• Concerns about rate impacts are possibly the biggest barrier to expanding efficiency activities.

• The standard response to rate impact concerns:
  – Rates go up, but average bills go down.
  – On average customers are better off.

• This response is not sufficient.
  – Program participants see higher rates but lower bills.
  – Non-participants see just higher rates.

• There is a widely-held belief that only a small minority of customers participate in efficiency programs.

• Rate & bill impacts are a matter of customer equity.
Addressing Customer Equity

• Program participation rates:
  – Typically not well understood or analyzed.
  – Are the key to drawing the right balance between rates and bills.
  – Can and should be addressed through regulatory policies.

• Big picture recommendations:
  – **Analyze** rate, bill and participation impacts, in order to fully understand what the impacts are;
  – **Manage** rate, bill and participation impacts, in order to achieve energy goals and optimize benefits to all customers; and
  – **Promote** customer participation, to address equity concerns.
Actual Utility with Aggressive Efficiency Plan

- Analysis here is based on a proposed three-year energy efficiency plan for Rhode Island.

- Program costs recovered through a system benefits charge. Distribution rates are decoupled.

- Standard EE programs, targeted to all customer types:
  - Low-income: audit and retrofit at no cost.
  - Residential: new construction, retrofits, lighting, appliances, HVAC.
  - C&I: new construction, small C&I, large C&I.

- Relatively aggressive programs have been in place for many years.

- Significant ramp-up in efficiency savings in recent years.

- Proposed annual energy savings: 2.4% for 2015-2017.
Relatively Cost Effective Programs

- Program average benefit-cost ratios:
  - Low-income: 1.5
  - Residential: 1.6
  - C&I: 2.9
  - Total: 2.3

- Program average cost of saved energy (¢/lifetime kWh):
  - Low-income: 12.9
  - Residential: 7.7
  - C&I: 3.7
  - Total: 4.9
Breakdown of Current Rates

Components of Rates

Rate (¢/kWh)

$0 $2 $4 $6 $8 $10 $12 $14 $16 $18

- DSM Charge
- Other Charges
- Transmission Charge
- Distribution Charge
- Supply Rate
- Customer Charge
Forecast of Rates – Without Efficiency

- Distribution
- Transmission
- Generation
- Other
- Customer

Electric Rate (c/kWh)

Residential Rate Impacts – by Components

![Graph showing change in rates (c/kWh) from 2015 to 2026. The graph includes categories for Transmission - Lost Revenue Recovery, Distribution - Lost Revenue Recovery, Energy Efficiency Charge, Avoided Transmission, Avoided Distribution, Avoided Capacity, Price Suppression, and Average Rate Impact. The change is indicated by bars for each year, with 0.3 being the average rate impact.](image)
Assumes participation in only one program.
Accounts for double participation
Residential Participation Rates: 1998 - 2017

Accounts for double participation
## Summary of Results - Residential

<table>
<thead>
<tr>
<th></th>
<th>Rate Impacts (% of Total Rate)</th>
<th>Bill Savings (% of Total Bill)</th>
<th>2015-2017 Participation (New % of Customers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Construction</td>
<td>2.1%</td>
<td>9.3%</td>
<td>0.5%</td>
</tr>
<tr>
<td>HVAC</td>
<td>2.1%</td>
<td>5.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Home Retrofit</td>
<td>2.1%</td>
<td>6.3%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Home Energy Reports</td>
<td>2.1%</td>
<td>-1.4%</td>
<td>53.5%</td>
</tr>
<tr>
<td>Lighting</td>
<td>2.1%</td>
<td>0.7%</td>
<td>97.5%</td>
</tr>
<tr>
<td>Appliances</td>
<td>2.1%</td>
<td>1.5%</td>
<td>19.7%</td>
</tr>
<tr>
<td>Non-Participant</td>
<td>2.1%</td>
<td>-2.1%</td>
<td>a minority</td>
</tr>
</tbody>
</table>

Accounts for double participation
## Summary of Results – All Sectors

<table>
<thead>
<tr>
<th></th>
<th>Highest Single-Year Rate Increase</th>
<th>Average Long-Term Rate Increase</th>
<th>Range of Bill Savings</th>
<th>General Participation Conclusion For Cumulative Participation 1998-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>7%</td>
<td>2%</td>
<td>-1% to 9%</td>
<td>Vast majority of customers participate.</td>
</tr>
<tr>
<td>Low-Income</td>
<td>8%</td>
<td>2%</td>
<td>-2% to 12%</td>
<td>Large majority of LI dwellings get retrofits.</td>
</tr>
<tr>
<td>Small C&amp;I</td>
<td>6%</td>
<td>1%</td>
<td>37% to 47%</td>
<td>Roughly 30% of customers participate.</td>
</tr>
<tr>
<td>Large C&amp;I</td>
<td>9%</td>
<td>0%</td>
<td>2% to 3%</td>
<td>Majority of customers participate.</td>
</tr>
</tbody>
</table>
2010 Electricity Savings by State (% of Sales)

Source: ACEEE 2012 Energy Efficiency Scorecard
What Does This Mean for Other States?

• This analysis is not directly transferable to other states.
  – However, some general conclusions can be drawn.

• States where efficiency savings is 0.5% or less:
  – Rate impacts probably in the noise.
  – Participation rates probably very low.

• States where efficiency savings is 1.0%-0.5%:
  – Rate impacts probably small.
  – Participation rates probably low to moderate.

• States where efficiency savings is 2.0% or greater.
  – Rate impacts: short-term probably acceptable, long-term probably modest.
  – Participation rates probably high to very high.
  – Participation rates nearly offset the rate impacts.
Program Designs to Increase Participation

- EE programs should address all end-uses.
- EE programs should address all customer types.
- All customers should have an opportunity to participate.
- Customer incentives and support should be tailored to assist all customers in overcoming barriers to energy efficiency.
- Program Administrators should actively pursue the non-participants and those who have not participated in a while.
Policy Options to Increase Participation

• Increase budgets to increase participation.
  – This is the exact opposite of the typical response to rate impact concerns.

• Require program administrators to gather better data on participation; annual & cumulative.

• Require program administrators to analyze participation rates when designing programs.

• Include participation requirements in efficiency plans and goals.

• Incorporate participation rates in utility shareholder incentives.

• Make the participation goal explicit:
  – Achieving all cost-effective energy efficiency means serving all customers.
Appendix
Benefits of EE that Flow to All Customers

- Increased system reliability.
- Reduced risk and exposure to volatile fossil fuel prices.
- Reduced cost of compliance with environmental regulations.
- Reduced consumption of fossil fuels.
- Reduced reliance upon imported fuels.
- Reduced environmental impacts, including reduced greenhouse gases.
Benefits of EE that Flow to All Customers - II

- EE will reduce the price of the wholesale energy and capacity markets in New England.
  - Lower peak and energy demands means that marginal supply-side resources are dispatched less.
  - This results in a lower market clearing price.
- This benefit flows to all customers in New England, regardless of whether they participate in EE programs.
- The MA Three-Year Plans were estimated to save over $700 million for all MA customers.
  - This is in addition to the bill savings to participants.
• Energy efficiency will avoid costs of transmission and distribution lines.
• MA Three-Year Plans were estimated to save roughly $423 million in avoided T&D costs.
  – This is in addition to the bill savings to participants.
• Transmission costs in New England are expected to increase dramatically.
ISONE Summer Peak (90/10) Forecast

MW

28000 29000 30000 31000 32000 33000 34000 35000


RSP12 RSP12-FCM RSP12-FCM-EEF
Impact of EE on New England Energy Demand

ISONE Annual Energy Forecast

- RSP12
- RSP12-FCM
- RSP12-FCM-EEF
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