

**U.S. Environmental Protection Agency
Advisory Council on Clean Air Compliance Analysis (Council)**

September 2-3, 2010

Park Hyatt Washington, 1201 24th Street, NW
Washington, D.C. 20037

Minutes of the Meeting

Attendees:

Council Members: James Hammitt (Chair), John Bailar, Michelle Bell, Sylvia Brandt, Linda Bui, Dallas Burtraw, Ivan Fernandez, Shelby Gerking, Wayne Gray, Alan Hansen, Nathaniel Keohane, Jon Levy (by telephone), Rich Poirot, Arden Pope, Ted Russell and Michael Walsh (for details, see Council Roster¹)

SAB Staff Office: Stephanie Sanzone, Anthony Maciorowski

Other EPA Staff: Jim DeMocker, Brian Heninger, Vicki Ellis

Other Attendees: Molly Davis, Inside Washington Publishers; Leland Deck, Stratus Consulting; Jim Neumann, Industrial Economics; Stuart Parker, IWP News; Jason Price, Industrial Economics

Purpose:

The purpose of the meeting was to review (1) the EPA's draft report, *The Benefits and Costs of the Clean Air Act: 1990 to 2020*, Revised Draft (August 2010), and (2) the draft *Summary Report* (August 16, 2010).

Meeting Materials:

All materials discussed at the meeting are available on the Council website, <http://www.epa.gov/advisorycouncilcaa>, at the [September 2-3, 2010 Council Meeting](#) page.

Summary of Discussions:

The meeting was announced in the Federal Register² and proceeded according to the meeting agenda³ as revised. **Ms. Stephanie Sanzone**, Designated Federal Officer for the Council, convened the meeting and noted that the Council operates in accordance with the Federal Advisory Committee Act. This means that meetings are announced and open to the public, meeting minutes are prepared, and all materials prepared for or by the Council are available to the public. She noted that the Council had been asked to review an EPA report to Congress on black carbon, with the review to be scheduled in early 2011. After noting that there had been no requests to make public comments, Ms. Sanzone turned the meeting over to **Dr. Anthony Maciorowski**, Deputy Director of the SAB Staff Office, who added his welcome and thanked the members for their participation on the Council. **Dr. James Hammitt**, Chair of the Council, then reviewed the plan for the 2-day meeting. He requested lead discussants to prepare summary

bullets or short paragraphs to capture the major points from the Council discussions, from which he would develop a draft report for review by Council members.

The following is a summary of the issues discussed and conclusions reached during the meeting.

A. Revised Integrated 812 Report

Mr. Jim DeMocker, EPA Office of Air and Radiation, thanked the Council for their assistance to date, and noted that EPA would look to Council comments as the Agency develops summary points for the upcoming anniversary of the Clean Air Act. He summarized the 812 Project Team's responses to the Council's July 2010 advisory letter⁴. Dr. Bailar noted that the final 812 documents should include responses to each of the points raised by the Council because other readers likely would have similar questions. Mr. DeMocker also described the Agency's plans for documenting the many analytical studies that had been done over the course of the Second Prospective Study (Presentation Slides⁵).

B. Council Disposition of AQMS Letter Report

Dr. Ted Russell, Chair of the Council's Air Quality Modeling Subcommittee (AQMS), briefly described the background for the draft AQMS letter put forward for Council consideration. At an earlier meeting, the AQMS had identified potential errors in some emissions estimates and learned of the Agency's use of MATS for adjusting outputs from the Community Multiscale Air Quality (CMAQ) modeling. As reported at the Council's May 4-5, 2010 meeting, AQMS recommended, and the Council agreed, that EPA should develop further documentation on the correction procedure and discussion of how monitoring data is used to adjust the CMAQ outputs for future simulations. The AQMS held a public teleconference on August 11, 2010, to evaluate the memos developed by the Project Team and concluded that the documentation was clear and appropriate. The AQMS prepared a draft letter report⁶ to convey this conclusion to the Council and the Administrator. During Council discussion of the AQMS draft letter, several Council members noted that the Integrated 812 Report should acknowledge the uncertainties introduced by the use of MATS. Following the discussion, **Dr. Hammitt** entertained a motion that the draft AQMS letter be accepted without amendment.

Council Action: By consensus voice vote, the AQMS draft letter was adopted as written.

The Council turned to discussion of the revised integrated report⁷ for the Second Prospective Study, taking each chapter in turn.

C. Emissions and Air Quality Modeling

Mr. Rich Poirot led the discussion of Emissions (Chapter 2). During the discussion, Council members made the following points:

- Requirements for woodstoves predate the 1990 Clean Air Act Amendments, so should these be include in the with- or without-CAAA scenarios?
- The table of uncertainties is useful, but it includes some that are not discussed in the chapter, and there is no sense of the overall uncertainty.
- For the summary document, more thought should be given to conveying the magnitude of the difference between simulated future emissions and current conditions (e.g., using

comparisons of current rural vs. urban, or current seasonal differences experienced at a location).

Dr. Russell led the discussion of Air Quality Modeling (Chapter 4). During the discussion, Council members made the following points:

- the discussion of uncertainties doesn't give a sense of the likely overall uncertainty (e.g., the table at the end of the chapter lists nine sources of uncertainty, each considered "probably minor", but taken together they are probably major)
- while acknowledging the uncertainties, don't give readers the impression that improvements in air quality from CAA programs aren't real
- provide a context for the future scenarios to show that the counterfactual scenarios are reasonable (e.g., using changes observed in present air quality, such as Beijing before and after the Olympics)

D. Direct Costs

Dr. Bui and **Mr. Walsh** led the discussion of Direct Costs (Chapter 3). During the discussion, Council members made the following points:

- the discussion of learning curves should acknowledge that the approach is controversial (e.g., the research was based on old industries, curves combine effects of changes in technology and production volume); more than a footnote is needed on this topic
- some parts of the analysis use an optimization routine, other parts use unit costs; the document should explain why different methodologies were chosen so that readers can assess whether the choices made were reasonable

E. Health Benefits

Drs. Bell and **Gerking** led the discussion of Health Benefits (Chapter 5). During the discussion, Council members made the following points:

- the chapter should include a discussion of differential toxicity of PM constituents to emphasize that the uncertainty arises from a lack of scientific understanding and consensus rather than a lack of data; note that this is an area of ongoing research
- the discussion of variation in Value of Statistical Life (VSL) is good, but more should be included on the reasons for controversy with these estimates (e.g., theoretical differences between "willingness to pay" vs. "willingness to accept" compensation; applying small changes in marginal risk to large populations)
- despite uncertainties, the valuation work done for this project is at the cutting edge
- it would be useful to add discussion of cost-effectiveness (dollars per life saved) to provide context
- make the point that, even without the VSL estimates, other benefit categories cover the estimated costs
- tables and figures should be carefully considered and made self-contained (e.g., explanatory titles and legends), so that they can stand on their own

F. Welfare Benefits

Drs. Brandt and **Fernandez** led the discussion of Welfare Benefits (Chapter 6). During the discussion, Council members made the following points:

- check Figures 6-2 and 6-3: the values seem high compared to back-of-the-envelope calculations of hydrogen ion (acidity). Are other dry deposition vectors included?
- report figures should not use red/green color scheme for the legends because of red/green color-blind, accessibility issues
- the discussion implies there is a linkage between changes in base saturation of forest soils and timber harvest (as a measure of forest health), but this cause/effect relationship is not supported in the scientific literature
- additional discussion of the FASOM model is needed (e.g., to describe how crop-switching is simulated, how crop yield functions are changed), and justification of why FASOM is the best model for the analysis
- emphasize that the APEEP model is a simplified representation of a much more complicated state-of-the art model (CMAQ)
- uncertainty tables describe uncertainties as “major” or “minor,” but this should be considered in the context of the relative contribution of the benefit category to the total estimated benefits

G. Benefit-Cost Comparison

Drs. Bailar and **Keohane** led the discussion of the Benefit-Cost Comparison (Chapter 7). During the discussion, Council members made the following points:

- if another 812 study is done in the future, the lessons learned from the Second Prospective Study would be very valuable; be sure to capture these now
- the chapter focuses on results for 2020, but also discuss 2010 results to show progress
- uncertainty discussions should be included in the individual chapters, with the uncertainty discussion in Chapter 7 referencing those discussions, but primarily focusing on the overall uncertainty (the “big picture”)

H. CGE Analysis

Drs. Burtraw and **Gray** led the discussion of the CGE Analysis (Chapter 8). During the discussion, Council members made the following points:

- emphasize that the inclusion of “labor market impacts” in the benefits estimate, in addition to the costs estimate, is an important new aspect of the analysis
- “wait time” for vehicle inspection programs could come out of leisure/well-being, rather than being a labor cost
- discuss what percent of the benefits are counted by the CGE (e.g., the cost of time loss vs. the cost of vehicle inspection/maintenance)
- Table 8-3 shows zero for time lost for ages under 25 years; explain that this is because the model does not capture time lost by caregivers

I. Summary Report

Dr. Pope and **Hansen** led the discussion of the Summary Report⁸ for the Second Prospective Study. During the discussion, Council members made the following points:

- the summary report was a good idea, well-written, and an important document to accompany the longer technical report
- most of the benefits come from valuing large number of estimated deaths; Exhibit 13 is the crux of the story
- avoid EPA jargon (e.g., particulates, EGU, VOC); consider having an outside editor look at the summary document
- be careful not to imply that uncertainties are only on the benefit side, since there are uncertainties on the cost side also
- emphasize that visibility benefits, for example, would cover the estimated costs, so that the message is clear that benefits cover costs, even if readers question the large mortality benefit estimates
- discuss why cutting medical costs reduces GDP (p. 27), i.e., by freeing up resources that would have gone to medical care
- for discussion of PM differential toxicity, be clear that research is ongoing
- clarify the FAQ to say that the results of the first and second prospective studies are not additive because they use different baselines, and they do not capture all of the benefits
- when reporting dollar figures, be clear about time period over which aggregated, etc.
- discussion of uncertainties should acknowledge that uncertainty arising from choice of models can be just as large as information uncertainties
- include a brief discussion of the need to invest in research on how to value endpoints relevant to EPA, including VSL, how to value morbidity changes from other rulemakings, value of ecosystem benefits beyond use values (e.g., service values, bequest values, intrinsic values)
- mention that there are uncertainties, and what the key uncertainties are, but don't dilute the message of the report
- don't oversell the Council review process (e.g., page 7 of the summary report)
- check on results in Exhibit 7 (air quality map) that appear different than the CMAQ results (i.e., are these an artifact of the post-processing of model outputs?); three areas colored orange are new, so make sure these are correct or provide an explanation.

Council members discussed the pros and cons of releasing the grid-level data from the CMAQ simulations, since the study was designed to look at the national level. Members generally concluded that for future studies, EPA should consider up front how/whether data would be released so that science advisors could comment on relevant study design issues and caveats on data reuse.

September 3, 2010

J. Messages for the Council Letter

Dr. Hammitt asked Council members to identify key points that should be included in the letter to the Administrator. He requested that lead discussants draft bullets or short paragraphs and

provide these to the DFO. Dr. Hammitt committed to produce a draft report for Council review on a public teleconference call.

In summarizing messages to include in the letter, Council members reiterated points from the previous day, and made the following additional comments:

- recognize that some of the models were not fully evaluated because of resource limitations, but note that this limits the Agency’s ability to assess uncertainty for some important pieces (e.g., forest and agricultural benefits)
- in the summary document, the authors should try to communicate risks and costs at the individual or household level, as a complement to the national level
- benefits of the CAA are immense, and the Council letter should say that
- include a concise table to show that some of the endpoints have market values, and some do not; for nonmarket endpoints, note that “use” values have been developed (i.e., this explains why VSL is used in one context and FASOM in another)
- compliment the project team on a truly heroic effort, and encourage EPA to do this type of study again in the future
- future 812 efforts, if undertaken, should be designed to assess the next set of regulatory challenges (e.g., greenhouse gases, multi-pollutant impacts) and include additional benefit categories (e.g., ecological services, HAPS); consider research needed in the interim
- highlight the innovations in the study, e.g., CGE and labor-force adjustment, and population simulation modeling to look at life extension
- all results included in the summary report should be backed up by details in the integrated report
- be careful in discussing benefits at ambient levels below the NAAQS; the benefits assessment reflects ubiquitous exposures to air pollutants, so even small changes in exposure are important to the total estimate of benefits

After the general discussion, Council members held a writing session to develop draft text for the letter and report.

The DFO adjourned the meeting at 10:45 a.m.

Respectfully Submitted:

/s/

Stephanie Sanzone,
Designated Federal Officer
EPA Science Advisory Board Staff Office

Certified as Accurate:

/s/

James K. Hammitt, Chair
EPA Advisory Council on Clean
Air Compliance Analysis

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations at the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the Panel. The reader is cautioned not to 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.

Materials Cited

The following meeting materials are available on the Council website, <http://www.epa.gov/advisorycouncilcaa>, at the [September 2-3, 2010 Council Meeting](#) page:

¹Council Roster, September 2-3, 2010

² Federal Register Notice of the Meeting (75 FR 48327, August 10, 2010)

³ Agenda, Advisory Council on Clean Air Compliance Analysis, September 2-3, 2010

⁴ Summary of Project Team Responses to July 27, 2010 Council Advisory Letter
Recommendations

⁵ Presentation by Jim DeMocker on Clean Air Act Second Prospective Study: Agency Analytical Choices and Documentation Plan

⁶ Review of Revised PM2.5 Emissions and Modeling Estimates for the Second Prospective Study (August 26, 2010 draft)

⁷ *The Benefits and Costs of the Clean Air Act: 1990 to 2020*, Revised Draft (August 2010)

⁸ *The Benefits and Costs of the Clean Air Act: 1990 to 2020 – Summary Report* (August 16, 2010 draft)