



December 4, 2020

Ms. Samantha Meserve
Deputy Director, Renewable and Alternative Energy Division
Massachusetts Department of Energy Resources
100 Cambridge Street, 10th Floor
Boston, MA

Subject: **A/Z Corporation Comments on potential changes to APS**

Dear Ms. Meserve,

A/Z Corporation (A/Z) is providing the flowing comments on the Alternative Energy Portfolio Standard (APS) review being conducted by the Massachusetts Department of Energy Resources (DOER). These comments are applicable to the Daymark study and the questions presented by the DOER.

A/Z is a 100% employee owned company that provides design and construction services to a variety of industries throughout Massachusetts. We have approximately 100 full time professional employees that work in the energy services sector. Many of our projects rely on utility and state-based incentives, APS Credits, to justify the capital investments. All of our energy projects provide environmental benefits as well as reliability and in some cases resiliency. The proposed changes would undermine many of the projects that we perform on a regular basis. We are strong proponents of a green economy through a deliberate planned transition and not an abrupt change in policy.

A/Z has completed over 30 CHP, Fuel cell or distributed generation projects throughout RI, CT and MA. My comments below are based on that direct experience and understanding.

#1 – The Daymark CHP economic assumptions incorrectly state the costs to build and operate CHP equipment in New England.

While the majority of our clients are private and specific project financial data is not approved for general release. However, our rule of thumb is \$4,000/kW as a starting point from which we factor an actual cost through a phased process. The cost of major equipment alone is greater than \$1,500/kW.

The Federal Investment Tax Credit (ITC) only applies to for-profit companies. This precludes most Hospitals and Higher Education Institutions from benefiting from this incentive. Hospitals and Higher Education Institutions are one of the best opportunities for implementation of CHP and often they do not benefit from the incentive.

To benchmark the true cost of CHP projects in New England there are Industry Groups with far greater experience than Daymark, such as; New England Clean Heat and Power Institute (NECHPI), International District Energy Association (IDEA) as well as many of the major equipment suppliers (Solar Turbines, Caterpillar, Cummins, etc.). Please note IDEA and NECHPI are both headquartered in MA.

#2 – Greenhouse Gas Reductions

CHP plays an important role in reducing Greenhouse Gas emissions. See the table below. Which represents CO2 emissions in ISO NE from 2018, the most recent year for which there is a report.

2017 and 2018 Annual Time-Weighted and Load-Weighted LMU Marginal Emission Rates (lbs/MWh)

LMU Marginal Emission Rates					
	Time-Weighted			Load-Weighted	
	2017 Annual Rate	2018 Annual Rate	Percent Change 2017 to 2018	2018 Annual Rate	2018 Load-Weighted vs. 2018 Time-Weighted
	(lbs/MWh)	(lbs/MWh)	(%)	(lbs/MWh)	(%)
All LMUs					
NO _x	0.15	0.17	13.3	0.20	17.6
SO ₂	0.08	0.11	37.5	0.13	18.2
CO ₂	654	655	0.2	745	13.7
Emitting LMUs					
NO _x	0.23	0.28	21.7	0.27	-3.6
SO ₂	0.12	0.17	41.7	0.16	-5.9
CO ₂	971	1,005	3.5	971	-3.4

We believe that Daymark used the incorrect emissions rate. Daymark used all LMUs (654 lbs/CO2 per MWh), but according to the ISO report, this included resources that were transmission constrained and did not represent the LMUs at the system level. See the below from the ISO report (p 19):

In 2018, as in 2017, wind often displaced gas as the price-setting fuel. However, wind predominantly set price in small, local export-constrained areas of the system, as opposed to setting price for large parts of the system. Though wind was marginal 16% of the time in 2018, it was generally marginal in a very local congested area and did not directly impact system price. At the system level, wind was the marginal fuel type approximately 1% of the time.

We believe the more representative number at the system level is 1,005 lbs/CO2 per MWh, which is the 2018 number for emitting LMUs. This assumption is based on an EPA report on CHP (p 29)¹:

Because the CHP capacity operates continuously, the load duration curve shifts downward. The additional CHP capacity displaces an equal amount of generation each hour that it runs, shifting the load curve down while it runs. The CHP system therefore displaces power from the last unit of generation that would have been dispatched in each of these hours. Generators with a lower dispatch order, such as nuclear, hydro, and certain renewables, are unaffected. These resources operate whenever they are available so are unaffected by changes in power demand that result from CHP additions.

Depending on the efficiency of the system, a CHP emits between 700 – 750 lbs/MWh (CO2).

CHP systems therefore reduce CO2 emissions by 25% - 30%, compared to business as usual.

¹ https://www.epa.gov/sites/production/files/2015-07/documents/fuel_and_carbon_dioxide_emissions_savings_calculation_methodology_for_combined_heat_and_power_systems.pdf

#3 – CHP Projects Provide Resiliency Benefits

CHP projects are located at facilities that need 1) resiliency and 2) high temperature hot water or steam. These include hospitals, research institutions, and critical manufacturing. In these cases, the CHP system provides islanding capabilities so that the CHP system can continue to provide electricity and steam in the event of a grid outage. In many cases these locations need steam, which cannot be provided by, for example, heat pumps.

Additionally, CHP projects often form the prime energy source for microgrids and alternative/renewable projects that might not otherwise be pursued due to a facility's economic goals.

#4 – To promote biogas, Massachusetts should not require physical delivery and should allow and promote long-term contracts with Natural Gas Local Distribution Companies

There is a limited supply of biogas, particularly in New England. To the degree that biogas is being generated and injected to a pipeline, it is likely to go to more valuable markets like the California Low Carbon Fuel Standard (LCFS) and/or the federal Renewable Fuel Standard (RFS). Neither the LCFS or the RFS require physical delivery. In other words, a user in California can enter into a contract with a digester in, for example, Ohio, inject the biogas into the pipeline, and be eligible for the LCFS and RFS credits.

If Massachusetts were to change its rules and not require physical delivery, and it allowed the utilities to enter into long term contracts for biogas (or Renewable Natural Gas), it could compete with other markets on the basis of the RPS, APS, Clean Peak Energy Standard, and long-term contracting. Without these changes, biogas will continue to flow to other, more valuable, markets, like the LCFS and RFS.

STAKEHOLDER QUESTIONS

See the following comments to the questions posted by the Department of Energy Resources.

Question 7: Are there modifications to the APS program that could be made to reduce the volatility of the APS market?

Mechanisms that respond to market conditions, such as increasing the obligation the following year if supply is greater than demand, could aid in reducing volatility of the market. The Clean Peak Energy Standard includes mechanisms which could be useful if applied to the APS. In addition to a responsive mechanism like CPS, creating a floor price for AECs, could also provide some longer-term certainty for project investment decisions. If the project owner thinks program is here to stay, developers can better encourage moving the project forward.

Question 10: Are there currently eligibility criteria in the APS program that you believe are a barrier to participation in the program? How would you address these barriers?

The APS currently only allows for renewable heating, and not cooling, to be counted toward APS certificates. Additionally, intermediate and large renewable thermal systems require some form of direct or indirect metering to calculate useful thermal.

Often these projects have equipment that simultaneously heat and cool. Having to meter and calculate these potential scenarios can be complicated. Allowing for cooling as eligible would eliminate this issue. At a minimum, allowing for instances of simultaneous heating and cooling without having to create complicated methodologies would be a benefit. Alternatively, if DOER created standard assumptions (rather than metering) to account for simultaneous heating and cooling for heat pump projects, it could reduce complexity and streamline program applications.

Due to aforementioned factors, and unless a site is designing for the program specifically in mind at the onset of a project, then we have found it can be difficult and often expensive to meet program requirements. Additionally, there can be a disincentive for sites that are more efficient (but not Passive, NetZero, or HERS rated which get the multiplier), as they potentially generate less credits because they efficiently heat a space and have a low designed EUI. These sites' projects are still expensive, but do not necessarily benefit from significant APS potential revenue.

Some further specific issues and suggestions for addressing barriers are:

- Relaxing ANSI C 12.20 standards for kW meters for renewable thermal projects, or to allow for metering points within the equipment itself. Revenue-grade kW metering is required on grid electric for intermediate/large projects. Revenue grade metering for often numerous heat pumps can be cost prohibitive.
- If DOER can provide a public list of btu compliant and affordable meters it would aid in program entrance. BTU meters are also expensive.
- Increase the intermediate threshold capture a larger portion of commercial buildings.
- Add multipliers for efficient projects (ex. EUIs under a baseline) that do not have HERS certificates.

To summarize for commercial-sized projects, the cost of complying with the metering requirements compared to projected APS generation can prevent program entrance, and for sites considering investing in these new technologies, provide less of an incentive to pursue a project (**DOER Question 8**).

Question 11: What revisions to the existing APS eligibility criteria would you propose to improve and simplify the APS program, if any?

Please see the above response to Question 10, namely allowing for cooling and relaxing metering requirements.

We appreciate the opportunity to provide these comments and we are available should you have any questions. If you have any questions or require further clarification, please contact me at 860.334.8349 / rrose@a-zcorp.com.

Sincerely,

A/Z Corporation



Robert P. Rose, PE
Vice President