March 16, 2015

Holly Stallworth
Designated Federal Officer
SAB Biogenic Carbon Emissions Panel
US Environmental Protection Agency
Via email

Re: EPA's Accounting Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources (November 2014)

Dear Dr. Stallworth:

The Natural Resources Defense Council (NRDC) is pleased to provide the following comments on EPA's November 2014 Accounting Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources (the revised Framework), which the agency submitted to the Science Advisory Board for review by the reassembled Biogenic Carbon Emissions Panel (SAB panel). These comments are also submitted on behalf of the Southern Environmental Law Center and Dogwood Alliance.

NRDC commends EPA for committing to a science-based framework for accounting for biogenic carbon emissions from large stationary sources, as well as the SAB panel for its continued contribution to this process. Unfortunately, in a November 19, 2014 memo from Janet McCabe, Acting Assistant Administrator for the Office of Air and Radiation, to regional air regulators (the McCabe memo), EPA proposed to treat several classes of biogenic fuels as "approvable elements" in state compliance under the Clean Power Plan (CPP), seemingly preempting the science-driven process to which the agency committed itself. While there may be a plausible basis for treating some waste-derived feedstocks and industrial byproducts as lower carbon sources, we see no scientific basis for treating "sustainably-derived" forest biomass sources (e.g. whole trees) as low carbon. NRDC believes the carbon accounting framework is the place to make that determination, based upon actual emissions from each source.

However, we not only have serious concerns about the interplay between the McCabe memo and the revised Framework, but also the revised Framework itself. Most critically, EPA has not identified the policy context to which the Framework is being applied, not even mentioning the Prevention of Significant Deterioration (PSD) permitting process, for which the Framework process was initially conceived. A related problem is that the revised Framework is entirely descriptive, not directive. Rather than specify a single, scientifically-grounded methodology for biogenic carbon accounting, it provides a menu of options, which produce highly divergent results depending upon underlying assumptions, and leaves key choices such as baseline type and timeframe of analysis to users.[1]

Further, while the revised Framework contains an improved discussion of some elements of biogenic carbon accounting, it does not adequately address three key shortcomings identified in the SAB panel's final report on EPA's 2011 draft Framework: 1) a lack of policy context and timeframe to which the Framework is to be applied; 2) use of fixed reference point baselines; and 3) accounting for emissions leakage. We urge the SAB panel to refine the revised Framework accordingly on the following points:

1. *Policy context*. EPA fails to identify the policy context to which the revised Framework is being applied[2]. This is despite the SAB panel's explicit concerns that the efficacy and reasonableness of any carbon accounting system depends on the regulatory context in which it is applied.[3] The agency's emphasis on policy agnosticism, even more stark in the revised Framework, will undermine the SAB panel's ability to conduct a fruitful scientific discussion and peer review process that helps lead to real guidance on biogenic carbon accounting by EPA. It is also nonsensical given the specific need to address the key issues that apply to regulations where *the emissions of an individual facility are at issue* (e.g. PSD permitting, CPP). As presented, the revised Framework sets up a system to rationalize almost any form of biomass as "carbon neutral".

2. *Baseline type.* The revised Framework persists in including fixed reference point baselines as a reasonable option, even for long-recovery feedstocks, despite the SAB panel's earlier rejection of that approach. A reference point baseline approach simply compares forest growth and removals over a specified timeframe in a given area. It neither links a facility's biomass harvesting to its atmospheric impacts nor accounts for exogenous factors, such as other biomass facilities moving into the area, weather events, etc. If overall forest growth exceeds removals over a given land base, woody biomass taken off that land for use in energy production is considered "carbon neutral". All this approach does is to certify that the amount of carbon in a defined landscape is constant and less than if wood had not been used as an energy source, while ignoring the fact that there is more heat trapping CO_2 in the atmosphere for decades than if the trees had never been cut and burned. The only relevant baseline for climate change is one that is defined by CO_2 in the atmosphere.

   Accordingly, the SAB panel warned that a reference point baseline approach risks an incorrect measure of net CO_2 emissions from an incremental biomass-burning facility and clearly rejected this approach, as applied to large geographic regions:

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[1] "The methodology in this report includes technical elements that can be adapted to reflect a variety of policy scenarios based on key decisions by the user, including type of baseline (e.g., reference point or anticipated), time frame of the assessment (e.g., future or historical, 20, 30, 50, 100 years), feedstock categories (i.e., waste-, agriculture-, and forest-derived), and scale (e.g., state, regional, national). Many of the decisions are dependent on the user's goals and could be coupled with practical considerations, such as data availability and user type. As a result, the framework is designed to be flexible so that decisions on specific components can be made to accommodate different policy constructs. The types of decisions a user of the framework could encounter are identified throughout this report, along with related considerations and implications of those decisions." (EPA 11-19-14, pg. iii)

[2] "EPA has not yet determined how the framework might be applied in any particular regulatory or policy contexts or taken the steps needed for such implementation." (EPA 11-19-14, pg. 2)

[3] "The SAB was asked whether we supported EPA's distinction between policy and technical considerations. We do not. In fact, the lack of information in the Framework on EPA's policy context and the menu of options made it more difficult to fully evaluate the Framework. Because the reasonableness of any accounting system depends on the regulatory context to which it is applied, the Framework should describe the Clean Air Act motivation for this proposed accounting system, including how the agency regulates point sources for greenhouse gases and other pollutants." (SAB 9-28-12, pgs. 2-3)

"…a fixed reference point and an assumption of geographic regions were chosen to determine the baseline for whether biomass harvesting for bioenergy facilities is having a negative impact on the carbon cycle. ***The choice of a fixed reference point may be the simplest to execute, but it does not properly address the additionality question, i.e., the extent to which forest stocks would have been growing or declining over time in the absence of bioenergy****. The agency's use of a fixed reference point baseline coupled with a division of the country into regions implies that forest biomass emissions could be granted an exemption simply because the location of a stationary facility is in an area where forest stocks are increasing. The reference point estimate of regionwide net emissions or net sequestration does not indicate, or estimate, the difference in greenhouse gas emissions (the actual carbon gains and losses) over time that stem from biomass use. As a result, the Framework fails to capture the causal connection between forest biomass growth and harvesting and atmospheric impacts and thus may incorrectly assess net CO2 emissions of a facility's use of a biogenic feedstock." (SAB 9-28-12, pg. 29)*

At any scale, reference point baselines are an ineffective and discredited approach for determining the additionality of carbon sequestration, whether across a geographic region, a county, or a fuelshed—i.e. they cannot determine whether atmospheric carbon emissions reductions are above and beyond what would have happened anyway, absent biomass demand for bioenergy.

Particularly concerning is the intersect between the EPA's proposed exemption for "sustainably-derived" forest feedstocks, as described in the McCabe memo, and the persistence of the fixed reference point baseline approach in the revised Framework. "Sustainably-derived" is an ambiguous standard which is not defined in the McCabe memo or the accompanying Framework revision. Moreover, even under the most comprehensive definition that considers biodiversity, habitat preservation and so forth, the concept of sustainability does not provide a measure of atmospheric carbon impacts on climate and cannot be justified scientifically as a proxy for carbon accounting. Even assuming a definition of "sustainably-derived" forest biomass were specified to include considerations of forest growth and removals, as captured using a reference point baseline, it would fail to accurately account for changes in carbon concentration in the atmosphere, which is the driver of climate change, for the same reasons that the reference point approach has been discredited.

Nevertheless, the bioenergy industry continues to promote the false approach, attempting to link forest "sustainability" with reference point stock changes:

"Thus, the sustainability of working forests must be evaluated solely by reference to forest carbon stocks, and forest biomass must be treated as a sustainable source of carbon neutral renewable energy as long as overall forest carbon stocks are stable or growing."[4] (National Alliance of Forest Owners, 2014)

We urge the SAB to reject this rationale outright. Should the fixed reference point baseline approach remain on the "menu of options", as provided in the revised Framework, regulated entities will see this as a means to claim that their fuel is "sustainably-derived" and to justify the erroneous conclusion that it is therefore carbon beneficial. Even worse, the revised Framework contains no

[4] National Alliance of Forest Owners' Comments on "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units," Proposed Rule, 79 Fed. Reg. 34,830 (June 18, 2014) Docket EPA–HQ–OAR–2013– 0602

directive to account for leakage, an issue that becomes more important as the regional scale of analysis becomes smaller (see below for comments on leakage).

The SAB panel should again underscore that EPA's carbon accounting framework must only credit emissions reductions above and beyond what would have happened anyway and that this requires rejecting the reference point baseline approach in favor of directing users to utilize an "anticipated future" baseline that can accurately assess additionality. This is the only scientifically rigorous means of evaluating the emissions of an individual biomass-burning facility, as concluded by the SAB panel in its 2012 report.[5] EPA acknowledges the critical limitations of reference point baselines in any context where the objective is to attribute the emissions impact of a marginal user of biomass for energy production or to assess additionality, but nonetheless does not reject the approach.[6]

3. *Timeframe.* In almost every case, the best available science shows that for timeframes less than 50 years, using long-recovery, forest-derived biomass to produce electricity results in net increases of carbon emissions to the atmosphere, and an increase in radiative forcing. Further, in its review of EPA's draft Framework, the SAB panel made clear that choice of timeframe is a policy decision. We agree and urge the SAB panel to seek clarity on the timeframe over which EPA intends to assess the net carbon emissions from covered sources that burn biomass.

   However, in the absence of such an agency directive, we believe the SAB panel should assume that relevant timeframes are those in line with existing Administration commitments on climate change—for example, the 2030 target in the CPP or the U.S.'s 2030 GHG emissions reduction targets, as agreed to at the 2009 UN Climate Change Conference in Copenhagen. To meet these commitments, short timeframes are imperative. Modeling and analysis of biogenic carbon emissions from covered stationary sources must be in accordance with those timeframes (e.g. 10-20 years).

   Unfortunately, the revised Framework entertains timeframes of analysis that are too long to be relevant to climate policy imperatives (e.g. 50 years). A 10-20 year timeframe would allow for analysis of the net emissions impact of biomass over a period in which we must avoid locking in long-lived emissions, as we try not to exceed the nation's total allowable emissions consistent with a

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[5] *"The SAB was asked to comment on the science and technical issues relevant to accounting for biogenic CO2 emissions. We found the issues are different for each feedstock category and sometimes differ within a category. Forest-derived woody biomass stands out uniquely for its much longer rotation period than agricultural (short-rotation) feedstocks. The Framework includes most of the elements that would be needed to gauge changes in CO2 emissions; however, the reference year approach employed does not provide an estimate of the additional emissions and the sequestration changes in response to biomass feedstock demand. Estimating additionality, i.e., the extent to which forest stocks would have been growing or declining over time in the absence of harvest for bioenergy, is essential, as it is the crux of the question at hand. To do so requires an anticipated baseline approach. Because forest-derived woody biomass is a long-rotation feedstock, the Framework would need to model a "business as usual" scenario along some time scale and compare that carbon trajectory with a scenario of increased demand for biomass. Although this would not be an easy task, it would be necessary to estimate carbon cycle changes associated with the biogenic feedstock." (SAB, 9-28-12, pg. 2)*

[6] *"…other limitations may result from using the retrospective reference point baseline approach, including the inability to attribute landscape biogenic carbon fluxes directly to stationary source use, or to assess additionality. Additionality is a criterion for assessing whether an activity has resulted in biogenic carbon emission reductions or removals in addition to those that would have occurred in the absence of the activity… If the goal of an analysis is to assess additionality (i.e., what would have happened in the absence of increased/decreased biomass use) or the potential impact of a marginal user of biogenic feedstocks, the use of the retrospective reference point baseline (as defined here) would not be the most appropriate choice because it does not include comparison with a counterfactual scenario. Unless conducted at a small scale, the retrospective reference point approach does not show the extent to which the increased or decreased use of a biogenic feedstock at a specific stationary source is contributing to the net carbon stock change." (EPA 11-2014, pg. 29)*

2˚ C threshold, while demand reduction and other mitigation measures have time to take hold more fully. It would also align with other regulatory efforts designed to avoid the worst consequences of climate change, reduce modeling uncertainty, which can increase dramatically over longer time horizons, and align with industry planning horizons for long term-contracts and operations.

4. *Leakage.* The revised Framework fails to explicitly require the assessment of leakage—i.e. the displaced demand for wood resulting from bioenergy production—without which it is impossible to accurately assess the carbon emissions impacts of bioenergy production at covered sources. For most long-recovery feedstocks, such as whole trees and other large-diameter wood, accurately accounting for leakage would show these feedstocks to be too carbon-intensive to play a large part in compliance with climate policies, such as the CPP. However, EPA leaves the decision to include or exclude an estimate of leakage at the discretion of the user, creating perverse incentives to ignore a key variable in determining the carbon emissions impacts of bioenergy.

   As mentioned, this is of particular concern should the reference point baseline be used by regulated facilities as scientific justification for the conclusion that use of forest biomass for electricity generation reduces carbon emissions because, year-over-year, forest growth in their fuelshed exceeds removals. As biomass from working forests is diverted for use in energy production, that biomass directly takes away from other wood products coming from the same ownership. By itself, diverting biomass from existing uses in food, paper and timber cannot reduce GHG emissions (except at the cost of food, paper and timber). Further, to the extent that increased demand for biomass results in the conversion of natural forests to forest plantations, we can expect enormous, almost immediate, releases of carbon as those older forests are cleared and burned for electricity. Without an explicit requirement to capture and rigorously account for emissions from leakage, these potentially significant transfers of carbon from biosphere to atmosphere will be overlooked.

Several of the appendices included in the revised Framework illustrate the central weaknesses we've identified above. At the same time, other appendices do well in addressing the need for appropriate baselines, timeframes, and leakage accounting. While the latter are a positive aspect of the November 19, 2014 Framework revision, the appendices as a whole are fundamentally contradictory, allowing the revised Framework to mean all things to all people. This is not what EPA is charged with doing according to the agency's statutory obligation under the Clean Air Act §111(d) to regulate carbon emissions. Instead, the agency must be directive and prescriptive in its final guidance on this important issue.

NRDC also notes that generally speaking, the longer the rotation age (or the larger the diameter of the material removed) the greater the length of time for recovery of atmospheric carbon through forest regrowth. Several studies on biogenic carbon suggest that the size of the material burned can be a predominant factor in determining its carbon impact.[7] [8] This is for two primary reasons. First, burning boles (including large tops and trunks) that would otherwise remain growing, or that would otherwise be used in long-lived end uses (pulp/lumber markets)[9], generates carbon impacts that persist for

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[7] Stephenson, A. L., and MacKay, D., *Life Cycle Impacts of Biomass Electricity in 2020: Scenarios for Assessing the Greenhouse Gas Impacts and Energy Input Requirements of Using North American Woody Biomass for Electricity Generation in the UK*, UK Department of Energy and Climate Change, July 2014.

[8] Lamers, P., & Junginger, M. (2013). The 'debt' is in the detail: A synthesis of recent temporal forest carbon analyses on woody biomass for energy. *Biofuels, Bioproducts and Biorefining*, *7*(4), 373-385 http://www.researchgate.net/profile/Patrick_Lamers/publication/259576449_The_debt_is_in_the_detail_a_synthesis_of_recent_temporal_forest_carbon_analyses_on_woody_biomass_for_energy/links/00b7d52cb045d39e5e000000.pdf

[9] We assume here relatively stable markets.

decades in most instances. Second, when burning a forest-derived material that would otherwise be left to decay in the forest (in any form, including slash, tops, branches, and/or tree boles), the decay rate of the material is a predominant factor determining emissions impacts. (If the decay time is short—for example, a matter of a few years—then burning the material creates less disparity with the emissions that would have happened anyway, indicating a potentially lower carbon feedstock. On the other hand, when the fuel's decay time is decades, the carbon emitted from burning it will persist in the atmosphere much longer than it otherwise would have). This will generally be true, except in cases where the material would otherwise be burned for silvicultural reasons (e.g. broadcast burns; roadside burns). While decay rates are determined by several factors (most of which can vary, such as climate, moisture, species, soil type), the size class of the material predominantly determines the decay function for a given set of climatic and soil conditions. These considerations suggest that the size class of the material, regardless of whether it is a branch, a top, or a bole, can in many instances serve as an initial measure of the carbon impact of the burning the material to produce electricity.

Recommendations

NRDC urges the SAB to recommend a final Framework that accurately differentiates among forest-derived fuels and determines their carbon impacts; relies on established "anticipated future baseline" modeling methods—i.e. compares emissions from bioenergy production to rigorous counterfactual scenarios of what would have happened to forest carbon stocks/emissions absent bioenergy; establishes verification and documentation to place the burden of proof on regulated entities and avoid "gaming" the system; integrates assumptions that ensure any uncertainties in the model are resolved conservatively; and incorporates the influence of diameter size-class on carbon outcomes.

We believe this can be accomplished using "default Biogenic Accounting Factors" (BAFs)—i.e. a "grading" system to evaluate different fuels' CO_2 release to the atmosphere, especially those derived from forests. The BAF approach originated in the SAB panel's 2012 report to EPA.[10] Under this approach, EPA would identify feedstock categories and major regions of analysis. For each region, modeling would determine the net change in stored carbon that results from the removal and combustion of a specific feedstock. Knowing this net change, EPA would calculate a "default BAF" for each feedstock by region, producing generalized factors to apply to stack emissions based on a facility's fuel mix.

The agency would then use these fuel-specific BAF's to adjust a facility's stack emissions to account for future sequestration and/or avoided emissions. A weighted average set of BAFs (depending on the

[10] *"Under EPA's current Framework, facilities would use individual BAFs designed to capture the incremental carbon cycle and net emissions effects of their use of a biogenic feedstock. Rather than trying to calculate a BAF at the facility-level, the SAB recommends that EPA consider calculating a default BAF for each feedstock category. With default BAFs by feedstock category, facilities would use a weighted combination of default BAFs based on their particular bundle of feedstocks. The defaults could rely on readily available data and reflect landscape and aggregate demand effects, including previous land use. Default BAFs might also vary by region and current land management practices due to differences these might cause in the interaction between feedstock production and the carbon cycle. The defaults would also have administrative advantages in that they would be easier to implement and update. Default BAFs for each category of feedstocks would differentiate among feedstocks using general information on their role in the carbon cycle. An anticipated baseline would allow for consideration of prior land use, management, alternate fate (what would happen to the feedstock if not combusted for energy) and regional differences. They would be 9 applied by stationary facilities to determine their quantity of biogenic emissions that would be subject to the EPA's greenhouse gas regulations. Facilities could also be given the option of demonstrating a lower BAF for the feedstock they are using. This would be facilitated by making the BAF calculation transparent and based on data readily available to facilities. Properly designed, a default BAF approach could provide incentives to facilities to choose feedstocks with the lower greenhouse gas impacts." (SAB, 9-28-12, pgs. 8-9)*

facility's fuel mix) would result in fully counting smokestack emissions, or discounting some or all of the emissions from burning biomass. This approach avoids the need to do facility-by-facility accounting and addresses several scientific factors that we believe are essential to accurate biogenic accounting.[11]

For the reasons described above, we urge the SAB panel to reject the "menu" approach currently proposed in the November 19, 2014 Framework revision and recommend that EPA finalize a framework that is directive and prescriptive on several key modeling/analysis decisions in the following ways:

1. **Rejects reference-point baseline approaches altogether, at any scale**. Instead, EPA must model changes in stored carbon using an anticipated future baseline, comparing emissions from increased biomass harvesting under a "business as usual" baseline to a scenario absent increased biomass demand for bioenergy. The goal must be to determine the amount of CO_2 entering the atmosphere relative to alternative fuels and forest management practices. This will ensure biomass carbon accounting accurately reflects what the atmosphere "sees" in terms of emissions.

2. **Prescribes short timeframes relevant to reducing GHG emissions in line with EPA's climate goals**. The framework must be directive regarding the timeframe and policy context chosen for analysis: it should be relevant to GHG reduction goals and climate policy imperatives. In particular, any modeled carbon sequestration (or increase) accrued in the future should be assessed over a time period that is consistent with federal, state, and international GHG reduction policies and commitments. We propose a time horizon that reflects existing Administration commitments on climate change, such as the President's Climate Action Plan (e.g. 10-20 years). Other regulatory precedents support this timeframe as well: the California Low Carbon Fuel Standard; the Massachusetts Renewable Portfolio Standard; the European Union Renewable Energy Directive, and the Federal Renewable Fuel Standard.[12]

   This relatively shorter time horizon range has four key benefits:

   a. It is in line with efforts to avoid the worst consequences of climate change;
   b. It helps to drive consistency across existing climate change policies and emission reduction commitments – including those cited above;
   c. It reduces modeling uncertainty, which can increase dramatically over longer time horizons; and
   d. It models BAFs on approximately the same timeframe as industry planning horizons for long term-contracts and operations.

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[11] The BAF approach has the following attributes: a) Is a general regional factor, which nevertheless can be applied to individual facilities; b) differentiates among different forest-derived fuel types; employs an "anticipated future baseline," a key SAB recommendation for forest biomass; provides regional specificity; accounts for land use, management approaches, end uses, alternate fates; relies on readily-available information and data, such as growth/mortality, decay rates, climatic variables, and customary silviculture.

[12] a) US commitment announced at Copenhagen in 2009: Reduce GHG emissions by 17% below 2005 level, by 2020. Target confirmed by President's Climate Action Plan (2013); b) Massachusetts Renewable Portfolio Standard: 225 CMR 14.02—Lifecycle period of 20 years: The aggregate quantity of greenhouse gas emissions, including direct emissions and significant indirect emissions such as significant emissions from land use changes, and temporal changes in forest carbon sequestration and emissions resulting from biomass harvests, regrowth, and avoided decomposition…. 225 CMR 14.05: "… over a 20 year life cycle …"; c) Federal Renewable Fuel Standard2 (RFS2) contemplates a *30 year analytic horizon.* In the RFS2 preamble (75 Fed. Reg. 14670, 14780), EPA's rationale to use a 30 year frame for assessing the lifecycle GHG emissions: *The full life of a typical biofuel plant seems reasonable as a basis for the timeframe for assessing the GHG emissions impacts of a biofuel, because it provides a guideline for how long we can expect biofuels to be produced from a particular entity using a specific processing technology. Also, the 30 year time frame focuses on GHG emissions impacts that are more near term and, hence, more certain.*

3. **Deals expressly with leakage**. We recommend two key simplifying assumptions that can sufficiently capture the interactions of demand for wood products and serve as a surrogate for leakage effects:

   - New biomass harvest displaces demand fully, 1-to-1 to a new, similar forest stand.
   - "Leakage" is additive and "new" standing trees are cut in forests that are biologically and climatically identical to the original wood source to meet the original non-biomass needs.

   These assumptions, combined with the short assessment timeframe (summarized above), would allow EPA to avoid the complexity and uncertainty inherent in modeling leakage through complex dynamic economic models. These simplifying assumptions allow the modeling to capture important economic factors without introducing large uncertainties. Even if the agency choses to use complex economic modeling, it must deal with the issue of leakage.

4. **Establishes conservative assumptions.** Critical to the success of a biogenic carbon accounting system is its approach to treating uncertainties in the modeling and implementation of biogenic permitting. Specifically, even with a robust model that incorporates our proposed methods and parameters (accurate degree of differentiation for forest types, management regimes, leakage; appropriate regional scale; correct timeframes, etc.), this does not guarantee a match with biomass sourcing as it occurs in practice for a particular facility/state. EPA's modeling of counterfactual scenarios should therefore incorporate simple, precautionary assumptions that reduce the risk of undercounting emissions and ensure any uncertainties in the model are resolved conservatively.

Respectfully submitted,

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