

Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Science Advisory Board (SAB)
Environmental Economics Advisory Committee
Meeting (EEAC)
May 12, 2004
SAB Conference Center, 1025 F St., NW, Washington, D.C.

Committee Members: See Roster – Attachment A

Date and Time: 12:30pm – 4:30pm, May 12, 2004

Location: 1025 F Street, NW, Room 3705
Washington, D.C. 20004

Purpose: The purpose of this meeting was to discuss advisory requests from three EPA program offices.

Attendees: Chair: Dr. Maureen Cropper

EEAC Members: Dr. Michael Hanemann
Dr. Kathleen Segerson
Dr. Michael Greenstone
Dr. James Hammitt
Dr. Stephen Polasky
Dr. Dallas Burtraw
Dr. Anna Alberini
Dr. Hilary Sigman
Dr. Arik Levinson
Dr. Gloria Helfand
Dr. James Opaluch
Dr. Lawrence Goulder (audited one session by phone)

SAB Staff: Dr. Holly Stallworth, Designated Federal Officer
Dr. Vanessa Vu, SAB Staff Office Director

Other EPA Staff:
Robin Jenkins
Jennifer Bowen
Kelly Maguire
Lisa Conner
Al McGartland
Rebecca Allen
Patricia Hall

Julie Hewitt
Melissa Friedland
Eric Smith
Steven Rose
Nathalie Simon
Chris Dockins
John Bennett
Allen Fawcett
Michael Shelby
Michael Leifman

Other Attendees: David Slutzsky, E², Inc.
C. M. Hausrath, E², Inc.
M. Hancox, E², Inc.
Hugh Pitcher, PNNL
Scott Farrow, GAO
Alex Farrell, U.C. Berkeley

Meeting Summary

The discussion followed the issues and general timing as presented in the meeting agenda (Attachment B).

WEDNESDAY, MAY 12, 2004

Opening of Public Meeting

Dr. Holly Stallworth, Designated Federal Officer (DFO), opened the meeting at 12:30pm with a statement that the EEAC is a standing committee of the SAB, a chartered federal advisory committee whose meetings are subject to the requirements of the Federal Advisory Committee Act. Consistent with the requirements of FACA, and with EPA policy, the deliberations of the EEAC are conducted in public at meetings, for which advance public notice is given. The discussions and substantive deliberations of the panel; its interactions with the public, and the Agency, are conducted in sessions where I, as the DFO, am present to ensure that the requirements of FACA are met (this includes the requirements for open meetings, for maintaining records of deliberations of the Panel, making available to the public summaries of meetings, and providing opportunities for public comment).

Welcome and Remarks

Following Dr. Stallworth, Dr. Vanessa Vu welcomed Committee members and EPA staff and turned the meeting over to the Chair, Dr. Cropper. Dr. Cropper reviewed the agenda.

Presentation on “Request for SAB Consultation on the Second Generation Model (SGM)”

Presenters: Dr. Michael Shelby, Mr. Michael Leifman

Dr. Shelby of EPA's Office of Atmospheric Programs described this project request and noted that the Office of Atmospheric Programs is requesting a consultation on SGM. Dr. Shelby described SGM as a computable general equilibrium climate economic model used extensively by the U.S. government to analyze the Kyoto Protocol as well as recent multi-emissions bills. Dr. Shelby expressed the hope of having an iterative process with EEAC.

Mr. Michael Leifman of the Office of Atmospheric Programs provided the Committee with background on the SGM. SGM can project emissions, determine the least-cost pathway for mitigation, and provides measures of the carbon-equivalent price. SGM covers 14 regions of the world but can be operated in a single region mode. It uses 5 year time steps from 1990-2050. The energy sector is the most elaborately modelled for obvious reasons. SGM forms hybrid input-output tables. Capital stock is tracked in 5 year vintages so that capital stock has a lifetime of 4 time periods or 20 years. SGM uses a CES (constant elasticity of substitution) production function or Leontief production function.

SGM is used to model various policy options for greenhouse gases such as a GHG fee within each region that would provide an incentive for the economy to substitute away from carbon. SGM allows trading between emissions permits at a global market clearing price. Dr. Shelby showed some sample outputs such as emissions reductions required to stabilize forcing at 4.5 watts per meter squared relative to pre-industrial times by 2150. Marginal abatement costs curves were also displayed for multi-emissions policies.

Some near term improvements expected include putting SGM on an object oriented platform (C++), incorporating advanced generation technologies and carbon sequestration. Some longer term improvements include allowing for different elasticities, linkages to an agricultural and land use model, and endogenization of technical change.

Mr. Leifman offered some draft charge questions as follows:

Is the model appropriate and useful for EPA?

Are the model's structure and fundamental assumptions consistently w/econ. theory?

Are the parameter values appropriate? Is the model's parameterization of physical phenomena logical?

Are the model's output and projections for short, medium and long term analyses reasonable within the range of your expert opinion?

In what areas is the model most in need of further development and refinement?

Dr. Lawrence Goulder (who participated by phone for this session) expressed his willingness to chair the subcommittee for the model's review and applauded the spirit of the model. Some Committee members asked about the time frame for the model and the consultation and Dr. Shelby expressed a hope for a consultation in late fall. Other Committee members asked about documentation for the model to which Dr. Leifman responded that full detailed documentation as well as an overview piece of 40-50-pages would be provided for the consultation.

Other Committee members suggested that uncertainty could be incorporated into the charge questions. In response to a question from a member about how the model was used, Dr. Shelby described two ways: in determining ways to achieve climate goals and in defining the economic consequences of climate policies today.

Presentation on “Request for SAB Study of Uncertainty in Economic Analysis”

Presenters: Dr. Al McGartland, Dr. Chris Dockins, Ms. Lisa Conner

Dr. Al McGartland, Director of the National Center for Environmental Economics (NCEE), introduced the project request in the context of NCEE’s forthcoming update to the existing *Guidelines for Preparing Economic Analysis*. Dr. Chris Dockins of NCEE elaborated by relating the Guidelines to OMB’s new guidelines and new requirements. . OMB’s new guidance in Circular A-4 (2003) says that for rules that exceed \$1 billion in economic impact, a formal uncertainty analysis is required, i.e. probability distributions must be constructed over net benefits. Dr. Dockins listed three criticisms that NCEE hoped to address: that EPA presents sensitivity analyses that are not probabilistically informed; that EPA has failed to address aggregate uncertainty; and that EPA has been inconsistent in highlighting key assumptions or summarizing uncertainty effects.

Ms. Lisa Conner of EPA’s Office of Air Quality Planning and Standards (OAQPS) presented the results of a pilot project conducted by OAQPS using expert elicitation to characterize uncertainty in the relationship between particulate matter (PM) and mortality. Ms. Conner said OAQPS’s goal was to better characterize uncertainty in PM mortality estimates in a probabilistic manner and to learn from a pilot with expert elicitation. The project had a one-year time frame and included collaboration with OMB on the recently signed non-road diesel final rule. The actual questions posed to experts included two separate quantitative questionnaires on long-term exposure to PM and mortality incidence. Experts offered judgments about the percent increase in mortality associated with a 1 ug/m³ increase in annual average exposures to PM 2.5. A technical report is now available: “An Expert Judgment Assessment of the Concentration-Response Relationship between PM_{2.5} Exposure and Mortality” (IEc, 2004).

The Chair discussed the treatment of uncertainty in specific Regulatory Impact Analyses (RIAs) at EPA. Buried in the middle of a huge document are assumptions about what the vehicle fleet is going to look like in 2030. The Chair suggested that EEAC deal with uncertainty by looking at a case study and pose questions such as: When do you use sensitivity analysis versus when do you use a formal Monte Carlo approach? Is expert elicitation best for dealing with model uncertainty? The Chair suggested that the Committee define what it would like to address, possibly in the form of a case study.

One Committee member suggested that the incorporation of uncertainty into Regulatory Impact Analyses would facilitate conducting a value of information analysis . Another member suggested looking at the covariance among sources of uncertainty. Another member discussed how EPA was trying to deal with uncertainty through the first Monte Carlo analysis in upcoming 812 analysis. Another member pointed out that uncertainty analysis could become yet another delay mechanism in getting rules out.

The Chair suggested that first members need to be brought up to speed as to how a regulatory impact analysis is conducted and then attempt an uncertainty analysis in the context of a regulatory issue. Several members discussed how uncertainties matter to the decision and some do not. The Chair offered to write some draft charge questions and begin an e-mail exchange on possible case studies.

Presentation on “Superfund Benefits Analysis”

Presenters: Ms. Melissa Friedland, Dr. Alex Farrell

Ms. Melissa Friedland, National Program Manager for Superfund Redevelopment within the Office of Solid Waste and Emergency Response (OSWER) began the presentation with a brief statement on Superfund. Ms. Friedland stressed that historically the focus in Superfund has been on costs and therefore OSWER had commissioned E², Inc. for a study of Superfund benefits. Dr. Farrell of the University of California is leading this study.

Dr. Alex Farrell presented an outline of the study with a series of slides. Dr. Farrell depicted existing reports as focusing on a narrow set of issues, including costs, liability and hazards. All studies are constrained by the scarcity of data. To the extent that benefits are covered, only cancer risk mitigation (resulting from NPL listings) is covered. Dr. Farrell described a large degree of health risk mitigation resulting from the removal program, not NPL site remediation. The removal program is very large, affecting 3 times as many sites as are on the NPL. Most remediation of NPL caliber sites rely on Superfund, but never enter the NPL. When asked about the removal program, Dr. Farrell explained that the removal program responds to emergencies, e.g. removes toxic barrels or puts a fence around contamination.

Dr. Farrell presented the Table of Contents for the “Superfund Benefits Analysis” and gave particular attention to the hedonics analysis in Chapter 6. Dr. Farrell explained that cleaning up a toxic site creates a benefit that can be partly measured as the reversal in the price decline experienced once the site was discovered. Dr. Farrell presented his method as follows.

Method:

1. Determine the effect of NPL sites on residential prices. (Four types of effects: linear/non-linear and absolute/percentage)
2. Characterize affected properties.
3. Calculate the value of cleaning up the entire NPL of 1572 sites.
4. Calculate present value of “clean up” (defined as construction completion or deletion) in for 1980-2002 and 2000-09.

Dr. Farrell noted that this approach is essentially the same as the one judged by a recent SAB Expert Review Panel as capable of providing a “ballpark” estimate of the value of cleaning up underground storage tanks. He stated that the benefits captured with this approach probably include the perceived hazards and risks to current neighbors. Although there are uncertainties about these hazards and risks, there remains a stigma of living in a contaminated neighborhood. The approach almost certainly excludes effects on water quality, benefits valued by non-

neighbors, benefits associated with other components of Superfund, and any effects of deterrence.

One member asked whether the hedonic effect wasn't already incorporated into the price when a house is purchased. Dr. Farrell responded that the prices of homes near NPL sites tend to fall when the NPL sites are announced, and to rise after they are announced as "cleaned up." Another member asked whether the study would add the hedonic property values to the health benefits to which Dr. Farrell responded that it would not.

One member asked about the asymmetry between Superfund's effect on the price when listed vs. when cleaned up. Dr. Farrell said he wasn't sure of a systematic way to handle that. Moreover, the total number of NPL sites on which the existing 9 studies are based is only 33.

Another member asked about indirect ecosystem service benefits. Dr. Farrell said he wasn't sure how was going to do handle that, but that he may include some benefits transfer if appropriate studies can be found

The Chair suggested the study review take place sooner rather than later and that Dr. Farrell needed some feedback on the methods being chosen.

One member asked about Dr. Farrell's source of information that a large fraction of benefits accrue off site. Dr. Farrell explained that when hazardous materials move offsite, there is documentation that exposure is low but numbers of people exposed can be high.

Another member suggested that changing the focus of the study from measuring benefits to designing useful management information systems could be helpful.

Discussion of requested projects, schedules and next steps

The Chair led the Committee in a discussion of how EEAC might respond to these three project requests and solicited volunteers first for the request for a consultation on the SGM. Drs. Burtraw, Opaluch, Polasky volunteered to join Dr. Goulder who has volunteered to chair the SGM project.

The Chair then solicited volunteers for responding to the project request on uncertainty. Drs. Levinson and Hanemann volunteered.

Finally, the Chair solicited volunteers for responding to the project request on Superfund benefits to which Dr. Segerson, Alberini, Greenstone and Sigman responded affirmatively.

The Chair thanked Committee members and Agency staff for their participation and the meeting was adjourned.

Respectfully Submitted:

/Signed/ Holly Stallworth
Designated Federal Officer

Certified as True:

/Signed/ Maureen Cropper

Chair

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Committee member during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect 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.

**U.S. Environmental Protection Agency
Science Advisory Board
Environmental Economics Advisory Committee**

CHAIR

Dr. Maureen L. Cropper, Lead Economist, The World Bank, Washington, DC

MEMBERS

Dr. Anna Alberini, Associate Professor, Department of Agricultural and Resource Economics - AREC, University of Maryland, College Park, MD

Dr. Dallas Burtraw, Senior Fellow, Resources for the Future, Washington, DC

Dr. Lawrence Goulder, Shuzo Nishihara Professor of Environmental and Resource Economics, Department of Economics and Institute for International Studies, Stanford University, Stanford, CA

Dr. Michael Greenstone, Assistant Professor, Department of Economics, Massachusetts Institute of Technology, Cambridge, MA

Dr. James Hammitt, Professor of Economics and Decision Sciences, School of Public Health, Harvard University, Boston, MA

Dr. W. Michael Hanemann, Professor, Department of Agricultural and Resource Economics, University of California, Berkeley, CA

Dr. Gloria Helfand, Associate Professor of Environmental Economics, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI

Dr. Arik Levinson, Associate Professor, Economics Department, Georgetown University, Washington, DC

Dr. James Opaluch, Professor, Department of Environmental & Natural Resource Economics, College of the Environment and Life Sciences, University of Rhode Island, Kingston, RI

Dr. Stephen Polasky, Fesler-Lampert Professor of Ecological/Environmental Economics, Department of Applied Economics, University of Minnesota, St. Paul, MN

Dr. Kathleen Segerson, Professor, Department of Economics, University of Connecticut, Storrs, CT

Dr. Hilary Sigman, Associate Professor, Department of Economics, Faculty of Arts and Sciences, Rutgers University, New Brunswick, NJ

**U.S. EPA Science Advisory Board
Environmental Economics Advisory Committee
1025 F St., NW
Washington, D.C. 20004
May 12, 2004, 12:30-4:30 pm EST**

Purpose of Meeting: To discuss advisory requests from the Agency

12:30 pm	Opening of the Meeting and Roll Call	Dr. Holly Stallworth Designated Federal Officer
	Welcome remarks	Dr. Vanessa Vu, Director Science Advisory Board Staff Office
12:40 pm	Introductory remarks and agenda review	Dr. Maureen Cropper, Chair
12:45 pm	Request for SAB Consultation on the Second Generation Model (SGM)	Dr. Michael Shelby EPA Office of Atmospheric Programs Clean Air Markets Division
1:15 pm	Discussion	
1:30 pm	Request for SAB study of Uncertainty in Economic Analysis	Dr. Al McGartland, Director, EPA National Center for Environmental Economics (NCEE) Dr. Chris Dockins, NCEE Ms. Lisa Conner, EPA Office of Air Quality Planning and Standards
2:00 pm	Discussion	
2:45 pm	Break	
2:45 pm	Presentation of Superfund benefits study	Ms. Melissa Friedland EPA Office of Solid Waste and Emergency Response Office of Site Remediation and Technology Innovation Dr. Alex Farrell Energy & Resources Group University of California, Berkeley
3:15 pm	Discussion	
3:30 pm	Discussion of requested projects, schedules and next steps	Dr. Cropper and Committee
4:15 pm	Summary of action items	Dr. Cropper
4:30 pm	Adjourn	