

 **EPA AN SAB REPORT ON THE  
EPA GUIDELINES FOR  
PREPARING ECONOMIC  
ANALYSES**

**A Review by the Environmental  
Economics Advisory Committee**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

September 30, 1999

OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD

EPA-SAB-EEAC-99-020

The Honorable Carol Browner  
Administrator  
United States Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

Subject: An SAB Report on the EPA Guidelines for Preparing Economic Analyses

Dear Ms. Browner:

This Report on the Environmental Protection Agency's (EPA's) revised *Guidelines for Preparing Economic Analyses* was developed by the Environmental Economics Advisory Committee (EEAC) of the Science Advisory Board (SAB) in response to a charge received from the Deputy Administrator on August 4, 1998 (attached). The review was carried out in a series of meetings with the Agency's Office of Policy, beginning in August 1998, and ending with a telephone conference on July 27, 1999.

As is described in detail in the full report, the Committee's general conclusion is that the Guidelines succeed in reflecting methods and practices that enjoy widespread acceptance in the environmental economics profession. Although some concerns remain about particular parts of the Guidelines, our overall assessment is that the Guidelines are excellent. It is our hope that the Guidelines demonstrate EPA's commitment to credible and consistent economic analyses in support of the policy process.

The best analytical tools of environmental economics are constantly changing, as experience with applications of existing tools and as new theoretical and empirical techniques appear in the scholarly literature. As a result, it is important that EPA carry out new reviews of the Guidelines every two to three years to reflect these developments in environmental economics. The Committee looks forward to working with EPA to strengthen this document in the years ahead.

The iterative process that the EEAC employed with EPA for this review represents a departure from the end-of-pipe assessments that are more typical of SAB practice. It was consistent, however, with the Mission Statement of the EEAC prepared by the Deputy Administrator, and was consistent with the SAB Executive Committee's previously expressed aims. Although this approach will not necessarily be appropriate for all SAB reviews, it may be a useful model in selected cases. Therefore, we briefly describe the procedure in the full report.

Finally, Dr. Albert McGartland and his staff in the Office of Economy and Environment should be commended for the professionalism they brought to this process. The excellence of the revised Guidelines is testimony to the dedication of the talented team of Agency economists and analysts who worked on this project. It was, as always, a pleasure for the EEAC to interact with Dr. McGartland and his staff. We anticipate that you and everyone involved will be proud of the quality of the new *Guidelines for Preparing Economic Analyses*, and we look forward to your questions and your response to our Report.

Sincerely,

/s/

Dr. Joan M. Daisey, Chair  
Science Advisory Board

/s/

Dr. Robert N. Stavins  
Environmental Economics Advisory  
Committee  
Science Advisory Board

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**U.S. Environmental Protection Agency  
Science Advisory Board  
Environmental Economics Advisory Committee  
Panel for Review of the Economic Analysis Guidelines**

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## 1. EXECUTIVE SUMMARY AND CONCLUSIONS

The Environmental Economics Advisory Committee (EEAC) of the EPA Science Advisory Board (SAB) reviewed the Agency's draft *Guidelines for Preparing Economic Analyses* (EPA, 1999) during a series of meetings extending from August 1998 to July 1999, in response to a request received from EPA to perform a full and complete review. This is EPA's first major overhaul of these guidelines in more than a decade. Because the Guidelines are to be used by all parts of the Agency for carrying out regulatory analyses, it is important that they reflect "methods and practices that enjoy widespread acceptance in the environmental economics profession," as specified in the charge to the EEAC received from the EPA Deputy Administrator. The draft Guidelines have been revised and improved as a result of the interactions between the Committee and EPA staff in several public meetings over the past year. The EEAC's general conclusion is that the Guidelines reflect best methods and practices that enjoy widespread acceptance in the environmental economics profession, notwithstanding the several EEAC concerns that remain about particular parts of the Guidelines. The Committee hopes that the Guidelines demonstrate EPA's commitment to credible and consistent economic analysis in support of the policy process.

The fundamental ingredients of an economic analysis of a proposed or existing environmental policy or program are well covered in the Guidelines, and key conceptual, analytic, and empirical issues are highlighted. The Guidelines acknowledge the practical limitations facing EPA analysts in terms of time, resources, and expertise, and hence provide flexibility to analysts. The Guidelines are just that — guidelines for analysis, not a rigid (or simplistic) cook book.

Economics, like any scholarly discipline, is constantly changing. Environmental economics, a relatively young branch of the discipline, has experienced particularly rapid growth. New areas of the literature continue to emerge, and existing areas change and expand. Hence, despite the Committee's generally positive assessment of the revised Guidelines, we urge EPA to carry out new reviews every two to three years. The time investments that will be required for such periodic reviews — both on the part of EPA staff and on the part of the EEAC — will be much less than was required for this first revision in ten years.

The interactive process that the EEAC employed with EPA for this review was something of a departure from the end-of-pipe assessments that are more typical of SAB practice. It was consistent, however, with the Mission Statement of the EEAC prepared by the Deputy Administrator, and, moreover, was consistent with the SAB Executive Committee's previously expressed interest in early involvement with the Agency on important issues. Although this approach will not necessarily be appropriate for all SAB reviews, it may be a useful model in selected cases. Therefore, we briefly describe the procedure here.

During the past twelve months, the EEAC held three one-day meetings in Washington, D.C., devoted primarily to our review of EPA's revised Guidelines for Preparing Economic



Analyses, plus a fourth meeting via teleconference. Each of the meetings was attended by Dr. Albert McGartland, Director of the Office of Economy and Environment, and many members of his staff. Intensive and extensive substantive discussions at these meetings provided an effective forum in which EEAC members and the Committee as a whole could pose questions, describe concerns, and express views, and for Agency representatives to explain the thinking behind their drafts. Each of the first three meetings led to a subsequently revised draft, which in every case addressed the general and specific concerns expressed by the EEAC at the previous meeting, and thereby represented a significantly improved draft document. Dr. McGartland and his staff should be commended for the openness, professionalism, and lack of defensiveness which they brought to this process.

## 2. INTRODUCTION

The Environmental Economics Advisory Committee was requested to perform a full and complete review of the *Guidelines for Preparing Economic Analyses* (EAGs or the Guidelines). EPA asked for comments on all aspects of the guidance document and written documentation, when applicable, on recommendations from the Committee for alternative methodologies, assumptions and data sources to improve the presentation of issues addressed in the guidance document.

The stated intent of the Guidelines is to:

- a) Represent EPA policy on preparing economic analyses under a variety of authorizing statutes and administrative requirements, each of which can influence the conduct and use of analyses by different EPA offices;
- b) Demonstrate EPA's commitment to credible/consistent economic analyses in support of the policy making process;
- c) Emphasize the need for analytic efforts commensurate with the value of that information in the EPA policy making process;
- d) Reflect mainstream economic science/methods that are well demonstrated and relatively straightforward to apply to particular environmental issues;
- e) Cover a number of principles and practices that virtually all economic analyses should follow and clarify, for a number of identified analytic issues, the process that analysts are to follow as they organize and conduct the analysis;
- f) Account for some of the practical limitations on time and resources that EPA analysts must contend with when preparing economic analyses; and

- g) Provide some flexibility to analysts to permit them to “customize” analyses to conform to administrative and legal procedures.

The document embodying the Guidelines is not intended to be a text on the theory and methods of applying economic analysis to EPA regulations and policies nor do they preclude new or path breaking forms of analysis. EPA intends to regularly and frequently review and revise parts of the Guidelines to reflect and report on significant changes in the literature used to support EPA analyses, as well as changes in administrative and legal requirements that affect the conduct of economics at the EPA.

### **3. SPECIFIC RESPONSES TO CHARGE QUESTIONS**

The Committee’s specific comments on the Guidelines are organized into nine sections, the first eight of which address, respectively, questions posed in EPA’s charge to the Committee. The last section includes the Committee’s advice on the topic of altruistic benefits.

#### **3.1 Discounting**

*Charge Question 1. Does the published economic theory and empirical literature support the statements in the guidance document on the treatment of discounting benefits and costs in the following circumstances: a) private and public costs for use in an economic impact analysis, b) social benefits and costs in an intragenerational context; c) social benefits and costs in an intergenerational context; and d) social benefit and cost information that is reported in nonmonetary terms?*

The guidance document is consistent with published theoretical and empirical analysis on the use of discounting for (a) private and public costs in an economic impact analysis, and for (d) social benefit and cost information expressed in non-monetary terms. The current literature also supports the discussion of issue (b), discounting social benefits and costs in an intragenerational context. In this context, the document should encourage the use of a discount rate in the middle of its recommended range, in addition to the values currently mentioned, to reflect common practice.

The proper application of discounting in an intergenerational context (issue (c)) remains controversial in the published literature. The guidance document lays out the positions in this debate clearly. Reflecting the disagreement within the economics profession, there is diversity of opinion within the EEAC on this issue. Some members believe that the guidance document is more critical than the published literature of the view that intergenerational discounting should not differ from other discounting, while other members support the document's current emphasis. The final quantitative recommendations for discount rate values in the intergenerational context are broad enough to be uncontroversial.

### 3.2 Quantifying and Valuing Human Fatalities

*Charge Question 2. Does the published economic theory and empirical literature support the statements in the guidance document on quantifying and valuing the social benefits of reducing fatal human health risks?*

The guidance document recommends that the mean value of a statistical life (VSL) based on 26 published studies be used as the default value in Agency analyses. It urges that a *qualitative* discussion of the appropriateness of this estimate to the population and risks analyzed accompany the use of the central tendency estimate.

The EEAC encourages the use of value of a statistical life (VSL) estimates in benefit valuation and in providing guidance for policy. Moreover, it believes that the general magnitude of the benefit value suggested in the Guidelines is in a reasonable range for broad population groups. However, these estimates could be refined, particularly when certain segments of the population are affected, such as children or persons over the age of 65.

One refinement that EPA could undertake now is to narrow the set of VSL studies to the most reliable estimates for the U.S. population, rather than taking the mean value from a set of studies of varying quality and with different statistical controls and with populations from various countries.

Hedonic studies based on market tradeoffs give values reflected in actual market decisions. Such studies have focused primarily on the labor market, but some have considered implicit values of life reflected in car safety and in housing price responses to hazardous wastes and pollution. Contingent valuation studies can also prove useful with respect to variations due to age, health status, and other factors not readily estimated using market data.

Care should be taken to avoid conveying the impression that \$5.8 million (in 1997 dollars) is always and everywhere the correct figure to use for the value of a statistical life. Footnote 29 in Section 7.6.1.2 attaches some important caveats to the \$5.8 million figure cited in the document. These caveats should be placed more prominently, so that casual readers do not come away with the notion that \$5.8 million is “the” value of a statistical life. It is, of course, simply the central tendency of a number of estimates of the VSL for some rather narrowly defined subpopulations. The individual study values from which this number is derived range from \$0.7 million to \$16.3 million, indicating considerable heterogeneity across different contexts.

In some cases, it may be desirable to use a VSL estimate specific to particular populations. The most prominent possible variation is with respect to age, but characteristics such as gender and income could also be influential. How and whether these differences should affect policy benefit assessment is more controversial. However, as a first step, EPA should show the age distribution of the lives saved, or the quantity of life at risk. In addition, when policies do not affect the entire population equally, a sensitivity analysis can show both the cost per life saved and

the cost per discounted life year. Policymakers can then be better able to assess the efficacy of the policy.

Clearly, any re-evaluation of the literature will take time. In the interim, if the mean VSL cited in the Guidelines is to be used, the limitations of the estimate should be described. In cases where the estimate is to be applied to populations whose age differs significantly from the average age of the populations in the 26 studies, a *quantitative* sensitivity analysis should be performed, such as that used in *The Benefits and Costs of the Clean Air Act, 1970-1990* (EPA, 1997).

### **3.3 Certainty Equivalents**

*Charge Question 3. Does the published economic theory and empirical literature support the statements in the guidance document on the treatment of certainty equivalents in the assessment of social benefits and costs of environmental policies?*

The discussion of principles for uncertainty analysis in the Guidelines highlights the important distinction between the analyst's uncertainty and individuals' uncertainty about future outcomes. The latter relates to assessing the effects of environmental changes on individuals' welfare under uncertainty. In this regard, the Guidelines are consistent with mainstream economic theory and the empirical literature in that they recognize the importance of taking account of individual attitudes towards risk and suggest certainty equivalents as one way of incorporating risk aversion into the assessment of social benefits and costs of environmental policies. However, the Guidelines recognize that information on risk attitudes may be difficult to obtain. The Guidelines also recognize that experts' and lay individuals' risk perceptions may differ. Because the latter affect individuals' behavior, it is important for the analyst to consider both types of risk assessments. The Guidelines are also consistent with current literature in recognizing the important role information plays in welfare evaluation in an uncertain world.

### **3.4 Valuation Approaches for Human Morbidity and Improved Ecological Conditions**

*Charge Question 4. Does the published economic theory and empirical literature support the statements in the guidance document on the merits and limitations of different valuation approaches to the measurement of social benefits from reductions in human morbidity risks and improvements in ecological conditions attributable to environmental policies?*

Overall, Chapter 7 does a very good job of explaining the state-of-the-art in the measurement of environmental benefits. This literature continues to evolve, and so frequent updates are likely to be necessary for this chapter. All currently relevant methods appear to be represented and sufficient caveats have generally been offered. Four concerns, however, should be highlighted.

First, care should be taken to avoid creating the impression that the benefits or costs associated with a proposed regulation are being misrepresented. Socially efficient policy-making is not well served by exaggeration or understatement of the benefits or costs of alternative policy choices. When benefits are uncertain, expected values should be emphasized. However, an assessment should be made concerning the sensitivity of the policy conclusions to the full range of possible benefits estimates.

Second, the claim that averting expenditures can reliably be used as a lower bound on environmental benefits is too strong. The draft overstates the idea that averting behavior is a generic lower bound on ex ante economic value for morbidity and mortality. The theoretical literature reveals that averting behavior need not be a lower bound on value when both private and collective risk reduction strategies are considered. Private actions to reduce risk mixed with collective actions yield ambiguous results. Further discussion is available in Shogren and Crocker (1999).

Third, the treatment of altruistic benefits should be clearer. Circumstances wherein altruistic benefits should, and should not, be included as a separate component of total social benefits should be highlighted. It is important to avoid double-counting of benefits and costs in assessing proposed policies. This issue is taken up, below, in Section 3.9.

### **3.5 Economic Impact and Net Social Benefits**

*Charge Question 5. Does the published economic theory and empirical literature support the statements in the guidance document on the relationships and distinctions between the measurement of economic impacts and net social benefits?*

The guidance document makes it clear that in order to make informed policy judgements it is important to study a variety of consequences of environmental policies, including impacts on particular industries, regions, and demographic groups (as well as other impacts whose analyses are mandated by statute) to complement conventional benefit-cost analysis. The relationship between conventional benefit-cost analysis and the analysis of the broad and diverse distributional impacts of environmental policies are discussed clearly and the relationships between these complementary policy analyses is consistent with the published economics literature.

### **3.6 Computable General Equilibrium Models**

*Charge Question 6. Does the guidance document contain an objective and reasonable presentation on the published economic theory, empirical literature, and analytic tools associated with computable general equilibrium (CGE) models, and description of their relevance for economic analyses performed by the EPA?*

The use of general equilibrium analysis, both as a conceptual and a numerical tool, is gaining expanded use in economics. The Guidelines provide a useful discussion of the current

uses and limitations of computable general equilibrium (CGE) models in Chapter 8. This is a rapidly developing area in economics, and so for the Guidelines to remain relevant, the Agency will need to commit to ongoing review of new tools and applications that broaden the applicability of CGE models, and that provide new intellectual insights that can guide benefit-cost analysis.

One area where new insights are proliferating is the interaction of environmental regulations with pre-existing economic distortions (that is, the deadweight loss due to existing taxes). Of particular relevance in this regard is the role of pre-existing taxes. Recent literature in economics indicates that the *costs and benefits* of regulations can be substantially different than indicated by partial equilibrium analysis. In addition, the relative cost-effectiveness of different policy instruments (technology standards, tradable permits, etc.) can be affected by these interactions.

The Guidelines address the issue of interactions of regulations with pre-existing economic distortions in a paragraph near the end of Chapter 5, under the label “Emerging Cross-Cutting Issues.” This is appropriate because the issue is both rapidly emerging and broadly cross-cutting. But the issue is not mentioned in Chapter 8 (“Analyzing Social Costs”), where general equilibrium analysis is discussed in detail. The exclusion of the issue from Chapter 8 is unfortunate: (a) because of the potential magnitude associated with “interactions” and (b) because general equilibrium tools provide the method for considering these “interactions.” Hence, one of the most compelling reasons to use CGE models is to develop an understanding of, and to estimate the magnitude of, this potential influence. While in most regards, the discussion of CGE models is objective and reasonable, the failure to integrate a discussion of tax interactions undermines the presentation.

### **3.7 Economic Impacts to the Private Sector, Public Sector, and Households**

*Charge Question 7. Does the guidance document contain an objective and reasonable presentation on the measurement of economic impacts, including approaches suitable to estimate impacts of environmental regulations on the private sector, public sector and households? This includes, for example, the measurement of changes in market prices, profits, facility closure and bankruptcy rates, employment, market structure, innovation and economic growth, regional economies, and foreign trade.*

The guidance document provides an objective and reasonable presentation of these topics.

### **3.8 Equity**

*Charge Question 8. Does the guidance document contain a reasonable presentation and set of recommendations on the selection of economic variables and data sources used to measure the equity dimensions identified as potentially relevant to environmental policy analysis?*

Conventional, primary dictionary definitions of equity refer to concepts such as fairness, impartiality, and justice. Thus, equity is typically treated as a normative concept in everyday parlance. The Guidelines, in keeping with mainstream practice in economics, however, seek merely to supply statistical measures of the distribution of costs and benefits, leaving it to citizens to judge whether the described distributions are fair or equitable. In this way, the document provides positive information that is relevant to making normative judgments, but offers no explicit discussion of norms. At the same time, however, since market prices and willingness-to-pay criteria are employed in the Guidelines, and because they are based on the existing distributions of income and wealth, those existing distributions are implicitly accorded normative status. Some may object to taking the existing distribution as the norm for equity assessments, especially as that distribution has become more concentrated in recent decades. This issue is noted, but in accord with mainstream practice, is not considered further in the document.

The Guidelines contain a reasonable presentation and set of recommendations on the selection of economic variables and data sources that can be used to measure the distributional consequences of environmental policies, both on the benefit side and the cost side.

### **3.9 Altruism**

The Guidelines would benefit from a discussion of when it is appropriate to include altruistic benefits in a benefit-cost analysis. Economic theory is quite clear on this point (Jones-Lee, 1991). If I care about my neighbor *and* respect his preferences, and if my neighbor would have to pay for the program or project being analyzed, then altruistic benefits should not be counted in a benefit-cost analysis. The intuition behind this result is that, if I respect my neighbor's preferences, although I value the benefits he will receive from the project, I also care about the costs it will impose on him. It is, therefore, inappropriate to add the value I attach to his benefits without considering the cost implications of doing this. Comparing individual benefits and costs in this case is the appropriate decision rule.

Altruistic benefits may be counted either when my altruism toward my neighbor is paternalistic, or when I will in fact bear the costs of the project but he will not. In the first case (paternalistic altruism), I care about the benefits my neighbor will enjoy, e.g., from a health or safety project, but not about the costs the project will impose on him. An example of the second case would be a project whose costs are borne entirely by the current generation; i.e., the project imposes no costs on future generations. In this case, altruism toward future generations by the current generation could legitimately be counted as a benefit.

## REFERENCES

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- U.S. Environmental Protection Agency (1997). *The Benefits and Costs of the Clean Air Act, 1970 to 1990*. Submitted to Congress pursuant to Section 812, Clean Air Act Amendments of 1990. Washington: U.S. EPA Office of Administration and Resources Management/Office of Policy, Planning, and Evaluation. October, 1997.
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## **APPENDIX A**

### **CHARGE TO THE COMMITTEE**

August 4, 1998

Dr. Robert Stavins  
Professor of Public Policy and Faculty Chair  
John F. Kennedy School of Government  
Harvard University  
79 John F. Kennedy Street, Room L-313  
Cambridge, Massachusetts 02138

Dear Dr. Stavins:

The Science Advisory Board, Environmental Economics Advisory Committee (EEAC or the Committee) is requested to perform an advisory review of a revised guidance document prepared for the Environmental Protection Agency (EPA) on the conduct of economic analysis. The document, titled "Guidelines for Preparing Economic Analyses," is the product of a deliberative Agency-wide process initiated at my direction and managed by the EPA's Regulatory Policy Council. The document is designed to represent Agency policy on the preparation of economic analysis called for under applicable legislative and administrative requirements, including, but not limited to Executive Order 12866 on regulatory planning and review. The revisions to the guidance document should embody sound economic thinking so that its application will continue to demonstrate the EPA's commitment to make credible and consistent economic analytic decisions in support of the regulatory and policy making process. The Agency is seeking external peer review of the guidance documents because of the pervasive influence of the documents on the conduct of agency-wide economic analysis.

#### **Background**

The decision to prepare a revised document is based on a number of events and factors. The current EPA operating guidance on performing economic analysis was written over the period 1983-1986. Since that time, there have been numerous advances in the economic literature. Because the guidance document is primarily intended to serve as a source for technical information on the conduct of economic analysis, it is important that the document reflect the most recent economics literature.

The original EPA guidance document was also written to support the administrative process for using economic information when developing regulations set forth in Executive Order (E.O.) 12291 on Regulatory Planning and Review (released in 1981). The Office of Management

and Budget (OMB) issued its own federal guidelines for performing economic analysis following the release of E.O. 12291. The EPA elected to issue its own guidance document in an effort to elaborate on the materials described in the OMB guidance, and provide additional source material to assist in the application of the OMB analytic principles to analyses prepared by the EPA. The issuance of an updated Order on the federal regulatory development process (E.O. 12866 released in 1993) led OMB to revise its federal guidelines for performing economic analysis in early 1996. The new OMB guidance drew heavily on the previous document, but developed additional details on several aspects of conducting economic analysis that reflected advances in the economic literature, and added information on several administrative measures and policy objectives receiving additional emphasis included in E.O. 12866. The new EPA economic guidance document seeks to accomplish the same objective, but in a manner that meets the distinctive needs of EPA staff working on economic analyses.

Other administrative and legislative requirements were issued since the mid-1980s that now affect the development and conduct of economic analysis at the EPA. Most are not directed exclusively at EPA regulatory activities, but their addition has led to some modifications to the preparation of economic analyses by the EPA. Some examples include legislation to consider unfunded mandates on non-federal governments, and the assessment of economic impacts on small entities. The revised EPA economic guidance document seeks to update and make reference to existing and anticipated guidance on these Congressional mandates and executive orders.

One major goal of the new guidance document is to provide more assistance to EPA analysts in the adoption of a consistent set of procedures used to formulate its economic analyses. The responsibility for preparing economic analyses at the EPA rests in many different offices in the Agency. As a consequence of differences in the authorizing statutes they operate under, the conduct and use of economic analysis can vary across documents prepared by these offices. Despite these differences, there are a number of guiding principles and practices that the EPA proposes to follow to aid in the consistent development of economic information. The new economic guidance document has been written to make clear, for a number of identified analytic issues, the process that EPA analysts are to follow as they organize and perform their economic analyses. One of the objectives in revising the guidance document was to adopt a process whereby the Agency's economic analytic staff participated as a group in the review and revision of the document. Because these offices have greater authority and responsibility for the content and quality of their economic analysis, the process provided a productive forum for raising common and critical issues that arise in the conduct of economic analysis.

The current guidance document's publication date of 1983 belies the fact that work has been undertaken by EPA since that time to support advances in the development and use of economic tools and information in its economic analyses. The Agency draws upon the results of new research and participates in professional workshops (e.g., events supported by the Association of Environmental and Resource Economists) to be current with the state of economic knowledge. EPA also uses materials produced by other government agencies (e.g., General

Accounting Office reviews, reports by the Presidential/Congressional Commission on Risk Assessment/Risk Management), incorporating new information and thinking into its economic analyses. Recognizing that the previous process resulted in development of a “static” EPA economic guidance document, this effort is viewed as the first of a series of more regular and frequent actions to continually review and revise component parts of the documents. The development and release of materials will follow a schedule that reflects and reports on significant changes in the literature used to support EPA analyses, as well as changes in administrative and legal requirements that affect the conduct of economics at the EPA.

The materials to be submitted to the SAB-EEAC for an advisory review at this time include a complete draft of the revised guidance document. The document consists of a main document and five separate appendices. Each appendix provides greater detail on subjects treated in the main document. The appendices are organized into major component parts of economic analyses produced by the EPA, or treat an analytic topic that merits significant attention. As of this revision, the guidance document contains appendices on the analysis of economic benefits, social costs, economic impacts, equity effects, and discounting future benefits and costs.

### **Charge to the Committee:**

The charge to the Committee is to undertake an advisory review of the draft materials and provide advice to the Agency pursuant to a series of questions concerning the preparation of economic analyses by the EPA. The EPA guidance directly refers to methods and practices that enjoy widespread acceptance in the environmental economics profession. The guidance document does not intend to preclude new or path breaking forms of analysis, but to provide EPA analysts with a reasonably concise and thorough treatment of mainstream thinking on important technical issues that arise in the conduct of economic analysis. The guidance accounts for some of the practical limitations on time and resources that EPA analysts must contend with when preparing economic analyses. It also is shaped by administrative and statutory requirements that contain direct references to the development of economic information in the formulation of regulations (e.g., evaluations of economic achievability). As a result, the guidance is not written to resemble a text on the theory and methods of applying economic analysis to EPA regulations and policies. Some of the language in the guidance was chosen for the express purpose of providing some flexibility to analysts that should enable them to “customize” the analysis to be as complex and complete as is necessary to conform to administrative and legal procedures. The document also emphasizes the need for the EPA analyst to ensure that their analytic efforts are commensurate with the value the information will provide to the regulatory and policy making process at the EPA. The document covers a number of principles and practices that virtually all economic analyses should follow, and it is these items to which the Committee is asked to devote the greatest attention in its review.

In general, we believe the Guidance should reflect mainstream economic science and methods that are well demonstrated and relatively straightforward to apply to particular environmental issues. Ideally, these methods should be general enough that EPA program

analysts can use them consistently across all of EPA's programs. Thus, while EPA recognizes that this document needs to provide pragmatic guidance, we have also attempted to reflect the state of the economic science. In some cases, our goal of making this useable has meant that we had to shorten or simplify the document. Your views about whether there are any important omissions or oversimplifications are critical.

The review questions to the Committee are as follows:

1. Do the published economic theory and empirical literature support the statements in the guidance document on the treatment of discounting benefits and costs in the following circumstances:
  - 1a. Discounting private and public costs for use in an economic impact analysis?
  - 1b. Discounting social benefits and costs in an intragenerational context?
  - 1c. Discounting social benefits and costs in an intergenerational context?
  - 1d. Discounting social benefit and cost information that is reported in nonmonetary terms?
2. Do the published economic theory and empirical literature support the statements in the guidance document on quantifying and valuing the social benefits of reducing fatal human health risks?
3. Do the published economic theory and empirical literature support the statements in the guidance document on the treatment of certainty equivalents in the assessment of social benefits and costs of environmental policies?
4. Do the published economic theory and empirical literature support the statements in the guidance document on the merits and limitations of different valuation approaches to the measurement of social benefits from reductions in human morbidity risks and improvements in ecological conditions attributable to environmental policies?
5. Do the published economic theory and empirical literature support the statements in the guidance document on the relationships and distinctions between the measurement of economic impacts and net social benefits?
6. Does the guidance document contain an objective and reasonable presentation on the published economic theory, empirical literature, and analytic tools associated with computable general equilibrium (CGE) models, and description of their relevance for economic analyses performed by the EPA?

7. Does the guidance document contain an objective and reasonable presentation on the measurement of economic impacts, including approaches suitable to estimate impacts of environmental regulations on the private sector, public sector and households? This includes, for example, the measurement of changes in market prices, profits, facility closure and bankruptcy rates, employment, market structure, innovation and economic growth, regional economies, and foreign trade.
8. Does the guidance document contain a reasonable presentation and set of recommendations on the selection of economic variables and data sources used to measure the equity dimensions identified as potentially relevant to environmental policy analysis?

The EPA requests that the Committee provide written review and documentation, when applicable, to support recommended changes to the guidance document. Our intention is that the Committee conduct a full and complete review. Although the specific questions identified above are those EPA believes are the most appropriate for the Committee to consider, EPA seeks comments on all aspects of the guidance document. The EPA also seeks recommendations from the Committee on alternative methodologies, assumptions and data sources that will improve the presentation of economic issues addressed in the guidance document. We would like the Committee to conclude its review by the end of October.

### **Review materials**

The first attachment to this memorandum is to both the Designated Federal Official and Chairman to the Environmental Economics Advisory Committee. The memorandum lists the publicly available documents supporting the “Guidelines for Preparing Economic Analyses.” This memorandum contains a list of the documents which are to be submitted to the Committee to assist in their review of the guidance document. The other attachments are the documents.

Please direct any inquiries regarding the review materials to me at 202-260-3354, or by e-mail at [mcgartland.al@epa.gov](mailto:mcgartland.al@epa.gov). Thank you for your assistance.

Sincerely,  
/ S /  
Fred Hansen,  
Deputy Administrator

## ABSTRACT

The Environmental Economics Advisory Committee (EEAC) of the EPA Science Advisory Board (SAB) reviewed the Agency's draft *Guidelines for Preparing Economic Analyses* during a series of meetings extending from August 1998 to July 1999, in response to a request received from EPA to perform a full and complete review. The draft Guidelines have been revised and greatly improved as a result of the interactions between the EEAC and EPA staff during the public meetings over the past year. The EEAC's general conclusion is that the Guidelines now succeed in reflecting methods and practices that enjoy widespread acceptance in the environmental economics profession, notwithstanding the concerns that remain with several particular parts of the Guidelines.

**Keywords:** benefit-cost analysis; economic efficiency; cost effectiveness; regulatory impact analysis