Policy Brief

The Need for More (Not Less) External Review of Economic Analysis at the U.S. EPA

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Introduction

Trade-offs are inherent in public policies designed to protect the environment and human health, and environmental economics provides an important framework for analyses that support the policymaking process. Economic analysis identifies and quantifies the relevant incentives, net benefits, programmatic (in)efficiencies, and distributional incidence of benefits and costs. Since the 1980s, a series of presidential executive orders in the United States have established and maintained the importance of and need for benefit–cost analysis of significant regulatory actions across government agencies. These executive orders have been especially important for the U.S. Environmental Protection Agency (EPA), where regulations often require a balancing of private compliance costs against public health and environmental benefits.

Under President Donald Trump, the EPA has made significant changes to the way it conducts economic analyses of regulatory actions. Changes in the assumptions and methods used in regulatory impact analysis (RIA) have produced fundamentally different conclusions about the economic benefits and costs of significant regulations. In each case, the Trump administration's economic analysis diminishes public benefits in ways that support an agenda of deregulation. In response, environmental economists have argued that the analytical assumptions and methods that were used are not consistent with best practices in the field of environmental economics (e.g., Boyle, Kotchen, and Smith 2017; Krupnick and Keyes 2017; Bento et al. 2018).

Given these recent analytical practices, it is especially concerning that the EPA's Science Advisory Board (SAB), which is the leading outside source of scientific input to the agency,

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voted in May 2018 to eliminate the Environmental Economics Advisory Committee (EEAC, Brennan 2018). For nearly three decades the EEAC consisted primarily of academic economists who were empaneled to provide the EPA with expert advice and peer reviews on its research efforts and analytical approaches concerning the quantification of the costs and benefits of environmental regulations. The sudden and unexpected elimination of the EEAC means that an important nexus between the EPA and the external research community has been lost at a time of increasing need for expert input to support agency analyses. Unfortunately, the elimination of the EEAC is part of a broader trend—both within the EPA and across other U.S. government agencies—toward diminishing the role of research and scientific input in government decision making.

The purpose of this article is to describe the role the EEAC served and explain why its input is needed now more than ever. First, we discuss the history and activities of the EEAC, including our own experiences as recent EEAC members. We then present examples of the very different results produced by the Obama and Trump administrations' economic analyses of the same EPA rules, which underscores the need for timely external reviews. We argue that such external reviews are fundamental for ensuring that economics analyses are credible and robust to different political agendas.

The History and Activities of the EEAC

The EEAC was established in 1991 under the George H. W. Bush administration. It continued to function through subsequent Democrat and Republican administrations, until it was eliminated in May 2018. The EEAC was a standing committee of the EPA's SAB, with a mandate to provide "independent advice to the EPA Administrator, through the chartered SAB, regarding the science and research to assess public benefits and costs of EPA's environmental programs" (U.S. EPA 2018b).

EEAC Membership and Tasks

As with all EPA advisory boards, the EEAC membership process began with a call for nominations. Then, after a period of public comment, the EPA administrator appointed EEAC members for a (once-renewable) term of three years.[1] With only a few exceptions, EEAC members held academic appointments, and many are active participants and leaders within the Association of Environmental and Resource Economists (AERE). Nearly one-third of former members are AERE Fellows, an honor that recognizes individuals who have made outstanding contributions to the field of environmental and natural resource economics.

At the request of the EPA, the EEAC would provide external advice on a specific topic, which occurred primarily through peer reviews of agency technical reports. The EEAC was tasked most frequently with reviewing methodological approaches for estimating benefits and costs that were to be used in regulatory impact analyses of EPA rules and regulations.[2]

[1]Table A1 in the online supplementary material lists all EEAC members who served at least one term, including those who served as chair.
[2]Table A2 in the online supplementary material lists all EEAC reports (excluding notifications of consultation) that are available through the SAB's online portal for final reports (U.S. EPA 2018a).

Review of Nonuse Values for Groundwater Improvements

A 1994 EEAC report reviewed an EPA-funded study that estimated nonuse values for groundwater protection (U.S. EPA 1994). The EPA commissioned the study to inform benefit and cost calculations of proposed groundwater protection actions. The EEAC's charge was to review this study, including addressing specific methodological questions and providing a "bottom-line" evaluation of whether the study's findings provided a credible basis for the EPA to determine nonuse values of groundwater.

The EEAC's final report was impactful for two reasons. The EEAC concluded that it could not endorse the study "as a means of generating valid and reliable estimates of the nonuse values associated with cleaning up contaminated groundwater" (p. ii). This conclusion established the EEAC as an objective review panel that would not simply provide a rubber stamp to EPA's desired outcome. Second, the report criticized several methodological issues in the study's approach and made recommendations for improving future estimates. Thus the EEAC also established its role in influencing the direction of research on nonmarket valuation and its application to policy analysis.

Review of Guidelines for Preparing Economic Analyses

Another area where the EEAC was active and impactful was in providing reviews of the EPA's Guidelines for Preparing Economic Analysis. These reviews were important because the guidelines established an agency-wide approach for conducting economic analysis and provide guidance to other federal agencies. The EEAC reviews ensured that EPA analyses were consistent with the latest developments and best practices in the field of environmental economics.

Review of the Updated Estimate of the Value of a Statistical Life

An important area for the EEAC was the estimation of the value of a statistical life (VSL). Requests for the EEAC to review VSL estimation were important given that the value of mortality risk reductions is often the most significant component of the benefits that arise from environmental policies (Cropper, Hammitt, and Robinson 2011), particularly those focused on improving air quality to enhance human health. Nevertheless, there has been considerable debate about the measurement and magnitude of the VSL, thus external review ensures that the estimation approach taken is credible and based on best practices in the field and that RIAs use the best possible estimates.

The EEAC's final assignment was to review an update of the VSL estimate (U.S. EPA 2017). The EPA's National Center for Environmental Economics (NCEE) provided a meta-analytic procedure for estimating the VSL, along with a proposed approach for updating the VSL estimate in the future. In its detailed review of the NCEE's VSL estimation approach, the EEAC commended the EPA's attempt to develop an innovative estimation procedure. However, the EEAC did not endorse the NCEE's approach, noting that some of the methods went beyond established practices and that implicit assumptions in the procedure were not always transparent, necessary, or conceptually consistent. To facilitate developing future

estimates of the VSL, the EEAC provided recommendations for improving the estimation and updating procedures.

Our Experience with the EAAC and the VSL Review

We were members of the EEAC and participated in the most recent VSL review. Our experience confirmed for us the importance of both the high-quality, detailed materials provided by the EPA to support EEAC reviews and the EEAC reviews themselves. First, foundational information provided by EPA economists enabled the EEAC to become an effective sounding board for the agency to vet its VSL estimation approach. Second, the EEAC review helped the EPA to anticipate and understand how critics might question the VSL estimate and provided the agency with the opportunity to make appropriate adjustments in the estimation approach. These benefits of EEAC reviews provide the EPA with a stronger legal basis when its actions are litigated. For example, if the VSL is the major component of the benefit estimates in an RIA, an EEAC review lends credibility to the estimates because they are based on generally accepted methods that have been peer reviewed (Grady 2016).

Finally, the EEAC review process promotes positive communication and collaboration between EPA economists and the external research community. It encourages the EPA to rely on the most credible methods and estimates, while also alerting the external research community about current and emerging policy issues that may spur policy-relevant research. Thus the peer-review process—as operationalized through the EEAC—provided reciprocity that was beneficial to both EPA staff and the external research community, which advances both economic research and best practices for governmental policy analysis.

Questioning the Decision to Eliminate the EEAC

The SAB voted to eliminate the EEAC in May 2018. The decision was a surprise to EEAC members. Although the EPA has the authority to reorganize standing committees such as the EEAC (U.S. EPA 2003), we question the explanations given for dissolving the EEAC, especially at a time when the expertise and advice of such committees is more important than ever.

The SAB's Expertise is Sufficient

One explanation given by the EPA leadership was that the current mix of expertise on the SAB is sufficient to provide economic advice and that rather than maintaining a standing committee, ad hoc committees could be established to address gaps in expertise when needed. However, a review of the current SAB members indicates that there are only 3 members (out of 44) with any professional expertise in environmental economics (U.S. EPA 2018c). Given the increasing importance of economics for the evaluation and justification of environmental policies, such a small representation of economists on the SAB is itself cause for concern. It also raises questions about whether this expertise on the SAB is adequate to anticipate and recognize when external reviews of economic analysis may be helpful. For instance, at the time the vote was taken to eliminate the EEAC, there was a lapse in appointing the EEAC chair, who would have been a voting member of the SAB. Indeed, according to the 2003 SAB reorganization (U.S. EPA 2003), the chair of the EEAC should have been a voting member of

the SAB. This means that the SAB member best qualified to answer questions about and advocate for the EEAC was not present for the SAB discussion and vote. Moreover, while distinguished in their own fields, the economists currently serving on the SAB have different expertise than the economists who had historically served on the EEAC, many of whom had expertise in nonmarket valuation of environmental benefits and costs.

Other Explanations Given for Eliminating the EEAC

Other explanations given by the EPA for eliminating the EEAC were its costs, recent inactivity, and a purported lack of relevant matters to come before the SAB. In fact, because the EEAC did not meet frequently, its operating costs were relatively low; individual compensation was at a nominal hourly rate and some members volunteered their time. The greater cost concerns appear to have been the EPA staff resources required to document that EEAC members qualify as special government employees (SGEs) and to comply with other federal requirements. Given the SAB's mandate to advise on scientific matters, one might reasonably question whether the SAB should find these concerns compelling. In any case, one way to reduce costs would have been to simply reduce the number of EEAC members. Membership had grown to 19 in 2018, from 9 in 1998. It is also questionable whether the creation of ad hoc committees will substantially reduce costs since members would still need to be recruited and committees established and it would take time to get each ad hoc committee up and running for each review, in contrast to the EEAC, which would already have its members appointed and be ready to respond to review requests.

Regarding the issue of the EEAC's inactivity, it is important to note that the committee did not set its own agenda. Rather, by design, the EEAC responded only to specific requests from the EPA, and it is not entirely clear from the outside when and how these requests originated inside the agency. Nevertheless, with unprecedented shifts in EPA policy under way—along with changes in the economic justification for these shifts (discussed next)—it is hard to imagine there being a time of greater need than now for external economic review of EPA analyses.

Conflicting Economic Analyses Under the Obama and Trump Administrations

President Trump's EPA has undertaken a series of actions to roll back significant environmental regulations and to change the way economic analyses are conducted. The EPA is required to conduct RIAs for both the implementation and the rollback of significant rules. This presents an unprecedented opportunity to compare how different administrations (i.e., Obama and Trump) have carried out benefit–cost analyses for what are essentially the same environmental regulations. With this in mind, we present brief summaries of the differences in the economic analyses that support RIAs under the two administrations for some of the most significant recent EPA rules. These differences underscore the need for and importance of objective review to help policymakers distinguish simple differences in administrative priorities from potentially questionable and perhaps politically motivated economic analyses. In fact, two of the rules we will discuss here—the Waters of the United States Rule and the

Clean Power Plan—were listed for SAB review in a recent EPA memo (Cullen 2018), suggesting that economic peer review would be relevant and important.

Waters of the United States Rule

The Waters of the United States Rule, which has become known as the WOTUS rule, expanded the number of streams and wetlands protected under the Clean Water Act. Under the Obama administration, the EPA estimated annual benefits of $450 million, which exceeded compliance costs of $300 million. In contrast, the RIA by the Trump administration's EPA found that repealing WOTUS had positive net benefits (after excluding the benefits of wetlands protection), with its finding based on the argument that using "old" studies introduced too much uncertainty into the estimates. Indeed, to arrive at their result of compliance costs exceeding benefits, the analysis simply assigned a value of $0 to the largest category of benefits, which had been valued at more than $400 million per year 2 years earlier (Boyle, Kotchen, and Smith 2017).

Clean Power Plan

Finalized in 2015, the Clean Power Plan (CPP) called for a reduction in carbon dioxide emissions from U.S. power plants of 32 percent by 2030. Obama's EPA estimated the annual costs by 2030 to be $8.4 billion, compared with benefits that ranged from $34 to $54 billion. The RIA for the Trump administration's proposed repeal of the CPP significantly reduces benefits such that the CPP no longer passes a benefit–cost test. The difference in the results arise because of changes to the estimated social cost of carbon (SCC)—specifically, the Trump administration's analysis is based on higher discount rates and includes only domestic (rather than global) damages. Additionally, the scenarios considered in the Trump RIA do not account for the health cobenefits of reducing other harmful pollutants and/or include the unconventional assumption that the reduction of pollutants below a threshold level does not produce health benefits (Krupnick and Keyes 2017).

Fuel Economy Standards

The Energy Independence and Security Act of 2007 mandated a doubling of the fuel economy standard from 27 to 55 miles per gallon between 2012 and 2025. In 2017, the EPA affirmed that the anticipated benefits of ramping up to the 2025 standards would exceed the costs. In 2018, the Trump administration issued a proposed rule to freeze the standards at the 2020 levels through 2025. Again, the RIA for the rollback found that the benefits of the initial rule would fall short of the costs. In this case, significant differences in the analyses include the Trump administration's approach of increasing compliance costs by a factor of seven, an unexplained shrinkage of the overall vehicle fleet by six million cars, and continued changes to the SCC. Although it is unclear exactly what drives some of the differences in results between the Obama and Trump administrations' analyses, the Trump administration's analysis appears problematic and inconsistent with basic economic theory and empirical studies (Bento et al. 2018).

A Call for Fundamental Change to Rulemaking Analyses

Beyond the conflicting RIAs associated with specific rules, in June 2018 the EPA issued a call for public comment on a proposal called "Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process" (U.S. EPA 2018c), which would change what are counted as benefits and would apply to rules under the Clean Air Act, the Clean Water Act, and the Safe Drinking Water Act. Many critics believe that the motivation for this proposed rulemaking change is to institutionalize the exclusion of cobenefits in future RIAs (Davenport and Friedman 2018), thereby eliminating a significant category of health benefits associated with many environmental regulations. Because "SAB standing Committees . . . address any specific issues that are considered of great importance to the Agency" (U.S. EPA 2003), one is left to wonder how the Trump administration and the SAB can reconcile this call for external input on such an important question of economic methodology with the near simultaneous elimination of the EEAC.

Conclusions: The Growing Need for Independent Review

EPA priorities have always changed when administrations change, and all economic analyses rely on assumptions. Therefore, external scientific review is helpful for separating politically motivated outcomes from evidence-based information to support decision making. The examples we have discussed here illustrate the critical need for scientific review of economic analyses at the EPA, especially now. Indeed, the fact that there are conflicting findings from the same agency concerning the benefits and costs of the same rule risks undermining the EPA's credibility for producing objective economic analyses. The EEAC could have been tasked to provide such external scientific reviews. We believe that its elimination, without even a discussion about the possibility of reorganizing it to increase its effectiveness, is a step in the wrong direction.

The elimination of the EEAC appears to be part of a broader trend in the Trump administration to diminish the scientific basis of public-policy decisions. Within the EPA, related examples include the exclusion of scientists with EPA grants from serving on EPA advisory boards (Cornwall 2017) and limiting the use of peer-reviewed research as the basis for EPA rules and regulations (Reilly 2018). In a related example outside the EPA, the U.S. Department of Agriculture (USDA) has proposed moving the Economic Research Service from the nation's capital, where it has a long history of providing insight on agricultural policies and related environmental and natural resource issues, to several locations around the country (Heller 2018). This would clearly reduce the ability of the research arm of the USDA to inform national policies. These efforts to diminish the role of economic analysis and its impact on environmental policy come after a long period of increased visibility and influence, particularly regarding the advantages of market-based policies and the quantification of nonmarket environmental benefits and costs.

The economics community must now find ways to maintain its ability to help ensure efficient and effective policies that are designed to protect human health and the environment. With the elimination of the EEAC, an effort is under way to organize a scientific review committee that is outside of the EPA. Led by J. R. DeShazo and Mary Evans, both former

EEAC members, the idea is to provide independent advice on the state of the science regarding the benefits, costs, and design of EPA's environmental programs, with the goal of ensuring that U.S. environmental regulations reflect sound economic science. At the time of this writing, the founding executive committee has begun to discuss organization, structure, goals, funding, and potential outputs.[3] Such an external review committee has the advantage of not needing to wait for EPA to solicit advice and not having the scope of reviews limited to specific charge questions. However, there are also potential disadvantages, including the absence of EPA staff to support administration of the review, a lack of coordination with the EPA for information sharing, and the lack of a reciprocal working relationship with EPA economists. It is also unclear how and whether the external committee's comments and reports will be recognized and used by the SAB and its ad hoc committees.

The effort to establish an external review committee for EPA actions is a constructive interim step. Professional associations such as AERE might also want to consider whether and how they might support such an effort. For example, with the federal government's disbanding of its interagency working group on the SCC, Resources for the Future has created the Social Cost of Carbon Initiative to update and improve SCC estimates.

In the future, we hope the SAB and the EPA leadership will reconsider the decision to eliminate the EEAC and systematically include members of the environmental economics community in discussions about the most constructive way to move forward. The use of ad hoc review committees potentially opens the door to the selection of politically driven committees for each review, whereas a standing committee has expertise to provide independent review and insight for the broad array of issues on which EPA may need economic advice.

References

Bento, A., K. Gillingham, M. Jacobsen, C. Knittel, B. Leard, J. Linn, V. McConnell, D. Rapson, J. Sallee, A. van Benthem, T. Wenzel, and K. Whitefoot. 2018. Flawed analyses of U.S. auto fuel economy standards. *Science* 362:1119–21.

Boyle, K., M. Kotchen, and V. K. Smith. 2017. Deciphering dueling analyses of clean water regulations. *Science* 358:49–50.

Brennan, T. 2018. There is no longer an Environmental Economics Advisory Committee at the EPA. https://www.env-econ.net/2018/06/there-is-no-longer-an-environmental-economics-advisory-committee-at-the-epa-.html.

Cornwall, W. 2017. Trumps EPA has blocked agency grantees from serving on science advisory panels. Here is what it means. *Science* October 31, doi:10.1126/science.aar3791.

Cropper, M., J. Hammitt, and L. Robinson. 2011. Valuing mortality risk reductions: progress and challenges. *Annual Review of Resource Economics* 3:313–36.

Cullen, A. 2018. Preparations for chartered Science Advisory Board (SAB) discussions of EPA planned agency actions and their supporting science in the spring 2017 regulatory agenda. SAB memorandum.

Davenport, C., and L. Friedman. 2018. The E.P.A.'s review of mercury rules could remake its methods for valuing human life and health. *New York Times*, September 7.

Grady, A. 2016. Daubert and expert testimony. *Virtual Mentor* 8(2):97–100.

Heller, M. 2018. Ex-USDA officials decry Perdue's plan to move researchers. *Greenwire*, September 20.

[3]Table A3 in the online supplementary material includes a list of the founding executive committee members.

Krupnick, A., and A. Keyes. 2017. Hazy treatment of health benefits: the case of the Clean Power Plan. Blog post, Resources for the Future, October 13.

Reilly, S. 2018. 'Banner day' for Pruitt as he signs 'secret science' proposal. *E&E News PM*, April 24.

U.S. EPA. 1994. An SAB report: Contingent valuation methodology (CV 1). Review of contingent valuation method for the proposed RIA for RCRA corrective action rule by the Environmental Economics Advisory Committee. EPA-SAB-EEAC-94-001. Washington, DC: U.S. EPA.

———. 2003. Reorganization of the EPA Science Advisory Board (SAB). A report of the EPA Science Advisory Board Staff Office. EPA-SAB-04-001. Washington, DC; U.S. EPA.

———. 2017. SAB review of EPA's proposed methodology for updating mortality risk valuation estimates for policy analysis. EPA-SAB-2017-005. Washington, DC: U.S. EPA.

———. 2018a. EPA Science Advisory Board (SAB). Advisory Reports. https://yosemite.epa.gov/sab/sabproduct.nsf/WebBOARD/advisoryreports?OpenDocument (accessed October 18, 2018).

———. 2018b. EPA Science Advisory Board (SAB). Environmental Economics Advisory Committee. https://yosemite.epa.gov/sab/sabpeople.nsf/webcommitteessubcommittees/environmental%20economics%20advisory%20committee (accessed October 18, 2018).

———. 2018c. Proposed rules: increasing consistency and transparency in considering costs and benefits in the rulemaking process. *Federal Register* 83(114):31098–99.