

## Massachusetts C&I Evaluation Contract Project Summary: CHP Process Evaluation

Project timeframe: May 2016 – October 2017

Program year(s) evaluated: 2010 – 2016

Research area: Process Evaluation

**High-level study objectives:** Identify market barriers facing CHP systems in Massachusetts and to help identify ways that these barriers can be mitigated.

### Selected recommendations and key supporting findings

**We recommend that Massachusetts CHP staff continue applying cost-effectiveness screens when identifying CHP candidates.**

- Participants listed the reduction of electric energy usage and costs as the top benefit.
- Program participants are generally satisfied with the CHP incentive offering as a whole. Most (9/12) rated their satisfaction a four or five on a five-point scale.

	Inter - connection Issues	# of Acceptable Facilities	Customer Lack of Knowledge or Awareness	Capital Cost	Incentive Request Process	Level of Customization	Economic Risk
<b>PA's</b>		X		X		X	
<b>Developers</b>	X		X	X	X	X	
<b>Participants</b>				X			X

**We recommend that the CHP PA staff work together to identify if any discrepancies exist with regards to CHP implementation in their territories. Furthermore, we recommend that the PA staff jointly work with the Department of Energy Resources (DOER) to identify how (if at all) metrics such as heat recovery requirement might differ between the PA implementation and the DOER's Alternative Portfolio Standard (APS) incentive for CHP.**

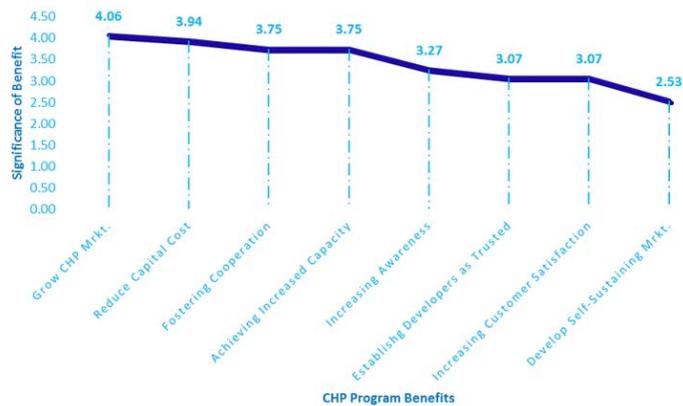
- Project developers identified CHP implementation differences across PA service territories, and between the energy efficiency incentive program and the DOER APS.
- One PA identified existing differences between the PA energy efficiency program and the DOER APS incentive for CHP.

**We recommend that the PA staff look for cost effective CHP solutions for customers with smaller thermal loads.**

- Project developers claim that smaller CHP systems (50 – 100 kW) can be cost-effective.

**We recommend that the PA staff expand marketing and outreach efforts to mid-sized customers.**

- PA outreach efforts are focused on larger CHP systems marketed to customers with large electrical and thermal loads like hospitals and industrial facilities.
- The PAs listed the number of facilities with a large coincident thermal and electric load as a limiting factor to CHP growth.
- Market assessments have suggested significant potential exists for small customers with average loads as low as 50 kW.



## CHP Process Evaluation Final Report Summary (cont.)

### Comprehensive findings and recommendations matrix

Recommendations	
Recommendation 1	We recommend that Massachusetts CHP staff continue applying cost-effectiveness screens when identifying CHP candidates.
Recommendation 2	We recommend that the CHP PA staff work together to identify if any discrepancies exist with regards to CHP implementation in their territories. Furthermore, we recommend that the PA staff jointly work with the DOER to identify how (if at all) metrics such as heat recovery requirements might differ between the PA implementation and the DOER's APS incentive for CHP.
Recommendation 3	We recommend that the PA staff look for cost effective CHP solutions for customers with smaller thermal loads. Micro CHP technologies (50 kW or less) for small hotels, restaurants, multi-family housing, and small assisted living facilities may prove to be cost effective.
Recommendation 4	We recommend that the PA staff expand marketing and outreach efforts to mid-sized customers with average loads as low as 50 kW and sufficient coincident thermal load, not just the customers with the largest thermal and electrical loads.

Findings	Recommendations			
	Recommendation 1	Recommendation 2	Recommendation 3	Recommendation 4
Program participants are generally satisfied with the CHP incentive offering as a whole.	X			
Massachusetts PAs indicated being very familiar with CHP technologies, costs, and incentives.	X		X	
Across the board, PAs, project developers, and participants agreed that the main customer perspective benefits and drivers for CHP are economic ones such as reducing purchased electric energy and receiving CHP incentives. Reliability, while an emerging driver, remains a secondary one with perceived environmental benefits being deemed as less important.	X			
The PAs see the primary barrier for CHP to be the limited number of projects with sufficient coincident thermal/electrical loads. In contrast, project developers see the primary barrier to be the interconnection process and PA outreach, and do not view load requirements as a limiting factor.			X	X
Participants identified economic concerns such as upfront capital costs, economic risks, and the opportunity cost of CHP investment (relative to other energy efficiency investments) as the main barriers to CHP adoption.			X	X
According to project developers, the interconnection process takes too long and creates unnecessary uncertainty at the onset of the project. However, interconnection issues were seldom raised by program participants and PA customers as a significant barrier.		X		
Project developers were dissatisfied with the level of customer outreach provided by the PAs.			X	X
Developers felt that the process of navigating the program itself, from completing requirements, waiting for feedback, communicating with program administrators, and calculating values necessary to secure incentives, was a barrier itself, and expressed a desire for a more streamlined incentive application process and quicker response time from the program.		X		
CHP developers reported the healthcare industry as the sector most frequently targeted for potential CHP projects, followed by college campuses. When asked to provide specific characteristics of high value CHP candidates, project developers indicated a gas usage of 1,000 – 5,000 Therms per summer month and electrical usage of 25,000 – 46,800 kWh per month.			X	X
Developers have mixed feelings about promoting reliability as a CHP benefit.	X			
High value candidates who have not installed CHP, defined as those with large coincident electrical and thermal loads, are generally aware of the technology. One third of high value candidates said that they learned about CHP from their PA account representative. The remaining candidates reported learning about CHP through experience in the industry or from CHP project developers. All high value candidates said that they were aware that their PA offers energy efficiency incentives for CHP. Most high value candidates reported financial factors are the most important barriers to CHP development. In other cases, candidates felt that the CHP proposition was too risky, or simply the physical requirements of the site did not make sense. Financing can be particularly challenging for public institutions.			X	X
Most high value candidates who did not install CHP indicated that they are either participating in demand response programs or implementing other energy efficiency measures like steam straps or LED lighting.			X	X