

**Summary Minutes of the
U.S. Environmental Protection Agency
Science Advisory Board
Economy-Wide Modeling Panel
Teleconference
March 10, 2016**

Economy-Wide Modeling

Panel Members:

Dr. Peter Wilcoxon, Chair
Dr. Edward Balistreri
Dr. Richard Belzer
Dr. Linda Bui
Dr. Francisco de la Chesnaye
Dr. Karen Fisher-Vanden
Dr. Alan Fox
Dr. Don Fullerton
Dr. Thomas Hertel
Dr. Edward Leamer
Dr. W. David Montgomery
Dr. Nick Muller
Dr. Sergey Paltsev
Mr. Richard Revesz
Dr. Lorenz Rhomberg
Dr. Adam Rose
Dr. V. Kerry Smith
Dr. Robertson Williams

Purpose: The Economy-Wide Modeling Panel discussed its draft responses to charge questions from EPA's National Center for Environmental Economics.

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

Other EPA Staff: Allen Fawcett, Alex Marten, James McFarland, Gloria Helfand, Jared Woollacott, David Evans, Charles Fulcher, Keith Sargent, Jim Democker, Ann Wolverton, Ann Ferris. Al McGartland

Public: David Roland-Holst (UC Berkeley), Pierre DuVair (California Energy Commission), Brittany Bolen (Senate Committee on Environment and Public Works), Steve Crookshank (American Petroleum Institute), Nancy Beck (American Chemistry Council)

Meeting Materials and Meeting Webpage:

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

<https://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/24f5072803f8987d85257f0700692a43!OpenDocument&Date=2016-03-10>

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Dr. Holly Stallworth, Designated Federal Officer for the Economy-Wide Modeling Panel, gave her opening statement noting the compliance of the Panel with the Federal Advisory Committee Act. Dr. Peter Wilcoxon, Panel Chair, said the Panel was working towards developing complete and well-written answers to charge questions that would provide concrete and usable advice to EPA.

Dr. Nancy Beck of the American Chemistry Council summarized her written comments posted on the meeting website. She called for the Panel to tie the choice of technique to the regulatory objective, transparency; accessibility for non-economists and guidance on retrospective analysis. She suggested that the panel list examples of regulations that would or would not particularly benefit from the use of CGE modeling. Dr. Beck suggested the Panel recommend a series of workshops to improve CGE models with respect to incorporating benefits before finalizing a recommended approach.

Dr. Wilcoxon cautioned the Panel against recommending ideas to EPA that could be computed but not parameterized. He also said the Panel needed to cite specific examples where CGE modeling should be used (or not).

Dr. Belzer said he would like for the Panel's report to become accessible to non-economists and perhaps the Panel should think about writing two answers for each question, one for a lay audience and another for a technical audience.

Dr. Leamer said the modeling culture should be more aware of the econometric culture which had more humility about the limits of knowledge.

Dr. Wilcoxon reminded the Panel that EPA has Economic Guidelines and it is his perspective that the Panel is primarily writing advice for analysts that would be implementing those guidelines.

Discussion of Charge Question Responses

On charge question C1, two minor edits were requested of Dr. Fullerton: (1) adding citations to support mention of new efforts to consider involuntary unemployment and irrational behavior by consumers and (2) adding externalities as an additional distortion in item 1B which listed market failures. In addition, some material at the end of the current response to C6 is to be merged into C1.

On charge question C2, Dr. Balistreri said he would like to bolster the section on the closure assumptions about international trade (e.g., on small open economies and the Heckscher-Olin model). Dr. Montgomery said he would like to see some discussion of anticipatory behavior in that same section based on how the single country models are closed with respect to capital flows and balance of payment and trade. He said it makes a big difference whether the model assumes an infinite supply of borrowing available from outside the country at a constant rate or whether it assumes the country must maintain some asset position or some intertemporal balance of payments constraint. Dr. Williams said he would revise this section (section vi) to incorporate

Dr. Montgomery's points and distortions in models without foresight that can lead to odd welfare results. With respect to the section on the magnitude of the shock (section i) Dr. Williams distinguished between absolute accuracy and relative accuracy (which may not increase as the shock increases) and pledged to add some language along those lines.

Dr. Wilcoxon said the report needed a new section on data which Dr. Balistreri suggested should go into C3 where NCEE asked about "other factors." Dr. Wilcoxon said he would draft a section on data to be added to C3.

Dr. Wilcoxon also reminded Panel members working on C2 that what EPA would like to know is how these issues affect the choice of model in the context of a specific type of regulation. He encouraged the Panel to use the examples from the white paper when germane.

On charge question C3, Dr. Balistreri said he would revise his list of 7 factors relevant to social cost to recast it in terms of model choice.

On charge question C4, Dr. Fisher-Vanden, in response to a suggestion from Dr. Montgomery, said she could make some revisions to incorporate the need for more granularity when modeling technology-based standards. Dr. Montgomery indicated that incorporating information about technologies is relatively straight forward for electricity where we have detailed information but may be harder in other contexts, He also said technology-based standards would constrain choices and thus create welfare triangles that will be missed in estimating social costs. Dr. Fisher-Vanden also pledged to edit her discussion of "challenges" to add a qualification that such challenges were more broadly applicable than just when modeling technology standards via price equivalents.

In response to a question from a panelist, Dr. Wilcoxon said an overview section would be needed to capture cross-cutting issues.

No changes were suggested for charge question C5 on equivalent variation as a measure of social costs.

On charge question C6 on linking sectoral models to CGE models, Dr. Wilcoxon asked whether the Panel wanted to declare "soft linking" inadequate for serious regulatory purposes. Dr. Hertel responded that the statement was motivated by practical factors related to replicability of results when soft linking models. Dr. Wilcoxon said the replicability question was a source of concern but not a deal-breaker. Others agreed that it would be better to characterize the main concerns with this approach instead of wording it as a prohibition against using soft linking. Dr. Montgomery said he would expand the discussion of soft linking to distinguish between the use of a summary function and sequential calibration, and add some caveats about the potential pitfalls of soft linking, e.g. the lack of reproducibility.

It was decided that the section on intersectoral linkages and the need for CGE analysis (last three paragraphs of C6) should be promoted to a location earlier in the document. It was decided to merge it with C1.

On charge question C7 on other economy-wide models, Dr. Rose said he would take responsibility for revisions but he would need help on dynamic stochastic general equilibrium models (DSGE) from Dr. Williams. Panelists discussed the issue of how involuntary unemployment should be integrated into social cost calculations. Panelists agreed to ask Dr. Shimer for input on the revised draft.

After a break, panelists turned to charge question B1 for which Dr. Smith said he would get a citation for the claim that Clean Air Act benefits constituted 15 – 20% of wage income.

On charge question B2, Dr. Smith said he would also leave a “marker” in this question referring the reader to a forthcoming report from the SAB Environmental Economics Advisory Committee which was reviewing NCEE’s white paper on “Valuing mortality risk for environmental policy” which discusses issues related to the value of a statistical life or VSL.

On charge question B3, Dr. Wilcoxon said he would draft language referring to responses from charge questions B4, B5 and B6 discussing the linkage between health and economic activity.

On charge question B4, Dr. Smith said the focus was initially on translating morbidity and mortality effects into time endowments but asked whether “other approaches” warranted consideration. Dr. Smith and Dr. Carbone had discussed these “other approaches” in B2. Attention should be focused on assumptions about the degree of substitution between time and non-market services that are entered in a non-separable way into preferences, as discussed in B2 and B5. He wondered how to reconcile the responses to these three questions—all of which refer to other approaches. Dr. Smith said he would make some edits and pass it to Dr. Paltsev.

On charge question B5, Dr. Wilcoxon stated that it would be helpful to distinguish between what is possible now and what might be possible with a considerable amount of research down road. He also asked whether any models were available that take estimates of involuntary unemployment as a result of air quality regulations and translate that into a health outcomes function. Dr. Smith, in Dr. Montgomery’s absence, said he would check. With respect to the last subpart of this B5, Dr. Wilcoxon asked for more discussion on when expected effects are too small to noticeably affect quantitative results. Dr. Smith responded that in his view there has not been enough experience with these models to make more than an informed guess as to when it would be too small to noticeably affect results. There are 3 or 4 things to consider to gauge the expected effects, and they interact to affect the ultimate outcome in a GE setting. Dr. Smith said he would investigate this and try to elaborate on this point.

On charge question B6, Dr. Williams said he would revise the last sentence to say “EPA could ...” rather than “EPA should.”

On charge question B7, Dr. Belzer said he was treating health care as a non-market good. Dr. Smith pointed out the question asked about changes in “relative preferences” as a result of positive or negative changes in life expectancy. Dr. Marten of NCEE clarified that the question referred to a state-dependent utility function. Dr. Wilcoxon said the Panel was converging on the view that changes in state-dependent utility functions were not easy to integrate into CGE

models due to complications in the way payments are made for healthcare services and the lack of robust parameterization. Dr. Wilcoxon said there should be an acknowledgement that state-dependent utility functions were discussed in the White Paper. Dr. Wilcoxon said he could work on qualifying some of the language in other parts of the question.

No changes were recommended for charge question B8.

On charge question B9, Dr. Wilcoxon asked Dr. Smith for examples when non-separable preferences might be most important; in other words, how they could be incorporated for specific environmental services or specific regulations.

On charge question B10, panelists discussed how to interpret results when only some types of benefits are incorporated into the modeling. Instead of interpreting results as a “lower bound,” panelists decided it was better to say the results are a “portion” of the benefits while another portion may be omitted. Dr. Wilcoxon also said the response should say that CGE and non-CGE benefits are not necessarily additive since they may be inconsistently calculated. Dr. Smith said he would revise accordingly.

On charge question B11, Dr. Hertel noted that he had, in response to Dr. Wilcoxon’s request, already rephrased his suggestion of exploring the role of spatial heterogeneity in estimating national welfare measures as a future research topic worthy of exploration. No additional changes were requested for this charge question.

In terms of next steps, Dr. Stallworth asked whether the Panel wanted to cancel or keep the May 19, 2016 teleconference. She said the purpose of such a teleconference would be to discuss a revised draft. Alternatively, a revised draft could be posted without the May 19 teleconference but would be revisited following the July 19 – 20, 2016 face-to-face meeting. Dr. Wilcoxon said he would like to cancel the May 19 teleconference because he thought the Panel had a pretty clear consensus as discussed on the call. He gave panelists a week to contact him if they wished to retain the May 19 teleconference.

Dr. Stallworth adjourned the meeting.

Submitted by:
Holly Stallworth, Ph.D. /s/
Designated Federal Officer

Certified as Accurate:
Peter Wilcoxon, Ph.D. /s/
Chair, SAB Economy-Wide Modeling 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.