How Ratepayer-Funded Efficiency Can Support State Energy Planning

energy.gov/eere/slsc/EEopportunities
This short presentation is intended to give states and their stakeholders a vision for what it would look like to include ratepayer-funded energy efficiency in their energy plans.
# Ratepayer-Funded Efficiency as an Energy Savings Approach

## Possible Lead
- Utilities (investor-owned, municipal, rural cooperative)
- Non-utility program administrators

## Energy 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

## Activity

<table>
<thead>
<tr>
<th>Energy Savings Approaches</th>
<th>EM&amp;V</th>
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<tbody>
<tr>
<td>• Program administrators generate energy savings from:</td>
<td>Recent resources provide guidance, including:</td>
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<tr>
<td>- EE programs that support improvements to residential, commercial, industrial buildings</td>
<td>- <a href="#">SEE Action Energy Efficiency Program Impact Evaluation Guide</a></td>
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## 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

## Opportunity:
- 741 million MWh (16%) in national electricity savings 2016-2035
- 12% to 22% savings as a percent of sales per state 2016-2035
Sizable Opportunity: Cost-Effective Efficiency Across Sectors by State

Economic Electricity Savings Potential for Residential, Commercial, Industrial Sectors by State (2035) (Million MWh)

Total electricity savings: 741 million MWh
State-level electricity savings: 0.9 to 87.3 million MWh per state

Example: Large Savings Opportunity from Efficiency in Existing Homes

Economic Electricity Savings Potential by State (2030) from Residential Efficiency (Million MWh)

Total electricity savings: 245 million MWh

State-level electricity savings: 0.2 to 22.2 million MWh per state

Additional Examples: Industrial EE, CHP, Building Codes

Estimated Economic Potential Electricity Savings by State (2030) from Industrial EE (million MWh)

Estimated On-Site Technical Potential by State from Combined Heat and Power (CHP) (MW)

Estimated Achievable Potential Total Energy Savings by State (2010-2040) from Building Energy Codes (Trillion Btu)

Ratepayer-funded EE is Producing Results across States

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

**Total Savings in 2015 from Utility Efficiency Programs**

**Top 10 States**

<table>
<thead>
<tr>
<th>State</th>
<th>2015 net incremental savings, MWh</th>
<th>% of 2015 retail sales</th>
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<tbody>
<tr>
<td>RI</td>
<td>222,822</td>
<td>2.91%</td>
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<tr>
<td>MA</td>
<td>1,472,536</td>
<td>2.74%</td>
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<tr>
<td>VT</td>
<td>110,642</td>
<td>2.01%</td>
</tr>
<tr>
<td>CA</td>
<td>5,040,603</td>
<td>1.95%</td>
</tr>
<tr>
<td>ME</td>
<td>183,347</td>
<td>1.53%</td>
</tr>
<tr>
<td>HI</td>
<td>144,240</td>
<td>1.52%</td>
</tr>
<tr>
<td>CT</td>
<td>435,740</td>
<td>1.48%</td>
</tr>
<tr>
<td>WA</td>
<td>1,275,447</td>
<td>1.42%</td>
</tr>
<tr>
<td>AZ</td>
<td>918,582</td>
<td>1.19%</td>
</tr>
<tr>
<td>MI</td>
<td>1,177,277</td>
<td>1.16%</td>
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* Includes states achieving ≥1% annual incremental electricity savings
Why Ratepayer-Funded Energy Efficiency?

Purpose of Ratepayer-Funded Energy Efficiency

- Support state policy goals
- Use energy efficiency as a least-cost energy resource
- 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 and regional 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
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
Current Status of Ratepayer-Funded Energy Efficiency

- Programs exist in all 50 states and DC
- Nationwide reported savings from utility and public benefits electricity programs in 2015 totaled 26.5 million MWh, equivalent to 0.7% of sales.\(^1\)

In 2015, program administrators* spent $6.7B on electric demand side management (DSM) programs

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


1 ACEEE, 2016. The 2016 State Energy Efficiency Scorecard
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
## Example Program Types: Quick Start and Deep Savings

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

Customer must take action to realize savings

- Efficient appliance manufacturers and retailers make, market, and sell the products
- Contractors design and install EE measures
- Program Administrator offers / manages program, provides technical assistance to partners and customers
- Lenders provide financing to cover upfront costs of EE, where applicable
- State translates program results to metrics that demonstrate progress towards policy goals
Best Practices in Ratepayer-Funded EE

States with successful track records have:

- Articulated overarching policy objectives such as least-cost resource planning or loading orders
- Set aggressive yet achievable EE targets that increase over time
- Included energy efficiency in an energy resource planning process (IRP)
- Established an EE stakeholder collaborative* to support a transparent and inclusive decision process
- Analyzed and managed customer bill impacts of energy efficiency programs
- Used industry standards for evaluating programs and measuring savings
- Developed energy efficiency programs to:
  - Offer support in all economic sectors
  - Address customer needs when designing programs
  - Evolve in response to changing state electricity use baseline
  - 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

* A 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**

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

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

• National and state-level energy savings potential estimates for 2030 and beyond
• 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
  – Ratepayer-funded programs
• Technical assistance available


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