COALITION TO LOWER ENERGY COSTS

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Re: Comments of Coalition to Lower Energy Costs on Proposed Rulemaking to Amend 225 CMR 14.00 and 225 CMR 15.00 RPS Class I and RPS Class II regulations

Dear Mr. Wassam:

Please accept these comments of the Coalition to Lower Energy Costs ("CLEC") on the Department of Energy Resources' ("DOER") proposed rulemaking to amend 225 CMR 14.00 and 225 CMR 15.00, its regulations for the RPS Class I and RPS Class II regulations.

CLEC is a non-profit Massachusetts association concerned about the threat to the Commonwealth and the region's families and economy from skyrocketing energy prices. The coalition supports a region-wide solution that will save on energy costs today, provide for economic growth, and eventually enable beneficial decarbonization of the economy.

Introduction

The proposed rulemaking is generally a step in the right direction as the Commonwealth advances on the uncharted path toward a zero-carbon economy. The strides made to date are enormous: a stunning amount of solar development, the start of historic and unprecedented offshore wind development and the commercialization of energy efficiency, among other actions. Yet as the Department is well aware, the data shows there remains a great distance to travel and some uncertainty of the resource availability to complete the journey. And as the production of sufficient renewable energy to meet all of current needs remains daunting, sophisticated analyses, including those conducted for ISO-NE and NESCOE, are showing that replacing fossil heating and transportation fuels with renewables through beneficial or strategic electrification will require a vastly larger electric grid along with exponential growth in renewables. The cost to society of this transition is presently unknown, but without question is so great that we cannot possibly afford to waste money by ignoring reasonable renewable options.

For New England in general and Massachusetts in particular, well designed and efficient biomass fueled generation is an underutilized renewable resource. Power cogenerated with biomass is highly efficient and is base load in nature, providing some of the fabric of reliability into which intermittent renewables can be usefully stitched. As DOER is aware, natural gas is inadequately available in the Commonwealth and the region in winter to meet this need and obviously is not renewable. There are no other available renewable options.

For these reasons we respectfully suggest that the present Rulemaking be used to permit power cogenerated at high efficiency biomass units to qualify for the Massachusetts RPS. Key to that efficiency is use of the entire fuel value of the biomass, including the lignin that provides most of the fuel value and is colloquially known as black liquor. We believe DOER may reasonably restrict such eligibility to black liquor employed entirely at the same manufacturing facility where it is manufactured. Similarly, it is reasonable for the final rule to limit RPS eligibility at this time to biomass used in high efficiency cogeneration, as that efficiency benefits society by reducing use of fossil fuels, since even if the cogenerated heat or steam is not entirely used to generate electricity, it directly displaces fossil fuels used for heat/steam generation.

Comments on Proposed Rule

CLEC notes that the Commonwealth has enacted an increasing number of laws and policies requiring more and more renewable resources. These policies include:

- The Class I renewable portfolio standard ("RPS"), which starting in 2020 will grow by 2% a year until reaching 35% by 2030 and then grow at 1% per year forever.
- The Class II RPS, which is set annually by a formula pursuant to a Department rule.
- The Alternative Energy Portfolio Standard which escalates by 0.25% annually forever.
- Procurements of significant amounts of clean energy generation and offshore wind energy through long-term contracts over the coming years.

Massachusetts is clearly serious about renewable energy. Meeting all of these mandates will require significant investment, however, at significant ratepayer expense. For Massachusetts to meet the requirements of the RPS Class I alone will require steady development of significant new renewable resources. The demand for renewable energy – and the resulting cost impacts to

ratepayers – will likely be even higher, as Massachusetts uses beneficial electrification of transportation and heating to further reduce the Commonwealth's carbon emissions. To honor these commitments, we need to think broadly, as a matter of fairness and to maximize cost-effectiveness of these programs. We also need to reduce barriers to success, making sure that the resources we need will be available to serve consumers' needs.

It will be increasingly hard, and soon impossible, for Massachusetts to meet the RPS Class I requirements without the Commonwealth's most abundant renewable energy resource: biomass. For 2017, total retail sales in Massachusetts equaled 45,722,855 megawatt-hours ("MWh"); by 2030, when the RPS Class I mandate is 35%, meeting this mandate would require over 10,000 megawatts ("MW") of solar photovoltaic projects with an 18% capacity factor if we relied solely on that technology – over four times more solar capacity than is currently installed in Massachusetts. As the DOER is aware, the cost of solar programs in Massachusetts has been substantial, on the order of several billions and estimated to cost as much as "$1,500 for every man, woman, and child in the state."[1] Building more solar should continue to occur, but costs must be controlled in the context of overall RPS and climate change goals. Higher capacity factor renewable resources that can be virtually baseloaded would create the MWhs necessary to meet the RPS, while also avoiding the costs of building many more MWs of low capacity factor resources. Efficient co-generated biomass appears to be the only resource available to fill this niche, as natural gas is largely unavailable in winter, is considered non-renewable, and natural gas-fueled power plants effectively can no longer be developed in Massachusetts following the 2014 Settlement Agreement between Conservation Law Foundation and Footprint Power Salem Harbor Development LP; nuclear is retiring and considered non-renewable; hydro is already being purchased in large quantities; and all other renewable resources have low capacity factors and/or high capital costs.

Offshore wind is a promising new development, with a higher capacity factor than other renewables resources. Meeting the RPS mandate with offshore wind alone, however, would require 3,600 megawatts of offshore wind generating capacity with a 50% capacity factor. Massachusetts law mandates the procurement of 1,600 MWs and authorizes an additional 1,600

[1] Commonwealth Magazine, Paul F. Levy, Has the Mass. solar gamble paid off? (December 15, 2018), available at https://commonwealthmagazine.org/opinion/has-the-mass-solar-gamble-paid-off/.

MWs. The DOER has intimated that it may require the additional 1,600 MWs, but that still is only 3,200 MWs total. Moreover, despite its high capacity factor, there are challenges around the cost of offshore wind, as apparently the first tranche of offshore wind was "too cheap." Additional offshore wind project will likely end up needlessly more expensive. Finally, while a worthwhile goal, getting to 3,200 MWs of offshore wind by 2030 is daunting to say the least. Among other state and regional roadblocks, Vineyard Wind (the first 800 MW offshore wind project) has already encountered a federal delay about which it has stated: "it would be very challenging to move forward … in its current configuration if the final EIS is not issued within, approximately, the next four to six weeks."[2] These uncertainties and challenges inherent in other resources highlight the critical need for including a sufficient volume of dispatchable, baseload renewable energy in the mix.

By contrast, modern efficient co-generation biomass facilities have higher capacity factors; Massachusetts could fulfill a 35% requirement with about 2,000 MW of biomass projects with 90% capacity factors. CLEC is not urging 2,000 MW of biomass, however. A portfolio that balances cost, construction, and operational risk is a much better approach. But unless a significant volume of biomass projects with relatively high capacity factors are included, Massachusetts ratepayers will face substantially and unnecessarily higher costs coupled with a far greater risk of failing to meet the RPS based on construction and operational risks.

Biomass electricity generation accounts for 10% of all utility-scale renewable energy generated in the United States and about 1.6% of total U.S. electricity generation.[3] And biomass has potential to do even more: the U.S. Department of Energy's 2016 Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy concluded that the U.S. has the potential to produce 1 billion dry tons of non-food biomass resources annually by 2040 and still meet demands for food, feed, and fiber. One billion tons of biomass could:

- Produce up to 50 billion gallons of biofuels;
- Yield 50 billion pounds of bio-based chemicals and bioproducts;
- Generate 85 billion kilowatt-hours of electricity to power 7 million households;

[2] https://www.vineyardwind.com/press-releases/2019/7/18/project-update-ongoing-discussions-with-us-bureau-of-ocean-energy-management

[3] U.S. National Renewable Energy Laboratory, 2016 Bioenergy Industry Status Report (2018), available at https://www.nrel.gov/docs/fy18osti/70397.pdf.

- Contribute 1.1 million jobs to the U.S. economy; and
- Keep $260 billion in the United States.[4]

Moreover, biopower greenhouse gas ("GHG") emissions can potentially be reduced (on average) by about 95% relative to coal on a well-to-plant basis.[5]

Unfortunately, the Department's proposed rulemaking imposes new restrictions that will frustrate or block the Commonwealth's ability to satisfy the RPS Class I and RPS Class II mandates in a cost-effective manner. The proposed rulemaking's changes to provisions addressing the calculation of a biomass project's lifecycle greenhouse gas emissions reduction, efficiency requirements, and fuel sourcing requirements will collectively block Massachusetts from being able to include this renewable resource in our portfolio.

For example, the Department's proposed elimination of the definition of "Co-mingled Biomass Woody Fuel", the exclusion of Co-mingled Biomass Woody Fuel from the definition of "Eligible Biomass Woody Fuel", and other revisions eliminating opportunities to use co-mingled biomass fuel will collectively bar the use of Eligible Biomass Woody Fuel that is mixed with other woody biomass fuel that is clean and devoid of non-woody biomass, paints, stains or other contaminants. This unnecessary restriction will exclude from the Massachusetts RPS market biomass facilities whose fuel source includes both Eligible Biomass Woody Fuel mixed with other clean woody biomass fuel. For example, a paper mill whose fiber basket is 98% "sustainable" would be fully disqualified from supplying renewable energy into the renewable portfolio standard. This may create the perverse incentive to not certify or de-certify the 98% that could qualify, because there is only expense and no benefit. This outcome is unnecessary: the RPS allows the qualification of the renewable portion of 100% sustainable biomass co-mingled with non-renewable fuels (like oil) to qualify; the same proportionality should apply to eligible biomass co-mingled with other biomass. In this manner, the Department should ensure that eligible biomass can be counted, even if mixed with other clean biomass.

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[4] U.S. Department of Energy, Billion-Ton Report: Advancing Domestic Resources for a Thriving Bioeconomy (2016), available at https://www.energy.gov/eere/bioenergy/2016-billion-ton-report.

[5] Chum, H., A. Faaij, J. Moreira, G. Berndes, P. Dhamija, H. Dong, B. Gabrielle, et al. 2011. "Bioenergy." In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation, edited by O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, et al. Cambridge, United Kingdom, and New York, NY: Cambridge University Press.

Likewise, the Department's proposed change to the definition of "Eligible Liquid Biofuel" could be interpreted to substantially exclude significant liquid biofuels such as black liquor from the wood pulping process – a renewable liquid fuel that is derived from Eligible Biomass Fuel or waste stocks consisting of previously used material resulting from industrial activities. According to the U.S. Energy Information Administration, black liquor is the "dominant wood-derived fuel," accounting for 27% of biomass- and waste-generated electricity in 2016.[6] Black liquor is an aqueous solution of lignin residues and hemicellulose (water/alkali soluble degradation components from wood). Lignin, and therefore black liquor, contains the bulk of the energy content of wood. Black liquor is used as fuel at papermaking facilities to generate electricity as well as the heat needed to remove the water from pulp to make paper. Black liquor is a renewable biomass fuel classified as a "liquid fuel derived from biomass". In addition to sawdust, bark, and other parts of the tree, black liquor is one of the renewable, carbon-neutral fuels used by pulp mills to produce electricity and heat, thus making it possible for these facilities to generate approximately 66 percent of their energy needs onsite. Moreover, this fuel is available at no incremental cost: according to the National Renewable Energy Laboratory, "the feedstock cost can be zero for otherwise unusable byproduct materials that are produced onsite as a part of the industrial process (e.g., black liquor at pulp and paper mills or bagasse at sugar mills), and the use of these materials for energy avoids transport costs related to disposal."[7]

The U.S. E.P.A.'s Technical Support Document for GHG gas reporting for the pulp and paper sector[8] ("EPA TSD") reviews the manufacture and combustion of black liquor and clearly considers it as a biomass fuel.[9] In addition, the EPA TSD reviewed existing reporting methodologies from around the world, and those either generally considered all biomass (not exempting black liquor) to be carbon-neutral or specifically recognize that biomass (including

[6] U.S. Energy Information Administration, "Biomass and waste fuels made up 2% of total U.S. electricity generation in 2016" (November 27, 2017), available at https://www.eia.gov/todayinenergy/detail.php?id=33872.
[7] U.S. National Renewable Energy Laboratory, 2016 Bioenergy Industry Status Report (2018), available at https://www.nrel.gov/docs/fy18osti/70397.pdf.
[8] U.S. Environmental Protection Agency, Office of Air and Radiation, Technical Support Document for the Pulp and Paper Sector: Proposed Rule for Mandatory Reporting of Greenhouse Gases (February 11, 2009), available at https://www.epa.gov/ghgreporting/subpart-aa-technical-support-document.
[9] Id., at for example pp. 3-4,6

black liquor) combustion is carbon neutral and any CO2 emissions are non-anthropogenic.[10] These include the methodologies developed for or by:

- the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Inventories;
- the Climate Change Working Group of the International Council of Forest and Paper Associations;
- the World Resources Institute and World Business Council for Sustainable Development;
- the European Union's *Commission Decision of 18 July 2007*; and
- the U.S. Department of Energy's Technical Guidelines.[11]

In addition, the EPA TSD specifically cites the Department of Energy's characterization of the United Nation's Framework Convention on Climate Change as providing that "CO_2 emissions from biogenic fuels (e.g. wood, black liquor used in the pulp and paper industry) do not 'count' as anthropogenic emissions under the UNFCC because the carbon embedded in biogenic fuels is presumed to form part of the natural carbon cycle…CO_2 emissions from the non-combustion oxidation of biomass (e,g., forest floor litter, biomass products, or discarded forest products such as mill shavings) are *similarly* considered carbon neutral".[12]

As a result of the paper industry's production and consumption of black liquor, the U.S. forest products industry has become one of the nation's leading generators of carbon-neutral renewable energy, producing approximately 28.5 terawatt hours of electricity annually. According to a study by the National Council for Air and Stream Improvement, "approximately 100 million tonnes of fossil-fuel derived CO2 emissions are avoided per year by using black liquor solids at US kraft mills. These avoided greenhouse gas emissions are approximately equal to the total of the forest products industry's emissions from fossil fuel combustion plus the emissions from electric power companies attributable to electricity purchased by the industry… The fossil GHG emissions and non-renewable energy consumption for a system using black

[10] Id,. at pp. 7-13.
[11] Citiations to these materials may be found at pp. 7-8 of the EPA TSD.
[12] EPA TSD, p. 12 (emphasis added).

liquor solids in the kraft recovery system are approximately 90% lower than those for a comparable fossil fuel-based system."[13]

While black liquor appears to qualify as Manufactured Biomass Fuel (and therefore as Eligible Biomass Fuel), the definitions of these terms should be revised to clarify that electricity generated from biomass in the form of black liquor qualifies for the RPS Class I and RPS Class II programs.

Furthermore, the requirement that biomass facilities demonstrate life-cycle greenhouse gas emissions, over a 30-year lifecycle, by at least 50% compared to the operation of a new combined cycle natural gas electric generating facility using the most efficient commercially available technology represents a deterrent to the entry of biomass to satisfy the Massachusetts RPS requirements. CLEC takes exception to this requirement for two primary reasons. It is important to first note, however, that this requirement at its core appears to create an incentive for efficiency. CLEC agrees that the most efficient biomass co-generation should be favored, and inefficient stand-alone biomass should not. While the draft rule does continue to include a minimum efficiency requirement for biomass facilities, it does not sufficiently prioritize the most efficient uses of biomass, such as cogeneration.

The first problem with the requirement is that it creates an uneven playing field, as it would inequitably impose a lifecycle GHG emissions requirement on biomass but no other renewable resource. All resources, renewable and non-renewable, produce lifecycle GHG emissions; no resources can easily or accurately account for them. For example, there are precious metals used in the components for wind turbines, solar panels, and batteries (e.g., cobalt). These resources must be mined using heavy equipment, often in places like Africa or India; refined into useful materials (likely using natural gas); fabricated into useful components at manufacturing facilities (again, likely using natural gas); transported across oceans and highways (using LNG or diesel fuel); and eventually re-purposed or disposed. Each step, and countless others, involves the emission of GHGs. Biomass should not be discriminated against as a matter of equity (and likely law) because of its fuel, as opposed to the various processes and

[13] National Council for Air and Stream Improvement, "Greenhouse Gas and Non-Renewable Energy Benefits of Black Liquor Recovery," Technical Bulletin No. 984 (April 2011), available at https://www.ncasi.org/wp-content/uploads/2019/02/tb984.pdf.

components that allow any fuel (wood, wind, water, or sun) to be transformed into electricity. The co-generated portion of electricity from an efficient biomass co-generation facility is as emissionless as wind and should be favored.

Second, using a "new combined cycle natural gas electric generating facility using the most efficient commercially available technology" as a benchmark does not make sense. Massachusetts, as a matter of policy, has all but prohibited the construction of new natural gas generation. The February 18, 2014 Settlement Agreement between Conservation Law Foundation and Footprint Power Salem Harbor Development LP effectively requires all future power plants permitted in Massachusetts to be subject to requirements at least as stringent as those imposed on the Salem Harbor facility; Massachusetts has adopted a variety of rules and permit limitations applicable to new generating facilities; and based on New England's past several years' experience, new or expanded natural gas pipelines can effectively no longer be built into the region. For these reasons, selection of a "new combined cycle natural gas electric generating facility using the most efficient commercially available technology," in Massachusetts, is an oxymoron. As other parts of the country take advantage of "new" next-generation natural gas generation technologies, already exceeding 62% thermal efficiency[14] (an effective heat rate of 5,785.5 kJ/kWh)[15], Massachusetts under its existing and foreseeable policies will be stuck using less efficient natural gas generators. Why should biomass in Massachusetts be benchmarked against new, more efficient natural gas generation in Texas or Florida? This requirement should be revised or eliminated.

Additionally, U.S. EPA's revised draft Accounting Framework For Biogenic CO2 Emissions issued in November 2014 recognizes that bioenergy from forest-derived industrial by-products, waste-derived feedstocks, and other sustainably-derived forest feedstocks are carbon neutral. Regulatory policies around the world, such as the European carbon trading system, recognize the carbon neutrality of black liquor. As stated by Roger Sedjo, Senior Fellow at the

[14] POWER Magazine, World's Most-Efficient Combined Cycle Plant: EDF Bouchain, (September 1, 2017), available at https://www.powermag.com/worlds-most-efficient-combined-cycle-plant-edf-bouchain/

[15] General Electric Co., POWERING A NEW RECORD AT EDF9HA.01 SETS EFFICIENCY WORLD RECORD (August 2016), available at https://www.ge.com/content/dam/gepower-pgdp/global/en_US/documents/product/gas%20turbines/White%20Paper/gea32885-bouchain-whitepaper-final-aug-2016.pdf.

environmental think tank, Resources for the Future, "there has been no scientific question as to the carbon neutrality of wood residues such as black liquor and wood waste."

Indeed, biomass has long been recognized as carbon neutral – meaning it does not contribute to global climate change – by scientists, academia and governments around the world, including the Intergovernmental Panel on Climate Change and the U.N. Framework Convention on Climate Change. During the Obama Administration, numerous EPA documents and policy memos cited positive benefits from the use of forest-derived biomass, including EPA's original draft greenhouse gas accounting Framework for Assessing Biogenic CO2 Emissions (September 2011) and revised draft framework (November 2014). Both documents recognize the GHG reduction benefits of bioenergy from paper mill residuals and byproducts, including liquid biomass. Reflecting international scientific consensus, the U.S. EPA earlier this year issued a policy statement reaffirming biomass as a carbon neutral energy source, and both the U.S House and Senate have included language in 2019 appropriations bills clarifying Congress' intent for long-term federal regulatory policy to reflect the carbon-neutrality of wood-based biomass.

Finally, the Department's proposed "Special Provisions for Generation Units Using Eligible Biomass Woody Fuels or Manufactured Biomass Fuels" provide additional restrictions that will discourage rather than encourage biomass from entering the Massachusetts markets. These restrictions include a Sustainable Forestry Management requirement, overall efficiency requirements (with draconian consequences for any shortfall), and onerous record and reporting requirements. These requirements should also be revised or eliminated.

These problems can be fixed. Specifically, in the context of the RPS Class I (225 CMR 14.00) and RPS Class II (225 CMR 15.00) regulations, this means ensuring that qualifying biomass is treated fairly and is not subject to these excessive restrictions which effectively block consumer access to this renewable energy resource.

CLEC would be glad to help the Department ensure that all renewable resources are treated fairly, so the RPS programs can be a cost-effective success for Massachusetts.

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