Creating A Greener Energy Future For the Commonwealth

DOER
Massachusetts Department of Energy Resources

Mass. Alternative Energy Portfolio Standard : Metering Steam Energy

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Applications for Revenue-grade Steam BTU Meters

Current :

- Performance based incentives for steam generating CHP systems
- Commercial District Steam Heating
- Monitoring and reporting of steam usage for state and municipal facilities for use in meeting energy plan goals.

Applications for Steam BTU Meters

Future

- Adding Performance based incentives for steam generated by:

  - Boilers using renewable bio fuels (e.g. wood, digester or landfill gas, liquid bio-fuels)

  - Waste heat recovery boilers

MA –Specific Incentives for CHP

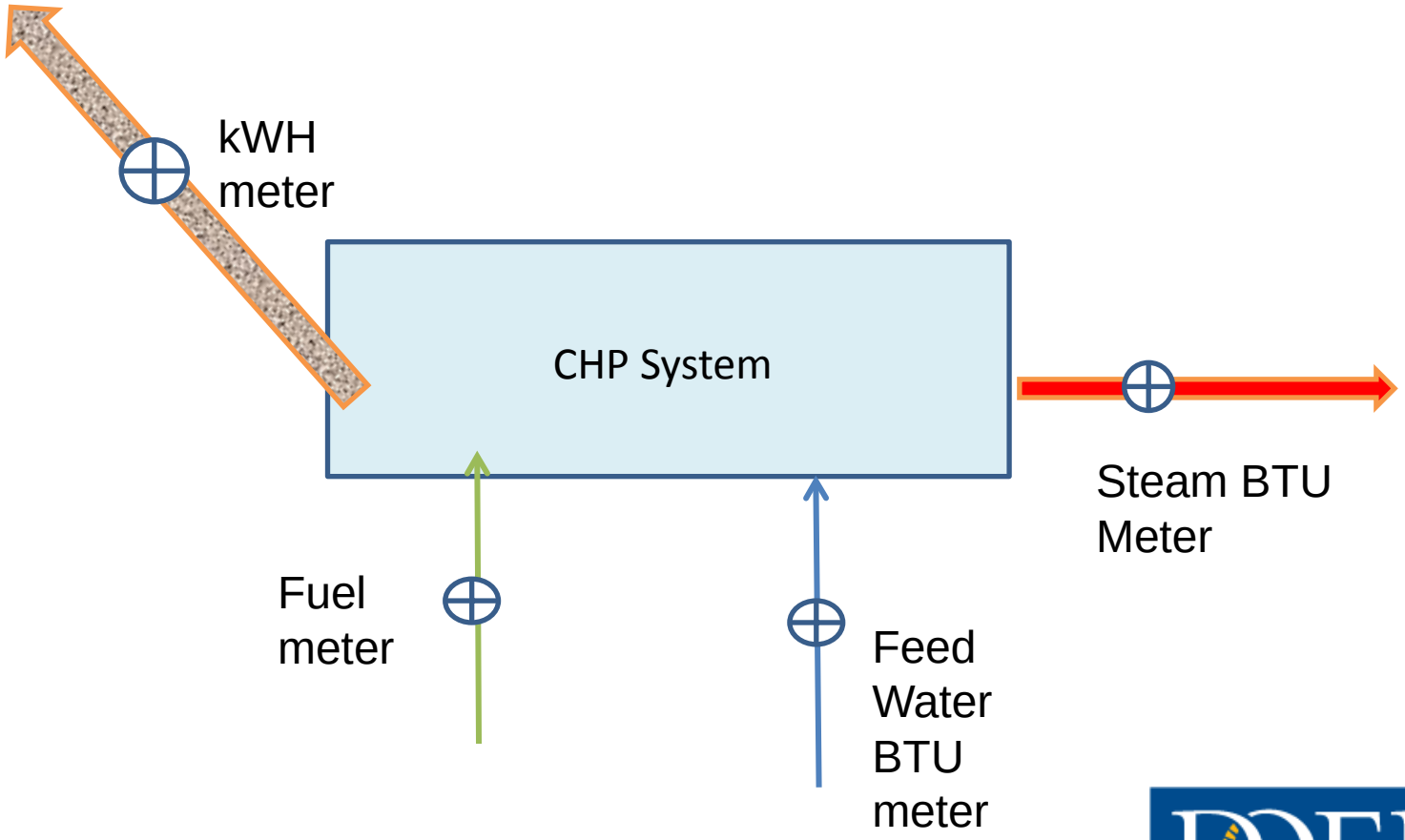
Alternative Energy Portfolio Standard (APS)

MassSave Efficiency Program

APS CHP

- Credits CHP attributes of efficiency and net source GHG emission reduction per unit of useful energy generated.
- Qualified units generate one tradable credit for each MWH of net source fuel energy saved as quantified based on metered fuel consumption, net kWh and net useful BTUs delivered to loads.
- Credits sold by generators at market price to load serving entities to fulfill their APS obligation (% of retail kWh).

Simplified APS CHP Metering – Steam Generating CHP



MA Alternative Portfolio Standard – Minimum Standard and Cumulative Demand

Year	APS Minimum Standard	Est. MW of Installed CHP
2009	1.00%	
2010	1.50%	64
2011	2.00%	92
2012	2.50%	121
2013	3.00%	148
2014	3.50%	177
2015	3.75%	205
2016	4.00%	215
2017	4.25%	226
2018	4.50%	237
2019	4.75%	249
2020	5.00%	261

Estimate based upon APS being met only by CHP

Approximately 27 MW of APS installations required each year through 2014, and half this amount in years following. Program has no sunset date.

APS-CHP

Snapshot of Current APS CHP

- Approx total number…. 65
- Total capacity (MW) …..65
- Expected range of net source GHG reduction: 15-19%

APS-CHP

Snapshot of Current APS CHP

- Systems with steam BTU meters):
  9 @ 44.7 MW combined
- Number of steam BTU meters: Approximately 25 (some systems have multiple meters)
- Range and average capacity of steam generating systems (MW).....Range 2 to 25 Avg.... 5.6
- Range of steam flows and conditions (psig, F, pph) … (600, 650 , 20,000) to (1100, 850, 160,000)

APS-CHP

Snapshot of Current APS CHP

- Steam System Types : Power Boiler + STG; Engine + HRSG; CC (CGT+HRSG + STG)
- Projected annual APS revenues for current steam generating APS systems range between $380,000.00 to $2,700,000.00 per system.
- Steam BTU Metering in place:
  - Flow Meters: Orifice plate, Vortex
  - Computers: flow, pressure and temperature signals into the existing plant DCS.

APS-CHP

APS steam CHP projects currently in planning or under construction

- Existing 255 MW merchant CHP plant steam tie-in to Boston district heating system (Incremental)
- Three projects totaling 32.5 MW.

DOER expects continued growth in steam generating APS CHP systems.

Potential Expansion of the APS

- Studies are underway to expand APS to issue credits to qualified systems to cover steam generated by:
  - Boilers fired with renewable fuels such as Biogas, Biomass and Biofuels. (Phase 1)
  - Waste heat recovery steam generators : (e.g. from a high temperature process stack gas) (Phase 2)

DOER Interest in a Standard for Steam BTU Meters

- APS steam system are relatively few in number but they represent a large fraction of the ASP CHP program's total thermal energy output.
  - DOER expects this to continue to be the case.
- Due to this, proper selection of steam meter system critical to the DOER in order to meet program management responsibilities:
  - Accurate allocation of credits
  - Accurate accounting of source GHG reductions

DOER Interest in a Standard for Steam BTU Meters

(continued):

- Similar to the ANSI standards for revenue grade kWH meters, a steam BTU meter standard that can be cited by applicants in submittals will greatly simplify the selection, submittal and review process for both the applicants and the DOER by ensuring that a known level of accuracy will be attained by any meter OEM meeting the standard.

DOER Contacts

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