Center for Biological Diversity | Clean Air Task Force | Partnership for Policy Integrity

Nicole Singh
Executive Director, RGGI Inc.

February 19, 2016

Dear Ms. Singh –

As part of its program review, RGGI has solicited input on program design elements, including policy scenarios to model, sensitivities to evaluate, and considerations for compliance under EPA's Clean Power Plan (CPP). Please accept the following comments from the Center for Biological Diversity, Clean Air Task Force, and the Partnership for Policy Integrity as part of the 2016 program review. Our comments here are focused on the role and impact of bioenergy for RGGI. Our groups have also commented extensively on the role of biomass energy in the Clean Power Plan, most recently on the draft Federal Implementation Plan and Model Trading Rules. (We are appending to this letter a letter that was sent to the Office of Management and Budget during consideration of the Clean Power Plan, expressing concern by a number of organizations with the potential impacts of bioenergy in the CPP. Inclusion of this letter does not imply that these groups endorse our comments to RGGI.)

Given the potential future importance of RGGI and other trading programs for CPP compliance, we think it is essential that the emissions impacts of bioenergy be made as transparent as possible. Accordingly, we strongly recommend that the RGGI program review include modeling to determine the sensitivity of model outcomes to the assumed carbon neutrality of bioenergy. Specifically, we recommend that the modeling include the following sensitivities in addition to the current assumption of zero carbon emissions from biomass: (1) an assumed CO_2 emission rate for biomass of at least 3,000 lb/MWh (reflecting no discounting of emissions, as discussed below) and (2) an assumed CO_2 emission rate for biomass that is between 0 lb/MWh and 3,000 lb/MWh (reflecting a partial discounting of CO_2 emissions). This second sensitivity case, however, should be analyzed only to the extent that such any partial emissions discount is justified by lifecycle accounting, conducted by RGGI and/or participating states, that evaluates a realistic mix of the biomass feedstocks typically used in regional power generation against emissions that would occur in the absence of bioenergy generation, specifically tailored to policy timeframes relevant to RGGI's emissions reduction goals.

RGGI currently treats bioenergy as if it has zero carbon emissions, but in fact, the day to day stack emissions from biomass electricity plants exceed those from fossil-fueled plants. Not counting bioenergy's carbon emissions thus leads to a large discrepancy between reported emissions under RGGI, and actual emissions. The following annotated slides from pages 5, 6, and 7 of RGGI's modeling overview demonstrate that the relatively small contribution of bioenergy to the total energy mix is responsible for a very large proportional increase in CO_2 emissions.

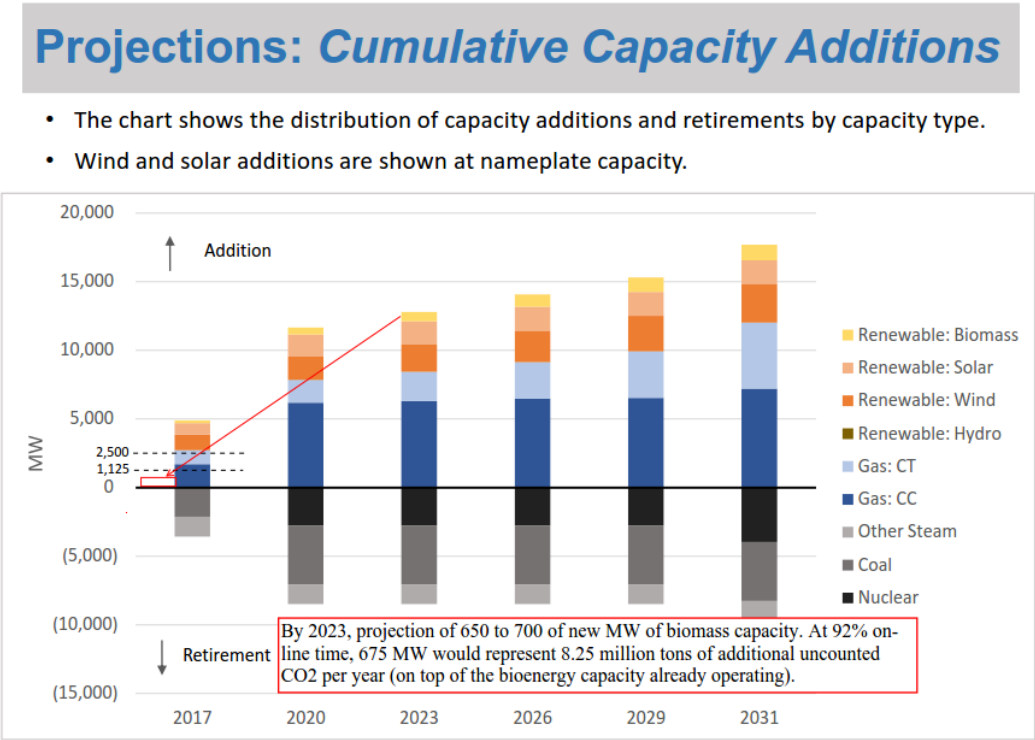

Figure 1: RGGI modeling[1] projects 650 – 700 MW of new bioenergy capacity by 2023.

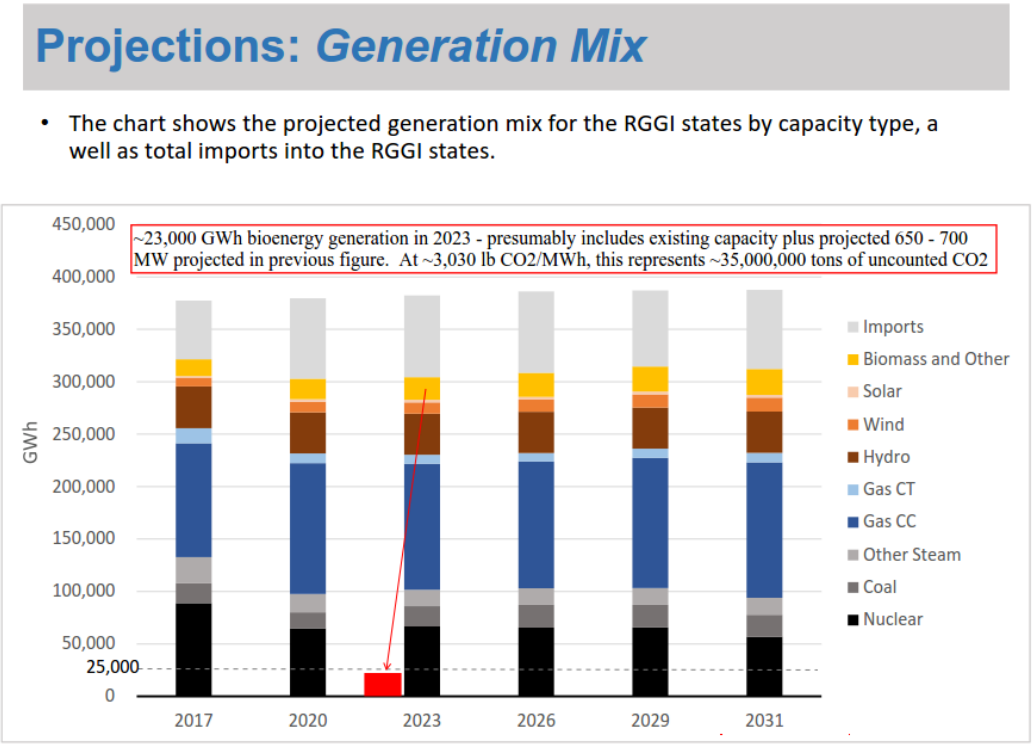

Figure 2: Total bioenergy generation is projected to be around 23,000 GWh by 2023. CO_2 emissions will be about 35 million tons per year.

[1] Draft 2016 RGGI Program Review Reference Case Results, Feb. 2, 2016.

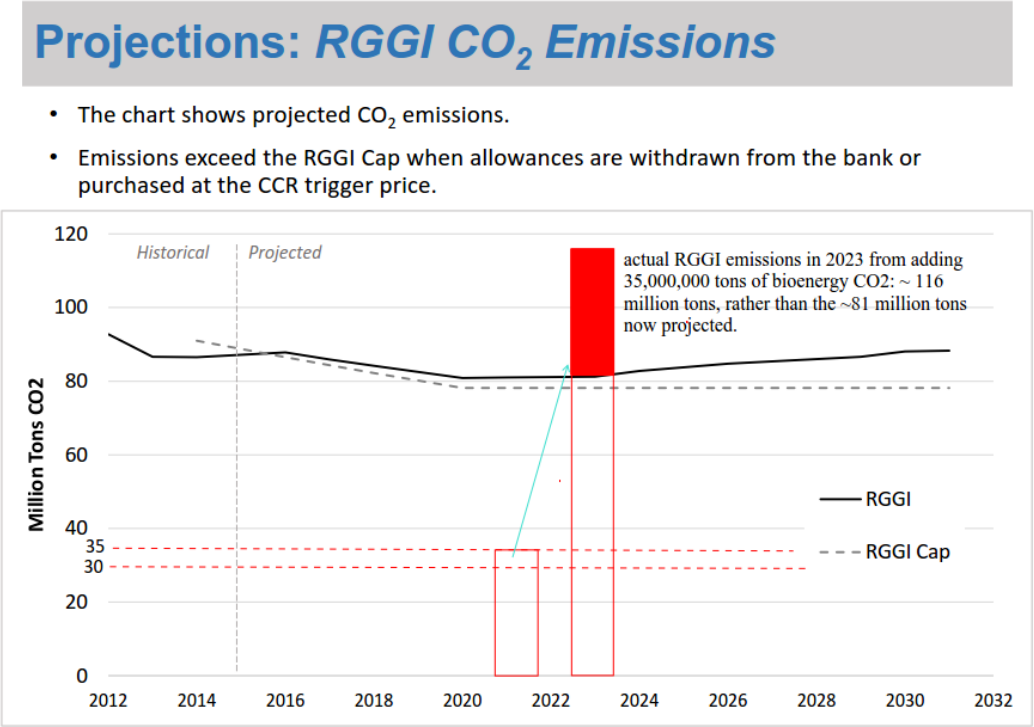

Figure 3: Adding the 35 million tons of uncounted bioenergy emissions to the projected RGGI emissions in 2023 sums to about 116 million tons, a 43 percent increase over the ~81 million tons now modeled.

Examining emissions from a single power plant burning both coal and biomass shows the impact of treating bioenergy emissions as zero. The Schiller plant in Portsmouth, NH, burns wood and bituminous coal. The following emissions data for Schiller are from 2012, from EPA's "EGRID" database[2].

	MWh	CO2 (tons)	lb/MWh
coal	95,205	130,449	2,740
wood	337,901	537,704	3,183

Table 1: 2012 emissions from the Schiller coal/biomass plant in New Hampshire.

Not only are total emissions from biomass significant, the per-MWh emissions rate is higher for biomass than for coal. Schiller's coal-fired boilers, which came online in 1952 and 1957, are extremely inefficient, and their emission rates are higher than even many other coal boilers. Likewise, the wood-fired boiler is from 1955. The following table specifies typical efficiencies for more modern plants and shows that the discrepancy between biomass and fossil fuel stack emissions is normally even greater than found at Schiller, due to fuel carbon/energy ratios, and the degradation in boiler efficiency that occurs when burning wood, which is 40-50 percent water by weight.

[2] http://www.epa.gov/sites/production/files/2015-10/egrid2012_data.xlsx

CO_2 Emission Rates From Modern Power Plants	Lb CO_2/MMBtu	Facility efficiency	MMBtu /MWh	Lb CO_2/MWh	Biomass v. Tech
New gas combined cycle[a]	117	51%	6.7	**786**	385%
New subcritical coal steam turbine[b]	210	39%	8.7	**1,839**	165%
U.S. coal fleet avg, 2013[c]	210	33%	10.5	**2,198**	138%
New biomass steam turbine[d]	213	24%	14.2	**3,028**	

CO_2 per MMBtu

a, b, c : from EIA at http://www.eia.gov/environment/emissions/co2_vol_mass.cfm. Value for coal is for "all types." Different types of coal emit slightly more or less.

d: Assumes HHV of 8,600 MMBtu/lb for bone dry wood (Biomass Energy Data Book v. 4; Oak Ridge National Laboratory, 2011. http://cta.ornl.gov/bedb.) and that wood is 50% carbon (although the 50% carbon content assumption is common, and is employed here, actual wood carbon content can vary from about 46% to 55% depending on tree species).

Efficiency

a: DOE National Energy Technology Laboratory: Natural Gas Combined Cycle Plant F-Class (http://www.netl.doe.gov/KMD/cds/disk50/NGCC%20Plant%20Case_FClass_051607.pdf)

b: International Energy Agency. Power Generation from Coal: Measuring and Reporting Efficiency Performance and CO_2 Emissions. https://www.iea.org/ciab/papers/power_generation_from_coal.pdf

c. EIA data show the averaged efficiency for the U.S. coal fleet in 2013 was 32.6% (http://www.eia.gov/electricity/annual/html/epa_08_01.html)

d: ORNL's Biomass Energy Data Book (http://cta.ornl.gov/bedb; page 83) states that actual efficiencies for biomass steam turbines are "in the low 20's"; PFPI's review of a number of air permits for recently proposed biopower plants reveals a common assumption of 24% efficiency.

Table 2: Typical emissions from power plants, as affected by fuel heat content and boiler efficiency.

The net addition to atmospheric carbon loading from burning biomass relative to fossil fuels can persist for decades. Highly relevant to the RGGI region is the Manomet Study,[3] which was commissioned by the State of Massachusetts to determine the "carbon debt" associated with burning forest wood. The study modeled harvesting of biomass fuels in a context of ongoing sawtimber operations typical for New England. Net emissions were calculated for residues from sawtimber operations, in which case the modeling assumes that if the residues weren't burned for fuel, they would decompose in the forest and emit CO_2. The study also calculated net biogenic emissions when whole trees are harvested that would otherwise continue growing and sequestering CO_2. The study did not consider the problem of leakage, that is, the net increase in forest harvesting that can occur if bioenergy fuel harvesting displaces harvesting for other uses, like pulp and paper. In this case, that wood original demand will likely not simply disappear, meaning that forest harvesting will increase overall.

The Manomet Study calculated cumulative emissions from residues and whole trees assuming the bioenergy emissions are offset (by avoided decomposition, or forest regrowth) over time. The study

[3] Walker, T., et al. 2013. Carbon Accounting for Woody Biomass from Massachusetts (USA) Managed Forests: A Framework for Determining the Temporal Impacts of Wood Biomass Energy on Atmospheric Greenhouse Gas Levels, Journal of Sustainable Forestry, 32:1-2, 130-158

then compared biomass emissions to cumulative emissions from fossil-fired boilers, and calculated how long it would take for net bioenergy emissions to be offset to the point of equivalency with emissions from fossil fuels (Table 3). Manomet found that it would take more than 45 years to offset the emissions from a boiler burning "mixed" wood (i.e., some residues, some whole trees) to the point of equivalency with emissions from a coal-fired power plant. The carbon debt payoff time relative to a natural gas plant is more than 90 years.

Massachusetts Carbon Recovery Summary
Emissions from Continuous Operation

Years to Achieve Equal Flux with Fossil Fuels				
Harvest Scenario	**Fossil Fuel Technology**			
	Oil (#6), Thermal	**Coal, Electric**	**Gas, Thermal**	**Gas, Electric**
Mixed Wood	15-30	45-75	60-90	>90
Logging Residues Only	<5	10	10	30

Table 3: The number of years required for bioenergy emissions to reach parity with fossil fuel emissions for different technologies and sources of fuel.

Other published, peer-reviewed studies have come to similar conclusions regarding the long periods of time during which biomass energy generation increases atmospheric CO_2 concentrations relative to what otherwise would have occurred.[4]

Facilities are burning forest wood

While some biomass power facilities burn mill residues like sawdust, and pulp and paper operations burn black liquor, large standalone biomass electric plants tend to burn wood, with much of it sourced directly from forests. Biomass acquisition plans and data on the amounts and origins of wood burned by three out-of-state biomass plants[5] getting renewable energy credits in Massachusetts[6] reveal that for the large plants that were getting renewable energy credits in 2013-2015, more than half the wood was "forest derived." The non-forest-derived category includes mill waste, but also trees removed during land-clearing and conversion to non-forest use.

A single facility has the potential to reduce forest biomass on a wide area of the landscape. For instance, the air permit for Burgess Biopower, [7] a 70 MW plant in Berlin, NH, states that the facility at full operation burns 113 tons of wood an hour, and that part of the facility's fuel supply is derived from

[4] See, for example, Stephen R. Mitchell, et al., *Carbon Debt and Carbon Sequestration Parity in Forest Bioenergy Production*, Global Change Biology Bioenergy (2012), doi: 10.1111/j.1757-1707.2012.01173.x; Ernst-Detlef Schulze, et al., *Large-scale Bioenergy from Additional Harvest of Forest Biomass is Neither Sustainable nor Greenhouse Gas Neutral*, Global Change Biology Bioenergy (2012), doi: 10.1111/j.1757-1707.2012.01169.x at 1-2; Jon McKechnie, et al., *Forest Bioenergy or Forest Carbon? Assessing Trade-Offs in Greenhouse Gas Mitigation with Wood-Based Fuels*, 45 Environ. Sci. Technol. 789 (2011); Anna Repo, et al., *Indirect Carbon Dioxide Emissions from Producing Bioenergy from Forest Harvest Residues*, Global Change Biology Bioenergy (2010), doi: 10.1111/j.1757-1707.2010.01065.x.

[5] The Covanta Jonesboro and West Enfield plants in Maine, and the Schiller plant in New Hampshire.

[6] PFPI requested these data from the Massachusetts Department of Energy Resources.

[7] The air permit is posted at http://www.pfpi.net/wp-content/uploads/2011/06/100726air_permit.pdf

"whole log" chipping on site. This is the amount of wood yielded by clearcutting more than one acre per hour of New Hampshire's forests.[8]

"Sustainably harvested" does not mean "carbon neutral"

The RGGI model rule definition of "eligible biomass" is not adequate to ensure low net emissions and a short carbon debt payoff time. It states:

(ap) Eligible biomass. Eligible biomass includes sustainably harvested woody and herbaceous fuel sources that are available on a renewable or recurring basis (excluding old-growth timber), including dedicated energy crops and trees, agricultural food and feed crop residues, aquatic plants, unadulterated wood and wood residues, animal wastes, other clean organic wastes not mixed with other solid wastes, biogas,and other neat liquid biofuels derived from such fuel sources. Sustainably harvested will be determined by the REGULATORY AGENCY.

As a threshold matter, it is incorrect to assume that materials produced under federal, state, or private "sustainable forestry" programs will result in atmospheric CO_2 reductions within relevant time frames. For example, state-level sustained yield forestry regulations and private certification programs may ensure that overall growth exceeds harvest, but they do not ensure the carbon neutrality of bioenergy or otherwise guarantee against net transfers of forest carbon to the atmosphere compared to what would occur in the absence of biomass generation.[9]

Thus far, the only state that has acknowledged the effect that "eligible biomass" may have on CO_2 emissions is New York, which replaced the model rule language with a more rigorous definition. The provisions define fuel as "sustainably harvested" if the Department of Environmental Conservation is persuaded that the biomass is obtained from land that has a plan and/or sustainability certification, and that will remain in a forested state for 100 years or a time period sufficient to re-sequester the CO_2 released through the combustion of the biomass.[10]

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[8] Oswalt, S.N. et al.. Forest Resources of the United States, 2012. U.S. Forest Service General Technical Report WO-91, October, 2014.

[9] *See* Michael T. Ter-Mikaelian, et al., *The Burning Question: Does Forest Bioenergy Reduce Carbon Emissions? A Review of Common Misconceptions about Forest Carbon Accounting*, 113 J. Forestry 57 (2015).

[10] From http://www.dec.ny.gov/energy/65141.html, New York State's criteria for sustainably harvested biomass under RGGI:
1) Certification Criterion: In order to demonstrate to the Department that a given fuel source satisfies the Certification Criterion, the AAR of a CO2 budget unit must provide sufficient documentation to the Department. The documentation should demonstrate that the biomass is obtained from land that has:

(a) a United States Department of Agriculture (USDA) Forest Service Forest Stewardship Plan in place, and a harvest plan. The harvest plan must be approved by a forester1 prior to harvest, and be based upon the New York State Renewable Portfolio Standard (RPS) approved template2 and recommended Best Management Practices (BMPs); or

(b) been issued a Certificate of Approval pursuant to Section 480-A of the Real Property Tax Law (RPTL); or

(c) been certified by a Department-approved non-governmental forest certification body, such as Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) or American Tree Farm (ATF).

2) Carbon Re-sequestration Criterion: The Carbon Re-sequestration Criterion may be demonstrated via a legally binding permanent conservation easement, or some other Department-approved land-use instrument, that documents that forest-based, woody biomass and unadulterated wood and wood residues are from forest land that will be maintained in a foested state for:

(a) A time period, as supported by a demonstration to the Department, that is sufficient to re-sequester the CO2 that was released through the combustion of the biomass. For purposes of making this demonstration to the Department, the AAR may

However, the state itself acknowledges that even with these provisions, the policy does not guarantee carbon neutrality, and that forest regrowth is a necessary, but not sufficient, precondition for eventual offsetting of bioenergy emissions: [11]

Part 242 is a program intended to stabilize and reduce CO2 emissions from power plants. Especially given this context, at least for Part 242, the Department ***does not consider the implicit carbon sequestration of renewable plant growth assumed for biomass to be a sufficient claim of carbon neutrality****. While some biomass production methods may produce low carbon intensity or possibly "carbon neutral" biomass, many do not, especially when taking into account the emissions associated with the growing, harvesting, processing, and combusting of the biomass. In some cases, such as in the generation of electricity alone, biomass may actually be more carbon intense than fossil fuels, resulting in greater GHG impacts, at least in the short term. The premise of biomass carbon neutrality, or low carbon intensity, cannot hold true over time without adequate future re-growth and attendant carbon sequestration to offset the CO2 emissions from biomass combustion. For further consideration, a recent study in the scientific literature emphasized the need for carbon uptake from additional plant growth or reduction of other biomass decomposition to properly account for and offset the GHG emissions associated with bioenergy.*

It is important to emphasize that this Policy does not constitute a full lifecycle or carbon accounting analysis of forest-based woody biomass as an alternative to fossil fuels. Nor does this Policy constitute a formal offset program in which sources are required to demonstrate additionality. However, this Policy is similar to afforestation offsets under Part 242, in that it considers sustainable forestry and a long-term commitment or conservation easement, in order to provide some degree of assurance that forest carbon stocks will not be lost through land conversion, and that an appropriate amount of the carbon emitted from the combustion of the biomass will be re-sequestered. The Policy sets forth the criteria by which the Department will make individual, case-by-case determinations regarding whether particular fuel sources are considered "sustainably harvested," and thus qualify as "eligible biomass" under Part 242. ***The Policy does not guarantee "carbon neutrality," or account for all GHG emissions associated with biomass production and land use change.***

The incompatibility of forest carbon offsets and bioenergy

The treatment of bioenergy under RGGI as instantaneously carbon neutral is fundamentally in opposition to the inclusion of forest carbon offsets in the program. RGGI's website[12] states:

U.S. forest offset projects sequester carbon through three project types that increase and/or conserve forest carbon stocks, increasing the removal of CO2 from the atmosphere, or reducing or preventing the emissions of CO2 to the atmosphere. The eligible project types include Reforestation, Improved Forest Management, and Avoided Conversion.

If increasing forest biomass is recognized as a means of taking carbon out of the atmosphere, it is inconsistent to then treat burning forest biomass as if it does not add carbon to the atmosphere. We are not commenting here on the efficacy of forest carbon offsets as a policy tool reducing atmospheric

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take into account forest lands that are not specifically included in the harvest of the biomass, provided such lands meet the Certification Criterion; or

(b) 100 years, with no additional demonstration to the Department.

[11] http://www.dec.ny.gov/energy/70483.html

[12] http://www.rggi.org/market/offsets/categories/forestry-afforestation

carbon dioxide, but the inclusion of such a policy tool within RGGI highlights the fundamental problem with treatment of bioenergy as carbon neutral.

Response to Comments from the Biomass Power Association

We would also like to address some statements and recommendations in comments that the Biomass Power Association (BPA) submitted to RGGI on December 4, 2015. First, we dispute BPA's underlying assumption that RGGI should exempt an electrical generating unit's (EGU's) biogenic CO_2 emissions from regulatory scrutiny. As described above, "biogenic CO_2" emissions from biomass-burning EGUs are real and undeniable: they will have an actual, physical impact on the atmospheric concentration of CO_2 and, consequently, on global climate change. There is no basis for ignoring these emissions altogether. Second, we broadly disagree with BPA's recommendation that RGGI take a passive view toward facilities that co-fire biomass and fossil fuels. Contrary to BPA's assertions, the combustion of biomass in power plants is not "encouraged" by EPA in its Clean Power Plan. Third, we reiterate that power plants that co-fire biomass and fossil fuels emit enormous quantities of CO_2. If RGGI were to ignore these emissions, as BPA urges, it will create a loophole that could significantly complicate efforts to achieve necessary emissions reductions from the region's electric power sector.

According to BPA, it would be "antithetical to RGGI's policy objective of reducing CO_2 emissions from fossil fuel-fired EGUs" if RGGI were to continue to regulate power plants that shifted from fossil fuel combustion to primarily biomass combustion. This might be true if RGGI's only purpose was the regulation of fossil fuel power plants, but this is not the case; rather, RGGI is concerned with the reduction of CO_2 emissions from the power sector as a whole.[13] RGGI-state EGUs that co-fire biomass and fossil fuel emit tens of millions of CO_2 tons each year; it cannot be antithetical to RGGI's mission to regulate such a large source of carbon pollution.

BPA also claims that regulating EGUs that co-fire biomass would be inconsistent with RGGI's policy objectives because biomass combustion is a "carbon neutral form of energy." Unfortunately, the biomass industry has stretched the meaning of the term "carbon neutral" to the point that it has become virtually meaningless in regulatory contexts, as it is unmoored from any concrete timeframe.[14] Depending on how a lifecycle analysis is conducted, it is possible to show that the volume of CO_2 emitted and sequestered (or avoided) during the biomass production and consumption process can achieve a neutral state over time. But that "neutrality" is by no means assured (for example, it depends heavily on how the relevant forest ecosystem is managed over ensuing decades), nor is "carbon neutral" synonymous with "climate beneficial." The amount of CO_2 emitted from a biomass-based EGU nearly always exceeds the amount emitted from a fossil fuel-fired EGU on a CO_2-per-MWh basis, and even if it

[13] RGGI, Program Design ("The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce power sector CO_2 emissions.") (http://www.rggi.org/design).

[14] For example, US EPA does not use the term "carbon neutral" in its final Clean Power Plan regulations or its proposed Federal Plan Requirements, except when quoting industry claims or the Science Advisory Board's review of the concept. *See, e.g.*, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule," 80 Fed. Reg. 64662, 64884 (October 23, 2015) "(Final CPP") ("Some [comments to EPA] argued that all biomass feedstocks should be considered 'carbon neutral'"); "Federal Plan Requirements for Greenhouse Gas Emissions from Electric Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; Proposed Rule," 80 Fed. Reg. 64966, 64995 (October 23, 2015) ("There are circumstances in which biomass is grown, harvested and combusted in a carbon neutral fashion but carbon neutrality is not an appropriate a priori assumption; it is a conclusion that should be reached only after considering a particular feedstock's production and consumption cycle.").

is assumed that all of the long term uncertainties surrounding forest regrowth are resolved favorably, it will be decades for the system can achieve "neutrality." During that time, carbon that might otherwise be safely sequestered in trees or other carbon pools will be in the atmosphere, exacerbating elevated CO_2 concentrations and contributing to climate change. An energy source that takes 50 years or more to produce a net reduction in CO_2 emissions may qualify as "carbon neutral" in some academic sense, but it will not benefit the climate within the timeframe that matters and it is wholly inconsistent with the urgency of the CO_2 reduction targets that underpin RGGI regulations.

Finally, BPA's attempt to analogize between the CPP and RGGI concerning the treatment of EGUs that co-fire biomass and fossil fuel ignores important differences in how the two programs regulate biomass combustion. As discussed above, RGGI currently—and erroneously—allows states to disregard the CO_2 emitted by biomass-fired EGUs. The biomass industry has pushed EPA to adopt a similar approach in the CPP, but so far EPA has declined. In the final CPP, EPA indicated that a biomass-fired EGU cannot earn emission reduction credits (ERCs) unless it burns "qualified biomass."[15] Moreover, "Regardless of what biomass feedstocks are proposed, state plans must specify how biogenic CO_2 emissions will be monitored and reported, and identify specific [emissions monitoring and verification], tracking and auditing approaches for qualified biomass feedstocks."[16] In its proposed Federal Plan Requirements, EPA specifies several kinds of renewable energy as eligible for ERCs in states that are subject to a federal plan:

> (a) ERCs may only be issued to an eligible resource that meet each of the requirements in paragraphs (a)(1) through (4) of this section. All categories of resources other than on-shore utility scale wind, utility scale solar photovoltaics, concentrated solar power, geothermal power, nuclear energy, or utility scale hydropower, and all provisions of this subpart relating to such resources, are not available or applicable in States where this subpart has been promulgated as a federal plan pursuant to section 111(d)(2) of the Act.[17]

Notably, EPA's list of ERC-eligible resources does *not* include biomass combustion. To the extent that biomass combustion results in net CO_2 reductions from the electricity sector, those reductions are significantly delayed, subject to considerable uncertainty, and exceedingly difficult to monitor and verify. BPA's claim that EPA "encourages" the use of biomass combustion in the CPP therefore mischaracterizes the CPP's approach to biomass.

Recommendations

For the foregoing reasons, RGGI's failure to account accurately for biomass CO_2 emissions threatens to undermine both the integrity and the potential success of the RGGI program. At the very least, therefore, RGGI should conduct modeling to determine the degree to which bioenergy carbon emissions increase actual power sector carbon flux.

[15] 40 C.F.R. § 60.5800 (limiting emission reduction credits to facilities that burn "qualified biomass"); § 60.5880 (defining "qualified biomass" as "a biomass feedstock that is demonstrated as a method to control increases of CO2 levels in the atmosphere").

[16] 80 Fed. Reg. 64662, at 64886; *see also id.* ("The EPA's determination that a state plan satisfactorily proves that proposed biomass fuels qualify would be based in part on whether the plan submittal demonstrates that proposed state measures for qualified biomass and related biogenic CO2 benefits are quantifiable, verifiable, enforceable, non-duplicative and permanent.")

[17] Proposed 40 C.F.R § 62.16435.

Thank you for the opportunity to comment.

Mary S. Booth, Ph.D.
Director, Partnership for Policy Integrity

Kevin Bundy
Senior Attorney, Center for Biological Diversity

Jonathan Lewis
Senior Counsel, Clean Air Task Force

Center for Biological Diversity | Chesapeake Climate Action Network
Clean Air Task Force | Dogwood Alliance | Earthjustice
Environmental Working Group | Friends of the Earth
Global Alliance for Incinerator Alternatives | Greenpeace
Partnership for Policy Integrity | Rainforest Action Network | Sierra Club
Southern Environmental Law Center | 350.org

The Honorable Shaun Donovan, Director
Office of Management and Budget
725 17th Street, NW
Washington, DC 20503

June 23, 2015

Dear Mr. Donovan —

The public interest environmental organizations listed above write to register our strong objections to the use of biomass combustion for power generation as a compliance measure in the Clean Power Plan (CPP). In the preamble to the proposed CPP, the Environmental Protection Agency anticipates that states will likely consider biomass as a compliance option, and asserts the importance of defining a clear path for states to do so.[1] This letter outlines several of the concerns our organizations have about the environmental impacts and the legal viability of the approach suggested by EPA in its proposed rule.

First, biomass-based power generation should not be included in the final CPP as a compliance measure because, at least in its proposal, EPA has not identified a rational basis for considering biomass combustion as part of the "best system of emission reduction" (BSER). Power plants burning wood and other forms of biomass emit about 3,000 pounds of CO_2 per megawatt-hour, an emissions rate that is approximately fifty percent higher than that of a coal-fired power plant. Co-firing biomass in a coal plant can increase emissions relative to burning coal alone, and, as EPA has acknowledged, can decrease facility efficiency[2] (thus working in opposition to Building Block 1 of the CPP, which calls for increasing coal plant efficiency).

The Clean Air Act requires EPA to promulgate a standard of performance for limiting the air pollutants emitted from each listed category of stationary sources. This performance standard must "reflect[] the degree of emission limitation achievable

[1] Carbon pollution emission guidelines for existing stationary sources: electric generating units; proposed rule, 79 Fed. Reg. 34,830, 34,924 (June 18, 2014).
[2] U.S. Environmental Protection Agency. Documentation for EPA Base Case v.5.13: Using the Integrated Planning Model. Page 5-9. http://www.epa.gov/airmarkets/documents/ipm/Documentation.pdf

through the application of the best system of emission reduction … the Administrator determines has been adequately demonstrated."[3] Section 111(d) of the Act is source-focused, requiring states to submit plans for implementing standards of performance at particular existing sources.[4] As biomass combustion does not produce contemporaneous reductions in CO_2 emissions, with any reductions in net lifecycle emissions depending on carbon offsetting that occurs offsite and in the future, it cannot be considered part of the BSER envisioned in the Clean Power Plan and required under Section 111 of Act.

EPA and other agencies have often treated CO_2 from bioenergy differently from CO_2 from fossil fuel combustion, even though CO_2 from both sources has the same effect on the climate. This different treatment is based on the theory that burning biomass to generate energy either results in emissions that will be recaptured as trees grow back, or avoids emissions that otherwise would have occurred if the biomass were to decompose. However, even if emissions are reduced by regrowth later in time, or if emissions that would have occurred later in time are avoided, the offsetting reductions are significantly delayed – on the order of years, decades, or more than a century, depending on the material used as fuel. The emission reductions typically attributed to power plants that burn biomass are therefore uncertain, speculative, and dislocated, and cannot be relied upon for the purpose of CPP compliance.

Second, if EPA decides to shift the development of biomass carbon accounting to individual states, with no guidance or standards for evaluating biomass-dependent compliance proposals, this would invite arbitrary results and would have no rational basis. EPA's proposed CPP would not require biomass-burning facilities to ensure that emission reductions are contemporaneous, or even that such reductions will occur within a specified time period. Nor did the proposal describe how states are to assess the connection between facilities that burn biomass and nominally related CO_2 reductions that occur elsewhere (due to either subsequent plant growth or avoided decomposition).

EPA points states and other stakeholders to the Agency's ongoing effort to develop a scientific carbon accounting framework to track the lifecycle CO_2 emissions associated with biomass-based energy production. According to EPA, states that want to incorporate biomass combustion into their CPP implementation plans should refer to the draft *Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources*. The draft Framework, however, is currently under review by an EPA Science Advisory Board (SAB) panel that roundly criticized the Agency's previous draft;[5] it states

[3] 42 U.S.C. § 7411(b)(1)(B), (a)(1).
[4] *Id*. § 7411(d)(1)(A).
[5] SAB review of EPA's Accounting Framework for Biogenic CO_2 Emissions From Stationary Sources. EPA-SAB-12-011 (Washington, D,C., Sept. 28, 2012), *available at* http://yosemite.epa.gov/sab/SABPRODUCT.NSF/57B7A4F1987D7F7385257A87007977F6/$File/EP

explicitly that EPA has not yet determined how to apply the Framework to any particular policy context, such as the CPP;[6] and it does not deliberate on the legal limitations and obligations that are particular to Section 111 of the Act or how the details of that provision apply to biomass combustion. Given the lack of guidance provided by EPA, there is a significant risk that some states will develop implementation plans that incorporate a diversity of biomass combustion measures that are arbitrary or otherwise legally baseless.[7]

Third, the concept of "sustainability" that EPA has said it will use to distinguish CPP-compliant biomass is not a proxy for carbon accounting. In a memorandum issued in late 2014, EPA signaled that it might bypass the scientific effort being conducted by the SAB by making two determinations: first, that the "use of waste-derived feedstocks and certain forest-derived industrial byproducts are likely to have minimal or no net atmospheric contributions of biogenic CO_2 emissions, or even reduce such impacts, when compared with an alternate fate of disposal;" and second, "that states' reliance specifically on sustainably-derived agricultural- and forest-derived feedstocks may also be an approvable element of their [CPP] compliance plans."[8] Sustainability standards in the forestry context, however, generally do not consider carbon dynamics at all, and thus cannot serve as an accurate proxy for carbon accounting.

The organizations represented on this letter have a range of perspectives about bioenergy. However, we all agree that the molecules of CO_2 emitted by biomass-burning facilities warm the atmosphere and acidify the oceans just as effectively as CO_2 from fossil fuels. Even if bioenergy emissions are eventually offset, the process of reaching net emissions parity with coal- and natural gas-fired power plants takes decades to more than a century, depending on the feedstocks used and the combustion efficiency of the facility. As such, biomass combustion is contrary to both the policy goals and legal requirements that underpin the Clean Power Plan, and cannot qualify as BSER.

A-SAB-12-011-unsigned.pdf. EPA recently extended the SAB's current review of the Framework through at least early September. *See* Notification of Three Teleconferences of the Science Advisory Board Biogenic Carbon Emissions Panel, 80 Fed. Reg. 32,113 (June 5, 2015).

[6] United States Environmental Protection Agency, Office of Air and Radiation. Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources (Nov. 2014).

[7] The forestry industry, emboldened by the possibility that EPA will discount the CO_2 emitted by biomass-burning power plants, anticipates a "new North American wood pellet market" under the CPP. *See* http://www.informationforecastnet.com/events/pellets-coal-plant-conversions/?utm_source=Pellets-J1-0526-1&utm_medium=Banner&utm_campaign=2015Events. A new market would exacerbate the rapidly growing demand for US-harvested trees from power companies in Europe, where bioenergy is wrongly assumed to be "carbon neutral." *See* Joby Warrick, How Europe's climate policies led to more U.S. trees being cut down, Washington Post, June 2, 2015, *available at* http://t.co/anLq0JuA6c.

[8] Memorandum from Janet McCabe, Acting Assistance Administrator, Office of Air and Radiation, EPA, to Air Division Directors, Regions 1 – 10, "Addressing Biogenic Carbon Dioxide Emissions from Stationary Sources," Nov. 19, 2015.

For the reasons described above, we believe that the inclusion of biomass combustion as a compliance option would deeply compromise the final CPP, and we respectfully urge the Office of Management and Budget to recommend its exclusion.

Respectfully submitted,

Center for Biological Diversity
Kevin Bundy, Climate Legal Director and Senior Attorney

Chesapeake Climate Action Network
Mike Tidwell, Executive Director

Clean Air Task Force
Jonathan Lewis, Senior Counsel, Climate Policy

Dogwood Alliance
Danna Smith, Executive Director

Earthjustice
Abigail Dillen, Vice President of Litigation for Climate and Energy

Environmental Working Group
Heather White, Executive Director

Friends of the Earth
Lukas Ross, Climate and Energy Campaigner

Global Alliance for Incinerator Alternatives
Monica Wilson, Canada & U.S. Program Director

Greenpeace
Larry Edwards, Forest Campaigner

Partnership for Policy Integrity
Mary S. Booth, Director

Rainforest Action Network
Amanda Starbuck, Climate and Energy Program Director

Sierra Club
Joanne Spalding, Chief Climate Counsel & Senior Managing Attorney

Southern Environmental Law Center
David Carr, General Counsel

350.org
Jason Kowalski, U.S. Policy Director