

**Summary Minutes of the
U.S. Environmental Protection Agency
Science Advisory Board
Biogenic Carbon Emissions Panel
Public Teleconference
September 9, 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. Charles Rice*
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 its draft 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, Sara Ohrel; Todd Goldman; John Steller

Public: Steve Gibb (Society for Environmental Journalists); Gregg Morris (Green Power Institute); John Upton (Climate Central); Caroline Gaudreault (National Council for Air and Stream Improvement); Reid Miner (National Council for Air and Stream Improvement); Nathalie Mills (Southern Company); Andrew Childers (Bloomberg BNA); Jessie Stolark (Energy and Environmental Study Institute); Carrie Annand (Biomass Power Association); Stan Lancey (American Forests and Paper Association); Donald Bisson (Composite Panel Association); John Barnwell (Society of American Foresters); Kim Cesafsky (Enviva); Dawn Reeves (Inside EPA); Patrick Griffith (L.A. County Sanitation District); Michelle Thibodeau, (Massachusetts Department of Environmental Protection); Emily McGlynn (The Earth Partners); Molly Armus (Biogenic CO₂ Coalition); Linda Tsang (American Forests and Paper Association); Dave Tenny (National Alliance of Forest Owners); William Stewart (University of California-Berkeley Center for Forestry and Center for Fire Research)

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/ec3848d8dee3b2b185257e5300464bf4!OpenDocument&Date=2015-09-09>

Dr. Stallworth gave her opening statement noting the compliance of the Panel with the Federal Advisory Committee Act. Dr. Stallworth also noted there were 5 requests for public comment. Dr. Khanna thanked the Panel for their hard work and introduced the public speakers.

Public Comments

Dave Tenny, on behalf of the National Alliance of Forest Owners (NAFO), said EPA has signaled to states that they will have broad discretion on how to gauge the carbon consequences of biomass and that there are multiple ways to apply scientific principles to biogenic carbon accounting. According to Mr. Tenny, this suggests that there are a variety of policy pathways that appropriately apply the body of science around biomass carbon emissions. Mr. Tenny's comments are posted on the meeting webpage.

Linda Tsang, on behalf of the American Forest and Paper Association and the American Wood Council, said the SAB's draft report's recommendation to use BAFs to incentivize or penalize specific production practices is a policy choice, not a scientific recommendation. She also said the draft SAB report did not adequately address forest products manufacturing residuals which constitute the primary source of energy use in the paper industry. AF&PA and AWC supports the recommendation to assess methane associated with landfills but she said the SAB report did not adequately account for the likely alternative fates of woody residuals that are not sold to other manufacturers to make paper or wood products. She said the likely alternative fate is disposal in industrial landfills where methane emissions are unlikely to be captured or used for energy. Ms. Tsang said that EPA's cumulative BAF metric calculated at a point in time was preferred over the SAB alternative of calculating emissions over a period of time. Ms. Tsang's comments are posted on the meeting webpage.

William Stewart, on behalf of the University of California-Berkeley Center for Forestry and Center for Fire Research, said Western forests do not fit the plantation model of forests used by EPA. Dr. Stewart said EPA should test its methodologies against a variety of forest types. He said for the wood that is not harvested for energy, most of it remains on the land raising the risk of forest fires. He said it was important for EPA to realize there may be multiple sources of wood into the facility and some of it would otherwise raise mortality risks in the forests. Dr. Stewart's comments are posted on the meeting webpage.

Reid Miner, on behalf of the National Council for Air and Stream Improvement (NCASI), called the Panel's attention to the methane emissions from wood waste. He also pointed out that the draft SAB report's statements about municipal solid waste (MSW) landfill gas were inconsistent with the boundary conditions used for other feedstocks. He said either the text should be clarified to indicate that avoided electricity generation is not part of the BAF calculation for

landfill gas or BAF calculations for all feedstocks should include avoided emissions from displaced fossil fuels. Mr. Miner's comments are posted on the meeting webpage.

Timothy Searchinger of Princeton University said the Panel's approach to timing is flawed because it is ignoring the question of how to value the carbon emissions over time. There are risks of crossing thresholds in early years, the technology forcing benefits of early action, the higher costs of achieving emissions reductions later rather than earlier. Dr. Searchinger also criticized the Panel's endorsement of the use of economic models rather than biophysical modeling. Dr. Rose pointed out that the Panel's $BAF_{\Sigma T}$ is designed specifically for emphasizing early emissions over later emissions. Dr. Searchinger's comments are presented on the meeting webpage.

Dr. Mary Booth of the Partnership for Policy Integrity said the Panel should revisit the need for economic modeling and harkened to the single most important study to date, the Manomet study in Massachusetts that did not rely on economic modeling. Dr. Booth said the BAF is really a curve that changes over time and should not be reduced to a single cumulative number. She criticized the Panel's cumulative BAF because it grants credit for carbon sequestration that may never occur. She said consequences of being wrong about the consequences of carbon re-sequestration were much worse than the consequences of being wrong about re-sequestration. Dr. Booth's comments are presented on the meeting webpage.

Dr. Allen Fawcett of EPA's Office of Air and Radiation thanked Dr. Khanna and the Panel for their work and said he was looking forward to the SAB's final report.

Dr. Khanna directed the Panel's attention to four items she wanted to discuss further, as follows:

- Non-CO₂ gases;
- Uncertainty analysis of the BAF;
- Model features and criteria for modeling; and
- Non-standard feedstocks like biomass being harvested for fire prevention or control of invasive species.

Dr. Woodbury said he wanted a caveat inserted into the draft report to the effect that the $BAF_{\Sigma T}$ approach did not solve all problems such as upstream and downstream emissions and Dr. Rose said he would like to refer to both the carbon stock approach and the $BAF_{\Sigma T}$ metric as a "formulation" instead of a "framework" in order to be a little more modest.

On the subject of non-CO₂ gases, Dr. Woodbury said nitrous oxide emissions would be an important part of total greenhouse gas emissions and therefore the Panel should point out that if the purpose is to reduce greenhouse gas emissions, then for certain feedstocks with nitrous oxide and methane emissions, these non-CO₂ gases would be very important.

On the subject of the Panel's recommendations on the treatment of uncertainty, Dr. Khanna asked for the Panel's thoughts on specific recommendations. Dr. Hill said variability should be discussed as well as uncertainty. Dr. Khanna said the Panel should mention the need for both a sensitivity analysis as well as uncertainty analysis. Dr. Hill requested some language that would call attention to variability within feedstocks which could be as large as the variability across

feedstocks. Dr. Skog said he thought the EPA would want to be able to characterize their confidence that the BAF lies within a certain range.

On the topic of modeling, Dr. Khanna said she wanted to make sure the report offered a rationale for economic models. In addition, she said models should combine ecological and economic data, should be dynamic and should include multiple feedstocks. Dr. Abt said he wanted to make sure the Panel's report recommended some analysis of the sensitivity of BAF to the choice of model and model features. Panelists discussed how to test the degree to which the BAF calculations are sensitive to assumptions about economic responses, e.g. anticipatory planting. Dr. Woodbury warned that if EPA went too far in the direction of quantitative uncertainty analysis, it could lose sight of intra-feedstock variability. Dr. Khanna underscored the importance of looking at the anticipatory planting assumption because of its apparent effect on BAF estimates for roundwood.

Dr. Harmon raised the issue of whether the Panel should recommend a standard time horizon across feedstocks. He said he was worried it implied a policy decision had already been made but feedstocks could have different temporal dynamics with some coming into an equilibrium much faster than others. Choosing the feedstock with the slowest dynamic and standardizing that time scale was one way to integrate feedstock analyses. Because a long time scale resulted in lower BAFs and a shorter time scale resulted in higher BAFs, Dr. Harmon thought the selection of time period (T) was, in essence, a policy decision. Panelists revisited the issue of whether the "long T" was the right time scale to recommend and Dr. West pointed out the distinction between calculating net emissions over time versus valuing those emissions at certain points in time. Dr. Woodbury said the lack of a policy context was hindering the Panel's discussion of time scale. Dr. Rose reiterated the Panel's earlier understanding that EPA's BAF_T was preferred if the equilibrium carbon stock was of most concern; whereas the Panel's alternative of $BAF_{\Sigma T}$ was preferred if near-term impacts were of greater concern. Dr. Rose pointed out that choosing a $t < T$ would overlook some carbon changes.

On the topic of feedstocks that are harvested for fire protection or to control invasive species, Dr. Woodbury suggested it could fit under the topic of variability. He suggested the Panel stress "alternate fate" to cover the point raised by Dr. Stewart in his public comments.

Dr. Stallworth summarized the edits that were discussed on the call and named specific panelists who were assigned to those edits. Dr. Khanna asked for and received the Panel's concurrence on the draft Advisory subject to the edits discussed.

Dr. Khanna and Dr. Stallworth thanked the Panel and Dr. Stallworth adjourned the meeting.

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.