Financial Impacts of Achieving Aggressive EE Program Savings Goals: 
*Building Stakeholder Support*

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Report Summary
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Background and Policy Context

- Increased interest by regulators and policymakers in pursuing aggressive energy efficiency (EE) goals

Massachusetts Case Study
- MA Green Communities Act (GCA) directs EE program administrators to achieve “all cost-effective EE”
- Resulted in establishing a target of 2.4% annual reduction in retail electric sales, beginning in 2012 (ramp up earlier)

Policy issues of interest
- Ratepayer concerns - What are the customer bill savings and potential rate impacts of a long-term commitment to highly aggressive EE goals?
- Shareholder concerns – What are the effects on shareholder value if highly aggressive EE goals are pursued over the long-term? Is there a viable utility “business model” that is acceptable to customers?
Presentation Overview

- Analysis Approach
- Characterization of Massachusetts “Super-Utility” and EE Portfolios
- Analysis Results
- Summary and Conclusions
Analysis Approach: Benefits Calculator

- Utilized a pro-forma financial spreadsheet model originally developed as part of the National Action Plan for Energy Efficiency (NAPEE) but significantly enhanced by LBNL over the past 3 years.
Analysis Approach

- Assessed impacts of varying levels of EE on a “super-utility”, composed of all major Electric Operating Companies (EOCs) in Massachusetts

- Constructed a baseline EE case in order to compare effects of two Additional EE portfolios that achieve significant savings
  - “No New EE” scenario establishes the case in Massachusetts if no new EE efforts are undertaken
  - “Business-As-Usual (BAU) EE” based on ~0.9% annual savings
  - “Aggressive EE” based on MA DPU decision approving utility compliance filings to achieve GCA goals (~2.4%/year)

- Assumed EE programs are only offered from 2010-2020
  - After 2020, no new EE programs are offered, but effects of measures still in their useful lifetimes are captured from 2020-2030

- Quantify impact on ratepayers if additional funding sources are utilized

- Quantify impact on shareholders and ratepayers if decoupling mechanism is implemented
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Impact of Energy Efficiency on MA “Super-Utility” Retail Sales Forecast

"No New EE" Utility Assumptions (% per year)

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Growth Rate</th>
</tr>
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<tbody>
<tr>
<td>Customer Growth</td>
<td>0.3%</td>
</tr>
<tr>
<td>Retail Sales Growth</td>
<td>1.2%</td>
</tr>
<tr>
<td>Non-fuel Cost Growth</td>
<td>1.9%</td>
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Costs grow faster than retail sales.
Initial EE Business Models

- **Lost Fixed Cost Recovery Mechanism**
  - Lost base revenue mechanism applied

- **Shareholder Incentive Mechanism**
  - 3% of program costs on after-tax basis are provided to “super-utility” annually

- **EE Program Cost Recovery**
  - EE program budgets are covered by Systems Benefits Charge (fixed 3 mills/kWh) and Energy Efficiency Surcharge (variable volumetric charge to cover residual EE budget)
  - Under Agg. EE Case, impacts of applying additional funding sources (FCM, RGGI and Other funding) are also shown
Funding Sources of Energy Efficiency

EE Program Costs

Direct Ratepayer Funding
- Systems Benefits Charge (Fixed)
- Energy Efficiency Surcharge (Variable)

Additional Funding Sources
- Regional Greenhouse Gas Initiative Revenue
- ISO-NE Forward Capacity Market Revenues
- Other Funding Sources (e.g., 3rd party financing)

Agg. EE Scenario Only
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Pursuing these EE Portfolios Produce Significant Net Benefits

<table>
<thead>
<tr>
<th>Portfolio Lifetime Savings (2009-2020)</th>
<th>Total Resource ($B, PV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Energy (GWh)</td>
<td>Off-Peak Energy (GWh)</td>
</tr>
<tr>
<td>BAU EE</td>
<td>12,221</td>
</tr>
<tr>
<td>Agg. EE</td>
<td>34,577</td>
</tr>
</tbody>
</table>

Long-term Avoided Cost Forecast (2009-2020)

- Avoided Peak Energy
- Avoided Off-Peak Energy
- Avoided Capacity (see right y-axis)
Customer Bills Are Reduced Significantly; Other Funding Alters Timing of Bill Savings

- Agg. EE portfolio w/ all additional funding sources saves customers \(~$7B (-7\%)\) relative to BAU EE and \(~$10B (-10\%)\) relative to No New EE, on a PV basis (2009-2030) (after accounting for rate impacts)
- After five years of achieving Agg. EE savings goals, customer bills are lower than what is observed under BAU EE
- Aggregate customer bill savings occurs two years earlier if all additional funding sources are applied in Agg. EE case
Aggressive EE Portfolio Results in Negative Sales Growth and Large Rate Increases

- Rate increases with Agg. EE are sizable (~4.4%/year) and are driven primarily by sales dropping while utility costs rise
  - Utility costs grow at 1.8% per year
  - Electric sales decrease by -1.1% per year
- Additional funding sources modestly offsets the rate increases with Agg. EE between 2009 and 2020 (down to ~4.2%/year)
Additional Funding Sources Affects both Customer Bills and Rates

- **Impact on Aggregate Customer Bills**
  - Utilizing additional funding sources reduces ratepayers’ share of EE program costs by ~32%
  - Ratepayers experience an additional $1.2B, or 1.3%, in bill savings due purely to the use of FCM, RGGI and Other Funding Sources

- **Impact on All-in Retail Rates**
  - Applying additional funding sources reduces annual all-in retail rates in 2020 by 0.25 cents/kWh
  - Mitigates rate increases somewhat, but not a “silver bullet” (because the rate increases are not driven primarily by program costs)
“Super-Utility” needs Decoupling to Reduce Effect of Agg. EE on ROE

- LBR mechanism is insufficient to keep pace with revenue erosion between rate cases (authorized ROE of 10.98%)
- Properly designed decoupling mechanism with a k-factor is capable of removing financial impact of Agg. EE on ROE erosion
- MA shareholder incentive mechanism provides opportunity for additional earnings for investors
Decoupling Mechanism Affects Both Shareholders and Ratepayers

- Utility -- Combining the decoupling mechanism with shareholder incentive provides 30 basis point improvement to ROE and slightly higher earnings (~$20M) than if utility did not pursue future EE efforts

- Customers – Implementing the decoupling mechanism, relative to lost base revenue mechanism, would raise customer bills by ~$830M and average rates by ~1.5 mills/kWh
  
  - However, applying all additional funding sources to Agg. EE program costs lowers customer bills by ~$1.2B

- Achieving Agg. EE, relative to No New EE, with application of both decoupling and additional funding sources produces ~$8.9B in total bill reductions
Summary: Policy Conclusions

- Aggressive EE portfolio provides very large customer bill savings; in MA, possible to design a “business model” that aligns the financial interests of utility program administrators with the state’s aggressive energy policy goals to achieve the substantial customer bill savings.

- As you move towards a “comprehensive” business model, important to consider the combined impact of decoupling (or LBR) and shareholder incentive mechanisms on utilities and customers in their design.

- Given current economic climate, rate impacts may limit broad stakeholder support for Agg. EE goals; leveraging additional funding sources besides ratepayer funds can mitigate rate impacts somewhat.