

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: RENEW Energy Partners, LLC comments on APS

Dear Ms. Meserve,

The purpose of this letter is for Renew Energy Partners, LLC (“Renew”) to provide comments on the Alternative Energy Portfolio Standard (APS) review being conducted by the Massachusetts Department of Energy Resources (DOER).

We appreciate the opportunity to provide input during this important process.

BACKGROUND

Renew is a Massachusetts-based firm that helps building owners reduce their carbon footprint and save money by making commercial and industrial buildings cleaner, more energy-efficient and more resilient. We fund, install, and manage systems for energy-efficiency and on-site clean power generation at no cost to the building owner. Upgrades are funded by future savings. Renew Energy Partners provides the up-front capital and expertise to purchase, install, and maintain the new systems under an energy service agreement (ESA) or Power Purchase Agreement (PPA). Monthly, for the duration of the agreement, a building owner makes payments to Renew out of the energy savings or for the system production and a portion of energy savings goes to the building owner. Renew is a mission-drive firm and every Renew project reduces a building’s carbon emissions.

We have funded numerous co-generation projects in many states including Massachusetts. For example, we recently executed a Power Purchase Agreement (PPA) with Macom Technology Solutions, Inc. for a 2.65 MW combined heat and power system, a 630 kW / 1500 kWh battery storage system, a 190 ton absorption chiller, and related equipment. The engineering is nearly complete, and we expect to break ground in early January 2021. We expect that the new system will come online in late 2021.

In addition to providing resiliency and GHG reductions, the new CCHP system would provide significant savings, helping MACOM to maintain a competitive position in the marketplace while providing manufacturing jobs in a part of the Commonwealth that is economically challenged. In determining whether to move forward on the project, the Alternative Energy Credits were a very important part of the decision.

We therefore strongly urge the DOER to continue to support CHP's inclusion in the program, as well as strengthen the APS moving forward.

COMMENTS

Comment #1 – Economic Assumptions

We are concerned that the conclusions in The Daymark study are based on a flawed financial analysis which, at a minimum, dramatically underestimated the capital and operating costs for CHP systems

In terms of Total Installed Cost, for example, the MACOM CCHP project installed cost is more than 2 times the \$2028/kW stated in the report. Our experience is that the capital costs for CHP installations are more appropriately in the range of \$4,000 - \$6,000 per kW.

In terms of O&M costs in the MACOM example, expected costs for the just the Long-Term Service Agreement (LTSA) for the CHP equipment are nearly \$50 per Operating Hour, equating to \$121 per kW-year. This does not include natural gas, urea, labor, costs to maintain other equipment like the control systems, chillers, etc., which add to the total operating and maintenance costs. Our experience with such systems suggests that total operating and maintenance costs should be in the \$0.03 - \$0.045 per kWh range.

Given these necessary corrections to the financial analysis, it is clear the AECs were extremely important to the economics of a viable project. Without AECs, we could not have delivered a project that would provide MACOM with the real savings that they sought from the project and therefore it is not at all clear that MACOM would have moved forward with this project. Moreover, these economics apply to all potential CHP projects in Massachusetts and the AECs are a key element of any such project.

This leads us to conclude that: i) the financial analysis for CHP should be corrected to incorporate the actual industry experience and expertise for CHP; and ii) in any going forward program, the Department should honor those economic decisions already made that have delivered CHP to the marketplace and ensure that they do no harm to these early adopters.

Comment #2 – Resiliency

We recommend that the Department tread careful when considering actions to disincentivize CHP as it has an extremely important dual function – not only does it dramatically improve energy efficiency it also provide operating resiliency that cannot be delivered from renewable energy sources or even be fully delivered by the grid. As important to our commercial customers as savings is the resiliency provided by the CHP systems that we fund and own. Just such an example is our project that is nearing completion in New York City at a large affordable housing complex on the East River. While this complex did not lose power during Super Storm Sandy, many similar such facilities did lose power. Such was the concern in

New York that the city and state developed aggressive programs to encourage the development of CHP that not only moved the needle on energy efficiency goals but that could also provide power during the next extreme event. We are delivering to that complex and those residents both energy savings and resilience in the face of the next crisis. The same is true for our other projects in multi-family housing across the country.

In Massachusetts, MACOM has been clear with us that the power quality from their utility grid has not always been reliable. The CCHP system that is currently being installed will have the ability to blackstart and island, including the ability to “ride-through” any utility disruptions. Our system will also include a 630 kW Tesla battery that will further add to the resiliency of the system.

In conclusion, we urge the Department to consider the value of CHP as not only an energy efficiency technology to incentivize but also as a key resiliency technology that supplies critical businesses and commercial loads in the time of ever increasing extreme climate events that effect the reliability and availability of the utility grid. Any decisions on the AEC program affecting CHP should carefully consider the public value of such ‘on demand’ resiliency.

Comment #3 – Greenhouse Gas Reductions

As noted above, RENEW invests in energy efficiency and on-site clean energy when such projects will generate carbon emissions reductions. In fact, through the investing process we have had a third-party evaluator confirm that all Renew projects, including our current CHP projects, lower carbon emissions as compared to the business as usual (do nothing) case. That firm also reviewed and approved Renew’s climate impact calculator, which is registered with the IRIS+ impact accounting system. Every co-gen project that we are working on and have evaluated using our calculator reduces carbon emissions as compared to the baseline scenario.

Depending on the efficiency of the system, a CHP emits between 700 – 750 lbs/MWh (CO₂). Because our CHP projects operate continuously, our systems “displace power from the last unit of generation that would have been dispatched in each of those hours” of operation.¹ We therefore believe the representative number at the system level is 1,005 lbs/CO₂ per MWh, which is the 2018 number for “Emitting LMUs”. CHP systems therefore reduce CO₂ emissions by at least 25% - 30% compared to business as usual. For example, our approved impact calculator has confirmed that the Macom project will reduce the carbon emissions at the site by 1,871 MTons per year as compared to the business as usual case.

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

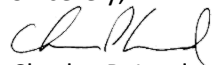
We also note that the Daymark report used a lifecycle emissions rate for natural gas but apparently did not use a lifecycle rate for electricity. The Report is therefore making an apples-to-oranges comparison. The published EPA emissions rate for natural gas is ~117 lbs/MMBtu¹. If this is used as the natural gas emissions rate, then a CHP's effective electric emissions rate is estimated to be 550 - 750 lbs/CO₂ per MWh², which represents a 25% - 45% savings compared to the emissions that CHP displaces.

Renew recognizes that the Carbon Intensity (CI) of the grid at the system level is not static, but rather dynamic. As a mission drive firm, RENEW is committed to working in the future to manage its CHP systems to maximize carbon emissions reductions.

In fact, we have worked with a number of prospective clients in the Commonwealth to explore a transition to Renewable Natural Gas as an option for CHP projects down the road as the CI of the grid decreases. Such potential clients include some of the largest employers in the Commonwealth. Pharmaceutical companies for example need the resilience provided by CHP to maintain the safety and quality of their manufacturing operations and laboratories in the face of the extreme weather brought on by climate change. No other technology currently available can meet that need continuously and help reduce their carbon emissions. With Renew, these same firms want to manage CHP going forward to meet their climate emissions reduction goals and those of the Commonwealth as a whole. Renew and these potential customers believe that RNG and biogas could be a very exciting option for CHP going forward, but as long as Massachusetts requires direct physically connected delivery of RNG and biogas to energy production facilities, realistically RNG/biogas will not be available for our projects except in a handful of cases. As such, we do recommend that the Commonwealth change its rules such that direct physical delivery is not required.

We applaud the work done to date on driving carbon reductions in the Commonwealth and would welcome the opportunity to participate in both the updated analysis for CHP as well as the furtherance of other decarbonization technologies. We are available should you have any questions, and we appreciate your time and attention on this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "C. Lord", is placed above the printed name.

Charles P. Lord

Principal

¹ Emission Factors from EPA Greenhouse Gases Inventories, 26 March 2020; <https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf>; Electronic Code of Federal Regulations Default CO₂ Emissions factors and High Heat Values for Various Fuel Types; https://www.ecfr.gov/cgi-bin/text-idx?SID=d7605b0c56cb1513877be74469c5ad19&mc=true&node=ap40.23.98_138.1&rgn=div9

² The range depends on technology (reciprocating engine vs. gas turbine) and thermal utilization.