon	595,548	1.27%

Source: ACEEE State Scorecard 2015. *Analysis includes 50 states and DC*

Ratepayer-Funded Efficiency Is Cost-Effective

EE is relatively cheap.

- **Total cost of saved energy: $0.046/kWh* (program administrator and participants splitting this cost almost exactly in half)**



The savings-weighted total resource cost for all efficiency programs in the U.S. is well below the cost of most generating resources

Sources: * LBNL The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs

** Schiller; LBNL Program Administrator Cost of Saved Energy and EIA Annual Energy Outlook 2013

Ratepayer-Funded Efficiency Cost-Effectiveness

- 5 typical cost-effectiveness tests used by state commissions for over 20 years to review and approve wide ranges of energy efficiency programs
- Each test offers different perspective; multiple tests often used together
- Many non-energy EE benefits (incl. avoided environmental compliance costs) are not captured in screening as usually applied today
  - Result is efficiency is under-valued; less efficiency is implemented; compliance and customer costs higher than necessary
- Expert recommendations:
  - Identify the full set of public policy goals addressed by EE
  - Use the benefit-cost test most appropriate to meet those goals
  - Identify the policy goals that the chosen test does not address
  - Address those goals outside the test framework
    - Ex: Use other evaluation methods; get stakeholder input; improve understanding to inform decisions
- For detailed analyses and recommendations see:

Synapse Energy Economics, Energy Efficiency Cost Effectiveness Screening: How to Properly Account for Other Program Impacts and Environmental Compliance Costs and Best Practices in Energy Efficiency Program Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For

EM&V Methods for Ratepayer-Funded Efficiency

DOE Uniform Methods Project

- Set of easy-to-follow protocols for determining the energy savings from commonly-installed energy efficiency measures and programs, based on commonly accepted engineering and statistical methods.
- The protocols provide a straightforward method for evaluating gross energy savings for common residential and commercial measures offered in ratepayer-funded initiatives in the U.S.

SEE Action Energy Efficiency Program Impact Evaluation Guide

- Definitive EM&V resource for both novices and experts to assist with energy efficiency program evaluation. It focuses on the most common approaches to estimating energy efficiency savings: M&V approaches (based on IPMVP), deemed savings values, and large-scale billing analysis.
- Includes a comprehensive glossary of EM&V terms, concepts, and steps for calculating savings, avoided emissions, and other non-energy impacts of energy efficiency programs.

More resources at SEE Action EM&V Resource Portal

Resources for States

- DOE/EPA State and Local Energy Efficiency Action Network - Lessons learned from states using utility regulatory policy to encourage EE
- DOE/EPA National Action Plan for Energy Efficiency - Guides on critical issues in designing utility regulatory policy and EE programs
- Lawrence Berkeley National Lab Electricity Markets and Policy Group - Technical, economic and policy analysis on ratepayer-funded EE topics
- Regulatory Assistance Project - Nonprofit team of experts (including former state utility regulators and staff) provide assistance to PUCs and government officials on EE
- Synapse Energy Economics - develop climate and energy planning tools and analyses; work with states to identify cost-effective approaches that meet their goals
- American Council for an Energy-Efficient Economy - Nonprofit EE research and advocacy organization providing assistance to state and local governments
- Regional Energy Efficiency Organizations - Six regional nonprofits providing tools and resources to states to advance EE as a first order resource
- Consortium for Energy Efficiency - Consortium of US and Canadian gas and electric efficiency program administrators

Get More Information on This Pathway and Others

Visit: energy.gov/eere/slsc/EEopportunities

How Energy Efficiency Programs Can Support State Climate and Energy Planning

Overview and individual presentations on features and benefits associated with including energy efficiency in climate and energy plans, covering:

- National electricity savings potential estimates for 2030
- Current activity at the national and state levels, best practices, energy savings examples, cost-effectiveness, measurement approaches, and DOE support for:
  - Building energy codes
  - City-led efficiency efforts
  - Combined heat and power
  - Energy savings performance contracting
  - Industrial efficiency, including superior energy performance
  - Low income energy efficiency
  - Ratepayer-funded programs
- Technical assistance available

Guide for States: Energy Efficiency as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution, and Meet Energy Needs in the Power Sector

State and Local Energy Efficiency Action Network (SEE Action) resource presents pathways thru:

- Case studies of successful regional, state, and local approaches
- Resources to understand the range of expected savings from energy efficiency
- Common protocols for documenting savings
- Sources for more information