

**Summary Minutes of the
U.S. Environmental Protection Agency
Science Advisory Board
Biogenic Carbon Emissions Panel
Public Teleconference
July 6, 2015**

Biogenic Carbon Emissions

Panel Members:

Dr. Madhu Khanna, Chair
Dr. Robert Abt
Dr. Morton Barlaz*
Dr. Marilyn Buford
Dr. Mark Harmon
Dr. Jason Hill
Dr. John Reilly
Dr. Steven Rose
Dr. Daniel Schrag*
Dr. Roger Sedjo
Dr. Ken Skog
Dr. Tristram West
Dr. Peter Woodbury*

* did not participate in teleconference.

Purpose: The Science Advisory Board (SAB) Biogenic Carbon Emissions Panel discussed responses to charge questions on EPA's draft report *Framework for Assessing Biogenic CO₂ Emissions from Stationary Sources (November 2014)*.

Designated Federal Officer: Dr. Holly Stallworth, Designated Federal Officer

Other EPA Staff: Allen Fawcett, Chris Zarba, John Stellar, Todd Goldman

Public: Kate Shank (Biomass Magazine); Dawn Reeves (Inside EPA); Stan Lancey (American Forests and Paper Association and American Wood Council); Caroline Gaudreault (National Council for Air & Stream Improvement); Katie Shank (Biotech Industry Organization); Jessie Levine (Rubber Manufacturers Association); Sasha Stashwick (Natural Resources Defense Council); Steve Wolke (Weyerhaeuser); Amanda Rutherford (American Forests and Paper Association); Elizabeth Harvell (Environment and Energy Publishing); John Upton (Climate Central); Chip Murray (National Association of Forest Owners); Jonathan Ohueri (Zilkha Biomass Energy); Ben Larson (National Wildlife Federation); Bob Palzer (no affiliation given).

Meeting Materials and Meeting Webpage:

The materials listed below may be found on the meeting webpage at:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/c0ba345dff487dd785257e530045ded0!OpenDocument&Date=2015-07-06>

Dr. Stallworth gave her opening statement noting the compliance of the Panel with the Federal Advisory Committee Act. Dr. Stallworth also noted there were no requests for public comment. Dr. Khanna thanked panelists who took the time to participate in responding to charge question 1, while noting that the Panel's report continued to be a work in progress.

Dr. Khanna highlighted the Panel's comments on the time scale with three points:

- Temporal scale should be chosen such that it incorporates all biophysical effects of the use of biogenic feedstocks on carbon stocks on the land.
- Temporal scale should be the same across all feedstocks. They should not differ by legislative horizon.
- The time horizon over which emissions impact climate is another consideration that should be taken into account.

One panelist spoke about the need to be modest in making any statements about temporal weighting because it was an area of climate science not well represented on the Panel. Dr. Rose challenged the concept of a 100 year time frame, noting that the GWP100 convention was merely referring to the atmospheric lifetime of CO₂ (usually cited as 100 years), not the time period over which land carbon changes should be considered. Dr. Skog countered that it would be possible to use the concepts in a similar way.

Dr. Harmon presented his comments in the "Graphical Illustration of the Terms Used in the New NBE Formulation" file posted at the meeting URL. Dr. Harmon said that capital T was the end period when terrestrial-physical effects cease. Dr. Harmon walked the Panel through his figures that demonstrated when capital T is occurring and, finally, to his last figure showing the different calculations of the Biogenic Accounting Factor (BAF). Dr. Skog pointed out the Panel's proposed stock-based BAF calculation would take the ratio of the area under the NBE(T) curve to the area under the PGE(T) curve whereas EPA's cumulative BAF would simply take the ratio of the vertical distance. Dr. Harmon pointed out that EPA's cumulative BAF took the ratio at a point in time versus the stock-based BAF which took the ratio over a period of time. Dr. Khanna noted that the gap between EPA's cumulative BAF and the stock-based BAF increases over time although both show that BAF falls as the time horizon increases. Dr. Khanna noted that the stock-based BAF is accounting over the entire period in which emissions are higher under the policy case vis-à-vis the reference case.

Dr. Fawcett from EPA asked whether the stock-based BAF would, essentially, change the units to something like "ton – years" and Dr. Skog agreed.

Dr. Khanna said the stock-based method adds up the differences in the stocks of carbon at every point in time. Dr. Rose expressed some discomfort with adding up the differences in the carbon stocks over time. Dr. Khanna said the intuition might be better evoked to think of the proposed BAF as the change in the *average* stock across time.

Dr. Hill wondered how the Panel should be thinking about downstream effects, specifically both leakage (L) and products containing biomass (P).

Dr. Khanna then addressed the final part of charge question 1 which asked how to evaluate the performance of a future anticipated baseline application on a retrospective basis. Panelists discussed the reasonableness of the rational expectations approach contained in the model used by EPA, the Forestry and Agricultural Sector Optimization Model (FASOM). Dr. Rose said “perfect foresight” was a somewhat misleading term. Rather it simply acknowledged the fact that people have expectations about the future. Dr. Skog said the point remains that FASOM should be validated against real world observations.

Dr. Harmon said panelists needed to think about leakage in a different way with the proposed stock-based BAF accounting framework because leakage merely changes the boundaries of the system. Accounting for leakage (or not) was merely a matter of setting the boundaries of the system which had to be specified prior to any accounting. Dr. Sedjo said he was worried about whether Dr. Harmon’s concepts could be useful beyond a conceptual tool, noting that although it’s very important to include all the effects, it’s not trivial to do so.

Dr. Khanna turned the Panel’s attention to charge question 2 on the scale of demand for biomass that should be modeled in order to determine the BAF. Dr. Khanna said the size of the shock could be set at different levels and for each level the mix of feedstocks to meet that demand could be determined endogenously by the model. Then a marginal increase in the demand for a particular feedstock above the equilibrium level determined endogenously could be used to estimate the NBE. Modeling exercises could also be undertaken to determine BAF thresholds for different levels of the size of the total shock. Dr. Abt noted that if the model can’t discern differences below a certain level of demand shock, there would be no need to waste time trying to model those levels. With respect to whether to model individual feedstocks one-by-one or as part of a joint production function, Dr. Khanna said it would be better to let the demand for individual feedstocks be determined endogenously so that it is economically viable and constrained by the joint production function. With respect to whether a BAF could be “policy-neutral,” Dr. Hill said EPA needed to be policy-specific because we need to know which products are captured under other policies and how the BAF itself was derived. Dr. Khanna said a menu of BAFs was needed depending on the scale of demand shock but the BAFs should be the same for a feedstock irrespective of which policy induces the demand for them.

In response to the charge question that asked how to do an ex post evaluation, Dr. Khanna repeated many of the same themes she had mentioned before in response to a similar question: namely that the model’s predictions would need to be compared to observations and an ex post evaluation would allow revisions of EPA’s estimates of feedstock demand changes.

Dr. Khanna and Dr. Stallworth agreed that they could put together a draft Executive Summary, along with written responses to charge question 2, for review by the Panel prior to the next teleconference on August 6, 2015.

Holly Stallworth, Ph.D. /s/
Designated Federal Officer
Certified as Accurate:

Madhu Khanna, Ph.D. /s/
Chair, SAB Biogenic Carbon Emissions Panel

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by committee members during the course of deliberations within the meeting. Such ideas, suggestions, and deliberations do not necessarily reflect definitive consensus advice from the panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters, or reports prepared and transmitted to the EPA Administrator following the public meetings.