August 24, 2012

Submitted via email
Dr. Angela Nugent
Designated Federal Officer
EPA Science Advisory Board (1400R)
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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board

Dear Dr. Nugent and Science Advisory Board Members:

The National Alliance of Forest Owners ("NAFO") welcomes the opportunity to submit these comments to the Environmental Protection Agency's ("EPA's") Science Advisory Board ("SAB"), in advance of its August 31, 2012 teleconference to discuss the Biogenic Carbon Emissions Panel's ("Panel's") *Science Advisory Board (SAB) Draft Report (7/26/12)* ("*Report*") on EPA's *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) ("*Framework*"). NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas ("GHG") emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. NAFO—as the party that filed the Petition for Reconsideration with EPA that led to the present SAB review process[1]—is an acutely interested stakeholder in EPA's reconsideration of the treatment of biogenic carbon dioxide ("CO_2") emissions from stationary sources and the scientific analysis EPA will utilize in making ultimate policy and regulatory decisions on how to treat biogenic CO_2 emissions. A detailed summary of NAFO's past participation in EPA's rulemaking process was included in its October 18, 2011 comments to the Panel.[2] NAFO has also been an active participant throughout the Panel's review process.[3] We are prepared to share our significant scientific, technical, and pragmatic experience and a considerable body of scientific studies and analysis to assist the SAB in its review.

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[1] *See* Letter from Gina McCarthy to Roger Martella (Jan. 12, 2011) ("EPA Reconsideration Letter"), *available at* http://www.epa.gov/nsr/ghgdocs/McCarthytoMartella.pdf.
[2] *See* Attachment 1, National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Oct. 18, 2011) ("NAFO October Comments").
[3] See Attachments 2-5, National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Dec. 21, 2011) ("NAFO December Comments"); National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Jan. 25, 2012) ("NAFO January Comments"); National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Mar. 16, 2012) ("NAFO March Comments"); National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (May 18, 2012) ("NAFO May Comments").

NAFO's mission is to protect and enhance the economic and environmental values of private forests through targeted policy advocacy at the national level. At the time of this submission, NAFO's members represent nearly 80 million acres of private forests in 47 states. NAFO is a solutions-oriented organization and is prepared to help EPA and the SAB better understand how biomass combustion for energy affects the forest carbon cycle and to assist the Agency in developing long-term policies that help achieve the nation's renewable energy and climate change objectives in an efficient and scientifically rigorous manner.

Introduction

The ultimate objective of EPA's reconsideration process, of which the SAB review is a component, is to develop a regulatory policy for biogenic CO_2 emissions under the Prevention of Significant Deterioration ("PSD") and Title V permitting programs. The peer review conducted by the Panel and the SAB provides an opportunity to consider and critique EPA's proposed *Framework* and offer alternative regulatory options. As the Panel recognized, EPA's charge to the Panel can be distilled into two questions: "whether and how to consider biogenic greenhouse gas emissions in determining these [PSD and Title V] thresholds for permitting." *Report* at 4. As the Panel recognized, a meaningful response and recommendation to EPA would exhibit both scientific integrity and operational efficiency. *Id.* at 3. Unfortunately, the *Report* fails to achieve either of these goals. Rather than focusing its analysis on sound science, the practical realities of the forestry and biomass energy industries, and the potential for efficient implementation, the Panel's theoretical analysis provides complex recommendations that, in many cases, are fundamentally inconsistent with long-standing, well-established forest management practices. Moreover these complicated analyses will present significant implementation challenges due to the high transaction costs and the inherent uncertainty surrounding many of the data that the Panel urges EPA to rely on in making regulatory decisions. Because biomass consumed for energy is a relatively low-value product, these implementation challenges will discourage biomass utilization in direct contravention of EPA's stated objective of developing a viable pathway for biomass utilization as a carbon-beneficial alternative to fossil fuels.

First, the Panel essentially ignored EPA's initial question—*whether* biogenic CO_2 emissions should be considered in calculating emissions thresholds under PSD and Title V. After hastily declaring that a categorical exclusion of biogenic CO_2 emissions, at least within the policy parameters accepted by the Panel, is not warranted *a priori*, the Panel effectively ended its consideration of a categorical exclusion. Rather than addressing this issue in a scientifically sound and pragmatic manner by considering the large body of science supporting the

longstanding treatment of biomass energy as having a net neutral impact on aggregate atmospheric carbon, such as the extensive deliberations of the Intergovernmental Panel on Climate Change ("IPCC"),[4] the Panel simply passes the buck, urging EPA to reconsider a categorical exclusion before selecting a final policy. *Id.* at 3. However, as NAFO explains below, a categorical exclusion of biogenic CO_2 emissions under the PSD and Title V permitting programs is a scientifically sound and operationally efficient alternative to EPA's *Framework*. Such an alternative should have warranted careful deliberation by the Panel.

Second, the *Report* provides little useful information to EPA regarding *how* biogenic CO_2 emissions might be considered in the PSD and Title V permitting programs. While the Panel appropriately criticized EPA's *Framework* for its lack of scientific rigor and implementation challenges, its own *Report* and recommendations suffer from the same defects. Assuming that greater detail will necessarily improve accuracy, the Panel adds layer upon layer of complexity and uncertainty to the *Framework* with little regard for separating policy from science or the costs of compliance. As a result, the Panel's recommendations are so fraught with uncertainty and complexity that it ultimately recommends that EPA compare the cost of compliance to the marginal savings in carbon emissions to determine whether the Panel's recommendations are even implementable as compared to a categorical exclusion of biogenic CO_2 emissions. *Id.* at 12. While a cost-benefit analysis is a step EPA will take in any event, the emphasis the Panel places on the need for such an analysis suggests a lack of confidence in whether the Panel's recommendations can, in fact, be implemented. Particularly troubling are the Panel's recommendations regarding spatial scales, anticipatory business-as-usual ("BAU") baselines, and default Biogenic Accounting Factor ("BAF") values.[5]

In sum, the Panel's *Report*, which is currently under review, is unlikely to provide EPA with a reliable basis upon which to implement any policy for biomass energy. The *Report* lacks essential and pragmatic analyses necessary to support the Panel's recommendations or inform EPA's ultimate policy choices. Instead, the Panel focused on theoretical concerns that, while academically important, must be reconciled with implementation and operational realities, particularly when considering the significance of the policy decisions at stake. NAFO urges EPA and the SAB to carefully consider the uncertainty and implementation challenges

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[4] *See, e.g.*, EPA, *Inventory of U.S Greenhouse Gas Emissions and Sinks: 1990-2007* at Energy 3-1 ("It is assumed that the C released during combustion of biomass is recycled as U.S. forests and crops regenerate, causing no net addition of CO_2 to the atmosphere."); Department of Energy, *Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program* at 77; *EU guidelines for the monitoring and reporting of greenhouse gas emissions*, Annex I, 4.2.2.1.6.

[5] EPA and the Panel propose using BAF as a coefficient that can be used to adjust the magnitude of biogenic CO_2 emissions to account for climate differences between biogenic and fossil fuels.

associated with accounting for biogenic CO_2 emissions so that the final policy chosen by EPA will not only have scientific integrity, but will also prove operationally effective and capable of implementation in practice.

I. A Categorical Exclusion is a Viable Alternative Approach that Offers Both Scientific Integrity and Operational Efficiency

As NAFO has demonstrated in its submissions to the Panel,[6] a reasonable categorical exclusion is warranted for existing (and potential) biomass feedstocks. The Panel fails to address the viability of a categorical exclusion, asserting that concerns over feasibility, along with legality and political will, are beyond the scope of its expertise. *Report* at 5. NAFO urges the SAB to reconsider the Panel's approach to accounting for biogenic CO_2 emissions, and fully explore the scientific basis for establishing a categorical exclusion.

The scientific principles of the forest carbon cycle are well understood and uncontroversial. Wood products—including biomass combusted for energy—are part of the natural forest carbon cycle. CO_2 is sequestered in forests through photosynthesis and emitted through respiration, decomposition, and combustion. The dynamic processes of carbon sequestration and emission occur simultaneously on the landscape and form an ongoing carbon cycle by which emitted carbon is sequestered and vice versa. Thus the CO_2 released through combustion of woody biomass for energy was only recently sequestered from the atmosphere and is replaced by an equivalent amount of CO_2 through ongoing forest growth and regeneration. In this way, biogenic CO_2 emissions are distinct from fossil fuel emissions which result from the combustion of geologic carbon that can only be returned to geologic sinks over millennial time scales.

As the Panel acknowledges, from a theoretical standpoint, biomass can be "grown, harvested, and combusted in a carbon neutral fashion." *Id.* Thus to understand the atmospheric impact of biogenic CO_2 emissions (and whether a categorical exclusion is warranted), the Panel should not have focused on differentiating among the particular methods for growing, harvesting and combusting biomass that might have marginal impacts on the overall carbon cycle, but rather on whether the atmosphere, in fact, ''sees'' a consequential net carbon change (positive or negative) over an appropriate timeframe. This can best be determined by observing changes in forest carbon stocks over time. As Dr. Sedjo explains, IPCC deliberations involving considerable scientific analysis have determined that as long as forest carbon stocks remain stable or are increasing, there is no net flow of carbon from forests to the atmosphere, even when biomass is combusted for energy. *Sedjo Dissent* at E-1. The

[6] *E.g.*, NAFO January Comments at 7-8.

United States Department of Agriculture ("USDA") agrees stating, "[a]s long as we're planting and growing as many or more trees than we're burning, using woody biomass for energy can be considered carbon neutral."[7] Historic forestry data confirm that this is the case now and suggest that it will remain so in the future. Despite an increasing demand for forest products, total forest carbon stocks have been stable or increasing since at least 1952. *Id.* at E-3.[8] This trend is expected to continue well into the future.[9] On the basis of this data alone, a categorical exclusion is warranted.

However, a proper understanding of the forestry and biomass energy sectors and the principles that guide forest management practices are critical to understanding why forest carbon stocks remain stable and a categorical exclusion is justified. As the Panel correctly observes, biogenic CO_2 emissions must be evaluated at a landscape scale to account for the "simultaneous management decisions that emit and sequester greenhouse gases concurrently and therefore define the net implications over time." *Report* at 21. Private forests are managed to meet an ongoing demand for goods, services, and uses, and this requires both a predictable continuation of a productive forest land base and a reasonable expectation of the existence of ongoing market demand for goods and services. Forest owners achieve a productive land base capable of meeting future demand by managing forests in age classes that are distributed along a continuum. In any given year a few stands are harvested while the vast majority continue to grow. Thus, when forest carbon stocks are properly evaluated at an appropriate landscape scale, it becomes clear that emissions associated with harvest are offset by contemporaneous sequestration elsewhere in the managed landscape, producing no net CO_2 emissions and, according to historic data, producing a net increase in forest carbon. While forest carbon stocks may fluctuate slightly from year to year in response to changing market conditions, disturbance, and marginal land-use changes, longer-term trends demonstrate that forest carbon stocks have remained remarkably stable over time. This stability is no accident; it is the inevitable result of deliberate actions influenced by management responses to market signals. To use a banking

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[7] *See also* Zoe Hoyle, USDA, Southern Research Station, *Bioenergy and Climate Change* (Aug. 23, 2012), *available at* http://www.srs.fs.usda.gov/compass/2012/08/23/bioenergy-and-climate-change/; *see* United States Department of Agriculture, Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (May 25, 2012) ("USDA SAB Panel Comments").

[8] *See also,* EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, Chapter 7 (Apr. 15, 2010), *available at* http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html.

[9] For example, in a recent study that considered a wide range of future scenarios for economic growth and biomass energy demand concluded that, under each scenario, total U.S. forest carbon stocks would increase annually until at least 2045 and would have net growth from current levels until at least 2060. Prakash Nepal, *et al.*, *Projection of U.S. forest sector carbon sequestration under U.S. and global timer market and wood energy consumption scenarios, 2010-2060*, 45 Biomass and Bioenergy pp. 251-264 (2012).

analogy, the entire forestry sector—including biomass energy—maintains a consistent level of carbon capital in the forest and only harvests a portion of the accrued interest.

Furthermore, an understanding of the forest products sector, including biomass energy, demonstrates that it is appropriate to consider forest carbon stocks as a whole rather than attempting to isolate individual product streams, such as the biomass that may one day be combusted for energy. The forest products sector is highly interrelated and, in many cases, the harvest of a single stand will produce a variety of primary and co-products. For example, after a stand is established, pre-commercial thinnings may be harvested to increase overall stand productivity. These thinnings will likely be sold for pulp or energy depending on prevailing market signals at the time of harvest. If they are sold for pulp, portions of the trees may be used directly to fuel boilers, while residual byproducts such as spent pulping liquors may eventually be used for energy production as well. During final harvest, high-value timber—such as whole, mature trees—will be sold for saw timber, furniture production, and other high value products,[10] while low-grade trees and slash will again be sold for pulp, energy production, or other uses. In the absence of markets, this material may be burned or left to decay on the forest floor. Finally, mill residues may also be used for energy generation. Thus, a single forest stand will produce a wide variety of primary and co-products and may produce biomass energy feedstocks through a variety of different pathways. A viable market for low-grade forest products, such as biomass energy feedstocks, is essential for the economic viability of the industry as a whole and it makes little sense to separate individual markets for accounting purposes, especially when the product of interest is a secondary product that influences proximate management decisions at various points in time along a rotation as opposed to a primary product that drives fundamental decisions regarding how a forest stand is managed over time. Moreover, any *et ante* attempt to disaggregate a forest stand based on the potential fate of low-value co-products would likely prove practically infeasible. While expected growth in biomass energy will increase overall investments in forests, the relatively long rotations on which forests are managed make it virtually impossible to predict in advance how a specific stand will be utilized over the course of a rotation or at the time of final harvest. As long as forest carbon stocks remain stable as a whole, EPA can be assured that biomass energy is not increasing net atmospheric CO_2 concentrations.

[10] As NAFO has previously explained, whole mature trees are much more valuable as saw timber than for biomass energy and, due to the difference in prices, whole mature trees will not be harvested for biomass energy. NAFO January Comments at 9..

In addition to ensuring the scientific justification for a categorical exclusion, it is important to consider whether such an approach is capable of efficient implementation. Because a categorical exclusion is premised on the maintenance of stable carbon stocks through responsible forest management, the critical question is whether forest carbon stocks remain stable over time. As Dr. Sedjo explains, the stability of carbon stocks can be monitored at a low cost by relying on existing data, such as the Forest Inventory and Analysis ("FIA") database maintained by the U.S. Forest Service. *Sedjo Dissent* at E-4. The Panel also acknowledges both the availability and efficiency of using this data. *Report* at 35. By aggregating FIA data on a national scale, EPA would have a scientifically robust means of assuring the stability of forest carbon stocks. While small changes may take place at the stand level as individual owners make management choices, a national scale monitoring system will ensure that, as a whole, forestry is practiced sustainably from a carbon standpoint and there is no net increase in atmospheric CO_2 concentrations as a result of biogenic CO_2 emissions from woody biomass. Furthermore, employing such a monitoring system would allow EPA to implement a categorical exclusion with the assurance that it can take further regulatory action if the factual circumstances supporting a categorical exclusion change.

Unfortunately, the Panel failed to even consider the merits of a categorical exclusion. *See Sedjo Dissent* at E1. After rejecting a categorical exclusion for biogenic emissions based on a determination that an *a priori* assumption of carbon neutrality is inappropriate, the Panel asserts that the propriety of a categorical exclusion is "a conclusion that should be reached only after considering a particular feedstock's production and consumption cycle." *Report* at 18. However, it fails to take its own advice, claiming that the adoption of a categorical exclusion depends upon considerations of legality, feasibility, and political will that are beyond the Panel's scientific purview. *Id.* Instead, the Panel urges EPA to reconsider a categorical exclusion *after* it has selected a final accounting methodology for biogenic CO_2 emissions. *Id.* at 12. NAFO agrees that EPA must compare alternative accounting approaches to a categorical exclusion and adopt them only if they offer improvements in accuracy that are sufficient to offset the additional compliance costs implementation challenges that will likely be incurred. However, the Panel was wrong to assert that issues of feasibility are beyond its scientific purview. The Panel was selected on the basis of its scientific and pragmatic expertise, and EPA's charge questions clearly indicate that the Panel was to address both the scientific integrity and feasibility of EPA's *Framework*.[11] EPA would be better served by a report that examines biomass energy supply

[11] For example, in the Charge Questions, EPA asks not only whether the framework is "scientifically rigorous," *Report* at 29, but whether "[i]t it simple to implement," *id.* at 35.

and production and evaluates whether a categorical exclusion can be supported as a viable policy option, based on the science and the pragmatic practices of the forestry and forest products industries in the United States. When practically irrelevant factors, such as upstream and downstream emissions,[12] and the harvest for energy production of whole, mature trees that are typically harvested for significantly higher-value uses are removed from consideration, it is clear that biomass energy has no net impact on atmospheric CO_2 concentrations and a categorical exclusion for biogenic CO_2 emissions is warranted.

II. The Panel Sets Aside the Need for Operational Efficiency and Adopts Recommendations That Are Unreasonably Complex and Rely on Inherently Uncertain Data

In the *Report*, the Panel offers a series of formal and informal recommendation intended to either fix or replace EPA's *Framework*. However, the Panel fails to subject it own recommendations to the same rigorous review it provided for the *Framework.* NAFO agrees with the Panel that any accounting approach must be judged based on a reasonable combination of scientific integrity and operational efficiency. *Report* at 3. But in most cases, these two goals cannot be maximized simultaneously, and tradeoffs must be made between them, particularly when the pursuit of scientific certainty does not produce marginal improvements toward a policy objective that are sufficient to justify their cost. For example, in some cases adding additional detail and complexity may increase accuracy and thereby improve scientific integrity. However, such detail and complexity may only yield relatively insignificant additional benefits while imposing significant transactional costs that reduce operational efficiency or even frustrate the policy objective altogether. In other cases, however, both scientific integrity and operational efficiency may point in the same direction—favoring a simpler and more straightforward approach.

While in theory additional detail and complexity should improve accuracy, this is not always the case in practice. Some data are inherently uncertain and unpredictable and simply cannot be measured within an acceptable range of certainty. Inclusion of such variables will fail to achieve scientific integrity as uncertainty in the initial data inputs will simply be carried through the accounting system. Moreover, the mere inclusion of these variables will increase transaction costs and thereby reduce operational efficiency. Proper evaluation of an accounting methodology, then, requires a thorough review process that will likely involve a number of trade-

[12] The Panel rejects an *a priori* adoption of a categorical exclusion in part based on a consideration of life cycle emissions. *Report* at 18. However, EPA has made clear that such upstream emissions, which may be relevant in a life cycle analysis, are excluded from calculating emissions thresholds under PSD and Title V. *Framework* at 15..

offs. First, before adding more detail and complexity, it is critical to ensure that the data can be measured accurately and without undue uncertainty so that the overall scientific integrity of the system can be assured. Second, even if adding complexity will improve accuracy, it must be weighed against the transactional costs that will be incurred. Complex solutions that only marginally improve accuracy may ultimately be unjustified if the associated transaction costs are sufficiently high.

The Panel focuses almost exclusively on the question of scientific integrity and accuracy in preparing its *Report* and recommendations. While operational efficiency and feasibility are occasionally mentioned in passing, they are never seriously examined. Nor does the Panel adequately address the scientific uncertainty that is often inherent in complex systems, particularly as it relates to the forestry and forest products sectors. Thus, in an effort to correct the scientific errors in the *Framework*, the Panel simply adds complexity, asserting that greater detail will improve scientific accuracy. Even when transaction costs and uncertainty are occasionally mentioned, little attention is given to quantifying them or ensuring that the increased complexity is worth the cost. As a result, the Panel's recommendations repeat many of the same errors that it identified in the *Framework* and will prove unworkable in a regulatory setting. While a focus on detail and complexity pervades the Panel's recommendations, its recommendations regarding spatial scales, baselines, and default BAF values warrant special attention.

A. The Panel's Complex Recommendations Fail to Cure the Defects in EPA's *Framework*

NAFO agrees with the Panel's critical assessment of EPA's *Framework*. The "uncertainties, technical difficulties, data deficiencies, and implementation challenges" presented by the *Framework* result in an accounting approach that lacks both scientific integrity and operational efficiency. *See Report* at 3. These flaws go to the heart of EPA's accounting approach and cannot be easily cured. In light of these deficiencies, NAFO agrees that the proper course of action for the Panel should have been to abandon the *Framework* and identify alternative approaches that avoid the same mistakes. *See Sedjo Dissent* at E-3. Instead, the Panel maintains EPA's basic framework and seeks to salvage it by adding layer upon layer of detail and complexity. While the Panel's recommendations are no doubt more comprehensive than those in the original *Framework*, the Panel fails to evaluate its recommendations or ensure that they offer improvements in scientific integrity or operational efficiency. Instead, the Panel seems to conclude that a more comprehensive approach is inherently a better approach and that problems related to data deficiencies and uncertainty will eventually be resolved. There is no critical analysis of the Panel's recommendations or assurance that they offer any

improvement over EPA's *Framework* or alternative approaches such as a categorical exclusion. Upon closer analysis, the Panel's recommendations offer few opportunities for improved accuracy and thus the additional transaction costs simply cannot be justified. As explained below, the Panel's recommendations (1) gloss over uncertainties and implementation challenges posed by complex accounting approaches, (2) incorporate factors that are beyond EPA's regulatory authority and (3) ignore the practical realities of the forestry industry by addressing purely hypothetical concerns.

1. The Panel Fails to Address the Inherent Uncertainty Incorporated in Its Recommendations

The Panel's near-universal response to perceived defects in the *Framework* is to add detail and complexity in the hope of improving accuracy. But too often, the Panel's complex recommendations fail to offer any hope of actual improvement in accounting for biomass energy's affect on atmospheric CO_2 concentrations. The Panel appears to assume the superiority of a more detailed and comprehensive approach that addresses every potential variable or factor that could influence the climate impact of biomass energy. In the few instances that the Panel addresses scientific uncertainty or implementation concerns, it simply glosses over them, assuming that EPA will find a way to overcome these deficiencies. In doing so, the Panel proposes purely theoretical solutions that are impractical. Such recommendations will be of little value to EPA as it attempts to develop a regulatory approach that can be applied to biogenic CO_2 emissions.

The most egregious example of the Panel's blind incorporation of complexity is its insistence that leakage be included in any accounting methodology. Although EPA determined that leakage may be a relevant factor in assessing the climate impact of biomass energy, it declined to incorporate a mandatory leakage term due in part to the significant difficulty in accurately measuring leakage. *Framework* at 40-41. The Panel largely concurs with EPA's technical assessment, noting that the measurement of leakage would require detailed "policy- and program-specific" information, is dependent on complex market forces, and, in any event, may not be appropriately attributed to biomass energy facilities. *Report* at 25. The Panel concludes that "[e]mpirically, assessing the magnitude of leakage is fraught with uncertainty." *Id.* However, even after acknowledging these defects, the Panel insists that leakage be accounted for, recommending that "[f]or all feedstocks, [EPA] consider information about leakage to determine its directionality as well as leakage into other media." *Id.* at 46. In recommending the inclusion of leakage, the Panel simply ignores the uncertainty, data deficiencies, and implementation challenges that it previously identifies. Rather than allowing

EPA to accurately assess the climate impact of biogenic CO_2 emissions, the inclusion of leakage will increase the costs of compliance without any assurance that EPA can correctly measure the sign, let alone the magnitude, of leakage. This uncritical acceptance of complexity and uncertainty makes the Panel's leakage recommendation unsuitable as a guide for developing policy.

2. The Panel Needlessly Increases Complexity by Considering Factors Outside of EPA's Regulatory Sphere

The Panel also adds needless complexity by continuing to address issues that EPA has excluded as a policy matter. Although the Panel asserts that its review would have been improved had EPA better explained the policy context in which the *Framework* would be applied, *id.* at 26-27, the criticism is belied by the Panel's disregard for the few policy limitations that EPA did put in place. For example, EPA states that the *Framework* "is not intended to address the . . . issues that arise when comparing lifecycle emissions between biogenic and fossil fuels." *Framework* at 2. Nevertheless, the Panel repeatedly inserts lifecycle considerations into its recommendations. For example, the Panel rejects a categorical exclusion in part because carbon neutrality cannot be assumed "where lifecycle emissions associated with the production and use of biomass are attributed to a stationary source." *Report* at 18. Likewise, the Panel criticizes EPA for failing to include upstream and downstream emissions associated with the forest products industry that would only be appropriate in a lifecycle context and cannot otherwise be attributed to biomass energy production. *See id.* at 30. In the same manner, EPA expressly limited the scope of the *Framework* to biogenic CO_2 emissions and excluded all other GHGs. *Framework* at 8. Nevertheless, the Panel continually raises concerns related to NO_2 and methane emissions from all phases of the biomass lifecycle, asserting that these emissions must be incorporated to provide a comprehensive understanding of the climate impacts of biomass energy production. *Report* at 6, 7, 17, 20, 27, 29, 39, 43. The Panel's attempt to expand the policy context in which EPA will regulate by incorporating these extraneous factors adds unnecessary complexity and ultimately renders its recommendations regarding these matters wholly unhelpful, as it fails to offer solutions that can be incorporated into the policy constraints that EPA will apply.

3. The Panel Needlessly Increases Complexity by Ignoring the Practical Realities of the Forestry Industry and Addressing Purely Hypothetical Concerns

As NAFO has explained, a successful accounting approach for biomass energy must be grounded in the practical realities of the forestry and forest products industry. To do otherwise would subject biomass energy facilities to artificial constraints that are unrelated to the climate

impacts of biomass energy. The Panel needlessly complicates its own recommendations by incorporating purely hypothetical scenarios that simply will not occur in practice. For example, the Panel rejects a reference point baseline after concluding that it does not adequately address the climate impact of harvesting a 150-year old forest for energy production. *Id.* at 31. Regardless of the accuracy of this conclusion, it addresses a purely hypothetical concern and is therefore irrelevant to the adoption of a reference point baseline. As NAFO has explained, whole mature trees, such as those found in a 150-year old forest, would never be harvested solely for energy production because healthy, mature trees have much higher value for use in other forest products. *See supra* p. 6. Thus, the Panel used a purely hypothetical concern as part of its basis for rejecting a simple baseline approach that could be efficiently implemented in favor of a more complicated alternative that will prove practically and scientifically infeasible.

Likewise, the Panel's continued emphasis on short time scales addresses a purely hypothetical concern that the Panel explicitly rejects elsewhere in the *Report.* The Panel criticizes EPA for ignoring time scales and urges the Agency to address both short- and long-term effects of biomass energy and consider the trade-offs between different time scales. *Report* at 15-17. The Panel asserts that EPA must consider the relevance of short time frames because "an early phase of elevated emissions from biomass could reduce the odds of limiting climate warming . . . ." *Id.* at 16. However, this "early phase of elevated emissions" is merely an artifact of stand-based accounting, which the Panel expressly rejects in favor of a landscape-based approach that accounts for simultaneous land management decisions across stands. *Id.* at 6; *see also Sedjo Dissent* at E-3. Thus the supposed short-term climate impacts based on a "carbon debt" are purely hypothetical in nature and disappear entirely when a more appropriate landscape-based approach is employed. By reintroducing the concept of a carbon debt after rejecting the accounting principles on which it is based, the Panel adds needless complexity and confusion, rendering its recommendation concerning the consideration of alternative time scales unhelpful.

B. The Panel's Inconsistent Recommendations Regarding Spatial Scales Create Confusion and Uncertainty

Throughout the *Report*, the Panel makes inconsistent recommendations regarding spatial scales that create confusion and uncertainty and ultimately fail to provide EPA with any guidance that could be used to develop a regulatory policy. Although the Panel appropriately concludes that a landscape-based approach must be adopted, it repeatedly offers recommendations that are based on stand-based accounting and critiques the spatial aggregation that a landscape-based approach necessarily entails. In addition, the Panel rejects

out of hand EPA's selection of a regional scale, calling it a "central weakness" of the *Framework, Report* at 8, but then incorporates a regional scale in many of its own recommendations, *id.* at 34, 37, 47. Ultimately, the Panel offers recommendations that could be used to support national, regional, fuelshed, and stand-based spatial scales and leaves EPA with little guidance going forward. While this certainly gives EPA significant decision space to make a policy decision, NAFO agrees with the IPCC and Dr. Sedjo that a nationally-based spatial scale is the option that produces both scientific integrity and operational efficiency and urges EPA to adopt this approach..

1. Stand-based Accounting Is Inconsistent with Domestic Forestry Practices

NAFO wholeheartedly supports the Panel's adoption of a landscape-based accounting approach that recognizes the simultaneous management decisions that occur on multiple forest stands and produce a stable supply of forest products over time. *See Id.* at 21. As described above, private forests are managed at a landscape scale and in any given year a few stands are harvested while the vast majority continue to grow and sequester carbon. *See supra* p. 5-6. A stand-based accounting approach artificially separates the harvest and growth processes and creates arbitrary carbon credits and debts, depending on when the accounting process begins. For example, if carbon stocks are measured beginning at the time that a stand is established, a carbon credit will accrue over time until the stand is harvested. In contrast, measuring carbon stocks beginning at harvest will produce a carbon debt that is paid back as the stand regrows. Thus, as Dr. Sedjo explains, the credits and debts associated with stand-based accounting are simply artifacts of the selected starting point. *Sedjo Dissent* at E-3. The credits and debts disappear entirely when individual stands are aggregated at the landscape level on which management decisions are made.[13]

Despite its affirmation of landscape-based accounting, the Panel takes inconsistent positions and at times advocates for stand-based accounting approaches. For example, as described above, the Panel urges EPA to consider the alleged short-term climate impact of biomass energy which is based entirely on stand-based accounting and carbon debt theories. *See supra* p. 12. An apparent preference for stand-based accounting is also evident in the Panel's rejection of EPA's regional scale. The Panel asserts that by incorporating a regional scale, EPA "substitute[s] a spatial dimension for time." *Report* at 21. But this substitution is not, as the Panel suggests, an artificial construct designed to simplify EPA's accounting framework.

[13] *See, e.g.*, Jim Bowyer, *et al.*, *Carbon 101: Understanding the Carbon Cycle and the Forest Carbon Debate* 6 (Dovetail Partners Jan. 5, 2012), *available at* http://www.dovetailinc.org/files/DovetailCarbon101Jan2012.pdf.

Id. at 30. Instead, the relationship between space and time is at the center of responsible, landscape-based forest management. Because forest stands are long-lived, forest managers must manage across the landscape to produce age class diversity and ensure a consistent supply of forest products over time. In other words, landscape-based management strategies allow private forest owners to account for the long period of return on their investments over time, which in turn allows carbon to accumulate in forest stocks while they grow. It is neither a short-cut nor an artificial construct. Ultimately, the Panel‘s inconsistent approaches confuse what should be a central feature of the its recommendations—the endorsement of a landscape scale.

2. A National Spatial Scale Promotes Scientific Integrity and Operational Efficiency

Even within the confines of a broad, landscape-based approach, there are a number of options to choose from among spatial scales. The Panel fails to directly address the choices among these options and at times advocates for national, regional, and fuelshed-based spatial scales. While the Panel appears to favor a facility-based, fuelshed approach, *see, e.g.*, *id.* at 30-31, it fails to engage in a comparative evaluation of the benefits of each of the three options. NAFO agrees with Dr. Sedjo and the USDA that a national scale approach, based on the IPCC methodology already employed by EPA, is the option that best promotes both scientific integrity and operational efficiency.

A national scale approach promotes scientific integrity and is technically superior for three reasons. First, a national scale mirrors the national nature of EPA's regulatory authority under the Clean Air Act and most closely corresponds to the global nature of climate change. Second, a national scale avoids the many of problems that the Panel identified in its critique of the *Framework*'s regional scale. For example, a national scale avoids issues related to domestic leakage and the creation of "sourcing" and "non-sourcing" regions as all forests and facilities will be treated equally. *See id.* at 31. A uniform national scale also avoids problems of scale sensitivity observed when smaller regions are employed. *See id.* at 38.[14]. In addition, a national scale avoids problems related to scientific accuracy of existing data sources that may be present at smaller spatial scales. *See id.* at 34. Third, a national scale is superior from a market perspective. Although biomass energy feedstocks are often sourced locally, they are essentially fungible products and are part of a nationwide market. Thus, a national scale most accurately depicts the market in which biomass energy facilities operate. A national scale treats all biomass facilities equally, allowing market conditions to dictate their location based on

[14] Christopher S. Galik & Robert C. Abt, *The Effect of Assessment Scale and Metric Selection on the Greenhouse Gas Benefits of Woody Biomass*, Biomass & Bioenergy 44:1-7 (2012).

considerations such as supply, demand, and market efficiency. In other words, there is no risk that EPA will inadvertently select winners and losers within the biomass energy community as a result of its policy choices.

In addition, a national scale will promote operational efficiency and will prove the most practical, predictable, and least burdensome approach to implement. As Dr. Sedjo and others have explained, a national scale approach is consistent with the IPCC accounting principles and FIA data that EPA already employs in conducting its annual GHG inventory. *Sedjo Dissent* at E-1, 4-5.[15] Thus, a national scale approach would allow EPA to rely on the existing data gathered from the FIA database and other sources. As a result, EPA could implement its regulatory policy at reasonable cost to the Agency and the regulated community and thereby promote climate-beneficial biomass energy.

While the facility-based, fuelshed approach favored by the Panel may have some theoretical appeal, it does not withstand close scrutiny from the perspective of scientific integrity or operational efficiency. While a facility-based approach could theoretically allow EPA to treat each facility independently for attribution purposes, such an approach is technically and practically infeasible because there is no geographic region that comprises "the fuelshed" for a specific facility. In fact, the Panel concedes that such an approach would be "complex, costly, and difficult to verify." *Report* at 30. First, individual facilities obtain feedstocks from a vast and constantly changing array of landowners, meaning that a facility's fuelshed is not static over time, but instead shifts from year to year based on the harvesting decisions of private forest owners. Only in rare cases would a biomass energy facility have any long-term assurance that it could obtain feedstocks from the same stand over successive harvest rotations. Second, as the Panel recognizes, biomass energy facilities may be located in close proximity to one another, resulting in overlapping fuelsheds. *Id.* at 41. As a result of these practical constraints, a true fuelshed-based approach could only be implemented through stand-based, chain-of-custody accounting, yet as NAFO has explained, such an approach would prove practically infeasible due to high transaction costs.[16] Indeed, even the most sophisticated wood control systems acknowledge the practical infeasibility of tracking feedstocks to their source through chain-of-custody accounting. Biomass energy relies on low-cost, low-grade forest products as feedstocks and the additional transaction costs associated with chain-of-custody accounting may well threaten the economic viability of biomass energy. Thus, adopting a facility-based,

[15] *See Framework* at 31-32; USDA SAB Panel Comments; NAFO March Comments at 7-8.
[16] *See* NAFO January Comments at 8.

fuelshed approach could have the perverse effect of discouraging growth in biomass energy and instead shift growth to lower-cost fossil fuels.

C. Application of an Anticipatory BAU Baseline Will Increase Uncertainty and Prove Practically Infeasible

The Panel asserts that EPA must adopt an anticipatory BAU baseline in order to accurately measure the "additionality" attributable to biomass energy facilities. However, the Panel fails to assess whether an anticipatory BAU baseline can be accurately measured and applied as part of a regulatory policy. In the *Framework*, EPA considered an anticipatory BAU baseline, but rejected it in favor of a reference point baseline due in part to concerns over implementation. While the Panel acknowledges the complexity associated with an anticipatory BAU baseline, it simply assumes that implementation challenges can be overcome through improved modeling. However, an analysis of the factors that the Panel would include in an anticipatory BAU baseline confirms that it could not be accurately measured. As a result, adoption of an anticipatory BAU baseline would subject biomass facilities to regulation based on modeling assumptions and without regard to the actual impact that they will have on atmospheric CO_2 concentrations.

The anticipatory BAU approach proposed by the Panel would require EPA modelers to project hypothetical future trajectories with and without demand for biomass energy. The difference between these two trajectories would establish the additionality of biomass energy and determine how biogenic CO_2 emissions should be regulated under the PSD and Title V permitting programs. While projecting the future is always difficult, the long-lived nature of forest biomass makes such projections especially challenging. Investments in forests are made by forest owners decades in advance of harvest based on anticipated future market conditions. Thus, investment decisions made by forest owners today will have effects for decades to come. By the same token, investments made years and even decades ago anticipated the growth of new markets, including biomass energy. As a result, predicting a future without additional biomass demand requires modelers to not only project future management plans, but to adjust prior ones as well. As we have seen in the recent past, projecting future market behavior is highly speculative even among the most notable experts.

As the Panel acknowledges, an anticipatory BAU baseline would require "sophisticated modeling" to "capture the complex interaction[s]" at play in the forestry and biomass energy sectors. *Report* at 9. The Panel does an admirable job of identifying many of the interactions at play. For example, the Panel asserts that an anticipatory BAU baseline would need to account for "market driven shifts in planting, management and harvests; induced displacement of

existing users of biomass; land use changes, including interactions between agriculture and forests; and the relative contribution of different feedstock source categories (logging residuals, pulpwood or roundwood harvests)." *Id.* In addition to these market-based factors, the Panel recognizes that an anticipatory BAU baseline would have to include energy policies and biophysical processes, such as natural disturbance and pest outbreaks. *See id.* at 37-38, 43. Notably, the Panel fails to consider in its analysis the primary climate benefit of biomass energy—the displacement of fossil fuels. By failing to include avoided fossil fuel emissions, an anticipatory BAU baseline would significantly overestimate the climate impact of biomass energy. More to the point, however, it is the wide array of complex factors and interactions identified by the Panel that provides the basis for why an anticipatory BAU baseline fails as a viable scientific or regulatory concept. To serve as a trustworthy policy tool, an anticipatory BAU baseline must produce accurate results in an efficient manner. Although the Panel fails to fully address this issue, even its cursory analysis suggests that an anticipatory BAU baseline will be practically and technically infeasible. While the Panel notes that modeling an anticipatory BAU baseline "will be difficult" and that "uncertainties will need to be assessed," *Id.* at 37, it declines to engage in such an analysis on its own. Instead, it merely identifies a number of ways in which models can be validated and assumes that EPA will find a way to develop and verify accurate models. *Id.* at 37-38. What the Panel fails to do is assess whether the variables it has identified are even capable of accurate measurement. Many of the market and biological factors identified by the Panel are not subject to accurate mathematical algorithms, and thus cannot be predicted *ex ante* with any decree of certainty. Management decisions made 40 years ago, for example, could not possibly have predicted the collapse of the housing market that occurred in 2007. Likewise, neither forest owners nor government regulators can predict the extent of widespread natural disturbances like insect and disease infestations, fire, and severe weather decades before they occur. For the same reasons, neither private forest owners, government regulators, nor academic modelers can possibly predict the full range of market and ecological circumstances that will exist in 10, 20, or 30 years or more. Even the Panel is finally forced to recognize the magnitude of this uncertainty, stating in its consideration of carbon accumulation in vegetation and soils that "future changes depend on natural processes such as fires and pest outbreaks that are not easily foreseen, and because of climate change and broader environmental change, we face a system that is hard to predict. Projecting forward based on current historical patterns is subject to biases of unknown direction and magnitude." *Id.* at 43.

But despite the fact that an anticipatory BAU baseline is practically impossible to predict and subject to biases of unknown direction and magnitude, the Panel insists that an anticipatory BAU baseline must be included in any accounting framework. By relying on variables that simply cannot be known or predicted within a reasonable range of certainty, adoption of an anticipatory BAU baseline would base regulation of biogenic CO_2 emissions on the biases of a modeler rather than on the science of the carbon cycle, empirical data, and actual forest management practices. Thus an anticipatory BAU baseline cannot actually determine the additionality or incremental impact of additional biomass energy production, whether through new facilities or augmentation of existing facilities. Furthermore, such an approach will discourage investment in biomass energy as forest owners, energy producers, and potential biomass suppliers would recognize that regulation under PSD and Title V would not be based verifiable empirical data, but rather on the biases or best guesses of a modeler, where predispositions or even minute errors in judgment could needlessly subject climate-beneficial biomass feedstocks to regulation under the PSD and Title V permitting programs.

Furthermore, adopting an anticipatory BAU baseline that includes a growth trajectory for forest carbon stocks would set a dangerous precedent for the forestry industry. Over the past 60 years or more, forest owners have voluntarily increased productivity and overall forest carbon stocks through good forest management, even as demand for forest products has increased. From a climate perspective, the increase in forest carbon stocks is a positive externality as forest owners are not paid for the carbon that they produce and store. However, if EPA were to establish an anticipatory BAU baseline that incorporated a growth trajectory, it would essentially require forest owners to exceed predetermined levels of annual forest growth before becoming eligible to benefit from the carbon mitigation contributions of energy from forest biomass or allowing their customers that produce biomass energy to avoid regulation as an emissions source. Thus, an anticipatory BAU baseline would transform the carbon growth that was once a voluntary, positive externality into a regulatory requirement. Such an approach could significantly reduce, or even eliminate in some instances, the economic value of utilizing biomass as an energy source and frustrate EPA's policy objectives for the use of this feedstock. Such an approach would also steer the Agency dangerously close to the direct regulation of forest carbon under the Clean Air Act and also create policy precedent that might one day be used to justify a regulatory taking of private carbon.

After EPA considered an anticipatory BAU baseline, it decided to employ a reference point baseline finding that it is data driven, more practical to implement, and avoids the many complexities and uncertainties of an anticipatory BAU baseline. As explained above, a

reference point baseline will help ensure that, even as biomass energy grows, forest carbon stocks will remain stable, and that no increase in atmospheric CO_2 concentrations will be attributable to the forestry sector.[17] In this manner, regulation of biomass energy under the PSD and Title V permitting programs will be tied to the management decisions of private forest owners and actual data, not the speculation of economic modelers, creating the incentives necessary to assure that biomass energy will continue to produce climate benefits for years to come. In addition, a reference point baseline will promote operational efficiency by incorporating existing data sets that will entail few if any additional compliance costs. Rather than insisting on its recommended theoretical approach, the Panel would have done well to join EPA in taking a pragmatic approach and adopting a reference point baseline in response to the implementation challenges associated with an anticipatory BAU baseline. *Report* at 30-31.

D. Applying Default BAFs as a Final Regulatory Policy Will Add Unnecessary Complexity

Finally, after attempting to salvage EPA's *Framework* approach, the Panel recommends that EPA "think outside the box" and consider alternatives to the *Framework*. *Id.* at 47. Specifically, the Panel urges EPA to develop a series of default BAF values. *Id.* NAFO agrees that EPA must consider alternatives to the *Framework* and believes that the default BAF approach described by the Panel could assist EPA as it conducts its review process and considers alternative regulatory approaches. However, the default BAF approach would ultimately require complex and impractical chain-of-custody accounting that would discourage investment in biomass energy. EPA should not employ such a complicated and costly approach unless it dramatically improves scientific accuracy. If instead, EPA can confirm that the default BAF values remain zero, a categorical exclusion would be warranted.

Exploring the effect, if any, that different feedstocks, regions, prior land uses, and land management practices have on atmospheric CO_2 concentrations can be incorporated into that review process and allow EPA and the SAB to gain familiarity with the forestry and biomass energy sectors. However, this does not mean that these factors should be automatically included as variables in EPA's final regulatory policy. If EPA concludes that these factors do not meaningfully affect atmospheric CO_2 concentrations, they can be ignored in EPA's final policy. In other words, if EPA concludes after considering each of these factors that a BAF of zero is warranted in all present cases, it can simplify its final regulatory policy by adopting a categorical exclusion.

[17] Even a reference point baseline may overestimate the climate impacts of biomass as it can be influenced by a variety of exogenous factors including natural disturbances and land use change due to urbanization. As a result, a reference point baseline provides a conservative estimate of the climate impact that can be attributed to management decisions within the forestry and forest products sectors.

Rather than engaging in its own scientific analysis of these factors, the Panel simply assumes, without offering any supporting evidence, that differences in feedstocks, regions, prior land use, and land management practices will in fact produce different outcomes that must be incorporated in a final policy for biomass emissions. *Id.* While the Panel suggests that applying default BAFs will produce a simple and efficient policy, that outcome is unlikely. To calculate a weighted average BAF, each biomass facility would have to collect site-specific data from each harvest site, essentially mandating a chain-of-custody approach. Even if data for prior land use and land management practices were known to logging companies and energy feedstock suppliers, collecting and maintaining this information through the supply chain would be a logistical nightmare. It would be irresponsible for EPA to simply accept the Panel's assertions and lock in these compliance costs unless it is first assured that default BAFs will produce an improvement in accuracy, efficiency, and effectiveness over a categorical exclusion.

As explained above the carbon neutrality of biomass is based on the science of the carbon cycle and the responsible management practices of private forest owners who ensure that forest carbon stocks remain stable over time in order to produce a continuous supply of goods and services. When biomass energy is properly evaluated in light of its role within the forestry sector as a whole, it is clear that carbon neutrality is dependent upon the maintenance of stable forest carbon stocks, not on the part of the tree that is harvested, differentiations among product streams, specific management or harvest practices, the region from which the tree is sourced, or the prior land use before forests were established. As long as forest carbon stocks remain stable, EPA will find that each default category proposed by the Panel will have a BAF of zero. Thus, rather than adopting a complex default BAF system that requires chain-of-custody accounting, EPA should use the default BAF approach as a scientific tool to confirm that these factors do not impact atmospheric CO_2 concentrations. It can then adopt a categorical exclusion that avoids the high compliance costs associated with the Panel's proposed alternative.

Conclusion

NAFO continues to support EPA's decision to seek an independent peer review of its proposed accounting methodology for biogenic CO_2 emissions and appreciates the Panel's efforts to assess this complex field. We urge the SAB to keep efficient and empirically trustworthy implementation at the forefront as it considers the Panel's *Report* and formulates its own recommendations. We hope that our comments will assist the SAB as it makes its final recommendations to EPA. NAFO is standing by to provide further information or answer any questions that the SAB may have.

Respectfully Submitted,
David P. Tenny
President and CEO
National Alliance of Forest Owners

ATTACHMENT A

National Alliance of Forest Owners
Investing in the Future of America's Forests

October 18, 2011

Submitted via email

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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel

To Whom It May Concern:

The National Alliance of Forest Owners (NAFO) welcomes the opportunity to submit these comments to the Environmental Protection Agency's (EPA's) Science Advisory Board Biogenic Carbon Emissions Panel (Panel), in advance of its October 25-27, 2011, meeting to review EPA's draft *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) (*Accounting Framework*). *See* EPA, *Notification of a Public Meeting of the Science Advisory Board Biogenic Carbon Emissions Panel*, 76 Fed. Reg. 61100 (Oct. 3, 2011). NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas (GHG) emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. We are prepared to share our significant scientific, technical, and pragmatic expertise and experience and a considerable body of scientific studies and analyses to assist the Panel in its review.

NAFO's mission is to protect and enhance the economic and environmental values of private forests through targeted policy advocacy at the national level. At the time of this submission, NAFO's members represent 80 million acres of private forests in 47 states. NAFO is a solutions-oriented organization and is prepared to help EPA and the Panel better understand how biomass combustion for energy affects the forest carbon cycle and to assist the Agency in developing long-term policies that help achieve the nation's renewable energy and climate change objectives.

NAFO is an acutely interested stakeholder in EPA's reconsideration of the treatment of biogenic CO_2 emissions from stationary sources. NAFO made the original request of EPA to reconsider its position in the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule regarding the treatment of biomass emissions resulting in the Agency's decision to defer the regulation of biomass for a three-year period. *See* Letter from Gina McCarthy to Roger Martella (Jan. 12, 2011) granting NAFO's Petition for Reconsideration, *available at* http://www.epa.gov/nsr/ghgdocs/McCarthytoMartella.pdf. During the deferral period, the Panel's review of the scientific and technical issues associated with accounting for biogenic CO_2 emissions from stationary sources will be critical to informing EPA and other agencies of as they develop a policy path forward.

In order to conduct a thorough review of the science, we urge the Panel to assess the full body of science on the forest carbon cycle. Biomass is a carbon-neutral alternative to fossil fuels that can reduce GHG emissions and mitigate the effects of climate change. NAFO refers the Panel to the attached comments it has previously

submitted to EPA on this topic.[1] As described further in these comments, the Administration and virtually every agency in the world to consider the issue have taken a consistent and clear policy course of encouraging the expansion of biomass energy as "an important step to cutting the pollution responsible for climate change."[2] The critical policy question before EPA is whether and how to address biogenic CO_2 emissions in the future in a manner that accurately recognizes the dynamics of the forest carbon cycle in pursuit of renewable energy and GHG reduction goals. This Panel's efforts will be essential to providing a transparent and balanced assessment of the scientific and technical parameters informing EPA's ultimate policy decision.

I. In implementing its Charge, we urge the Panel to distinguish between science and policy issues.

In reviewing EPA's *Accounting Framework* and Charge Questions, we believe it is critical that the Panel distinguish between science and policy questions. As NAFO has previously shown,[3] there is broad agreement regarding the scientific principles

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1 *See* Attachment 1, National Alliance of Forest Owners' May 5, 2011 Comments on "Deferral for CO2 emissions from Bioenergy and Other Biogenic Sources under the Prevention of Significant Deterioration and Title V Programs: Proposed Rule, 76 Fed. Reg. 15249 (Mar. 21, 2011)"; Attachment 2, National Alliance of Forest Owners' September 13, 2010 Comments on "Call for Information: Information on Greenhouse Gas Emissions Associated With Bioenergy and Other Biogenic Sources; 75 Fed. Reg. 41173 (July 15, 2010)"; Attachment 3, National Alliance of Forest Owners' December 28, 2009 Comments on "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule."

[2] EPA, *EPA to Defer GHG Permitting Requirements for Industries that Use Biomass* (Jan. 12, 2011), *available at* http://www.epa.gov/aging/press/epanews/2011/2011_0112_1.htm; *see also* Barack Obama, U.S. President, State of the Union Address (Jan. 25, 2011) (committing to a policy of expanding renewable energy), *available at* http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address; USDA, *Statement from Agriculture Secretary Vilsack on EPA Biomass Announcement* (Jan. 12, 2011), *available at* http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2011/01/0008.xml.

[3] *See, e.g.*, Attachments 1-3.

supporting the consistent treatment of biomass CO_2 emissions as “carbon neutral” in domestic and international policy. It is well established in scientific literature that (1) all wood products – including biomass combusted for energy – are part of a natural global carbon cycle through which CO_2 is sequestered during photosynthesis and emitted during decomposition or combustion; (2) CO_2 that is released during the combustion of biomass was only recently sequestered from the atmosphere and is replace by an equivalent amount of CO_2 through ongoing forest regeneration; and (3) this dynamic process stands in stark contrast to the combustion of fossil fuels which release CO_2 that has been stored for millennia, could remain in that state indefinitely, and, when combusted, permanently increases atmospheric CO_2 concentrations.

Despite the broad consensus with respect to these basic scientific principles, policy preferences – which are sometimes presented as scientific principles – have generated much of the controversy surrounding the carbon neutrality of biomass combustion. This has been particularly true in instances where science is framed with assumed time and space parameters that unnecessarily constrain the presentation of carbon cycle dynamics. While it is true that a single set of underlying scientific principles can often support multiple policy preferences, it is the role of science to inform policy and the role of policy makers to select an appropriate policy that accurately applies the science.

Depending on how they are interpreted, the EPA’s Charge Questions to the Panel may introduce policy preferences that would unnecessarily constrain the Panel’s review. For example, NAFO is concerned the Charge Questions could be interpreted to prejudge a need to ultimately regulate biogenic CO_2 emissions and preclude an in-depth

scientific analysis that could support a decision to make permanent the existing categorical exclusion of biomass CO_2 from stationary source emissions regulations based on a finding that they have a neutral net impact on atmospheric CO_2. Although EPA notes its "conclusion" that a categorical approach is inappropriate,[4] this is a preliminary policy statement that should not prevent the Panel from a full assessment of the underlying science on biomass CO_2 emissions and the carbon cycle. Similarly, although EPA announces a preference for a "regional" approach to accounting for biogenic CO_2 emissions, this is far from a final Agency decision. To provide EPA with a full and fair scientific review that will not unnecessarily limit the Agency's policy choices, the Panel must consider the science underlying a full range of policy options rather than limit its scientific review to fit within an assumed set of policy parameters. As NAFO's attached comments show, scientific research supports a conclusion that measuring energy impacts to the biomass carbon cycle can be appropriately addressed at a national scale. The forest carbon cycle is a dynamic, global, and ongoing process and accounting at a national scale is widely viewed as most closely reflecting this reality. *See, e.g.,* Attachment 1 at 21-22.

As the body charged to peer review EPA's draft *Accounting Framework*, we urge the Panel to engage in a full assessment of established scientific principles without limitations that could result in overstatements or contradictions of what the science would otherwise conclude. To do so, the Panel must acknowledge EPA's policy assumptions and distinguish them from the parameters within which the Panel will

[4] Notably, as set forth in NAFO's attached comment letters, any "conclusion" to count biomass emissions would reverse the Agency's own long-standing presumption that biogenic CO_2 emissions do not increase atmospheric carbon.

conduct its science and technical review. To this end we urge the Panel to point out instances where scientific findings and conclusions may support alternatives to any policy assumptions included in the EPA's draft *Accounting Framework* and Charge Questions.

Finally, in reviewing EPA's draft accounting methodologies, the Panel should not only assess their scientific accuracy, but also their technical and practical feasibility. Specifically, we urge the Panel to be mindful of the realities of forest conditions and management in the U.S., the economics of the forest products sector supply chain, and the economic factors affecting the biomass energy sector rather than abstract assumptions that will not come to pass. For instance, while some have suggested that biomass energy could lead to the widespread combustion or conversion of entire mature forests, economic and transactional data compiled for decades by experts on the forestry sector marketplace have determined that this will not be the case. Similarly, despite theorizing that harvested forest stands might not be regenerated, or that market forces will, over time, deplete raw material supplies, the overwhelming evidence shows that U.S. forest stocks are currently growing and are expected to do so in the future because of, rather than in spite of, existing and emerging markets. *See generally* Attachments 1-3. We look forward to sharing our technical and scientific expertise as well as our practical experiences in these and other areas with the Panel.

II. The Panel should consider recent scientific studies on the carbon cycle.

To ensure that EPA understands both the science of the carbon cycle and the practical realities of implementing a biogenic carbon accounting system, we urge the Panel to review the most recent findings that are cited and briefly described herein.

These recent scientific articles and studies confirm that forest biomass is a part of the natural carbon cycle and thus does not add additional carbon to the atmosphere.[5]

An extensive review of numerous recent studies of forest carbon relationships has identified four key premises, which we urge the Panel to consider:

> 1. Energy produced from forest biomass returns carbon to the atmosphere that plants absorbed in the relatively recent past. It essentially results in no net release of carbon as long as overall forest inventories are stable or increasing (as is the case with forests in the United States).
>
> 2. Energy derived from burning fossil fuels releases carbon that has resided in the Earth for millions of years, effectively creating a one-way flow to the atmosphere. Whether emissions from fossil fuel combustion are ultimately taken up by land, ocean or forests, they are not returned to fossil fuel reserves on anything less than a geologic time scale.
>
> 3. Wood products used in place of more energy-intensive materials, such as metals, concrete, and plastic reduce carbon emissions, store carbon, and can provide additional biomass that can be substituted for fossil fuels to produce energy.

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[5] As NAFO has explained in its prior comments, the renewable power generated by combustion of biomass actually reduces atmospheric concentrations of carbon dioxide in three respects. *See* Attachment 1 at 3-5. First, combustion of biomass displaces combustion of fossil fuels, meaning that combustion of biomass actually means fewer emissions of geologic carbon dioxide than would occur in its absence. Second, biomass energy avoids the biogenic GHG emissions (mainly methane) of the various alternative disposal fates of biomass residues, replacing them with the lower potency CO_2 emissions of energy production. Third, biomass combustion actually promotes further forest growth by providing land owners with an incentive to maintain forests instead of converting to other land use options that sequester less carbon.

> 4. Sustainably managed forests can provide greater carbon mitigation benefits than unmanaged forests, while delivering a wide range of environmental and social benefits including timber and biomass resources, jobs and economic opportunities, clean water, wildlife habitat, and recreation.

Jim Bowyer, et al., Managing Forests for Carbon Mitigation 1-16 (October 2011) at p. 2, *available at* http://www.dovetailinc.org/files/DovetailManagingForestCarbon1011.pdf; *see* Robert W. Malmshimer, et al., Managing Forests Because Carbon Matters: Integrating Energy, Products, and Land Management Policy, Journal of Forestry 109(7S) (2011).[6]

Recent studies also confirm that carbon stocks in United States forests have been increasing, and will continue to increase. As a recent study concludes, the world's forests are a "large and persistent carbon sink." *See* Yude Pan, et al., A Large Persistent Carbon Sink in the World's Forests, Science 333(6054) 988 993 (Aug. 19, 2011). Indeed, estimates of the net flux of CO_2 confirm that forest sequestration is increasing, meaning that the flux of carbon into forest biomass is greater than the flux returning to the atmosphere due to respiration, decay, and combustion. *See* Linda S. Heath, et al., Managed Forest Carbon Estimates for the US Greenhouse Gas Inventory,

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[6] *See also* Reid Miner, Impact of the global forest industry on atmospheric greenhouse gases, Food and Agriculture Organization of the United Nations i-71 (2010); Peter J. Ince, Global Sustainable Timber Supply and Demand, in Sustainable Development in the Forest Products Industry, Chapter 2, 29-41 (2010), *available at* http://www.fpl.fs.fed.us/documnts/pdf2010/fpl_2010_ince001.pdf. Another recent report summarizes scientific findings supporting the environmental and economic benefits of using wood and wood products in green building construction, including the sequestration of carbon in forests, and the continued storage of that carbon in wood products used in place of other materials. *See* Michael Ritter, et al., Science Supporting the Economic and Environmental Benefits of Using Wood and Wood Products in Green Building Construction: The use of wood as a building material can provide substantial economic and environmental benefits to our nation's citizens, USDA Forest Service 1-18, *available at* http://www.fs.fed.us/news/2011/releases/09/green-building-report.pdf.

1990-2008, Journal of Forestry 109(3) 167-173 (April/May 2011), *available at* http://saf.publisher.ingentaconnect.com/content/saf/jof/2011/00000109/00000003/art00009. As a result, forests are continually accumulating carbon and sustainably-managed forests are "better than carbon neutral." *See* Jim Bowyer, et al., Life Cycle Impacts of Forest Management and Bioenergy Production 1-13 (July 2011) (Bowyer Life Cycle Impacts), *available at* http://www.dovetailinc.org/files/DovetailLCABioenergy0711.pdf; *see also* Bruce Lippke, et al., Life cycle impacts of forest management & wood utilization on carbon mitigation: knowns and unknowns, Carbon Management 2(3) 303-333 (2011) (reviewing research on life cycle carbon accounting), *available at* http://www.future-science.com/doi/pdf/10.4155/cmt.11.24. In addition, "[l]ife cycle assessment comparing electricity production from biomass versus coal shows an overwhelming emission reduction per unit of electricity produced." Bowyer Life Cycle Impacts, at p. 2.

Finally, recent articles also confirm that biomass energy has a smaller carbon footprint than fossil fuel energy because biomass energy involves the emissions and sequestration of carbon that is already part of the biosphere, while fossil fuel energy irreversibly adds new carbon that was not part of the biospheric cycle. *See* Robert A. Sedjo, Carbon Neutrality and Bioenergy: A Zero-Sum Game?, Resources for the Future Discussion Paper 1-9 (April 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf. Therefore, as long as net carbon stocks are growing, biomass energy is a carbon neutral energy source. *Id.* Recent scientific reviews have also demonstrated that studies suggesting biomass fuel always incurs a "carbon debt" at the outset ignore the systemic nature of forests. *See id.; see also* William Strauss, How Manomet got it

Backwards: Challenging the "debt-then-dividend" axiom 1-11 (May 2011), *available at* http://www.futuremetrics.net/papers/Manomet%20Got%20it%20Backwards.pdf.

NAFO anticipates that the Panel will find the recent articles and studies cited herein to be helpful in conducting a thorough review in response to the EPA's charge regarding the draft *Accounting Framework*.

Conclusion

NAFO supports EPA's decision to seek an independent peer review of its proposed accounting methodology for biogenic CO_2 emissions. We urge the Panel to undertake its review free of unnecessary policy parameters and hope you find the materials referenced and submitted within this comment letter helpful in answering EPA's Charge Questions on its draft *Accounting Framework*. NAFO is standing by to provide further information or answer any questions that the Panel may have.

Respectfully Submitted,

David P. Tenny
President and CEO
National Alliance of Forest Owners

ATTACHMENT B

National Alliance of Forest Owners
Investing in the Future of America's Forests

December 21, 2011

Submitted via email
EPA Science Advisory Board Biogenic Emissions Panel
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Designated Federal Officer
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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel

Dear Dr. Stallworth and Panel Members:

The National Alliance of Forest Owners (NAFO) respectfully is writing to follow up regarding the Environmental Protection Agency's (EPA's) Science Advisory Board Carbon Emissions Panel's (Panel's) October 25-27, 2011 meeting to review EPA's draft *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) (*Accounting Framework*). NAFO representatives appreciated the opportunity to attend the Panel's October 2011 meeting as part of our ongoing interest in utilizing our expertise as the leading organization representing private forest owners in helping respond to questions and contribute to solutions moving forward. In furtherance of that ongoing goal, we offer these comments in response to the Panel's discussions and the concerns raised by Panelists throughout the meetings. NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas (GHG) emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. These comments are intended to supplement comments already provided to the Panel, but below we address specific questions that arose during the meeting.

During the discussion at the panel meeting there appeared to be little dispute among the panelists that biomass energy provides important climate benefits and that EPA should adopt GHG emissions regulations that recognize biomass energy's role in mitigating climate change in an efficient and cost-effective manner. We believe the Panel can help ensure EPA achieves this goal by recommending that the agency pursue a policy that is based on sound science, reflects the realities of the forestry, forestry products, and biomass energy sectors, and is not needlessly complex. Specifically, the Panel should maintain its focus on the ultimate objective of EPA's regulation of certain GHG emissions – overall mitigation of atmospheric GHG concentrations. As described below, we strongly believe this objective can be best achieved through an approach that encourages carbon beneficial energy from forests by applying a categorical exclusion to biogenic CO_2 emissions at a national scale based on a determination that forests in the U.S. under the management of Federal, non-federal and tribal entities are not contributing net carbon to the atmosphere.

A. The Recommendations of the Panel Should Reflect the Net Effect of Biogenic CO_2 Emissions on Atmospheric CO_2 Concentrations.

During the October 2011 meetings, Dr. Rose's subgroup correctly recognized in their presentation that the overarching goal of the accounting methodology is to estimate the net change in atmospheric CO_2 concentrations attributable to stationary biogenic CO_2 emissions. The starting point for this inquiry must be the carbon cycle. The Panel has recognized that, unlike fossil fuels, biomass is part of the natural carbon cycle, carbon combusted during energy production was only recently removed from the atmosphere, and carbon is sequestered on an ongoing basis as harvested stands regenerate and young stands grow rapidly. So long as forest carbon stocks are stable or increasing – as they are in the United States – biogenic CO_2 emissions are fully offset by CO_2 sequestration in regenerating forests and do not result in a net increase in atmospheric CO_2 concentrations.[1] Biomass energy is only one aspect of the many uses of our forests that provide public benefits. As described in materials submitted previously by NAFO, these uses, over time, have produced more overall forest carbon rather than less. In fact, there is a demonstrated positive correlation between the markets for forest products, including biomass energy, and the continuous annual increase in forest carbon stocks.[2] Because of this positive correlation, all uses of forests, including energy production, presently have no net adverse impact on atmospheric CO_2 concentrations.

Despite the fact that biomass energy does not increase overall atmospheric carbon, some commenters and Panelists suggested that the EPA should consider the "opportunity cost" of increased forest carbon stocks that could occur in the absence of harvesting. NAFO urges the Panel to remember that the objective of the science review is not to determine pathways for increased overall carbon sequestration in our forests over time, but rather to advise EPA on science-based methods for determining whether the use of biomass will increase overall carbon in the atmosphere.

If the Panel recommends the consideration of opportunity costs, we urge the Panel to include *all* opportunity costs by focusing on their long-term impacts. While foregoing harvest may increase forest carbon stocks to a greater degree in the near term, the long-term benefits will be minimal. Increased carbon sequestration will not occur indefinitely as growth rates in maturing forests slow and ultimately reach a point of equilibrium or decline.[3] Additionally, unmanaged forests with historically high carbon stocks are often at greater risk of fire and disease, which will release the stored carbon without providing an energy benefit.

Conversely, biomass energy displaces fossil fuels and their associated fossil carbon emissions.[4] Because biomass is a renewable and sustainable energy supply, fossil fuel

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[1] Francesco Cherubini, GHG balances of bioenergy systems – Overview of key steps in the production chain and methodological concerns, Renewable Energy 35:1565-73 (2010); Stith Gower, Patterns and mechanisms of the forest carbon cycle, Annual Review of Environment and Resources 28:169-204 (2003).

[2] Peter J. Ince, Global Sustainable Timber Supply and Demand, *in* Sustainable Development in the Forest Products Industry, Chapter 2, 29-41 (2010), *available at* http://www.fpl.fs.fed.us/documents/pdf2010/fpl_2010_ince001.pdf.

[3] Robert W. Malmshimer, *et al*. Managing Forests Because Carbon Matters: Integrating Energy, Products, and Land Management Policy, *forthcoming in* Journal of Forestry 109(7S) (2011); Bruce Lippke, *et al.*, Life cycle impacts of forest management & wood utilization on carbon mitigation: knowns and unknowns, Carbon Management 2(3) 303-333 (2011), *available at* http://www.future-science.com/doi/pdf/10.4155/cmt.11.24.

[4] *Id.*

displacement can occur indefinitely, long after fully mature forests reach equilibrium. Biomass energy also contributes to a robust market for forest products, creating incentives for forest owners to invest in forests rather than alternative land uses with more limited carbon storage potential.[5] Forest products are much less energy intensive to manufacture than alternative materials such as concrete or steel, which further reduce carbon in the atmosphere relative to not having a healthy market for forest products.[6] Thus, if all of the opportunity costs are considered on an appropriate time scale, biomass energy has a greater potential to mitigate atmospheric CO_2 than continued sequestration through foregone harvests.[7]

Finally, because biomass energy displaces fossil fuel energy, it is critical that the Panel encourage a direct comparison between biomass and fossil fuel sources. Certain CO_2 emissions that may be relevant in a life cycle analysis are inappropriate or unnecessary in this context, because they are not included in the accounting methodology for fossil fuel emissions. Specifically, emissions associated with the processing and transportation of biomass fuel and the emissions of co-products including paper and durable wood products should not be included in an accounting methodology. While some differences between biomass and fossil fuels certainly exist, an "apples to apples" comparison of CO_2 emissions is necessary so that the EPA, energy producers and consumers can determine which energy sources provide greater climate benefits.

B. Net Forest Carbon Emissions Should be Considered the Broadest Practical Scale

While EPA has announced a preference for a regionally-based accounting methodology, NAFO agrees with Dr. Olander that there is no scientific justification for selecting regions. A source-based approach is equally inappropriate, because it both ignores the realities of the forestry and biomass energy sectors and skews the measurement of carbon impacts. Biomass energy producers obtain feedstocks from many suppliers and forest owners within a large wood basket and do not exercise control over stand-level forest management decisions. Nor do they maintain long-term supply contracts covering multiple harvest rotations. Due to the sheer number of biomass suppliers and the lack of control over subsequent management decisions, it is neither economically or practically feasible for biomass energy sources to maintain source-based records. Despite any theoretical appeal, it is simply not capable of implementation.

The carbon measurement flaws of a source-based approach are already well-recognized. Recent studies with overly prescriptive spatial and temporal scales have produced irrational outcomes when comparing biomass emissions and fossil fuel emissions notwithstanding the application of otherwise sound scientific principles.[8] International bodies recognize that appropriately large spatial and temporal scales are fundamental to an accurate

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[5] Ince (2010), *supra* note 2;*see also* Roger Sedjo, Carbon Neutrality and Bioenergy: A Zero-Sum Game?, Resources for the Future Discussion Paper 1-9 (April 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf.

[6] Lippke (2011), *supra* note 3.

[7] B. Metz, *et al.*, Intergovernmental Panel on Climate Change, Climate Change 2007: Mitigation of climate change 543 (2007) ("In the long-term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit.").

[8] William Strauss, How Manomet got it Backwards: Challenging the "debt-then-dividend" axiom 1-11 (May 2011), *available at* http://www.futuremetrics.net/papers/Manomet%20Got%20it%20Backwards.pdf; Sedjo (2011), *supra* note 5.

understanding of forest carbon flux.[9] Even a regional scale, as suggested by the EPA, is riddled with impracticalities that resemble the problems associated with a source-based approach.

In contrast, a national scale is cost-effective and capable of implementation because it can use existing data sources such as EPA's GHG Inventory to monitor changes in forest carbon stocks and ensure that net forest carbon emissions are not contributing to increased overall atmospheric carbon on an aggregate level. In addition, a national scale mitigates many of the concerns voiced by Panelists during the October 2011 meetings. First, a national scale would apply equally to all biomass energy producers, mitigating any concern over picking winners or losers. It avoids the risks of arbitrarily selecting boundaries or worse, the risk that boundaries would be "gerrymandered" to achieve a particular policy objective. Second, the use of a scale that is more granular than the harmful effect of the pollutant is needlessly complex. Climate change and GHG emissions are a global issue and a national scale represents the best domestic approximation of that scale. While no domestic policy can fully avoid the possibility of international leakage, a national scale recognizes that the U.S. forestry sector operates as an integrated whole and avoids the potential for domestic leakage between different regulatory regions. Finally, a national scale will protect individual biomass energy sources from the negative effects of localized natural disturbances, such as fire, storms and insect infestations, and rapid changes in land use, which are outside of their control, but can have a significant impact on forest carbon stocks at local or regional scales.

C. A Categorical Exclusion is Preferable to an Accounting Framework

At the close of the October 2011 meeting, the Panel considered whether an accounting framework would be preferable to a categorical exclusion. Although this is strictly a policy rather than a scientific question, NAFO anticipates that this is a threshold question the Panel must confront. Should the Panel decide to make a determination, we urge the it to consider the specific context in which any accounting framework would be applied and not as an abstract concept. U.S. forest carbon stocks are currently stable and increasing and are expected to remain so for the foreseeable future, notwithstanding anticipated increases in the production of forest products, including renewable energy.[10] A complex accounting framework cannot represent an improvement over a categorical exclusion unless it produces a better greenhouse gas reduction outcome and more accurate results in a cost-effective manner. As long as overall forest carbon stocks remain stable or increasing, it is neither necessary from a scientific perspective nor efficient from a cost-benefit perspective to go beyond a categorical exclusion for biomass.

First, a complex accounting framework cannot be superior to a categorical exclusion unless it can produce greater greenhouse gas reductions or more accurate results. It is not sufficient that a framework includes all of the necessary components from a theoretical perspective. Unless those components can be measured accurately and with small (and known) degrees of uncertainly, a framework will be of little value from a practical perspective. Some of the variables in EPA's proposed model, such a leakage, simply cannot be measured

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[9] IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventores Programme, Institute for Global Strategies, Hayama, Kanagawa, Japan: IPCC National Greenhouse Gas Inventories Programme (2006); EU guidelines for the monitoring and reporting of greenhouse gas emissions, Annex I, 4.2.2.1.6 (2004), *available at* http://inni.pacinst.org/inni/climate_change/EUGuidelinesGHGJan2004.pdf.

[10] *See* Yude Pan *et al*., A Large Persistent Carbon Sink in the World's Forests, Science 333(6054) 998 993 (Aug. 19, 2011) and Linda S. Heath, *et al*., Managed Forest Carbon Estimates for the US Greenhouse Gas Inventory, 1990-2008, Journal of Forestry 109(3) 167-173 (April/May 2011).

with a sufficient degree of accuracy to support their inclusion in a framework. Similarly, other source- or feedstock-specific variables are economically or practically infeasible to measure and cannot be relied upon to produce accurate results. A proposed framework must withstand scientific scrutiny in practice as well as on a theoretical level. Because EPA's *Accounting Framework* includes variables that cannot be measured or cannot be measured accurately, it is not an improvement over a categorical exclusion.

Second, because the data collection requirements of complex frameworks would make them prohibitively costly to implement, in many cases to the point of discouraging investment in biomass energy, they should not be used unless they produce significantly better results than a categorical exclusion. As NAFO has previously noted, an accounting framework that is anticipated to always result in a BAF of zero is inferior to a categorical exclusion from a cost-benefit perspective because it adds considerable compliance, monitoring, and recordkeeping costs and uncertainties without altering the final regulatory outcome, thus removing significant incentives for industry to invest in carbon beneficial biomass over traditional fossil fuels. For example, accounting for differences in tree species, harvest methods, types of biomass, or biomass uses may theoretically improve accuracy, but they will also impose significant costs on regulated entities, particularly when considering that nearly every part of the value chain produces byproducts that can be used for energy. Yet, as some Panelists have noted, comprehensive accounting frameworks will produce a BAF of zero as long as forest carbon stocks remain stable. If these frameworks do nothing more than confirm that biomass energy produces no net CO_2 emissions – as they must as long as forest carbon stocks remain stable – the end results is simply a more costly version of a categorical exclusion posing significant hurdles for a decision to employ biomass energy. At the present time, there is simply no reason to suggest that the added compliance costs of complex accounting frameworks can be justified when cost effective alternatives such as a categorical exclusion remain available.

Conclusion

NAFO strongly supports the Panel's independent peer review of EPA's proposed accounting methodology for biogenic CO_2 emissions and hopes you find the materials referenced and submitted within this letter and in previous comments helpful in answering EPA's Charge Questions on its draft *Accounting Framework*. We look forward to continuing to work closely with the Panel to contribute ideas and solutions to questions that emerge. In the meantime, NAFO is prepared provide further information or answer any questions that the Panel may have.

Respectfully Submitted,

David P. Tenny

President and CEO

National Alliance of Forest Owners

ATTACHMENT C

January 25, 2012

Submitted via email

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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel

Dear Dr. Stallworth and Panel Members:

The National Alliance of Forest Owners (NAFO) welcomes the opportunity to submit these comments to the Environmental Protection Agency's (EPA's) Science Advisory Board (SAB) Biogenic Carbon Emissions Panel (Panel), in advance of its January 27, 2012 conference call to discuss the Panel's *Draft Advisory* on EPA's *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) (*Accounting Framework*). NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas (GHG) emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. NAFO – as the party that filed the Petition for Reconsideration with EPA that led to the present SAB process – is an acutely interested stakeholder in EPA's reconsideration of the treatment of biogenic CO_2 emissions from stationary sources and the scientific analysis EPA will utilize in making ultimate policy and regulatory decisions on how to treat biogenic CO_2 emissions. A detailed summary of NAFO's past participation was included in its October 18, 2011 comments to this

Panel.[1] As we have done from the earliest outset of EPA's review of the treatment of biogenic GHG emissions, we remain prepared to provide our significant scientific, technical, and pragmatic expertise and experience and a considerable body of scientific studies and analyses to assist the Panel throughout its review and evaluation of the *Accounting Framework*.

Summary

As NAFO and its members have explained in earlier comments and presentations to the Panel and EPA, critical to NAFO's mission in reducing GHG emissions is supporting the use of biomass as a renewable energy supply that offers important climate and energy security benefits. EPA's decision to reconsider its approach to regulating biogenic CO_2 emissions from stationary sources offers an opportunity to encourage the continued development of climate-beneficial bioenergy capacity. It is NAFO's goal that, with the assistance of the Panel's expertise, EPA will develop a regulatory framework that accurately reflects the climate benefits offered by bioenergy, encourages its continued development, and promotes appropriate distinctions between bioenergy and other types of energy such as fossil fuel combustion.

While NAFO supports the Panel's ongoing efforts in exploring and attempting to quantify the climate benefits of bioenergy, NAFO is concerned that this review process threatens to introduce undue complexity into EPA's regulation of biogenic CO_2 emissions, which in turn would create significant disincentives for the adoption of bioenergy as an alternative to fossil fuel combustion. While significant scientific analyses may be needed to understand the full scope of the climate benefits of bioenergy, unnecessary complexity is counterproductive to the ultimate goal of providing a workable regulatory framework for biogenic CO_2 emissions. Complex scientific analyses that address questions beyond the scope of the pertinent issues at

[1] National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Oct. 18, 2011), *available at* http://yosemite.epa.gov/sab/SABPRODUCT.NSF/MeetingCal/D1D833DBF27626A6852578F600610AC5?OpenDocument

hand risk EPA creating, in turn, an overly complicated regulatory framework. This would frustrate the ultimate goal of deploying biomass as a significant means of reducing net GHG emissions and promoting energy independence. Thus, in these comments, NAFO respectfully offers suggestions for ways in which the Panel can use its scientific expertise to clarify and simplify the *Accounting Framework* that EPA has proposed to further the goal of promoting favorable bioenergy as a viable alternative to fossil fuel combustion. In short, NAFO recommends the Panel:

- Use its expertise to simplify EPA's *Accounting Framework* by identifying general principles that can be applied broadly to the bioenergy sector. To do so, the Panel must address the practical realities of private forest management and the spatial and temporal scales on which it operates.

- Limit its recommendations to the scope of its mandate from EPA and avoid incorporating extraneous factors outside of that scope.

- Maintain its focus on the ultimate goal of this review – to provide scientific assistance to policy makers for the development of a reasonable policy for addressing biogenic CO_2 emissions from stationary sources. The Panel must ensure that its recommendations are both science-based and capable of efficient implementation.

- Acknowledge the practical limits of science and pursue a balance between achieving a reasonable degree of scientific certainty and maintaining reasonable compliance processes and costs. In doing so the Panel must ensure that factors included in its recommendation will ultimately promote rather than discourage the development of beneficial bioenergy facilities.

I. The Panel's Scientific Review Should Aim to Aid EPA in Developing a Reasonable Policy for Addressing Biogenic CO_2 Emissions

At present, there is no debate that, when compared to fossil fuels, biomass can provide important climate benefits as an energy feedstock and that those benefits should be accounted for by treating biogenic CO_2 emissions from stationary sources

differently than fossil CO_2 emissions. This distinction—and the associated climate benefits— is acknowledged in the Panel's *Draft Analysis* and serves as the basis of EPA's decision to defer regulation of bioenergy facilities and to reconsider whether and/or how to account for biogenic CO_2 emissions. In order to capture these climate benefits and create proper incentives for the continued growth of the bioenergy sector, EPA ultimately must design a straightforward and pragmatic policy that is capable of efficient and effective implementation and consistent with the realities of bioenergy production. An unnecessarily complex approach with high compliance costs will create market ambivalence for the bioenergy sector and reduce the sector's ability to produce the climate benefits that it has the capacity to provide. Indeed, if the compliance burdens and costs become too great, a policy intended to promote renewable bioenergy could have the perverse effect of discouraging continued growth of this important industry and the associated environmental benefits.

NAFO agrees with the Panel's assessment that EPA's *Accounting Framework* presents "daunting technical and implementation challenges" as a result of its complexity and also believes that an alternative approach is warranted. *See Draft Report*, at 38. By ignoring the practical realities of the forestry and bioenergy sectors, the *Accounting Framework* incorporates unnecessarily narrow subcategories – such as a regional spatial scale – that lack scientific justification and would complicate implementation. Similarly, the *Accounting Framework* includes many variables that have little, if any, value in quantifying the climate impacts of bioenergy, but would add significant compliance costs if implemented as a part of a regulatory program. Thus, to achieve the goal of a straightforward regulatory framework, we urge the Panel to seek to remove complexity rather than adding to it and prepare recommendations and conclusions EPA can implement through a straightforward approach that that promotes rather than discourages bioenergy production.

While NAFO supports the Panel's overall assessment of the challenges associated with EPA's *Accounting Framework*, we respectfully submit that many of the specific recommendations included in the *Draft Analysis*, if implemented by EPA in a regulatory scheme, would significantly increase complexity and maintain high

transactional costs of compliance while not resulting in benefits that justify such costs. While NAFO addresses some of the specific recommendations offered by the Panel below, on the whole we respectfully believe the Panel would be aided in assessing the appropriate scope of its recommendations by actively engaging the forestry and bioenergy sectors on the practical questions related to implementation. This will allow the Panel to assess fully whether the *Accounting Framework*, or any alternative recommendations from the Panel, can be implemented in an efficient manner and thereby send the proper signals and incentives to encourage climate beneficial bioenergy. In turn, we urge the Panel to not limit itself to an abstract and theoretical analysis of the carbon impacts of the bioenergy sector detached from the pragmatic considerations impacting both the industry and EPA's ultimate policy.

As the *Draft Analysis* correctly notes, case studies are an extremely valuable tool in determining how the *Accounting Framework* or a regulatory program would apply in specific cases. *Draft Analysis* at 33. NAFO agrees that case studies should be based on real-world scenarios and use real rather than illustrative data so that the impacts of alternative approaches can be accurately assessed. *Id.* As the Panel continues to evaluate EPA's *Accounting Framework* and its own *Draft Analysis* and develops recommendations to EPA, we urge the Panel to make use of the case study approach endorsed by the *Draft Analysis* and consider carefully the challenges that arise during implementation.

Specifically, as the Panel continues its review, we urge it to focus on correcting the following examples of unnecessary complexity incorporated into the treatment of biogenic CO_2 emissions from stationary sources leading to significant hurdles and disincentives for pursuing this beneficial form of energy:

- Ignoring the practical realities of the forestry industry and addressing purely hypothetical scenarios that will not occur in practice. For example, there is no need to include parameters that address the harvest of mature trees for energy consumption because their high value for saw timber ensures that they will not be used to produce bioenergy.

- Adding additional detail and complexity that does not affect the final regulatory outcome. Improved accuracy and precision are not ends in themselves and should only be pursued if they produce changes at the relevant policy scale. For example, distinguishing between feedstocks provides no benefit if each sub-category has the same climate impact.

- Incorporating external issues that are beyond the scope of EPA and the Panel's review. For example, economy-wide accounting and Life Cycle Analyses are far beyond the scope of EPA's legal authority under the relevant provisions of the Clean Air Act applicable to the regulation of stationary sources and unnecessary to determine an appropriate policy solution.

- Incorporating complexity to produce marginal gains in accuracy that are exceeded by the high costs of data collection. Calculating climate benefits of bioenergy to the precise levels contemplated in the *Accounting Framework* and *Draft Analysis*, even if feasible, would entail extraordinary and costly requirements with little marginal benefit. The added cost and complexity would have the perverse effect of discouraging bioenergy production.

- Including parameters that cannot be determined to a reasonable degree of certainty. When uncertainty cannot be resolved, the appropriate response is to exclude the parameter and continue to study it until more certainty can be provided. For example the concept of leakage as applied to bioenergy as opposed to more familiar contexts, such as carbon offsets, is unclear and riddled with significant imprecision and should be excluded until it is better defined and understood.

When the Panel identifies unnecessary complexity that will inhibit the development of climate-beneficial bioenergy, we urge it to strive to find ways to eliminate such complexity and promote efficient implementation.

II. The Panel Must Use Both its Scientific Expertise and Knowledge of the Forestry and Bioenergy Sectors to Simplify EPA's *Accounting Framework*

While the Panel is expected to use its considerable scientific expertise and experience to rigorously evaluate the science related to biogenic CO_2 emissions, there is no reason to require analogous complexity in its recommendations. Rather, the Panel should focus on identifying consistent patterns that emerge as it completes its scientific review. As consistent patterns emerge, the Panel will be able to recommend generalized principles that will simplify rather than complicate EPA's *Accounting Framework*. Further, as it searches for such patterns, the Panel must remain mindful of the practical realities of the forestry and bioenergy sectors. By avoiding consideration of hypothetical scenarios that are unlikely to occur in practice, the Panel will be better positioned to discover generally applicable principles that are not evidenced through theoretical *a priori* analyses.

A. An *A Priori* Rejection of a Categorical Exclusion Is Not Warranted

The Panel should strongly resist dismissing out of hand the applicability of a categorical exclusion for biogenic CO_2 emissions even in the event it does not fully adopt the assumption that all biomass combustion is carbon neutral. Rather than making *a priori* judgments, the Panel must engage in a rigorous assessment of the net carbon impact of the bioenergy sector as it actually operates (and is expected to operate in the future). In so doing, NAFO believes the conclusions of the Panel can fairly support a categorical exclusion. For example, it is appropriate for the Panel to become familiar with the processes associated with different feedstocks utilized by bioenergy facilities. At the same time, if the combined carbon emissions of the various feedstocks, when considered at an appropriately broad scale, do not increase net atmospheric CO_2 concentrations, the Panel should recommend that there is no basis to distinguish among feedstocks in an accounting framework. Such a conclusion also provides the Panel a strong basis for recommending a categorical exclusion of biomass from a regulatory regime.

While NAFO believes that a categorical exclusion is appropriate for all applicable feedstocks, the Panel should not consider purely hypothetical feedstocks that have no prospect of being used by the bioenergy sector. At best, such consideration will add complexity to the Panel's review process and, at worst, will insert unnecessary complexity into the regulations themselves. For example, there is no need for the Panel to consider whether there is a unique carbon impact associated with the combustion of whole, mature trees for energy. As the Panel has appropriately recognized, mature forests will not be harvested for energy because they are valued much more highly for other products, such as saw timber. *Draft Analysis* at 29. However, parts of whole trees, (limbs, bark, shavings, and other residues) will likely be used for bioenergy in final harvests as part of an efficient harvest and manufacturing operation. The only roundwood likely to be used directly for bioenergy is immature roundwood from thinning treatments, a practice that typically increases overall carbon sequestration rates of the remaining trees. While the harvest of whole, mature trees for energy has generated much debate and opposition, a careful analysis of the practical realities of the forestry and biomass sectors show that this issue is a red herring. Rather than designing a framework that addresses this abstract and hypothetical situation, the Panel can simplify its analysis and the *Accounting Framework* by focusing on the types of feedstocks that will actually be used for bioenergy.

B. The Panel Must Focus Its Analysis on Appropriate Spatial and Temporal Scales

In the same manner, general trends are likely to be observed if the Panel focuses its analysis on appropriate spatial and temporal scales. Indeed, many of the complications evident in the *Accounting Framework*, the *Draft Analysis*, and comments submitted to EPA and the Panel are based on distinctions that are not relevant when appropriate spatial and temporal scales are adopted. For example if the Panel focuses on spatial scales that are relevant to how the carbon cycle functions (e.g., changes in net overall atmospheric CO_2 concentrations over time) the many concerns related to short-term fluctuations in carbon stocks disappear. It is no accident that the ages of forests tend to be evenly distributed along a continuum. Forests are managed to meet an ongoing demand for goods, services and uses, and this requires a predictable

continuation of a productive forest land base. Assessing individual stands outside of the broader context in which they are managed can produce misleading results. For example, concerns over short-term fluctuations in carbon stocks raised by Cherubini *et al.* (2011) and Walker *et al.* (2010) are based on this type of stand-based accounting. While the "snap-shot" approach offered by these methodologies may have value in describing how individual carbon molecules cycle between different carbon pools over time, it creates an arbitrary spatial distinction that is not representative of how the forestry and bioenergy sectors affect the overall forest carbon cycle. Instead, as individual "snap shots" from different stands are aggregated into appropriate spatial scales that represent the carbon flux associated with a forest landscape, the small, short-term fluxes in carbon emissions are balanced and the net changes in CO_2 concentrations attributable to bioenergy approach zero. Using the bank account analogy, when considered at the proper spatial scale, it becomes clear that the entire forestry sector – including bioenergy – maintains a consistent level of carbon capital in the forest and only harvests a portion of the accrued interest.

Similarly, adopting an appropriately broad temporal scale can greatly simplify accounting for biogenic CO_2 emissions. As the Panel has recognized, the global climate system is insensitive to intermediate changes in carbon stocks that occur on timeframes shorter than 100 years. *Draft Analysis* at 11. Yet many of the concerns over the climate impacts of biomass involve changes that occur over much shorter timeframes. Moreover, forests are universally managed on rotation cycles that are shorter than 100 years, meaning that the global climate system is insensitive to changes in carbon stocks that occur during the harvest and regeneration cycle. Thus the Panel is correct when it notes that, even if valid, concepts addressing short-term carbon fluxes such as "carbon debt" are irrelevant due to the time scale on which climate responses occur. *Draft Analysis* at 11.

By recognizing the importance of maintaining a broad temporal scale on the order of 100 years, the Panel can avoid complicating its recommendations through the inclusion of components that address proximate changes in biogenic CO_2 emissions over shorter timeframes. Rather than incorporating short-term models of emissions

fluxes such as Cherubini *et al*.'s GWP_{bio} Index and the time path of decay of emissions into an accounting framework, the Panel's recommendations should focus on changes in cumulative biogenic CO_2 emissions over policy-relevant 100-year time frames. Again, assessing short-term carbon fluxes may be a valid part of the Panel's scientific assessment of biogenic CO_2 emissions, but it should not be a part of its final recommendations to EPA.

III. The Panel Should Avoid Incorporating External Factors Outside the Scope of EPA's Regulatory Review

As the Panel has correctly observed, its scientific review and ultimate recommendations are constrained by the scope of the regulatory review that EPA has undertaken. As a legal and policy matter, EPA has chosen to limit its review to an "examination of the science and technical issues associated with biogenic CO_2 emissions from stationary sources." EPA, Deferral for CO2 Emissions from Bioenergy and Other Biogenic Sources Under the Prevention of Significant Deterioration (PSD) and Title V Programs (Deferral Rule), 76 Fed. Reg. 43,490, 43,490-91. While the Panel has correctly noted that EPA has left many important policy issues unanswered in its *Accounting Framework*, the Panel must be responsive to the boundaries of the questions presented by EPA. The purpose of EPA's review is to determine whether biogenic CO_2 emissions from stationary sources have different impacts on atmospheric CO_2 concentrations than fossil CO_2 emissions, meaning that the regulatory framework must allow, to the extent possible, a direct comparison between the climate impacts of biomass and fossil fuels. Incorporating additional factors will not further EPA's policy objectives and, instead, will unnecessarily complicate the *Accounting Framework*.

A. Greenhouse Gases Other than CO_2

Under the Deferral Rule, EPA has limited the scope of this review and its future regulation of bioenergy stationary sources to CO_2 emissions. As EPA stated in the *Accounting Framework*, carbon-based GHGs are unique because carbon can "cycle between different reservoirs in the atmosphere, ocean, land vegetation, soils, and sediments." *Accounting Framework* at 9. While the production of biomass and fossil

fuel energy may result in some emissions of other GHGs, EPA has made a policy decision to focus on the carbon cycle and its role in reducing the climate impact of carbon-based GHG emissions from bioenergy facilities. Regardless of whether or not the Panel agrees with this direction, it should not expand the scope of its review or recommendations to incorporate emissions of other GHGs. While including emissions of N_2O and other non-carbon GHGs may be appropriate when quantifying GHG emissions by conducting a lifecycle analysis, EPA has expressly foreclosed this approach. Indeed, as the *Draft Analysis* suggests, including the emissions of other GHGs through a lifecycle analysis would prevent EPA from comparing the climate impacts of biomass and fossil fuels. *Draft Analysis* at 12-13. Recommending factors that have been explicitly excluded by EPA will be counterproductive because they are not responsive to EPA's charge, introduce confusion, and will inevitably be excised from EPA's final regulations.

B. Upstream and Downstream Emissions

Similarly, EPA's review is limited to stationary sources and the Panel should ensure that appropriate comparisons between bioenergy and fossil fuel facilities can be made. While differences between biogenic and fossil carbon dictate inclusion of carbon *sequestration*, there is no basis to include additional upstream and downstream *emissions*, which are not included in the regulation of fossil fuel facilities. For example, the Panel has appropriately recognized that it is inconsistent to account for transportation losses for biomass facilities, while ignoring fugitive emissions from natural gas pipelines. *Draft Analysis* at 26. For the same reason, it would be inconsistent to account for downstream emissions from co-products such as ethanol or paper when comparable emissions are ignored for fossil fuel facilities. While the Panel may prefer a more comprehensive accounting framework associated with the life cycle of all forest products, including those used for bioenergy, it should not go beyond the reach of the questions presented by EPA, which in turn are linked to EPA's regulatory authority.

C. Environmental Co-Benefits

By the same token the Panel must ensure that its recommendations do not inadvertently suggest that policy should require bioenergy facilities or their suppliers to provide unrelated environmental co-benefits as a condition for receiving credit under the PSD and Title V programs for the climate benefits that they provide. Thus the broad suite of environmental benefits addressed by forest certification and forestry best practices programs make them inappropriate proxies for establishing "sustainability" in the context of net atmospheric CO_2 impacts. While NAFO members are committed to third party verification of sustainable practices and recognize the value of these programs, they are designed to produce a variety of environmental benefits, such as biodiversity and clean water, that are outside the scope of the regulatory program where the *Accounting Framework* will be applied. Although production of these environmental benefits is a worthy goal and should be rewarded in an appropriate context, it should not be a precondition for recognition under the PSD and Title V programs.

Similarly, the Panel and EPA should resist the urge to make distinctions among feedstocks based on factors unrelated to climate impacts. In many cases concerns about bioenergy are based on perceived impacts of forestry practices on biodiversity, water quality, or aesthetics. Preferences for older forests and natural landscapes should not play a role in the Panel's review and recommendations unless they are directly related to changes in atmospheric CO_2 concentrations. While forests without question provide many benefits, EPA has limited this review to climate benefits and the Panel must respect the policy decision that EPA has made.

IV. The Panel Should Acknowledge the Limits of Science and Avoid Recommending Parameters that Increase Compliance Costs and Regulatory Uncertainty Without Commensurate Gains in Accuracy and Precision

Finally, as it conducts its scientific review and formulates its recommendations, the Panel must remain cognizant of its ultimate objective, which is to aid EPA's policy-making process. This is particularly important as the Panel considers uncertainty. As a general matter, scientifiic research is designed to reduce uncertainty (and thereby

improve accuracy and precision), often through increasingly detailed and complex studies. While detailed analyses can be extremely important in advancing scientific understanding, they do not necessarily improve policy outcomes or the implementation of regulatory programs. Rather than simply pursuing greater detail and developing finer distinctions, we urge the Panel to consider whether its recommendations will allow EPA to create better policies.

In some cases, rigorous and detailed analyses can only be realized through an exponential increase in the cost of collecting detailed data. In instances where data collection is infeasible because compliance costs exceed marginal benefits in accuracy and precision, these marginal improvements become counterproductive from a policy standpoint and should be avoided. While ultimate policy decisions must be made by EPA, the Panel should take into account the pragmatic challenges and costs associated with its recommendations and avoid recommending complex approaches that will result in disproportionate increases in compliance costs. In other cases, the Panel may find that due to the inherent complexity of forestry and the forestry industry, it cannot resolve uncertainty and provide sufficiently accurate measurements for certain paramaters of interest. Rather than seeking complex ways in which to incorporate these uncertain parameters, the Panel must inform EPA that current scientific limitations have been exceeded. EPA can then make an appropriate policy decision of how to proceed in the face of such uncertainty. In some cases, an alternative approach may be taken and in others EPA may simply choose to monitor a parameter of interest in the hope that uncertainty can be resolved as scientific understanding improves.

A. Facility-Based Chain-of-Custody Accounting

As the Panel and many commenters have stated, facility-based chain-of-custody accounting can, in theory, be used to measure the changes in atmospheric CO_2 concentrations attributable to each bioenergy facility. Yet, when the transactional costs associated with collecting the necessary data are considered, it becomes apparant that the costs greatly overwhelm the marginal improvements in measuring changes in atmospheric CO_2 concentrations. Bioenergy facilities procure feedstocks from a vast

and constantly changing array of land-owners as well as other entities in the forestry sector. The logistics of precisely tracking feedstocks from harvest to combustion would impose significant new costs on the bioenergy sector and would threaten its cost-effectiveness when compared to fossil fuel combustion. Thus, while a facility-based chain-of-custody accounting approach may, in theory, accurately measure the climate benefits of bioenergy, the costs assosiated with its implementation would prevent those benefits from being realized. Rather than adding cost and comlexity for the sake of marginally improved accuracy, the Panel must consider whether increased accuracy is necessary and worth the transactional costs of compliance. In the case of facility-based chain-of-custody accounting an honest assessment will lead to the conclusion that the high compliance costs simply cannot be justified.

B. "Business As Usual" Baseline

Complexity is also a critical issue that must be considered as the Panel makes recommendations for the baseline in EPA's *Accounting Framework*. Errors in baseline measurements pose a significant risk to the success of EPA's policy as they have the potential to send unintended signals to the marketplace and create perverse incentives that discourage climate-beneficial bioenergy facilities. The "Business as Usual" (BAU) baseline included in the Panel's *Draft Analysis* poses exactly this type of risk. The Panel's recommended approach requires calculating "what would have happened anyway" without any biomass consumption by the bioenergy sector. *Draft Analysis* at 5. The Panel recognizes that such projections would be uncertain, *id.* at 5, and highlights a number of drivers that will complicate future projections including "economic conditions, domestic and international policy and trade decisions, commodity prices, and climate change impact." *Id.* at 25. In addition to these macro-scale variables, exogenous factors such as land use change and natural disturbances including fire and disease will have a significant influence on future carbon stocks, but are difficult to predict *ex ante*. Finally, bioenergy's role within the forestry sector as a whole is extremely difficult to isolate and remove from future projections. In many cases, other forestry products are co-produced with bioenergy and, in any event, forest productivity investments are made

far in advance of harvest as land managers anticipate future market demands.[2] Sedjo (forthcoming). Imposing a BAU baseline requirement may also result in an unintended regulatory taking by requiring that an existing net carbon sequestration trajectory must be maintained going forward, thereby affecting the value of additional carbon for other purposes in the marketplace.

As a result of this inherent complexity, it is difficult to assess with any certainty the precise path that carbon stocks will take in the future, let alone the hypothetical path that would occur in the absense of bioenergy. Rather than allowing EPA to "isolate the incremental or additional impact of the bioenergy facility," *Draft Report* at 24, a projected BAU baseline will simply reintroduce uncertainty based on a host of factors outside of the bioenergy sector's control. Regardless of its incremental impact on atmospheric CO_2 concentrations, a bioenergy facility's regulatory obligations could change simply because EPA's projections of other factors proved incorrect. Even if the Panel is correct in asserting that additionality is an important concept for EPA to consider, it must acknowledge that a projected BAU baseline cannot be accurately measured and will likely produce perverse regulatory results unrelated to the climate impact of bioenergy. In light of this uncertainty, the Panel must provide a thorough assessment of the state of the science related to baselines that will allow EPA to make an informed policy choice.

C. Leakage

Measurement of leakage suffers from the same problems of uncertainty. Although EPA identified leakage as an issue of concern in the *Accounting Framework*, it did not attempt to quantify leakage, due in part to the uncertainty surrounding it. *Accounting Framework* at 41. Instead EPA suggested that leakage could be incorporated at a later date once its impact was better understood. *Id.* The *Draft*

[2] Given the interrelated nature of the forestry sector and the fact that significant investments have already been made in anticipation of bioenergy demand, it would simply be unfair to apply a BAU baseline to the bioenergy sector. Forest owners have been providing significant carbon benefits over time by increasing carbon stocks on the lands they manage. They should not be required to maintain that rate of growth without compensation and only receive credit for "additional" sequestration beyond what they already provide.

Analysis confirms the uncertainty surrounding the measurement of leakage, noting that while non-zero leakage is plausible it could be positive or negative. *Draft Report* at 18. Indeed, it states that "the precision associated with qualitativlty estimating negative leakage may involve huge errors that could be so great as to overwhelm any usefulness of the development of high quality data for other interrelated parts of the assessment." *Id.* at 19. In the face of such uncertainty, it is simply not appropriate to include this factor in an Accounting Framework at this time. If, as the Panel has suggested, there is uncertainty even as the appropriate sign for leakage, its inclusion will almost certainly lead to perverse effects that will distort the bioenergy market and disrupt the development of climate-beneficial bioenergy faciliites. Rather than recommending that EPA incorporate some proxy for leakage based on its best guess as to what may occur, the Panel should cite the existing uncertainty and recommend that EPA exclude leakage until it can be better understood and quantified.

Conclusion

NAFO continues to support EPA's decision to seek an independent peer review of its proposed accounting methodology for biogenic CO_2 emissions and applauds the Panel's efforts to assess this complex field. We urge the Panel keep implementation at the forefront as it formulates its recommendations to EPA and to strive to add clarity rather than complexity to the *Accounting Framework* that EPA has proposed. NAFO is standing by to provide further information or answer any questions that the Panel may have.

Respectfully Submitted,

David P. Tenny
President and CEO
National Alliance of Forest Owners

ATTACHMENT D

National Alliance of Forest Owners
Investing in the Future of America's Forests

March 16, 2012

Submitted via email

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United States Environmental Protection Agency
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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel

Dear Dr. Stallworth and Panel Members:

The National Alliance of Forest Owners (NAFO) welcomes the opportunity to submit these comments to the Environmental Protection Agency's (EPA's) Science Advisory Board (SAB) Biogenic Carbon Emissions Panel (Panel), in advance of its March 20, 2012 conference call to discuss the Panel's revised *Deliberative Draft Report* (*Report*) on EPA's *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) (*Framework*). NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas (GHG) emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. NAFO – as the party that filed the Petition for Reconsideration with EPA that led to the present SAB process – is an acutely interested stakeholder in EPA's reconsideration of the treatment of biogenic CO_2 emissions from stationary sources and the scientific analysis EPA will utilize in making ultimate policy and regulatory decisions on how to treat biogenic CO_2 emissions. A detailed summary of NAFO's past participation was included in its October 18, 2011 comments to this

Panel.[1] As we have done from the earliest outset of EPA's review of the treatment of biogenic GHG emissions, we remain prepared to provide our significant scientific, technical, and pragmatic expertise and experience and a considerable body of scientific studies and analyses to assist the Panel throughout its review and evaluation of the *Framework*.

Introduction

As NAFO and its members have explained in earlier comments and presentations to the Panel and EPA, critical to NAFO's mission in reducing GHG emissions is supporting the use of biomass as a renewable energy supply that offers important climate and energy security benefits. EPA's decision to reconsider its approach to regulating biogenic CO_2 emissions from stationary sources offers an opportunity to encourage the continued development of climate-beneficial bioenergy capacity. It is NAFO's goal that, with the assistance of the Panel's expertise, EPA will develop a regulatory framework that accurately reflects the climate benefits offered by biomass, encourages its continued development, and promotes appropriate distinctions between bioenergy and other types of energy such as fossil fuel combustion. We believe that the Panel can achieve these goals by making recommendations that avoid unnecessary complexity and by using its expertise to apply scientific theories to real-world scenarios.

First, we applaud the Panel's commitment to distinguishing between scientific and policy questions and leaving the latter category to EPA. However, the Panel need not retreat to the consideration of purely abstract and theoretical issues detached from real world considerations relevant to forest management and bioenergy production. It is not enough for the Panel to verify that a particular model or approach to carbon accounting is scientifically valid at an abstract level. Instead, the model's assumptions must be rigorously evaluated to ensure that they are consistent with the way that forests are managed and biomass energy is actually produced in the United States. When the Panel finds that multiple alternatives accurately reflect the forestry and forest products

[1] National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Oct. 18, 2011) (NAFO October SAB Panel Comments), *available at* http://yosemite.epa.gov/sab/SABPRODUCT.NSF/MeetingCal/D1D833DBF27626A6852578F600610AC5?OpenDocument.

sectors and are capable of efficient implementation, it is appropriate to include such an assessment in the final report and allow EPA to make an informed policy choice among such alternatives. At the same time, when, as a result of its experience, expertise, and investigation, the Panel finds that a model's assumptions do not accurately reflect real-world domestic forestry practices, it must include that information in the final report, and recommend against adoption of the model. For example, the Panel should make clear that the assumptions underlying stand-based accounting methodologies, as well as other assumptions or methodologies that constrain temporal and spatial scales, are inconsistent with U.S. forest management practices and thus are inappropriate for inclusion in an accounting framework.

Similarly, the Panel should not merely defer consideration to EPA of factors and conclusions that can inform EPA's policy decisions. Again, as a result of its expertise and experience, the Panel is uniquely qualified to assess the costs and benefits of various approaches and determine whether they can be successfully implemented from both a technical and practical perspective. The Panel must bring its experience to bear and inform EPA's decision-making process with sound, objective, and reliable information. It is appropriate, after identifying the pragmatic challenges, costs, and benefits of alternative approaches, to defer a legitimate policy choice for EPA with the benefit of the Panel's analysis of the underlying considerations. It is also appropriate for the Panel to conclude that the benefits of an alternative cannot be achieved without increasing transaction costs to the point that the proposal becomes technically or practically infeasible. These circumstances arise, for example, in facility-based chain-of-custody approaches that require the collection of detailed data from countless landowners and suppliers. In such circumstances, the Panel should inform EPA that the alternative is not viable and recommend against its adoption.

Finally, above all, the Panel must strive to reduce uncertainty and complexity. The Panel's conclusions will serve as the foundation for EPA's regulatory decisions, which, in turn, will have a critical and long-lasting influence on the future of sustainable bioenergy in the United States. As the Panel has noted, the *Framework* proposed by EPA presents "daunting technical challenges" for implementation due to its complexity. *Report*, at 6. Unfortunately, NAFO remains concerned that the Panel's efforts to

provide greater scientific precision and accuracy threaten to increase rather than decrease that complexity. In our prior comments, we provided a series of ways in which the Panel could reduce the complexity of the EPA's proposed regulatory program.[2] Those suggestions are summarized below. First, NAFO urges the Panel to limit its analysis to actual rather than hypothetical biomass energy feedstocks in order to develop generally applicable principles that could be applied uniformly to all biomass energy feedstocks without introducing complex analyses into the regulatory framework. Second, we urge the Panel to focus on spatial and temporal scales that are relevant to U.S. forestry practices in order to avoid complex analyses that are simply irrelevant to biomass energy production. Third, we urge the Panel to avoid consideration of factors that are beyond the scope of EPA's regulatory review. Fourth, we urge the Panel to accept the limits of science in resolving uncertainty and avoid recommending impractical data collection processes that produce diminishing returns in improved accuracy. After reviewing the revised *Report*, it is clear that the Panel has addressed some of these suggestions and has made efforts to reduce the complexity in its recommendations. However, on the whole NAFO remains concerned that the recommendations still are so complex that, if adopted, they unfortunately would have the perverse effect of discouraging or foreclosing the development of biomass energy due to the high transaction costs of compliance.

By applying the principles described above and focusing on the pragmatic realities of the forestry and biomass energy sectors, NAFO believes that it is possible to develop a simple and straightforward approach to accounting for biogenic CO_2 emissions from woody biomass that can be efficiently and effectively implemented. As described below, such an approach would be based on three threshold determinations, as informed by scientific theory and an understanding of the forestry and biomass industry sectors: (1) the adoption of a national scale; (2) a reference point baseline; and (3) a 100-year time scale. Once these three principles are adopted, the *Report*'s conclusions will properly inform EPA on appropriate and scientifically sound

[2] *See* National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Jan. 25, 2012) (NAFO January SAB Panel Comments), *available at* http://yosemite.epa.gov/sab/SABPRODUCT.NSF/MeetingCal/1DB6AEA2DF05DE7E8525793B0065B76E?OpenDocument.

alternatives, including the option of a categorical exclusion for biogenic CO_2 emissions. While a conclusion on how to treat biogenic emissions in a regulatory regime ultimately entails some policy choices for EPA, this recommended approach will enable EPA to make sure decisions based on the strongest possible scientific and technical considerations and, for that reason, should be included in the Panel's recommendations to EPA.

A. Biogenic CO_2 Regulations Must Be Based on a National Scale

Before an accounting methodology can be developed, there are a number of threshold issues which must be resolved, including the appropriate spatial scale for regulations. A national scale is the only alternative identified by EPA and the Panel that is supported by science, consistent with actual U.S. forest management practices, and practical to implement. While the ultimate selection of a spatial scale may entail policy considerations, the strong scientific and technical support for a national scale warrants its inclusion in the Panel's recommendations to EPA.

1. A Broad Spatial Scale is Required to Reflect Domestic Forest Management Practices

In order to properly reflect the way in which forests are managed and biomass feedstocks are produced, the Panel must recommend and EPA adopt a broad spatial scale. Because the goal of forest management is to produce a continuous supply of forest products, it is fundamentally inconsistent with forestry practices to isolate a single stand and arbitrarily choose a starting point for the carbon cycle. By choosing to start the carbon cycle at the time of planting or harvest such an approach creates an arbitrary carbon credit or debt.[3] While it is theoretically valid to view the carbon cycle in a linear fashion, tracking the movement of a single carbon atom or the carbon stocks on a single plot of land, this approach is inconsistent with the way that forests are managed in the United States. Thus, even if the stand-based accounting principles included in Walker (2010) and Biomass Energy Resource Center (2012) are scientifically valid in an abstract sense, *see* Report at 11, they should not be incorporated into an accounting

[3] *See* National Alliance of Forest Owners' Comments on "Deferral for CO2 emissions from Bioenergy and Other Biogenic Sources under the Prevention of Significant Deterioration and Title V Programs: Proposed Rule" (May 5, 2011) at 21 (NAFO Deferral Rule Comments) (submitted as Attachment 1 to NAFO October SAB Panel Comments).

framework as their primary assumptions are at odds with the established practices of the forestry sector as a whole.

Forest owners and managers do not treat each stand independently, but instead develop broad management plans at a landscape level. These plans are designed to produce diverse age classes and a constant supply of harvestable forest products over an extended period of time. As a result, the processes of CO_2 emission and sequestration occur simultaneously within the landscape.[4] Therefore, as NAFO has previously explained, the emissions associated with harvesting are offset on a continuous basis by regeneration that is occurring on the many other stands that are not harvested and forest stocks remain stable.[5] By focusing on the simultaneous emissions and regeneration, it is also apparent that a broad spatial scale is consistent with the science of the carbon cycle. While the carbon cycle is often viewed linearly, focusing on the growth, harvest, and regeneration of a single tree or stand, it can also be viewed in a single temporal plane as emissions and regeneration take place in different portions of a single, managed landscape. Thus adopting a broad spatial scale would be consistent with both the science of the carbon cycle and domestic forest management practices.

In the same manner, the forest products industries – including biomass energy – are integrated at a national level as individual producers also obtain supplies from a vast and ever-changing array of forest owners and suppliers.[6] Moreover, the producers compete with each other in the marketplace making it impossible to isolate impacts on small spatial scales. Indeed, as the Panel noted, a national scale is necessary to model forestry markets and the economic behavior of landowners. *Report* at 32-35. Thus, individual forest owners continually respond to market signals that are sent at national or even global scales, and shift their plans in anticipation of and response to new market demands. While geographic constraints may fix the location of forests and biomass energy facilities, the markets that they serve are unconstrained and treat all

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[4] Jim Boyer *et al.*, Carbon 101: Understanding the Carbon Cycle and the Forest Carbon Debate 5-7 (Dovetail Partners, Jan. 2012) (submitted to the Panel, Jan. 27, 2012), *available at* http://www.dovetailinc.org/reportsview/2012/responsible-materials/pjim-bowyerp/carbon-101.
[5] NAFO Deferral Rule Comments at 20.
[6] *See* National Alliance of Forest Owners' Comments on Call for Information: Information on Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources; 75 Fed. Reg. 41173 (July 15, 2010)" at 24-25 & n.45 (NAFO Call for Information Comments) (submitted as Attachment 2 to NAFO October SAB Panel Comments).

forest owners and suppliers equally. Thus, both market demands and the response from forest owners is best captured at a national scale. Indeed, this relationship can be readily observed in historical data as forest owners have repeatedly responded to new market demands, increasing national forest carbon stocks in the process.[7] Thus, the nature of forest products markets also requires that biogenic CO_2 emissions be considered on the broadest scale possible.

2. A National Scale is the Most Appropriate Choice Among Broad Scales

A national scale is clearly superior from a technical standpoint among other options such as a broad landscape-based spatial scale. First, a national scale responds most closely to the global nature of climate change and EPA's regulatory authority under the Clean Air Act to implement air policies at a national level. Thus, it avoids the problems of scale sensitivity and domestic leakage that plague regional approaches. *See Report* at 6. It also has the advantage of treating all biomass facilities equally and allowing market forces to dictate their location based on considerations such as supply, demand, and market efficiency. Second, a national scale will prove the most practical, predictable, and least burdensome approach to implement. As EPA and NAFO have noted, data from the U.S. Forest Service's Forest Inventory and Analysis (FIA) program and other sources are readily available and can be incorporated into a regulatory framework at little cost to EPA or the regulated entities. *Framework* at 31-32.[8] Thus adopting a national scale would serve the important purpose of reducing complexity and transaction costs and thereby promote climate-beneficial biomass energy.

The application of a national scale is also consistent with the Panel's own recommendations in its discussion of alternatives. The Panel's endorsement of the development of default BAFs for feedstock categories as an alternative to facility-specific BAFs would necessarily be applied at a national level. *Report* at 45. While the necessity of distinguishing among feedstocks is addressed below, the Panel's inclusion of this alternative shows that a national, rather than facility-based, approach to

[7] As Boyer *et al.* (2012) explain, domestic timber production increased by more than 50 percent from 1950 to 2010, while forest carbon stocks also increased. Boyer *et al* (2012) at 10.

[8] *See also*, National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Dec. 21, 2011) (NAFO December SAB Panel Comments) at 4, *available at* http://yosemite.epa.gov/sab/SABPRODUCT.NSF/MeetingCal/1DB6AEA2DF05DE7E8525793B0065B76E?OpenDocument..

accounting for biogenic CO_2 emissions is consistent with scientific theory and would be appropriate in practice.

While EPA might consider the alternative of incorporating a broad spatial scale by adopting a facility-based fuelshed approach, this does not withstand close scrutiny of sound science or pragmatic forest management considerations. As NAFO has previously explained, while a facility-based approach would theoretically allow EPA to treat each biomass facility independently for attribution purposes, such an approach would prove technically and practically infeasible. First, applying such an approach at the landscape level would be technically infeasible as individual facilities have overlapping fuelsheds and obtain feedstocks from a vast and constantly changing array of landowners.[9] Thus there is no way to distinguish between facility fuelsheds based on geography. The only alterative would then be a complex stand-based chain-of-custody approach, but such an approach would prove practically infeasible due to the high transaction costs.[10]

While the selection of a spatial scale ultimately entails some policy considerations by EPA, such policy decisions must be supported by reliable, credible, and sound scientific conclusions. Under that standard, it is not a choice where all options are equal. As the Panel recognizes, a national scale offers a number of important benefits that could ensure that the final regulations adopted by EPA can be successfully implemented. Having noted the shortcomings in EPA's proposed regional scale, *Report* at 26-27, the Panel should likewise assess the alternative choices and inform EPA of its conclusions. NAFO is confident that, if the Panel were to do so, a national scale approach would emerge as the only alternative that is fully supported by scientific and technical considerations and capable of efficient implementation.

B. A Reference Point Baseline Must Be Adopted Because No Other Alternative Is Capable of Implementation

One of the most challenging issues related to the development of an accounting framework for biogenic CO_2 emissions is the selection of a baseline. After considering several alternatives, EPA selected a reference point baseline because it provided "a straightforward way to assess an individual stationary source's emissions using existing

[9] NAFO Deferral Rule Comments at 21.
[10] NAFO January SAB Panel Comments at 13-14.

data." *Framework* at 42. NAFO supports this conclusion as a sound policy decision. In contrast, the Panel has proposed an anticipated future baseline that seeks to isolate the positive impact of biomass energy and determine what would have happened in the absence of additional biomass energy demand. Despite its theoretical logic, the Panel's attempt to describe such an approach only confirms the inherent complexity associated with anticipatory future baselines and demonstrates why EPA's straightforward and accurate approach must be applied.

As NAFO has noted in previous comments to the Panel, it is virtually impossible to isolate the impact of biomass energy and determine what would have happened without demand for biomass energy.[11] In reality, biomass energy is a small segment of the forestry sector and is intimately related to other forest products in both time and space. First, in most cases, biomass is not produced and harvested as a separate product for energy production. Instead, the forestry residues and milling residuals that are combusted for energy represent co-products that are produced alongside more valuable primary products. Indeed, even when roundwood is harvested and used directly for biomass energy, it is harvested as part of a thinning process that is designed to improve the quality of the remaining trees that will be harvested later for other, more valuable forest products.[12] It is simply not economical to grow and harvest mature trees for energy.[13] Instead, biomass co-products provide incremental economic value to the forest owner producing subtle, yet important, market signals that encourage biomass production and increase forest carbon stocks. As a result of this close relationship between forest products and the long time frames over which forest rotations occur, there is no simple and straightforward way to strip out biomass energy demand and determine what would have happened in its absence.

As the Panel is well aware, developing an anticipated future baseline is a daunting, although ultimately unnecessary, task. The approach described in the revised *Report*, which seeks to "combine the economic behavior of landowners with the associated dynamics of forest management and growth while allowing for competing uses of land for forestry, agriculture, and other activities," *Report* at 33, is a marked

[11] NAFO January SAB Panel Comments at 14-15.
[12] NAFO January SAB Panel Comments at 8.
[13] NAFO Deferral Rule Comments at 26 & n.69.

improvement over the approach described in the initial report. Importantly, this approach seeks to account for the decision-making processes of forest owners and reflects the anticipatory nature of investments in forests. *Report* at 34-35.[14] By doing so, it moves closer to identifying and attempting to account for all of the factors that can influence forest management decisions and the quantity of forest carbon stocks.

But even the inclusion of anticipatory investments and other market forces is not enough to produce a comprehensive model of the impact of biomass energy. As the *Report* notes elsewhere, the purpose of an accounting methodology is to account for the changes that "the atmosphere sees" as a result of biogenic CO_2 emissions from stationary sources. *E.g.*, *Report* at 15. But as currently formulated, the Panel's anticipated future baseline only considers what the forest sees, as it focuses solely on "changes in forest stocks." *Id.* at 2.3. This ignores the primary climate benefit of biomass energy – the displacement of fossil fuel emissions.[15] Thus, the assertion that "a reduction in the rate of increase of carbon stocks is equivalent to an increase in emissions," *id.* at 4, is incorrect. A reduction in the rate of increase in carbon stocks that results in a reduction in fossil fuel emissions could actually reduce total emissions. In other words, the anticipated future baseline described by the Panel, which is already hopelessly complex, must either become even more complex in order to accurately reflect what "the atmosphere sees" or remain fundamentally flawed for failing to fully capture the carbon cycle associated with forest-based biomass energy.

Further, the adoption of an anticipated future baseline would raise significant legal concerns and add uncertainty to the implementation process. By requiring forest owners to continue to increase forest carbon stocks at current rates, applying an anticipated future baseline to stationary source regulations would transform what is a voluntary, climate-friendly practice into a mandatory duty. If such a regulatory program were in place the baseline could also be applied elsewhere, for example in carbon offset programs. If these regulatory programs make carbon sequestration a mandatory duty for forest owners, they could present regulatory takings issues. Thus, the potential legal

[14] *See also* NAFO January SAB Panel Comments at 14-15.
[15] Boyer *et al.* (2012) at 9; NAFO December SAB Panel Comments at 2-3.

concerns associated with an anticipated future baseline would add further uncertainty and make implementation even more difficult.

In light of this complexity, and ultimately the uncertainty surrounding these future projections, *see Report* at 35-36, it was certainly appropriate for EPA to propose a reference point baseline. While it cannot entirely isolate the impact of biomass energy, a reference point baseline does describe what "the atmosphere sees" as a result of the forestry sector as a whole. As EPA recognized in the *Framework*, as long as forest carbon stocks are stable or increasing, the atmosphere does not see any increase in CO_2 concentrations as a result of the forestry sector. *Framework* at 25-26.[16] Indeed, when fossil fuel displacement and long-term storage in forest products are considered, the atmosphere is likely to see a reduction in CO_2 concentrations when forest carbon stocks remain stable.[17]

This is not to say that the predictive models referenced by the Panel have no purpose, but only that they are too complex, uncertain, unmanageable, and inaccurate in their current form to be included as a part of a regulatory program. Given these concerns over implementation, the Panel should support EPA's conclusion that a reference point baseline is appropriate and instead recommend ways that EPA can use these predictive models to monitor forest carbon stocks and perhaps refine its regulatory approach over time.[18]

C. The Climate Impact of Biogenic CO_2 Emissions Must Be Assessed on a Policy-Relevant 100-Year Time Scale

Finally, as the Panel appropriately recognizes, the selection of a time scale is an important policy decision that will have a significant effect on the final regulations adopted by EPA. But, despite the Panel's clear preference for a 100-year time scale *see Report* at 10-13, it declines to make a recommendation, asserting instead that the choice of time scales is a policy decision that must be resolved by EPA, *Report* at 44.

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[16] *See also* Roger A Sedjo, Carbon Neutrality and Bioenergy: A Zero-Sum Game?, Resources for the Future Discussion Paper 6 (April 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf.

[17] *See* NAFO Call for Information Comments at 7-8. As NAFO has previously explained, domestic forests have long been considered carbon sinks due to increasing forest carbon stocks and this trend is expected to continue in the future. *See generally*, NAFO Deferral Rule Comments; NAFO Call for Information Comments; National Alliance of Forest Owners Comments on "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (NAFO Tailoring Rule Comments) (submitted as Attachment 3 to NAFO October SAB Panel Comments).

[18] *See* NAFO January SAB Panel Comments at 13, 15.

While there are certainly tradeoffs between different time scales, sound science reflecting pragmatic considerations squarely favors a 100-year time scale. While other time scales may also be scientifically correct, *Report* at 11, only a 100-year time scale is consistent with EPA's regulatory goals, domestic forestry practices, and the administration's mandate promoting climate-beneficial renewable energy.

First, a 100-year time scale is consistent with EPA's regulatory goals for biogenic CO_2 emissions. EPA decided to defer regulation of biogenic CO_2 emissions, in part, to "conduct a study of the science surrounding biogenic CO_2 emissions and their role in the carbon cycle." 76 Fed. Reg. 43,490, 43,499 (July 20, 2011). Further, to understand how biogenic CO_2 emissions affect the climate, the time scale must help explain what "the atmosphere sees" as a result biogenic CO_2 emissions. A 100-year time scale can answer these questions. First, as the Panel notes, climate modeling studies have demonstrated that "the peak warming in response to greenhouse gas emissions is primarily sensitive to cumulative greenhouse gas emissions over a period of roughly 100 years, and is relatively insensitive to the emissions pathway within that timeframe." *Report* at 11. Thus adopting a 100-year time scale will allow EPA to consider the biogenic carbon cycle over time periods that are relevant to the global climate system. In contrast, as the Panel notes, shorter time periods such as those relied upon by Walker (2010) and others, focus on irrelevant intermediate time scales and do not provide an appropriate analysis of the biogenic carbon cycle because these intermediate effects prove transient and disappear over longer time scales. *Report* at 11.[19]

Second, a 100-year time scale is consistent with the manner in which forestry is practiced in the United States. As the *Report* notes "it is important to consider the turnover times of different biogenic feedstocks in justifying how they are incorporated into the framework." *Report* at 10. Although, as described above, the forest carbon cycle is best considered spatially on a landscape scale, it is nevertheless instructive to also consider it in a linear fashion for purposes of conducting a thorough scientific review. While in theory it would be possible to adopt a different time scale for each feedstock corresponding to its turnover time, such an approach is unnecessary as few,

[19] *See also* NAFO January SAB Panel Comments at 9.

if any, forests are managed with turnover times longer than 100 years. Thus by adopting a 100 year time scale, EPA would simplify the regulations while ensuring that, for any given feedstock, the landscape would have turned over at least once during the relevant time period and avoid the potential for short-term, transient carbon fluxes that could skew the analysis of the carbon cycle. In contrast, if a shorter time period – on the order of 30 to 50 years – were adopted, some feedstocks may not undergo a complete turnover during the study period. Thus, a 100 year time scale offers a simple, uniform approach to carbon accounting that is consistent with forestry practices.

Third, adoption of a 100-year time scale will provide appropriate incentives for biomass energy that are consistent with the administration's commitment to promoting renewable fuels, such as biomass.[20] As the Panel recognizes, the climate benefits of biomass, as compared to fossil fuels, become more pronounced as time scales increase. *Report* at 13. In other words, as NAFO has explained, the climate benefits of biomass energy continue to grow over time as each successive rotation used for biomass displaces more fossil fuels.[21] While a time scale of 100 years is likely sufficient to create the incentives needed to promote biomass energy, shorter time frames may have the perverse effect of discouraging biomass energy due to the differences in energy produced by equivalent amounts of biomass and fossil fuels. Thus, adopting a shorter time frame that discourages biomass energy produces the wrong kind of tradeoffs as it would lock in the continued combustion of fossil fuels in lieu of biomass, despite the recognized long term benefits biomass offers.

D. Recommendations for a Regulatory Approach to Biogenic CO_2 Emissions

In the event that a national scale, reference point baseline, and 100-year time scale are adopted, EPA can develop a scientifically accurate, predictable, and straightforward regulatory framework for woody biomass. First, within this framework, a categorical exclusion can be implemented as a practical matter because domestic forest management practices and sound science demonstrate that biomass energy will not

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[20] *See, e.g.*, President Barack Obama, *Remarks by the President on America's Energy Security*, March 30, 2011, *available at* http://www.whitehouse.gov/the-press-office/2011/03/30/remarks-president-americas-energy-security; Letter from President Barack Obama to Governors John Hoeven and Chet Culver (May 27, 2009), *available at* *http://governorsbiofuelscoalition.org/?page_id=461*; President Barack Obama, Memorandum for the Secretary of Agriculture, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, 74 Fed. Reg. 21,531-32 (May 5, 2009).

[21] NAFO December SAB Panel Comments at 2-3.

result in a net increase in atmospheric CO_2 concentrations on a policy-relevant spatial or temporal scale. Second, the continued applicability of the categorical exclusion will depend solely on the continued use of sustainable forestry practices, which can be monitored on a continuous basis through the comparison of carbon stocks over time.

1. A Categorical Exclusion is Appropriate as a Practical Matter as Woody Biomass Feedstocks Do Not Increase Net Atmospheric CO_2 Concentrations

When considered in the context of a national spatial scale and 100-year time scale, the scientific conclusions in the *Report* fully support a categorical exclusion for biogenic CO_2 emissions from woody biomass, even if such position cannot be accepted *a priori*. As NAFO noted in its previous comments, the Panel must rigorously test and apply the best science to determine the climate impacts of biogenic CO_2 emissions, but must do so with the goal of producing an accounting framework that is simple to implement and provides reasonable certainty to EPA and stakeholders. As NAFO previously observed, this can be accomplished by using sophisticated scientific models to confirm broadly applicable regulatory approaches.[22] Indeed, the Panel has already started down this path by endorsing feedstock-based BAF values as an alternative to facility-specific BAFs. However, this recommendation does not go far enough. Taken to its logical conclusion, it supports a categorical exclusion for woody biomass as all feedstocks derived from woody biomass would have a BAF of zero.

First, when the carbon cycle is applied on a national spatial scale, a categorical exclusion is warranted because carbon stocks are stable and are expected to remain so for many years to come. Unless and until carbon stocks decline on a national scale, there will be no net biogenic CO_2 emissions from woody biomass because emissions will be balanced by carbon sequestration on a regular and continuous basis.[23] As the Panel is aware, projecting forest carbon stocks far into the future is fraught with uncertainty, but even the most conservative models suggest that domestic forests will

[22] NAFO January SAB Panel Comments at 7-8.

[23] Sedjo (2011) at 6; Jim Boyer *et al*., Life Cycle Impacts of Forest Management and Bioenergy Production 1-13 (Dovetail Partners July 2011), *available at* http://www.dovetailinc.org/files/DovetailCABioenergy0711.pdf; Bruce Lipke, *et al.*, Life cycle impacts of forest management & wood utilization on carbon mitigation: knowns and unknowns, Carbon Management 2(3) 303-333 (2011), *available at* http://www.future-science.com/doi/pdf/10.4155.cmt.11.24.; *see also* NAFO December SAB Panel Comments at 2; NAFO Deferral Rule Comments at 2-5; NAFO Call for Information Comments at 9-10.

remain a net carbon sink for decades into the future.[24] Since the near-term trajectory of forest carbon stocks remains positive, it makes no sense to incorporate complex regulatory processes to address hypothetical concerns about events that may happen decades into the future. A more prudent approach is to incorporate a monitoring program, as described below, so that EPA can , if necessary, modify its regulatory approach in the future.[25]

Second, the Panel's own analyses based on a time path of decay or recovery confirm that biomass energy will not increase net atmospheric CO_2 concentrations over the relevant temporal and spatial scales. As discussed above, peak warming is insensitive to short-term carbon fluxes that occur on time scales shorter than 100 years. *Report* at 10-13. Thus, the question that the Panel, and ultimately EPA must answer is which, if any, biomass feedstocks that are used (or are expected to be used) for biomass energy will increase atmospheric CO_2 concentrations over time scales that exceed 100 years. There are none.

In this *Report* the Panel reverses course and asserts that forestry residues are not "anyway emissions" when combusted for energy because they do not decompose instantaneously. Instead, the Panel asserts that forestry residue emissions must be modeled through a complicated process that estimates a time path of decay. *Report* at 18-20 & App'x A. Even if the Panel's approach were accepted in theory, it is simply irrelevant when considered on an appropriate time scale. Regardless of the type of forestry residue considered, these models show that decomposition would be nearly complete after 100 years. Thus emissions from forestry residues are "anyway emissions" on a 100-year time scale, and there is no net increase in atmospheric CO_2 concentrations as a result of the combustion of these feedstocks. As a result, a categorical exclusion for forestry residues is warranted.

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[24] Further, as NAFO has previously explained, a regulatory approach that promotes biomass energy is likely to increase, rather than decrease forest stocks by creating incentives for individual landowners to maintain or even increase forested acres. NAFO Deferral Rule Comments at 3-4; NAFO December SAB Panel Comments at 2.

[25] Even if domestic forests were to become a net carbon source, the appropriate regulatory response is far from certain. For example, to the extent that the change is attributable to stochastic events such as fires and disease or increased urbanization, EPA may conclude that it need not alter its approach to regulating bioenergy.

By the same token, the scientific models endorsed by the Panel for evaluating the time path of recovery for long-recovery feedstocks confirms that these products will produce no net change in atmospheric CO_2 concentrations on policy-relevant time scales. Here, the Panel relies primarily on Cherubini (2012) and the GTP_{bio} factor.[26] As the Panel notes, under Cherubini's model this factor initially increases after harvest, but for all feedstocks used in biomass energy, it will return to zero within 100 years. *Report* at 11-13. Thus, these models confirm that the biomass feedstocks that are currently used (or expected to be used in the future) will have no affect on peak warming and, on policy relevant time scales, will not alter what "the atmosphere sees." Because there are few, if any, commercial forests managed on time scales longer than 100 years, all woody biomass would have a BAF of zero, meaning that a categorical exclusion would also be warranted for long-recovery feedstocks.

Thus, contrary to the Panel's current recommendations, which would require the application of a time path of decay or recovery for all woody biomass, *Report* at 11, 18-20, 44 a categorical exclusion can be applied instead. This demonstrates a fundamental flaw in the Panel's recommendations, which is not supported by the content of the *Report*. In the *Report*, the Panel appropriately recognizes that the relevance of these time path functions is dependant on the time scale, and that concepts such as carbon debt are not relevant when long time scales are considered. *Report* at 11. Thus, while these concepts, without doubt, are valuable tools for understanding the carbon cycle and the impact of biogenic CO_2 emissions on net atmospheric CO_2 concentrations, there is no *a priori* basis for including them in a final regulatory framework as the Panel suggests. Instead, as NAFO has previously suggested, these models can simply be used to confirm that, under all circumstances and for all feedstocks, biomass energy does not increase atmospheric CO_2 concentrations.[27] While NAFO urges the Panel to replace its current recommendations with a categorical exclusion for woody biomass, the Panel should, at a minimum, note

[26] As the Panel has noted elsewhere, the application of stand-based accounting methodologies – including those proposed by Cherubini *et al.* (2012) – are inconsistent with domestic forestry practices and produce arbitrary results because they ignore the relationship between harvested and regenerating stands in the larger landscape. *See Report* at 11 (criticizing carbon debt concept). Thus, while the concept of carbon debt may be scientifically valid in the abstract, it should not be applied to domestic forestry practices.

[27] NAFO January SAB Panel Comments at 7-8.

that its recommendations to incorporate time paths of decay and recovery are in fact scale dependant and provide alternative recommendations that can be incorporated if EPA chooses to adopt a longer time scale.

2. A Continuous Monitoring Program Can Be Used to Ensure that Forest Carbon Stocks Remain Stable Over Time

While a categorical exclusion is supported by the science included in the Panel's *Report*, it is also based upon the fact that forest carbon stocks are – and will continue to be – stable or increasing.[28] Given the critical role that sustainable forestry practices play in supporting a categorical exclusion, it would be appropriate to include a monitoring component into a regulatory framework to ensure that current trends continue. This is what EPA proposed by requiring short-term comparisons of carbon stocks over time. *Framework* at 25-26.

Contrary to the Panel's assertions, continuous monitoring using, for example, annual FIA data is not inconsistent with the adoption of a 100-year time scale as the two time frames address different issues. The 100-year time scale addresses the relevant time period over which emissions should be considered. But the assumption that there will be no net increase in atmospheric CO_2 concentrations is implicitly dependant on the fact that the forests under consideration will be managed sustainably. Indeed, the Panel recognizes this in its alternative proposal for a certification program based on carbon neutrality and "sustainability" principles. *Report* at 7, 45-47.[29] Thus, even under a 100-year time scale, a monitoring approach is needed to ensure that forestry is practiced sustainably and that harvested stands are regenerated.

While the monitoring approach included in EPA's *Framework* is national in scale and cannot establish stand-based linkages, that is not necessary to demonstrate sustainability over time. A national scale approach that incorporates annual FIA data offers a practical and cost effective method to ensure that forestry is practiced

[28] *See generally*, NAFO Deferral Rule Comments; NAFO Call for Information Comments; NAFO Tailoring Rule Comments.

[29] While the Panel's revised certification proposal appropriately responded to NAFO's concerns, s*ee* NAFO January SAB Panel Comments at 12, by focusing on carbon neutrality rather than existing certification programs that are focused on other environmental co-benefits, a certification program will still prove complex and difficult to implement. First, a significant portion of private forests are owned by small landowners for whom certification can be prohibitively expensive. Moreover, applying a certification program at the landowner level will create significant administrative and recordkeeping challenges for the biomass energy facilities that will be subject to the regulations.

sustainably *in the aggregate*. While small changes can take place on the stand level as individual owners make management changes, a national scale monitoring system will ensure that, as a whole, forestry is practiced sustainably and that there is no net increase in atmospheric CO_2 concentrations as a result of biogenic emissions from woody biomass. By including such a monitoring system, EPA can implement a categorical exclusion with the assurance that it can take further regulatory action if the factual circumstances supporting a categorical exclusion change.

Conclusion

NAFO continues to support EPA's decision to seek an independent peer review of its proposed accounting methodology for biogenic CO_2 emissions and applauds the Panel's efforts to assess this complex field. We urge the Panel to keep implementation at the forefront as it formulates its recommendations and hope that our comments will assist the Panel in identifying means to simplify its final recommendations to EPA. NAFO is standing by to provide further information or answer any questions that the Panel may have.

Respectfully Submitted,
David P. Tenny
President and CEO
National Alliance of Forest Owners

ATTACHMENT E

May 18, 2012

Submitted via email
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Re: National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel

Dear Dr. Stallworth and Panel Members:

The National Alliance of Forest Owners ("NAFO") welcomes the opportunity to submit these comments to the Environmental Protection Agency's ("EPA's") Science Advisory Board ("SAB") Biogenic Carbon Emissions Panel ("Panel"), in advance of its May 23, 2012 conference call to discuss the Panel's revised *5-9-12 Deliberative Draft Report* ("*Report*") on EPA's *Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources* (Sept. 2011) ("*Framework*"). NAFO and its members are key stakeholders who contribute to the solutions that private forests and forest biomass bring to lowering greenhouse gas ("GHG") emissions and, in turn, are keenly impacted by any controls or regulations on biogenic GHG emissions. NAFO—as the party that filed the Petition for Reconsideration with EPA that led to the present SAB process—is an acutely interested stakeholder in EPA's reconsideration of the treatment of biogenic CO_2 emissions from stationary sources and the scientific analysis EPA will utilize in making ultimate policy and regulatory decisions on how to treat biogenic CO_2 emissions. A detailed summary of NAFO's past participation was included in its October 18, 2011 comments to this Panel.[1] As we have done from the earliest outset of EPA's review of the treatment of biogenic GHG emissions, we remain prepared to provide our significant scientific, technical, and pragmatic expertise and experience and a considerable body of scientific studies and analyses to assist the Panel throughout its review and evaluation of the *Framework*.

Introduction

In his 2012 State of the Union Address, President Obama articulated an "all-of-the-above" strategy to meet our country's energy needs. Renewable energy, particularly from

[1] National Alliance of Forest Owners' Comments to the Science Advisory Board Biogenic Carbon Emissions Panel (Oct. 18, 2011) ("NAFO October SAB Panel Comments").

reliable, carbon-beneficial baseload sources such as biomass, is a key aspect of the President's approach and forms an important policy context for the work of EPA, the SAB, and the Panel. The work of the Panel should be oriented toward helping the Administration and our nation achieve energy policy objectives that will preserve and increase our options, rather than limiting or foreclosing them, while at the same time providing a pathway for reducing overall CO_2 concentrations in the atmosphere over the long term.

As NAFO and its members have explained in earlier comments and presentations to the Panel and EPA, NAFO is committed to helping our nation achieve its energy potential and reduce GHG emissions through the use of biomass as a renewable energy source that offers important solutions on both fronts. EPA's decision to reconsider its approach to regulating biogenic CO_2 emissions from stationary sources is the right first step toward ensuring the continued development and use of bioenergy, which, in turn, will lead to significant benefits in addressing climate change consistent with the President's plan. It is NAFO's expectation that, with the assistance of the Panel's expertise, EPA will develop a regulatory framework that accurately reflects the climate benefits offered by biomass and promotes appropriate distinctions between bioenergy and other types of energy, such as fossil fuel combustion, thereby encouraging the use of biomass energy as a critical component of a long-term national "all-of-the-above" energy portfolio.

As the Panel moves forward to finalize its *Report* and recommendations to EPA, we respectfully encourage the Panel to assess its progress through the lens of whether the *Report* will assist EPA in its ultimate goal of developing policy for biogenic CO_2 emissions from stationary sources that is "scientifically sound and manageable in practice"[2] and consistent with the President's goals. EPA will rely on the outcome of the SAB peer review process as an important consideration among scientific, legal, and pragmatic issues in developing further policies regarding the treatment of biogenic CO_2 emissions; policies that will, in turn, play a significant role in whether our nation can utilize energy that contributes solutions to our nation's climate change challenges. Thus, the guidance and advice provided by the Panel will play an important role among these factors in shaping the future of biomass energy policy. Given this role, it is critical that the Panel's *Report* and recommendations consider both sound science and the practical realities of the forestry and forest products industries that have been presented to the Panel. Unless EPA can apply the Panel's recommendations in a real-world policy context,

[2] Letter from Gina McCarthy to Roger Martella (Jan. 12, 2011) granting NAFO's Petition for Reconsideration, *available at* http://www.epa.gov/nsr/ghgdocs/McCarthytoMartella.pdf.

the *Report* will fall short of its potential, and the Panel will lose an important opportunity to inform the Agency in a manner that translates into good policy..

First, the Panel must ensure that its recommendations are clear, within the scope of its charge, unambiguous, and internally consistent. EPA will be hindered in considering the Panel's recommendations unless the Panel consistently provides in-depth scientific and technical analysis while reserving EPA the discretion to make final policy judgments based on a wider range of factors. A final *Report* that contains internal inconsistencies will preclude effective implementation. In some cases, for example the discussion of time scales, the *Report* fails to meet this objective, foregoing the opportunity to inform EPA of the scientific and technical analysis important to making a final policy judgment. In other cases, for example the adoption of a carbon-debt framework, the *Report* makes implicit policy judgments on its own without providing any justification at all. In either case, the *Report* fails to fulfill the role of a robust peer review.

Likewise, EPA will be unable to make full use the Panel's intended considerations if they are not clearly communicated to EPA in the *Report*. Inconsistent use of key terms creates confusion and will hinder EPA's ability to consult the *Report* in fashioning policies. For example, the *Report* includes inconsistent references to atmospheric CO_2 concentrations, forest carbon stocks, and land carbon stocks. Unless the Panel clarifies these and other inconsistencies, EPA will be unable to make full use of the Panel's work in determining the proper focus for its biogenic CO_2 policies.

Second, the Panel must ensure that the *Report* and recommendations fully inform EPA regarding both the scientific validity and technical feasibility of the accounting approaches that it considers. For example, to meet EPA's objectives for the peer review process, the Panel must go beyond an abstract description of existing hypothetical models and bring its expertise to bear through an evaluation of the validity and practical feasibility of competing approaches. In order for EPA to fully benefit from the Panel's *Report* in formulating its policy options, the *Report* must analyze the full range of considerations and alternatives so that the Agency can make fully informed policy decisions.

Third, the Panel must ensure that its recommendations are capable of efficient implementation. The Panel's charge is not an academic exercise in the possible, but a peer review of the science and technical aspects underlying an accounting framework that will eventually be applied in a real-world policy setting. Thus, before making its final recommendations, the Panel must ensure that they are scientifically sound and technically feasible. The Panel must avoid recommendations, such as an anticipated future baseline, that

are so complex and fraught with uncertainty that they will either be unable to produce reliable results or incapable of implementation in the field. Similarly, the Panel must avoid recommendations, such as the development of a carbon-based forest certification program that will introduce additional complexity and regulation, while inviting the inclusion of other environmental considerations or co-benefits that move well beyond the question of GHG emissions and exceed the scope of the Panel's charge. Finally, the Panel must be careful to avoid recommendations that would mandate the continued production of positive externalities of private carbon on private forestlands and raise the issue of a regulatory taking by EPA.

I. The Panel Must Provide EPA With Clear and Consistent Recommendations That Are Capable of Implementation

As the Panel continues to refine the draft *Report* and finalize its recommendations to EPA, it must be sure that it provides a clear and internally consistent *Report* and recommendations. The objective of the Panel's peer review process is to aid EPA in developing a policy for biogenic CO_2 emissions from stationary sources. If the Panel's *Report* is unclear or contains material internal inconsistencies, EPA will lack the guidance it needs to develop science-based, practical policies for biogenic CO_2 emissions. First, the Panel must be sure that it takes a consistent approach to policy questions, leaving such choices to EPA unless certain policy options are foreclosed by science or feasibility issues. Second, the Panel must be sure to define key terms and use them consistently to avoid any confusion regarding the Panel's findings and conclusions.

A. The Panel Must Take a Consistent Approach with Respect to Policy Judgments

In prior comments, NAFO has urged the Panel to distinguish between policy and scientific questions and to focus its review on questions of scientific validity and technical and practical feasibility.[3] In general, the Panel has recognized its role in this peer review process to "offer scientific observations that may inform the Administrator's policy decision." *Report* at 15. Still, despite this explicit acknowledgement, the *Report* and recommendations do not consistently apply this principle. At times, the Panel identifies policy decisions, but fails to include the scientific and practical observations that will guide EPA's ultimate policy choice. At other times, the Panel makes policy judgments that are not supported by scientific or practical considerations. In all cases, NAFO urges the Panel to provide sound scientific and technical advice to EPA, leaving ultimate policy decisions to the Agency unless the Panel's scientific and technical analysis requires the elimination of a particular policy option.

[3] NAFO October SAB Panel Comments at 3-6.

1. The Panel Must Provide Scientific and Technical Analysis, Even When It Identifies Policy Decisions That Must Be Made by EPA

On several important issues, the *Report* appropriately identifies policy decisions that should be left for EPA, yet fails to provide analysis that will inform EPA's policy decision. For example, the Panel correctly notes that applying a categorical exclusion is ultimately a policy decision: "A decision about a categorical inclusion or exclusion will likely involve many considerations that fall outside the SAB's scientific purview such as legality, feasibility and, possibly, political will." *Report* at 15. However, after contending that some biomass feedstocks are carbon neutral, the *Report* fails to provide any scientific or technical analysis of the carbon neutrality of the full range of feedstocks that are actually used for biomass energy. As NAFO has explained, a scientific analysis of existing and anticipated biomass energy feedstocks demonstrates that all relevant biomass energy feedstocks are in fact carbon neutral when considered at the appropriate scale.[4] By failing to engage a full scientific and technical analysis, the *Report* creates the perception that science cannot inform EPA's policy choice on this important question. This is not the case.

The *Report* takes the same approach when discussing time scales, asserting that "[t]here is no scientifically correct answer here for choosing a time horizon" and simply recommending that "the *Framework* should be clear about what time horizon it uses." *Report* at 14. While it is undoubtedly true that carbon cycles through storage pools on a variety of time scales, the *Report*'s limited examination of these time scales fails to provide EPA with any basis for choosing an appropriate time scale for a policy that will account for biogenic CO_2 emissions from stationary sources. Specifically, the *Report* is devoid of any analysis or judgment regarding the relevance of each time scale to forest management practices or climate change mitigation. In particular, it fails to address the distorting impact of arbitrarily short timeframes on the apparent dynamics of the forest carbon cycle. By failing to take this critical next step, the *Report* deprives EPA of valuable information that would allow the Agency to better understand how biogenic CO_2 emissions affect atmospheric CO_2 concentrations.

It is not enough for the Panel to identify policy judgements that must be made in order to implement a policy for biogenic CO_2 emissions from stationary sources. Instead the Panel must use its collective expertise and provide EPA with the scientific support, tools, and analysis needed to make those policy decisions.

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[4] National Alliance of Forest Owners' Comments to the Scientific Advisory Board Biogenic Carbon Emissions Panel (Jan. 25, 2012) at 7-8.

2. *The Panel Must Avoid Making Policy Judgments Without Scientific or Technical Justification*

Of similar concern are a number of instances where the *Report* implicitly adopts policy judgments without providing any scientific or technical justification. Not only does this preempt EPA's authority to make policy determinations, it fails to disclose the fact that the Panel has made a policy judgment at all. As a result, EPA may inadvertently adopt the Panel's recommendations without fully appreciating the incorporation of policy judgments that constrain EPA's decision space.

For example, the Panel repeatedly endorses the concept of a carbon debt without providing any justification for the many questionable assumptions in this approach. *See Report*, Letter to Administrator Jackson at 3; *Report* at 11, App'x C. As NAFO has explained in prior comments, the concept of a carbon debt is ill suited to a generally applicable regulatory program because it is inconsistent with U.S. forestry practices. The concept of a carbon debt is dependent upon a stand-based approach where the harvest and combustion of biomass results in a "pulse" of emissions. This approach is simply not applicable to private forest management, where forests are managed on a landscape level to meet an ongoing demand for goods, services, and uses, which requires a predictable continuation of a productive forest landbase. Moreover, the concept of a carbon debt arbitrarily selects the moment before harvest as time zero, resulting in an immediate emissions pulse. The Panel fails to explain why this approach is preferable to more realistic approaches where forest growth precedes harvest or where harvest and growth occur simultaneously on the landscape. The result of the Panel's adoption of a carbon debt approach is a significant bias against woody biomass, especially "long-recovery" feedstocks, even though empirical evidence demonstrates that private forest owners have successfully managed these products on a sustainable basis over an extended period of time. In fact, over the past 60 years, the total forest extent in the U.S. has remained stable and total forest carbon on the existing landbase has increased by more than 50 percent, while forest owners have produced more than 800 billion cubic feet of timber for forest products.[5]

Likewise, the Panel offers no scientific justification for the policy judgment that the *Framework*'s baseline must incorporate "additionality." Specifically, the *Report* fails to explain why the concept of additionality—as applied to forest carbon stocks—is necessary to determine "what the atmosphere/ climate sees" as a result of biomass energy. As NAFO has previously explained, biomass energy has no net impact on atmospheric CO_2 concentrations as long as

[5] Jim Boyer, *et al.*, Carbon 101: Understanding the Carbon Cycle and the Forest Carbon Debate 9 (Dovetail Partners, Jan. 2012) (submitted to the Panel, Jan. 27, 2012), *available at* http://www.dovetailinc.org/reportsview/2012/responsible-materials/pjim-bowyerp/carbon-101.

biogenic CO_2 emissions are balanced by carbon sequestration in growing forests. The *Report* offers no scientific or technical justification why biomass energy must prove itself more than carbon neutral in order to be excluded from PSD and Title V thresholds. Further, the *Report* glosses over the fact that EPA's initial decision to apply a reference point baseline was explicitly presented as a policy choice, based on the complexities and uncertainties associated with alternative baselines. This makes the Panel's additionality approach nothing more than a policy recommendation. Rather than asserting its own policy preferences into the *Report*, the Panel must focus on scientific and technical analysis, making policy recommendations only when they are compelled by scientific and technical considerations.

Furthermore, as NAFO has stated previously, the Panel must be especially careful not to interject a policy recommendation such as additionality in a way that could result in a regulatory taking. Production of forest carbon continues to be a positive externality in that private forest owners have not yet been compensated for the tremendous potential market value of the carbon mitigation that their forest provide against industrial emissions from fossil fuels and other non-cyclical sources. To suddenly incorporate this carbon mitigation into a regulatory baseline that will undoubtedly have precedential impacts on future forest carbon policies may deprive forest owners of a significant unrealized interest in private property. This would have both the effect of devaluing working forests in the marketplace (a further reduction in real market value) and diminishing or forecosing altogether the use of forests as a voluntary source of carbon mitigation, either as an alternative to fossil fuels within the PSD, Title V, or other comparable regulations or as a voluntary offset in the marketplace under an existing or future carbon reduction framework.

B. The Panel Must Avoid Ambiguity in its Recommendations and Clearly Define Key Terms

In order to provide EPA with guidance on developing policies for biogenic CO_2 emissions, the Panel must ensure that its final *Report* and recommendations are free from ambiguity. To do so, the Panel must carefully define key terms and ensure they are used consistently throughout the *Report*. In several instances, the *Report* appears to refer to central concepts with related, yet distinct terms. As a result, the *Report*'s meaning is clouded.

For example, in the "Letter to Administrator Jackson," the *Report* notes that *Framework* "should provide a means to estimate . . . what the atmosphere/ climate sees" as a result of biogenic CO_2 emissions. *Report,* Letter to Administrator Jackson at 2. However, the text of the *Report* does not address this issue and instead refers through the *Report* to changes in "forest carbon stocks" and "land carbon stocks." While each of these terms is relevant to the carbon cycle and accounting for CO_2 emissions, each describes a different carbon pool, creating

ambiguity. In particular, there is ambiguity over the inclusion of fossil fuel displacement. A focus on what the atmosphere sees would necessarily include changes in each emissions pathway, including fossil fuel emissions, meaning that biomass energy would be credited with displacing fossil fuel. However, measurement of forest carbon stocks would exclude such considerations. When construed broadly, "land carbon stocks" could include geologic storage and thus incorporate avoided fossil fuel emissions, but that is not the only plausible interpretation. Unless the Panel clarifies these ambiguities by adopting and defining a single term, EPA may misinterpret the Panel's intention, resulting in confusion in the development of policies for biogenic CO_2 emissions.

Similarly, the Panel includes considerable ambiguity with respect to its determination of an anticipated future baseline. In some cases, the Panel appears to recommend a hypothetical baseline based on "what would have occurred in the absence of biomass usage." *E.g. Report* at 28. In other places the *Report* focuses on the incremental impact of future growth in the biomass energy sector. Given the significant investments in biomass energy that have already occurred, the difference in these two approaches is significant. Before making recommendations to EPA, the Panel must clarify its intent here and include a science-based justification for its approach rather than simply making a policy assertion. As stated previously, the Panel must be very careful to not simply assume a baseline that could have real-world economic and market impacts on the value of forest carbon that presently belongs to forest owners. The Panel would more appropriately identify the alternative baseline approaches that exist, provide the science for how the forest carbon cycle really works at a non-arbitrary scale, and leave to the EPA the policy question of an appropriate baseline.

II. The Panel Must Use Its Expertise to Provide EPA with a Full Range of Scientific Perspectives That Will Assist the Agency in Developing Regulatory Policies for Biogenic CO_2 Emissions

As the Panel notes in the *Report*, "[t]he question before the Agency, and hence, the motivation for the *Framework*, is whether and how to consider biogenic greenhouse gas emissions in determining these [PSD and Title V] thresholds for permitting." *Report* at 2. To be of the greatest value to EPA's ultimate decision, the Panel should provide its expert judgment on the scientific validity and potential applicability of competing accounting approaches. If Panelists disagree on important scientific issues, EPA's overall goals will be best met by presenting in the *Report* a range of views that provide EPA with deep analysis and preserve the Agency's discretion to make important policy decisions.

Over the past two years, EPA has actively engaged interested stakeholders in order to develop an understanding of the science associated with biogenic CO_2 emissions. Specifically,

EPA has asked all stakeholders to "survey[] and assess[] the science" related to biomass energy and "evaluat[e] different accounting approaches and options" for measuring biogenic CO_2 emissions.[6] The draft *Framework* was the culmination of EPA's own "detailed examination of the science associated with CO_2 emissions from biomass-powered and other biogenic stationary sources."[7] As a result of the input from interested stakeholders as well as EPA's own scientific review, the Agency is well aware of the significant body of research related to biogenic CO_2 emissions. While the Panel's citation to recent, and in some cases still unpublished, research will undoubtedly provide EPA with additional insight beyond what it gleaned through the Call For Information and its own detailed analysis, that is not the Panel's sole and primary purpose.

Instead, EPA convened a Panel of the foremost experts in the fields of study closely related to biogenic CO_2 accounting who would be capable of critiquing EPA's *Framework* and providing expert analysis and judgment while informing EPA on a range of viewpoints with respect to both the existing scientific literature and EPA's incorporation of that information into its accounting *Framework*. Thus, it is not enough for the Panel to simply review relevant scientific research or merely identify alternative approaches to accounting for biogenic CO_2 emissions. Instead, the Panel must go a step further, evaluating the research and alternatives it identifies, providing EPA with an opinion as to the validity of the science and the potential for implementation, and thereby presenting EPA with a full range of expert scientific considerations on a variety of options that will inform EPA's ultimate policy discretion.

For example, when discussing market and biological responses to increased biomass demand, the *Report* identified a number of models that could be used and notes that "they differ in scope, ecological and market resolution, and how future markets are formed." *Report* at 34. While the *Report* describes each model objectively, it fails to include any evaluation or subjective assessment that would assist EPA in choosing among them. In the same manner, the *Report* fails to include any evaluation of the potential applicability of the sometimes conflicting time scales identified as "inherent in the carbon cycle and climate system." *Report* at 10. For example, the *Report* identifies Cherubini et al. (2012) as "[a]n example of a climate-relevant framework for exploring intertemporal effects," *Report* at 6, without providing an evaluation of the model's scientific validity or its potential applicability to EPA's policy for biogenic CO_2 emissions from stationary sources. Ultimately, EPA must determine which, if any,

[6] Call for Information: Information on Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources, 75 Fed. Reg. 41,173, 41,174 (July 15, 2010).
[7] Letter from Gina McCarthy to Roger Martella (Jan. 12, 2011).

of the models identified in the *Report* are applicable to EPA's regulation of stationary sources under the Clean Air Act and, if so, whether they are capable of efficient implementation. Unless the Panel expands upon its objective descriptions, it will lose the opportunity to share its expertise with EPA.

III. The Panel Must be Cognizant of Complexity and Uncertainty

As the Panel prepares its final *Report* and recommendations to EPA, it must focus again on the context in which the *Report* will be used. EPA's ultimate goal is to develop a policy to account for biogenic CO_2 emissions from stationary sources in a manner consistent with the President's overall energy policy. Thus, the Panel's recommendations will be of little value unless they are capable of implementation in that policy context. Recommendations that add layer upon layer of complexity and uncertainty will be of no value to EPA because they will prove technically and practically infeasible. As NAFO has explained in prior comments, the Panel must focus on the practical realities of the forestry and forest products industries and continually ask whether its recommendations are practical and capable of efficient implementation. Like its predecessors, the most recent draft *Report* does little remedy to the complexity and technical challenges that would make implementation of EPA's *Framework* a "daunting" task. *Report* at 7. Instead the solutions offered by the Panel, such as an anticipated future baseline and the use of forest certification programs, are, in some respects, more complex than the *Framework* that they seek to replace.

As EPA and the Panel have recognized, biomass is a clean, renewable fuel source that can offer important climate benefits by displacing fossil fuels. As a result, it will play a critical role in the "all-of-the-above" energy strategy needed to meet our nation's renewable energy goals. While there is undoubtedly value in quantifying the benefits that biomass energy offers, detailed and overly costly analyses and recordkeeping requirements do not necessarily improve policy outcomes or aid in the implementation of regulatory programs. An unnecessarily complex approach with high compliance costs will instead create market ambivalence for the bioenergy sector and reduce the sector's ability to produce the energy and climate benefits it has the capacity to provide. Indeed, if compliance burdens and costs become too great, a policy intended to promote renewable bioenergy could have the perverse effect of discouraging research, development, and growth in this important industry along with the associated environmental benefits it will provide.

If the Panel's scientific review is divorced from pragmatic considerations of the way that forestry is practiced on private lands in the United States, its recommendations will not be capable of efficient implementation. The practice of forestry is inherently complex. Thousands

of forest owners participate in this sector by making long-term investments with the expectation of future returns as they manage and harvest their forests over long time periods. The industries that comprise the forest products sector operate across the forested landscapes, sourcing materials from a diverse and ever-changing array of forest owners and suppliers to meet their need for a continuous supply of raw materials over time. While diverse and decentralized, these actors operate efficiently, using their inherent flexibilty to adjust to changing conditions while ensuring the stable production of high-value, timber products along with co-products such as bioenergy feedstocks. However, the very characteristics that allow these markets to operate efficiently and adjust to changing conditions make them difficult to predict through modeling. Likewise imposing a regulatory overlay with detailed monitoring and recordkeeping requirements would add significant costs that will limit, if not remove entirely, the return on investment forest owners might otherwise receive through the biomass marketplace.

In order to obtain the renewable energy and climate benefits biomass energy can provide, EPA's policies for biogenic CO_2 emissions—as informed by the Panel's *Report*—must send the proper market signals to encourage bioenergy development. Rather than adding cost and complexity for the sake of marginally improved accuracy, the Panel must consider whether increased accuracy is necessary and worth the transactional costs of compliance. While it is important for the Panel and EPA to "get the science right," the Panel must do so within the broader context of mitigating climate change through an understanding of the economics of natural resource management. Policies that incorporate unnecessary complexity will add significant compliance costs and create perverse incentives in the marketplace that will discourage, rather than incent the development of clean, renewable biomass energy. In order for biomass energy to particpate as an effective part of an "all-of-the-above" energy strategy, EPA must incorporate a robust economic analysis into its overall consideration of biogenic carbon emissions. Unless it takes such an approach the Panel will not be advising EPA in a manner that will enable the Agency to develop a practical and straightforward policy that accounts for biogenic CO_2 emissions in a manner that can be implemented efficiently in the marketplace at reasonable cost to the Agency, forest owners and operators, and energy producers alike.

A. The Complexity and Uncertainty Surrounding An Anticipated Future Baseline Will Preclude Effective Implementation

The most troublesome example of the Panel's perpetuation of complexity involves its recommendation to incorporate additionality and an anticipated future baseline. As explained above, the Panel offers no scientific justification for its insistence on the inclusion of an

anticipated future, which is at its core a policy determination. Nevertheless, among its recommendations to EPA, the *Report* states:

> For long rotation woody biomass, sophisticated modeling is needed to capture the complex interaction between electricity generating facilities and forest markets, in particular, market driven shifts in planting, management and harvests, induce displacement of existing users of biomass, land use changes, including interactions between agriculture and forests and the relative contribution of different feedstock source categories (logging residuals, pulpwood or roundwood harvest).

Report at 44. Without question, the interactions within the forestry and forest product industries are complex and difficult to predict *ex ante*. Market participants make decisions not based on exact mathematical algorithms, but rather on their best educated predictions of how future markets may unfold. Management decisions made 40 years ago, for example, could not possibly have predicted the collapse of the housing market that occurred in 2007. Likewise, management decisions made today cannot possibly predict the full range of market circumstances that will exist in 10, 20, or 30 years or more. Thus, an objective assessment of these interactions compels the conclusion that they are simply too complex and speculative to model with any certainty and are thus of little or no value in an accounting framework. In contrast, the reference point baseline proposed by EPA applies a reasonable and conservative emperical benchmark that can be used in a practical framework that is capable of implementation.

1. An Anticipated Future Baseline is Incapable of Implementation

According to the *Report*, the purpose of an anticipated future baseline is to incorporate "additionality," that is, the impact on atmospheric CO_2 concentrations that can be attributed to biogenic emissions from stationary sources. This is no small task. First, it is virtually impossible to isolate the "market effect" of biomass energy. *See Report* at 33. Biomass energy feedstocks are among the lowest value forest products.[8] As a result, biomass energy feedstocks are rarely, if ever, produced on their own or act as a sole determiner of market behavior. Instead, residues, residuals, and pre-commercial thinnings are incidental co-products in the production of other, higher value forest products. While forest owners respond to market signals for biomass energy by altering forest management plans to facilitate the production of energy feestocks and maximize overall value, the magnitude of these market signals is often overshadowed by that of primary forest products. While it is difficult to separate market signals when multiple co-

[8] Peter J. Ince, *Global Sustainable Timber Supply and Demand*, *in* Sustainable Development in the Forest Products Industry, Chapter 2, 40 (2010), *available at* http://www.fpl.fs.fed.us/documnts/pdf2010/fpl_2010_ince001.pdf.

products are produced together, it is virtually impossible to isolate the smallest market signal and determine how forest management plans might have changed in the absence of that additional market driver.

Even if it were possible to isolate the market effect of biomass energy, it would be impossible to project these market forces into the future to develop an anticipated future trajectory, with or without biomass energy. Putting aside the complexity associated with the production of multiple co-products over time, the multitude of exogenous factors that influence the forestry and forest products industries make any attempt to predict the future hopelessly uncertain. Without speculating about what might happen in the future, a review of the past several years highlights the uncertainty associated with market and non-market forces that are beyond the control of either forest owners or biomass energy facilities. For example, short-term, unpredictable market trends can have a significant effect on forest management activities and forest carbon stocks. Weakness in the housing and construction markets since 2007 have resulted in reduced demand for saw timber and a corresponding short-term increase in forest carbon stocks. At the same time, the mountain pine beetle has been spreading rapidly, infecting entire forests in Canada and the northwestern U.S. Despite the profound impact that these two events have had on forestry markets and forest carbon stocks, neither could have been predicted *ex ante* with any degree of certainty had an anticipated future baseline been constructed a decade ago. Nor could forecasters ten years ago have contemplated the impact of low-cost natural gas on energy development decisions today.

By the same token, some significant drivers of forest carbon stocks over the next decade may well be market and non-market forces that are yet to be identified. Thus, to develop an anticipated future baseline, EPA would have to speculate as to the relationship between overall anticipated future demand and the investment and management activities that might respond to that demand. This will require, for example, speculation regarding the return of the housing market, which by itself will result in a significant increase in feedstock for power generation independently from EPA's policy choices. These are forecasts that even the most sophisiticated economists struggle to determine in the private sector. As a result of this inherent uncertainty, private forest owners develop flexible management plans that allow them to adjust to changing and unforeseen market demands, while still securing a reasonable return on their investments. To transpose these uncertain forecasts into a regulatory framework and extrapolate them over the course of decades would provide very little reliable information or real value. In light of this inherent uncertainty, even the best models will be unable to predict with any degree of useful certainty what the future will hold for the forestry and forest product sectors.

As already noted, the speculation associated with a future projected baseline is further complicated by the fact that it locks into regulation valuable carbon that is currently held in private ownership and contributed to the public good as a positive externality. Future markets for this valuable carbon will be implicated in any baseline decision proposed by the Panel.

Finally, even the modeling approaches described in the *Report* fail to include all of the necessary parameters needed to project the change in atmospheric CO_2 concentrations attributable to biomass energy. To truly project an anticipated future baseline, EPA cannot, as the *Report* suggests, consider the impact of biomass energy "relative to emissions that would have occurred in the absence of biomass usage." *Framework* at 28. At present, biomass energy is firmly established as a central component of this nation's renewable energy infrastructure.[9] Thus, to accurately project an anticipated future baseline, EPA would have to incorporate into the baseline all existing biomass energy capacity as well as the projected growth, decline, or fluctuations in the sector. In other words, to develop an anticipated future baseline, EPA cannot simply isolate the demand for biomass energy as a whole; it must instead isolate the incremental change in demand attributable to its policy choices.

While the *Report* asserts that an anticipated future baseline is required to estimate the "incremental effect of feedstock harvesting," it fails to demonstrate that this approach will allow EPA to develop better policy. *Report* at 33. Instead, the *Report* candidly admits that adoption of such a baseline would merely substitute one form of uncertainty for another, without attempting to quantify that uncertainty or assess its practical effect on forest markets. *See Report* at 29. When each of the layers of complexity is added together, it becomes clear that there is simply too much uncertainty and complexity to justify the inclusion of an anticipated future baseline in regulatory policy for biogenic CO_2 emissions. Not only would the cost of complying with such a complex approach tax the resources of both EPA and regulated entities, the likelihood of measurement errors would threaten to distort the markets, create perverse incentives that would discourage rather than incent biomass energy production, and potentially take valuable property in the form of carbon that could otherwise be traded in the marketplace .

2. A Reference Point Baseline Provides Reasonable, Conservative Alternative to BAU

In contrast to the *Report*, which blindly endorses an anticipated future baseline without considering whether such an approach is feasible, EPA considered and rejected an anticipated

[9] According to the Energy Information Administration ("EIA"), biomass energy currently supplies 40% of the nation's non-hydro renewable electricity. *See* EIA, Renewable Energy Annual 2009, Table 1.11: Electricity net generation from renewable energy by energy-use sector and energy source, *available at* http://www.eia.gov/renewable/annual/trends/pdf/table1_11.pdf.

future baseline approach before settling on a reference point baseline. *Framework* at 25-28, 42. While far from perfect, a reference point baseline serves as a reasonable, and ultimately conservative, proxy for "what the atmosphere/ climate sees" as a result of biogenic CO_2 emissions. Because a reference point baseline can be based on existing data sources such as the FIA database, it can be implemented at a low cost to EPA and regulated entities.

While the reference point baseline is a simplified approach to biogenic carbon accounting based on a series of assumptions about biomass energy, these assumptions are very reasonable. The primary assumption embodied in the reference point baseline is that changes in forest carbon stocks are related to changes in atmospheric CO_2 concentrations attributable to biogenic CO_2 emissions from stationary sources. While forest carbon stocks are influenced by a number of drivers other than biomass energy, there can be no dispute that, as long as forest carbon stocks are at least stable, any emissions associated with biomass energy are offset by the carbon absorbed by growing forests.[10] Even if the precise contribution from biogenic CO_2 emissions from stationary sources cannot be established with absolute certainty, the reference point baseline ensures, at a minimum, that there is no net increase in atmospheric CO_2 concentrations attributable to the forestry and forest products sector.

In this respect, the reference point baseline represents a very conservative approach to accounting for the climate impact of biogenic CO_2 emissions. Like all renewable energy sources, the primary climate benefit of biomass energy is the displacement of fossil fuels.[11] While biomass combustion produces CO_2 emissions, they are part of the forest carbon cycle and are balanced by carbon sequestration in growing forests.[12] In contrast, fossil fuels are formed over millennia and CO_2 emissions associated with fossil fuels permanently increase atmospheric CO_2 concentrations. While a reference point baseline ensures that biomass energy is generated without depleting forest carbon stocks, it does not account for the maintenance of geologic carbon stocks through avoidance of fossil CO_2 emissions. Because the reference point baseline ignores this important carbon pool, it produces a conservative estimate of the climate benefits of biomass energy.

The conservative nature of the reference point baseline can be readily observed in the *Report*'s Appendix C: Carbon Debts, Gains and Balances Over Time. Beginning with a 50-year harvest rotation, the Appendix considers three different scenarios where the harvest rotation is increased, decreased, or stays the same. When the harvest rotation is reduced to 25 years,

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[10] *See* Roger A Sedjo, Carbon Neutrality and Bioenergy: A Zero-Sum Game?, Resources for the Future Discussion Paper 6 (April 2011), *available at* http://www.rff.org/documents/RFF-DP-11-15.pdf.
[11] Boyer *et al*. (2012) at 9.
[12] *Id.* at 4.

forest carbon stocks decline and eventually reach a new equilibrium state. If a reference point baseline were applied, the reduction in forest carbon stocks would imply a negative climate impact. But the reduction in forest carbon stocks is only part of the story and does not determine that a "carbon debt" would be created, much lest persist over time.[13] To the contrary, conversion to a shorter harvest rotation may allow forest owners to increase productivity and harvest volumes, displacing significant amounts of fossil fuel. Thus, under this hypothetical scenario, the reduction in forest carbon stocks only tells half of the story. To fully understand what the atmosphere sees as a result of biomass energy, EPA must also account for displaced fossil fuels.

Nevertheless, as long as forest carbon stocks remain at least stable—as they are projected to do for decades into the future—the reference point baseline provides a conservative approach that assures there will be no net effect on atmospheric CO_2 emissions. In the event that forest carbon stocks begin to decline at some point in the future, EPA may wish to revisit the applicability of the reference point baseline and instead identify an approach that more accurately reflects the climate impacts of biomass energy. But, for the time being, a reference point baseline provides adequate assurances of carbon neutrality while avoiding the complexities and uncertainty that plague the anticipated future baseline recommended in the *Report*.

B. A Forest Certification Program for Biomass Energy Will be Technically Infeasible

Forest Certification, the *Report*'s primary alternative approach, fares no better than its proposal for an anticipated future baseline. Although the *Report* only provides "sketchy details" of the content of an new carbon-based forest certification program, the information included in the *Report* is more than sufficient to establish that such a program would be too complicated and costly to implement.

Again, ignoring the practical realities of the forestry industry, where, over the life of a facility, hundreds, if not thousands, of private forest owners will supply biomass energy feedstocks, the *Report* suggest that a new carbon-based certification program could be developed to account for biogenic CO_2 emissions. As the *Report* notes, a certification program "would make the stationary source responsible for providing information on certification of feedstocks" and that the owner, or perhaps buyer of feedstocks would be responsible for obtaining certification. Thus, this approach would necessitate a chain-of-custody accounting approach where each biomass energy facility would be responsible for proving that its

[13] The Appendix asserts that "the decline would be considered a carbon debt" that "would remain as long as the 25 year management system persists." *Report* at B-1.

feedstocks were obtained from certified sources. Given the multitude of forest owners and buyers involved in the procurement process, a chain-of-custody accounting approach would prove practically infeasible, especially for small forest owners.[14]

The *Report*'s reference to the Massachusetts draft Renewable Portfolio Standard regulations, *Report* at 47, only underscores the complexity and ultimate infeasibility of certification programs. Under the draft Massachusetts regulations, a forest owner would need to receive an individualized, case-by-case certification from a qualified forester for each harvest treatment.[15] This detailed certification would include information regarding species diversity, harvest volume, and other site-specific characteristics.[16] While such a certification would prove burdensome to large forest owners, the cost of compliance would be prohibitive for many small landowners. As a result, many of the feedstocks that biomass energy facilities depend on would be priced out of the system by the costs of compliance.

Indeed, even the *Report* itself notes that "certification systems can be very complex" and would involve "use of complex protocols to differentiate" between different feedstocks. *Report* at 46. Having identified the complexity involved in a forest certification system, the Panel could have paused and asked whether such an approach was capable of implementation. But instead of asking questions about implementation, the *Report* takes the opposite approach and seeks out even more complexity. Abandoning any hope of producing a workable policy for accounting for biogenic CO_2 emissions, the *Report* instead speculates that "[m]ore complicated schemes could be devised so that certification is combined with default BAFs." *Report* at 48. While developing a complicated, hypothetical accounting approach that lacks any prospect of successful implementation may be an acceptable academic pursuit, such an approach will be of no value to EPA when the Agency must select a policy that is capable of implementation.

Conclusion

NAFO continues to support EPA's decision to seek an independent peer review of its proposed accounting methodology for biogenic CO_2 emissions and applauds the Panel's efforts to assess this complex field. We urge the Panel to keep implementation at the forefront as it formulates its recommendations and hope that our comments will assist the Panel in identifying

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[14] Robert W. Malmshimer, et al., Managing Forests Because Carbon Matters: Integrating Energy, Products, and Land Management Policy, Journal of Forestry 109(7S) S26 (2011) ("High transaction costs can prevent interested nonindustrial landowners with small acreages from particpating in biomass projects.").

[15] 225 CMR 1405 (8) Proposed Final Regulation, *available at* http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html.

[16] *See* Biomass Eligibility and Certificate Guideline DOER 042712, *available at* http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/biomass/renewable-portfolio-standard-biomass-policy.html.

means to simplify its final recommendations to EPA. NAFO is standing by to provide further information or answer any questions that the Panel may have.

Respectfully Submitted,
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