



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 CO₂ 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 CO₂ emissions from stationary sources and the scientific analysis EPA will utilize in making ultimate policy and regulatory decisions on how to treat biogenic CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ emissions affect atmospheric CO₂ concentrations.

It is not enough for the Panel to identify policy judgements that must be made in order to implement a policy for biogenic CO₂ 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.

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 CO₂ 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 CO₂ 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 foreclosing 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ emissions.⁶ The draft *Framework* was the culmination of EPA’s own “detailed examination of the science associated with CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ 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 flexibility 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 CO₂ 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 participate 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 CO₂ 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 empirical 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 CO₂ 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 feedstocks 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 sophisticated 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 CO₂ 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 CO₂ 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 CO₂ 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 CO₂ concentrations attributable to biogenic CO₂ 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 CO₂ 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 CO₂ 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 CO₂ emissions. Like all renewable energy sources, the primary climate benefit of biomass energy is the displacement of fossil fuels.¹¹ While biomass combustion produces CO₂ 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 CO₂ emissions associated with fossil fuels permanently increase atmospheric CO₂ 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 CO₂ 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,

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 less 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 CO₂ 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 a 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* suggests that a new carbon-based certification program could be developed to account for biogenic CO₂ 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 CO₂ 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 CO₂ 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

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 participating 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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