Creating A Greener Energy Future For the Commonwealth

Massachusetts Department of Energy Resources

Use of an Alternative Energy Standard Portfolio Standard by Mass for the Support of CHP

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Mass CHP Incentive Programs
General Overview

- Incorporate 50 MWe of Operating Mass. CHP Projects
- Two Mass specific incentive programs which are intended to be both complementary and supplementary:
- A Utility Administered Efficiency Plan Measure Benefit (funded on-bill by rate payers).
  - Provides “front end” capital for feasibility studies , procurement and installation
  - ≤ 150 kW; $750.00 per kWh capacity(Max incentive = $112,000)
  - > 150 kW - at the discretion of the Utility Program Administrator. For small to mid-size projects cap is usually at 50% of installed cost.

Mass CHP Incentive Programs General Overview

- For larger , > 2 MW , cap is affected by need to reserve funds for to last for the funding year.
- Eligibility:
  - As-designed system efficiency ≥ 60%
  - Must pass a cost-effectiveness screening threshold established by the Mass DPU resulting in a Benefit to Cost ratio ≥ 1.
  - Link to Guidebook Document for the MassSave CHP measure

http://www.masssave.com/~/media/Files/Business/Applications%20and%20Rebate%20Forms/CHP%20Incentive%20Guidebook%20-%20dated%2011-18-10.ashx

Mass CHP Incentive Programs
General Overview

- Alternate Energy Portfolio Standard for CHP
  - Provides a program structure for the scheduled growth of both capacity and the related incentive level needed to ensure CHP's projected role in meeting overall economic and environmental policy goals.
  - Production, "back-end" based incentive administered by the MA DOER.
  - 1 credit earned per MWH of net source fuel energy saved by the CHP unit.
  - Systems over 200 kW have kWh , BTU and Fuel meters. Meters are read by independent parties.
  - Virtually all of the projects that have received a Utility incentive are also enrolled in the APS.

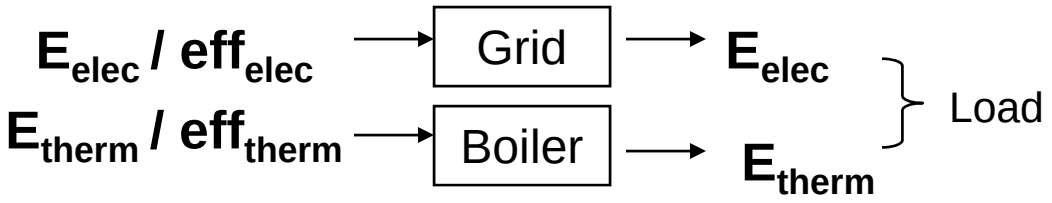
Mass. APS

- Alternate Energy Portfolio Standard for CHP
  - Creates obligation of all retail electricity suppliers to acquire Alternative Energy Certificates (AECs) equal to a set percentage (Minimum Standard) of load served. Purchase of AECs from qualified generators provides additional revenue.
  - Intended purpose is to “green up” the ISO-NE grid. Only CHP systems with thermal loads located in MA are eligible.
  - Regulated suppliers (IOUs) can recover cost of obligation via adjustments in rate cases. Competitive suppliers do not have this cost recovery path.

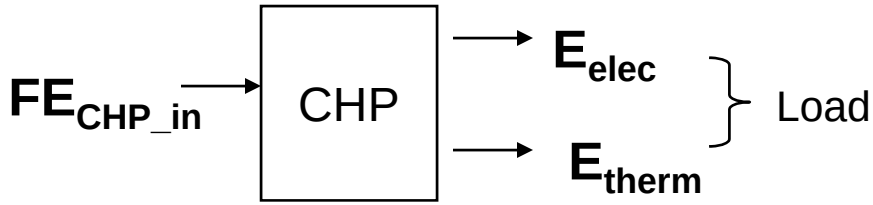
Mass. APS

- Established under Green Communities Act 2008. Provides for RPS-type program for alternative (non-renewable) technologies.
- Program compliance obligation began in 2009.
- Qualified units produces Alternative Energy Credits (AECs).
- APS includes other eligible technologies. At this time and for foreseeable future virtually 100%of the APS credits have been and will continue to be generated by CHP .

AECs for CHP Credit Greater Efficiency



Without CHP



With CHP

Alternative Energy Credits (AECs) calculated as source fuel energy savings of CHP compared with grid power and separate thermal conversion unit, to meet the same load.

AECs = E_{elec}/0.33 + E_{therm}/0.80 - E_{CHP_in}

all energy expressed in MWh

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Administration

Governing Regulations: 225 CMR 16.00

http://www.mass.gov/eea/docs/doer/rps/rps-225-cmr16-mar-12-2009.pdf

Cut-off Dates :

- New Systems: Limited to those which started up after Jan.1 2008.
- Pre-1/1/2008 Systems: A provision for incremental modifications occurring after Jan.1, 2008.

Payment Mechanism: Certificates traded quarterly using the NEPOOL Generation Information System (NEPOOL-GIS).

MA APS Obligation Schedule

Year Launched: Emergency regulations; Effective 3/31/09; Finalized 5/29/09
CHP eligible if running after January 2008.

Year	Cumulative Minimum %
2009	1.0
2010	1.5
2011	2.0
2012	2.5
2013	3.0
2014*	3.5

* After 2014, the Minimum Standard shall increase by 0.25% per Compliance Year.

Economic Benefits

- Smaller(50 to 1,000 kW) projects.
  - At Mass. incentive levels, the APS alone is usually not sufficient to ensure financial viability for smaller Combining the APS with Utility administered capital incentive results in significant improvements in both payback and ROI.
- For projects greater than 1,000 kW, the APS is typically a more significant factor due to cap limitations on the Utility administered incentive.
- Source Fuel Savings: From 2009 until September of 2011, the APS CHP systems have generated 590,466 AECs, equivalent to 2,014,670 MMBTU of source fuel energy savings.

Environmental Benefits

- Net Source GHG Reduction
  - Will be specific to the emission coefficient of the regional grid system.
  - For the ISO-NE grid, a typical natural gas fueled CHP system
  - Will achieve an 18% net reduction.
  - 0.078 short tons per AEC.
  - Between 2009 and September 2011, APS CHP systems have achieved a net reduction of approximately 46,000 short tons (equivalent to removing 9,200 cars from operation for a year)

Impact on Stimulation of CHP

- Total CHP capacity installed in Mass (per US EIA) is 1,036 MW
  - 990 MW are central plants (all pre-2008)
  - 909 MW are plants > 230 MW (all pre-2008)
- APS installed capacity = 50 MW (6% of total installed)
- APS represents > 90 % of all CHP installations post 2008.
- All of the post 2008 plants have been < 25 MW, with the large majority < 500 kW.
- APS has been a major factor in successful progress to completion for all CHP projects started post 2009.

Some Factors Inhibiting Growth

- Lack of access to capital due to economic conditions
- Complex information requirements to qualify for the Utility administered benefit
- The existence of conservative stand by tariffs in one of the major Utility service areas. (As of yesterday this barrier will likely be removed)
- APS represents > 90 % of all CHP installations post 2008.
- Lack of a Federal Investment Tax Credit large enough to spur limited partnership investment by third parties.
- APS has been a major factor in successful progress to completion for all CHP projects started post 2009.

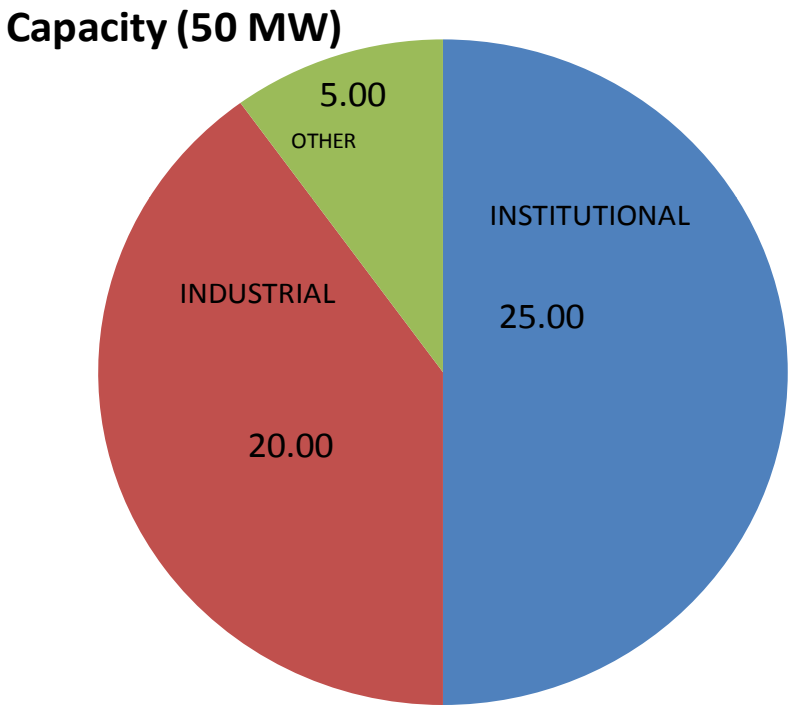
Some Factors Inhibiting Growth

- Limited effective coordination between the two state programs
- Slow acceptance of CHP benefits by the Utility programs.

Possible Relevance to CA

- The Mass Programs and in particular, the APS have been shown to be successful components of a program to stimulate CHP insofar as they have been critical to the successful completion of all post 2008 CHP projects. This is projected to continue to be the case.
- However, an APS for CHP cannot, as a mechanism by itself, guarantee the steady and required growth of CHP without sufficient support from complimentary programs and conditions, including access to capital, adequate staffing, and promotion.

Distribution of MA APS CHP Installations by End Use



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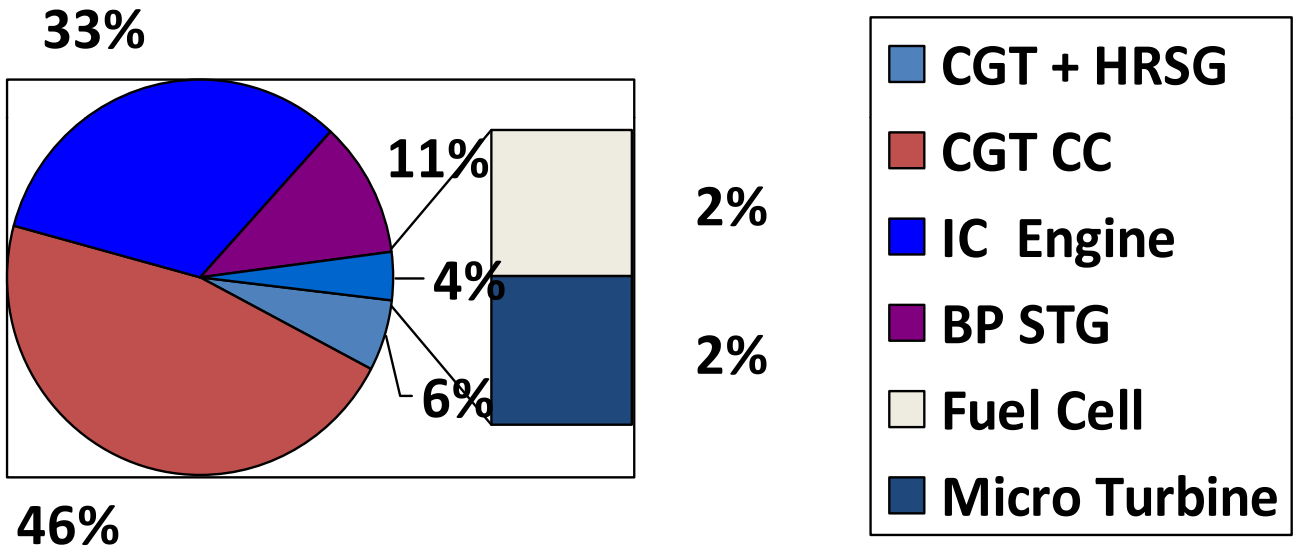
Breakdown by System Type



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MA DOER CHP Website

http://www.mass.gov/eea/energy-utilities-clean-tech/energy-efficiency/ee-for-business-institutions/combined-heat-power/

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Appendix

Administration

- Recipient of Payments: The owner of the certified facility (third party owner can share this benefit as contracted with host site owner).
- Quality Assurance:
  - Applicants submit a Statement of Qualifications Application for review and approval by the DOER which includes a substantial documentation of the system as well as the projected performance and generation of AECs.
  - Meters are read by Independent Verifiers, who also compute and register the AECs with the GIS.
  - DOER has right of inspection including access to detailed meter data.

Appendix

- Program Administrator: MA DOER
- Governing Regulations: 225 CMR 16.00

  http://www.mass.gov/eea/docs/doer/rps/rps-225-cmr16-mar-12-2009.pdf
- Eligible Participants: Any owner in the state installing the eligible technology. Owners will likely utilize a GIS provider to trade the certificates.
- Cut-off Dates :
  - New Systems: Limited to those which started up after Jan.1 2008.
  - Pre-1/1/2008 Systems: A provision for incremental modifications occurring after Jan.1, 2008.
- Recipient of Payments: The owner of the certified facility (third party owner can share this benefit as contracted with host site owner).

Appendix

Payment Stream

- Frequency of Offering: Aggregators will likely pay asset owners quarterly after trading.
- Payment Structure: Max. Value is $20/MWh Fuel Savings (from formula); Similar to RPS: Asset owners report certificates are minted and traded at the GIS on a quarterly basis. Actual value negotiated between sellers and buyers.
- Reporting Requirements: Metered power output and useful thermal are reported quarterly with 3rd-party independent verification.