C&I TRANSITION PLAN: BEYOND LIGHTING

May 20, 2020

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INTRO/AGENDA

► C&I savings vs. C&I usage
  - Lighting dominant
  - Need to pivot to other end-use savings

► Need Fundamental Market Transformation
  - Commodity-style approach will only get us so far
  - Short, Mid, and Long-term plans for how to transform the market

► Workforce is a critical enabling investment for deeper savings

Adam Jacobs - EEAC Consulting Team
Lighting was 17% of New England commercial electric consumption in 2012 (even less for industrial), and still makes up 46% of planned net lifetime savings.
NEED TO GO DEEPER

17% lighting

83% everything else
GOING DEEPER IS DIFFICULT – KEY PERFORMANCE INDICATORS

► KPI #4 – less than 5% of C&I lighting projects had controls in 2019
  - Upstream is 91% of project volume and delivers 2% of projects with controls
  - Upstream is easy for participants but hard to push customers to better solutions

► KPI #5 – only achieved 75% of planned custom HVAC electric and 57% of custom gas savings in 2019
  - HVAC savings have been declining
  - goal was for rebound this plan cycle

► KPI #6 – over 88% of small business electric savings was lighting in 2019
MARKET TRANSFORMATION – EASY THINGS ALONE WILL NOT MEET GOALS

Source: PA October 2019 EEAC Presentation
MARKET TRANSFORMATION – THREE DIFFERENT TIME HORIZONS

- **Short-term** (immediate)
- **Mid-term** (remainder of this plan)
- **Long-term** (next 3YP and beyond)
SHORT-TERM... NOT A BAD TIME TO TAKE A STEP BACK

2020... 2021... 2022...
SHORT-TERM: PRESERVE OPPORTUNITY FOR BETTER LIGHTING SOLUTIONS

**2020 Council Priority:** increasing the percentage of lighting projects that include controls towards a goal of 50% penetration

Source: DNV GL Massachusetts Lighting Market Model
SHORT-TERM: FOCUS ON WORKFORCE

► Several PA-sponsored trainings for C&I vendors in response to COVID:

- Building Operator Training (BOC)
- Design Lights Consortium (DLC) Networked Lighting Controls
- BPI Building Science Principles
- BPI Building Analyst, Envelope Professional and Infiltration and Duct Leakage trainings
- ResCaz Simulation
- OSHA Confined Space: Attics & Crawlspace

► More on this later…
MID-TERM: DOUBLE DOWN ON GOOD THINGS WE’RE ALREADY DOING

► C&I programs already experimenting with program enhancements
  - New construction redesign w/ EUI targets
  - Savings from O&M/behavior measures
  - Active Demand Reductions

► Promoting alternative fuel CHP like biogas
MID-TERM: THINGS WE KNOW ARE IMPORTANT BUT HAVEN’T FIGURED OUT

► Energy Management Systems (EMS) and controls critical
  − Significant savings from controls, need clarity on baselines

<table>
<thead>
<tr>
<th>INCENTIVE DESCRIPTION</th>
<th>HVAC CONTROLS UPGRADE INCENTIVE</th>
<th>PSE ELECTRIC (OR COMBINED ELECTRIC &amp; NATURAL GAS SERVICE)</th>
<th>PSE NATURAL GAS SERVICE ONLY</th>
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<tbody>
<tr>
<td>Maximum Total Incentive = Base + Performance</td>
<td>50 percent of total project cost</td>
<td>25 percent of total project cost</td>
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<tr>
<td>Base Incentive (Based on 5 percent whole building savings*)</td>
<td>$0.35 per kilowatt-hour (kWh) saved (+ $4.70 per therm saved)</td>
<td>$4.70 per therm saved</td>
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<tr>
<td>Maximum Base Incentive</td>
<td>35 percent of cost</td>
<td>15 percent of cost</td>
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<tr>
<td>Performance Incentive (Based on first year whole building savings)</td>
<td>Based on actual percentage of whole building savings greater than six percent</td>
<td>$4.70 per therm saved</td>
<td></td>
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</tbody>
</table>
MID-TERM: THINGS WE KNOW ARE IMPORTANT BUT HAVEN’T FIGURED OUT

► Energy Optimization and Fuel switching for C&I

Source: NEEA Very High Efficiency Dedicated Outside Air Systems
MID-TERM: THINGS WE KNOW ARE IMPORTANT BUT HAVEN’T FIGURED OUT

- Demand Response: cross-promoting is a good start
- To grow ADR: need coordinated and/or integrated delivery

ACEEE Levels of EE/DR Integration

1. RECOGNIZE
2. PROMOTE
3. COORDINATE
4. INTEGRATE

Source: ACEEE Integrated Energy Efficiency and Demand Response Programs
MID-TERM: THINGS WE KNOW ARE IMPORTANT BUT HAVEN’T FIGURED OUT

► Determining the role of traditional CHP in climate goals
  - Tipping point for emissions benefits; Renewable fuel or bust?

Source: Greater Lawrence Sewer District CHP Presentation at 2020 RI Annual CHP Meeting
LONG-TERM: DEEP ENERGY RETROFITS

► Need to go deeper on savings; need to find ways to make this appealing to more customers
  – Rocky Mountain Institute defines *Deep Energy Retrofits* as 50% savings; heavy emphasis on building envelope and electrification
  – Carbon Free Boston says ZNE construction needed… also says 85% of 2050 build stock exists today and need deep energy retrofits

► How do we close that gap?
  – Move more customers away from simple measures towards comprehensive retrofits
    • Small Business Turnkey participant customers save more than twice as much as Upstream participants
  – Deep Energy Retrofits will help make buildings Zero Net Energy ready
LONG TERM: FINANCE OPTIONS TO PAY FOR COMPREHENSIVENESS

► Financial instruments abound (on-bill finance, C PACE, Energy savings performance contracts, etc.)

► Key is to bundle measures with short and long paybacks to get a reasonable average payback for customers.
LONG-TERM: GRID INTERACTIVE EFFICIENT BUILDINGS

LONG-TERM: INVESTING IN OUR FUTURE WORKFORCE IS CRITICAL

► 79% of employers reported that employees spend some of their time on C&I buildings

► Increasing demand for interdisciplinary knowledge
  – “This gap is preventing many buildings from operating at maximum efficiency”

► Need to spend much more on workforce development
  – Mass Save spent $1.5 million between 2013-2018 (0.05% of budget)
  – PG&E spent $10.7 million in 2018 alone (2.8% of budget)

Source: Mass Save Workforce Development Needs Assessment
SUMMARY

► Short-term: Use this time productively
  - Pivot away from lighting savings
  - Train vendors and customers on operational best practices to lay foundation for market transformation

► Mid-term: Shifts from equipment to operational savings and EO
  - Double down on the good things like ESPO, SEM, NC redesign
  - Answer the hard questions like Energy Optimization and integrating EE/ADR

► Long-term: Nobody said it would be easy
  - Need to be more comprehensive and deliver deeper savings
  - Use financing and bundle measures w/ short and long paybacks
  - Workforce is critical to success
QUESTIONS