![Institute for Policy Integrity — New York University School of Law]

November 25, 2008

Environmental Economics Advisory Committee (EEAC)
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Subject: Comments on 2008 Draft of *Guidelines for Preparing Economic Analyses*

EEAC Member:

The Institute for Policy Integrity offers the following comments on the draft to the update for the Environmental Protection Agency's guidelines for preparing economic analyses. For now, our comments will focus only on a few broad concepts. We hope to be part of the discussion throughout the process of revising and finalizing these guidelines, and we may submit additional comments in the future.

The Institute for Policy Integrity ("IPI") at New York University School of Law is a non-partisan advocacy organization and think-tank dedicated to improving the quality of governmental decision-making in the area of environmental, public health, and safety regulation. IPI advocates using properly conducted cost-benefit analysis as a tool to advance socially-beneficial regulation. We enthusiastically support the Environmental Protection Agency ("EPA") in its efforts to improve the accuracy, consistency, and transparency of the economic analyses produced by the agency. With this mutual goal in mind, we make the following suggestions:

- Provide additional guidance on contentious points to ensure more uniform analysis;

- Expand the scope to cover deregulatory and non-regulatory decisions;

- Encourage a more dynamic view of the market and of technological innovation;

- Guard against the underestimation of ancillary benefits; and

- Revise the discussion of discounting to more accurately reflect inter-temporal risk preferences and social welfare concepts

Additional Guidance on Contentious Points

IPI agrees that the guidelines on economic analysis must be flexible enough to allow analysts to adapt and respond to case-specific complications. EPA rightly designed its guidelines to "provide

assistance" and not to create a "rigid blueprint."[1] However, flexibility can be the enemy of consistency, and letting analysts decide contentious issues on an *ad hoc* basis can undermine the transparency and legitimacy of economic analysis. IPI believes some additional guidance would be useful on at least the following matters:

Life-years and quality-adjusted life-years. The guidelines list a range of techniques and considerations for valuing mortality risks. In particular, the guidelines mention alternative measures of mortality risks that attempt to capture the "quantity of life" saved. While the guidelines do acknowledge that using the life-years model "remains a subject of debate" and that the relationship between willingness to pay and age is "ambiguous,"[2] the main text of the guidelines does not prohibit use of the life-years model. In fact, the main text of the guidelines seems to recommend the model as the "typical" method for cost-effectiveness analysis.[3] Only in an appendix do the guidelines specify that "[s]ince published support is lacking [for the life-years model], [the] approach is [not] recommended at this time."[4]

The guidelines do go further in discouraging the use of a quality-adjusted life-years (QALYs) model, stating that "composite metrics that combine information on quality and quantity of life lived under various scenarios…should not be used for deriving monetary estimates for use in benefit-cost analyses."[5] However, the guidelines seem to place no limitations on the use of this model for non-monetary estimates or for cost-effectiveness analyses.

The life-years and the QALYs models are too problematic to be listed in the guidelines, even with warnings, as available techniques for valuing mortality risks. Proponents of the life-years method use a constant per-life-year value, so that all life-years are valued equally no matter when they occur. This approach is fundamentally inconsistent with both economic theory and existing empirical data. The life-years methodology ignores the effect of scarcity on valuation and, instead of assuming that the elderly may have an increased willingness to pay to safeguard their few remaining years, delivers greater marginal regulatory benefit to those who have the least marginal valuation. No plausible economic model or empirical study provides even lukewarm support for the diminishing linear relationship between life expectancy and willingness to pay that undergirds the life-years approach.[6] The valuation of life-years is not a useful or ethical substitute for the value of a statistical life. Simply warning analysts in an appendix not to use the model "at this time" is

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[1] Nat'l Ctr. for Evntl. Econ., U.S. Envtl. Prot. Agency, Guidelines for Preparing Economic 1-3 (Sept. 12, 2008) (unpublished external review draft) [hereinafter "2008 External Review Draft"].

[2] *Id.* at 7-8.

[3] *Id.* (also stating "The value of mortality risks can vary both by risk characteristics and by the characteristics of the affected population.…Population characteristics include…remaining lifespan; health status.").

[4] *Id.* at App. B-7.

[5] *Id.* at 7-10.

[6] No consensus has emerged around a single economic model, but some proposals predict that as the probability of death increases, so does the willingness to pay to avoid risk, because people cannot take money to their graves. *See* Chris Dockins, Kelly Maguire & Nathalie Simon, U.S. Envtl. Prot. Agency, *Willingness to Pay for Environmental Health Risk Reduction When There Are Varying Degrees of Life Expectancy*, 7-8 (Working Paper, Aug. 22, 2006) (citing Pratt and Zeckhauser study). Similarly, empirical studies have alternatively revealed that willingness to pay is independent of age, increases with age, or has an inverted-U shape relationship with age. *See* Ann Alberini et al., *Does the Value of a Statistical Life Vary with Age and Health Status? Evidence from the United States and Canada*, (Resources for the Future Working Paper No. 01-19, 2001); Joseph Aldy & W. Kip Viscusi, *Adjusting the Value of a Statistical Life for Age and Cohort Effects*, (Resources for the Future Discussion Paper No. 06-10, 2006); W. Kip Viscusi & Joseph Aldy, *Labor Market Estimates of the Senior Death Discount for the Value of Statistical Life*, (Resources for the Future Discussion Paper No. 06-12, 2006).

insufficient, and reference to the model should either be removed from the main text of the guidelines or more definitely rejected as an inappropriate option for valuing mortality risks.

The idea of QALYs is similarly flawed. QALYs systematically overestimate the loss to quality of life resulting from less-than-perfect health because they fail to account for how people adapt to health setbacks. Moreover, people do not have a constant rate at which they are willing to trade dollars for QALYs: people may be willing to pay more to extend life than to increase health, even if the result is the same QALY increase; people may be willing to pay more to avoid some risks instead of others, even if the change in QALYs is the same; and people may be willing to pay different amounts per QALY at different points in their lives. Thus, QALYs are not compatible with cost-benefit analysis because they do not provide an alternative to the direct measurement of willingness to pay. While more research on QALYs may be warranted, right now the guidelines must place stronger limitations on the use of this model. Such decisions should not be left up to individual analysts.

Selection and analysis of alternative options. The guidelines repeatedly instruct analysts to analyze alternative regulatory and non-regulatory options, and they do present a range of traditional, market-based, voluntary, and informational approaches in an introductory chapter.[7] However, throughout the main text, the guidelines often stress analyzing alternatives along only one dimension: stringency. The guidelines suggest that the goal of economic analysis – "a desire to find an optimal outcome" – is simply a matter of specifying the right "degree of stringency in a regulation."[8] To that end, the guidelines call on analysts to present cost and benefit estimates for "at least one option [that is] more stringent and at least one option less stringent than the chosen or preferred option."[9]

Yet stringency is not the only dimension along which reasonable alternative policies can be found. The Office of Management and Budget recommends looking at such other considerations as different compliance dates, different enforcement methods, different requirements for different-sized firms, different requirements for different geographic regions, and so forth.[10] Indeed, the September 2000 version of EPA's guidelines included suggestions to consider "tailoring pollution control requirements to account for geographical differences" or "phasing in policies over time."[11] The updated guidelines should similarly include an explicit list of potential alternative regulatory and non-regulatory options, as well as additional details on the appropriate number of alternative scenarios to consider, lest analysts assume that they only need examine one more stringent option and one less stringent option.

Existence values. The guidelines note that analysts should consider certain "nonuse" values, "including an intrinsic concern for the existence of species populations or ecosystems in a relatively undisturbed state or a desire to preserve healthy ecosystems for future generations."[12] IPI strongly supports the proper valuation and inclusion of non-use values in economic analysis. However, a

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[7] *See generally* 2008 External Review Draft, *supra* note 1, at 4-1 to 4-26 (chapter four: regulatory and non-regulatory approaches to pollution control).

[8] *Id.* at 10-4.

[9] *Id.*; *see also id.* at 10-7 ("OMB's *Circular A-4* requires that at least one alternative be more stringent and one less stringent than the preferred option, and the incremental costs and benefits would be reported for each increasingly stringent option.").

[10] OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, 7-9 (2003).

[11] OFFICE OF THE ADMIN., U.S. ENVTL. PROT. AGENCY, EPA 240-R-00-003, GUIDELINES FOR PREPARING ECONOMI ANALYSES 15 (2000) [hereinafter "2000 Guidelines"].

[12] 2008 External Draft Review, *supra* note 1, at 7-11.

great deal of controversy surrounds the existence and measurement of non-use values.[13]   If the guidelines hope to encourage analysts to consider existence values in a routine and consistent manner, more advice should be given on the types of existence values to measure and the types of studies to rely on.

International versus domestic effects. As understanding and awareness of the imminent dangers of climate change continue to grow, so does the importance of considering the effects of regulations on greenhouse gas emissions. In fact, a federal circuit court recently ruled that failure to consider ancillary climate benefits in a cost-benefit analysis was arbitrary and capricious.[14]   Environmental issues like climate change have significant transnational implications. While the guidelines do acknowledge that effects of a regulation beyond the borders of the United States may be considered in an economic analysis, the default assumption presented is that only domestic costs and benefits matter.[15]   The valuation and inclusion of international costs and benefits will become an increasingly important issue as more economic analyses consider trans-border environmental issues like climate change.   Indeed, EPA has recently suggested that at least in the context of climate change, international effects must be considered: failure to do so falsely assumes that Americans are unwilling to pay to avoid international damages caused by U.S. pollution and that international impacts will not produce security risks or economic disruptions felt within U.S. borders.[16] The guidelines should provide more direction on when and how to analyze foreign costs and benefits.   Especially when international effects may be large and may influence policy choices – as is likely with climate change – a consistent approach is crucial.

Scope: Deregulation, Non-Regulatory Approaches, and Agency Inaction

Deregulation can be just as costly, in terms of adverse impacts on social welfare, as inefficient regulation.   Similarly, the decision to adopt non-regulatory (i.e., voluntary or informational) policies or to do nothing at all can be as costly as the decision to regulate too much. Efficient regulations deliver large benefits and counteract important failures of the unregulated market. Just as regulations impose some cost on the economy, the lack of regulation, if regulation is called for, also imposes costs in the form of reduced social welfare.[17]   Economic analysis can be just

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[13] *See e.g.* SUSAN DUDLEY & DANIEL SIMMONS, MERCATUS CENTER, PUBLIC INTEREST COMMENT ON THE ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM REGULATIONS 8 (2005), *available at* http://www.mercatus.org/PDFDownload.aspx?filePath=/ WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=18750 (suggesting that countervailing existence values exist for many regulations – "Some individuals may gain nonuse values from the knowledge that the Alaskan wilderness is untouched by oil drilling, while others may gain nonuse values from the knowledge that oil wells exist to provide jobs for Alaskan workers and national security. Some individuals may assign nonuse values to knowing people attend church regularly, while others may gain nonuse values from knowing others engage in hedonistic behavior."). *See also* Letter from National Roofing Contractors Association to Lorraine Hunt, Office of Information & Regulatory Affairs (May 5, 2003) (on file with author) (arguing that contingent valuation "is so fundamentally flawed as to warrant exclusion altogether").

[14] *See* Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 508 F.3d 508, 547 (9th Cir. 2007).

[15] *See* 2008 External Draft Review, *supra* note 1, at 1-3.

[16] *See* U.S. ENVTL. PROT. AGENCY, TECHNICAL SUPPORT DOCUMENT ON BENEFITS OF REDUCING GHG EMISSIONS 11 (2008).

[17] These comments draw from RICHARD L. REVESZ & MICHAEL A. LIVERMORE, RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH (2008). Please see that text for more detailed explanations of and more support for all arguments presented throughout these comments.

as valuable for cases of deregulation, non-regulatory approaches, and agency inaction as for examining new regulations.

Unfortunately, the guidelines underemphasize the need for economic analysis of these other kinds of regulatory actions. For example, the guidelines state that "formal economic analysis is not required for the selection and implementation of a non-regulatory approach."[18] While the guidelines do allude to the need to address effectiveness and "accountability,"[19] the more rigorous approach advocated in the 2000 version of the guidelines has been deleted: "Without some assessment of costs, it is difficult to establish whether a particular voluntary program is cost-effective in comparison with other policy actions. As a consequence, it is useful to investigate the social costs associated with nonregulatory programs—quantifying how they affect economic markets, and evaluating the relative economic efficiency of these approaches as compared with regulatory policies."[20] Given the value of conducting economic analysis, that language should be restored.

Moreover, the entire presentation of costs and benefits in the guidelines seems to assume that a regulatory action is being analyzed and not a deregulatory action. For example, the chapter on costs focuses exclusively on compliance costs, capital costs, transactional costs, government costs, and so forth. However, in the case of a deregulatory action, the costs may be environmental harms or negative health effects, while the benefits may instead be measured in terms of compliance costs. Yet the guidelines do not describe how analysts should model environmental and public health costs resulting from deregulatory decisions.

The guidelines should specify that agency decisions to deregulate, to adopt voluntary or non-regulatory policies, or to take no action on a significant environmental issue are equally subject to economic analysis. Additionally, the guidelines should adjust their recommendations when necessary to provide advice more specific to such types of analyses.

Technological Innovation and Compliance Costs

One mistaken and often-overlooked assumption made in the calculation of compliance costs is that industry cannot adapt to new requirements. Though the empirical literature on cost estimation is not sufficiently well-developed to generate clear conclusions about the extent of systematic bias, there is ample anecdotal evidence of the overestimation of costs. For example, William Reilly, EPA administrator under President George H.W. Bush, has stated that there has been "a pattern of consistent, often substantial, overestimation of [regulations'] economic costs."[21]

This result stems in part from a failure to consider the full potential of technological innovation, learning effects, and process changes to lower compliance costs over time.[22]

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[18] 2008 External Review Draft, *supra* note 1, at 4-24.

[19] *Id.* at 4-25.

[20] 2000 Guidelines, *supra* note 11, at 135.

[21] William K. Reilly, *EPA's Cost Underruns*, WASH. POST, Oct. 14, 2003, at A23. *See also* OFFICE OF MGMT. & BUDGET, VALIDATING REGULATORY ANALYSIS: REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 42 (2005) (noting a greater tendency for costs to be overestimated than underestimated).

[22] Another component is the routine reliance on industry data to calculate compliance costs, which the guidelines also fail to caution against. Industry representatives may be tempted to find the easiest and cheapest way to estimate compliance costs, which is likely to consist simply of totaling the costs of existing technologies and processes. By failing to consider the short- or long-term development of technological advancements and process improvements, such estimates can sometimes be quite severely off the mark: for

Unfortunately, the guidelines take a hesitant approach to the consideration of technological innovation, especially when compared with the 2000 version of the guidelines.

To begin, the guidelines repeatedly refer to most costs as remaining "constant"[23] or "permanent"[24] over time. Such language does not properly prime analysts to think about costs as potentially declining in the future. Similarly, while it is certainly necessary to be careful when considering the role of technological innovation,[25] the guidelines are overly-cautious to the point of being discouraging. Even though the Office of Management and Budget and the EPA Advisory Council require consideration of learning effects "even when sector- or process-specific empirical data are not available,"[26] the guidelines only indicate that learning effects "*may* be included" in "*some* cases."[27] In contrast, the 2000 version of the guidelines announced the expectation that "accounting for exogenous technological change would decrease estimated abatement costs."[28] Finally, the guidelines do not list the ability to incorporate potential technological innovations or learning effects as one of the factors to consider when selecting a cost estimate model.[29]

While retaining all appropriate cautions, the guidelines should go further in encouraging analysts to adopt a dynamic view of the marketplace that allows for significant technological innovation, learning effects, and production process changes. Rather than assuming most costs will remain permanent, the guidelines should assume that many costs will decrease over time.

Ancillary Benefits

IPI appreciates that the guidelines generally advise analysts to count indirect or ancillary benefits.[30] But since the concept has historically received so little attention in economic analysis,[31] a more thorough description of ancillary benefits seems deserved and necessary if analysts are expected to give them sufficient attention.

In particular, the guidelines' overall presentation of indirect or countervailing costs and that of indirect or ancillary benefits is asymmetrical and risks deemphasizing the importance of ancillary benefits. To begin, while the labels "implicit costs" and "indirect costs" appear prominently in the

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example, the actual cost of phasing out leaded gasoline in the United States proved to be 95% lower than industry had expected. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION 561 fig.4.8 (2d ed. 1996). The tendency for industry to overestimate compliance costs could sometimes be intentional. As Sally Katzen, head of the Office of Information and Regulatory Affairs under President Clinton, has written, "If you do not want to do something, you inflate the amount of time, inconvenience, and cost you estimate it would take." *Cost-Benefit Analysis: Where Should We Go from Here?*, 33 FORDHAM URB. L.J. 1313, 1315 (2006).

[23] 2008 External Draft Review, *supra* note 1, at 5-4.

[24] *Id.* at 8-11 & 8-12.

[25] *See id.* at 5-7 (discussing technological innovation on the benefits side and the need to consider only policy-induced technologies).

[26] *Id.* at 8-13.

[27] *Id.* at 5-7; *see also id.* at 5-8 ("*If* learning effects are to be included in an analysis…").

[28] 2000 Guidelines, *supra* note 11, at 30.

[29] 2008 External Draft Review, *supra* note 1, at 8-16.

[30] *See id.* at 7-11 ("Environmental policies can lead to ecological improvements that may benefit people in a variety of direct and indirect ways."); *id.* at 7-16 ("Analysts should take care to think through potential secondary or indirect effects of the policy options as well as these may prove to be important.").

[31] *See* RISK VERSUS RISK: TRADEOFFS IN PROTECTING HEALTH AND THE ENVIRONMENT (John D. Graham & Jonathan Baert Wiener eds. 1995) (arguing that ancillary benefits should be discounted).

headings of two sections,[32] no such subsection heading is devoted to indirect benefits. A section on "indirect benefits" had appeared in the 2000 version of the guidelines, along with a chart depicting "indirect benefits" at an equal hierarchical level with "direct benefits."[33] That material has been removed from the updated guidelines.

Beyond asymmetry in language and attention, the guidelines also do not explicitly define a broad scope of potential ancillary benefits. To identify ancillary benefits, the guidelines recommend that analysts "research the physical effects of the pollutants on human health and the environment."[34] These instructions ignore the potential for ancillary economic impacts, even though studies show that environmental regulations may generate substantial indirect benefits to capital investments.[35] Similarly, while the guidelines refer to a "ripple" effect of costs through the economy,[36] the guidelines give little attention to potentially beneficial economic "ripples."[37]

The guidelines are also limiting in their discussion of how to measure ancillary benefits. The guidelines are right to caution that "the science behind [a particular ancillary effect] may be too uncertain to include the effect in the quantitative analysis"[38] and to warn against "double-counting,"[39] but there should be symmetry on these points when discussing indirect costs. The revised guidelines also seem to require a larger magnitude effect before ancillary benefits are counted than the 2000 version had required. Instructions on how to determine which benefit categories to include now direct analysts to look for benefits that account for "the bulk of the total benefits,"[40]

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[32] 2008 External Review Draft, *supra* note 1, at 8-9.

[33] 2000 Guidelines, *supra* note 11, at 70. That same section also contained a much longer list of examples of ancillary benefits than the current version contains. *Compare id.* at 70 ("Wetlands recharge groundwater, mitigate flooding, and trap sediments. Forests sequester carbon, anchor soil, and maintain microclimates. Estuaries protect adolescent fish. Terrestrial ecosystems provide habitat for natural pollinators. All of these systems support biodiversity.") *with* 2008 External Review Draft, *supra* note 1, at 7-11 ("Such valuable ecological functions include the partial stabilization and moderation of climate conditions, the regulation of water availability and quality, and nutrient retention"). *See also* 2000 Guidelines, *supra* note 11, at 66 (discussing much more attenuated and economic ancillary benefits – "For example, increased fish populations may cause commercial prices to drop, in which case consumers may increase their purchases.").

[34] 2008 External Review Draft, *supra* note 1, at 7-16.

[35] *See* Dallas Burtraw et al., *Ancillary Benefits of Reduced Air Pollution in the United States from Moderate Greenhouse Gas Mitigation Policies in the Electricity Sector* 4 (Resources for the Future Discussion Paper No. 01-61, 2001) (estimating that in addition to the benefits of helping to avert climate change, greenhouse gas regulations would deliver significant direct health benefits and investment savings for industry). Similarly, when the guidelines state that "If a proposed regulation is expected to increase compliance with a previous rule, the correct measure of the costs and benefits generally excludes impacts associated with the increased compliance," 2008 External Review Draft, *supra* note 1, at 5-8, they overlook the potential for new regulations to decrease the compliance costs of a previous rule, regardless of whether the overall compliance rate is affected.

[36] 2008 External Review Draft, *supra* note 1, at 1-5, 8-9 ("Changes in these prices then ripple through the rest of the economy, causing prices in other sectors to rise or fall and ultimately affecting the incomes of consumers.").

[37] *But see id.* at 9-9 ("regulations may cause a rise in output and employment in other sectors"). That one reference represents a good start, but more explanation, more examples, and a broader picture of ancillary economic benefits are still necessary.

[38] *Id.* at 5-4.

[39] *Id.* at 7-1 & 7-13 ("Because many ecological functions serve intermediate roles in the production of final goods and services enjoyed by people, it is important to avoid double-counting the value of those functions.").

[40] *Id.* at 7-16.

while the old guidelines only required that benefits represent "a major proportion"[41] – "bulk" suggests a majority is required, whereas "major" suggests a significant amount though not necessarily a majority. Similarly, the 2000 version noted the need to include a benefit category that might be important to stakeholders or decision-makers, "even if its magnitude is relatively small."[42] By contrast, the new guidelines simply note that such benefits "are not necessarily large."[43]

Though these criticisms may seem more concerned with word choice and rhetoric than with actual substance, given the history of ancillary benefits as an over-looked category, the guidelines need to set a tone and prime analysts to look for and recognize a wide range of ancillary benefits. By subtly emphasizing indirect costs more than indirect benefits, the guidelines risk perpetuating the undervaluation of ancillary benefits.

Intra-Generational and Inter-Generational Discounting

IPI offers three comments on the subject of discounting: (1) to reflect true inter-temporal risk preferences, the concept of "dread" must be incorporated into the discount rate in the intra-generational context; (2) inter-generational discounting should be prohibited; (3) if inter-generational discounting is retained, the guidelines must clarify the appropriate procedures.

Dread. In general, IPI endorses the discounting of intra-generational costs and benefits as a useful and appropriate tool. The value of a statistical life is derived from willingness-to-pay studies mostly conducted in the context of industrial accidents. By comparison, available data on deaths resulting from latent harms is sharply limited by the problems of tracking people, events, and health outcomes over long periods of time. The cognitive limitations of understanding the very low probability risks for latent diseases also means that potential wage differentials due to risk preferences are less reliable in this area. Finally, teasing out work-related factors from lifestyle choices is extremely tricky for long-latency-disease risks. Given these difficulties with directly measuring willingness-to-pay to avoid long-latency disease,[44] discounting represents a second-best approach to estimating the costs of future illness.

The standard practice for discounting in the long-latency context, however, is incomplete and requires some refinement. The discounting technique assumes that people always prefer immediate gratification and delayed pain; in practice, this assumption often does not hold true. In certain situations, people may prefer to hasten an unpleasant risk to avoid feelings of dread.[45] The anti-dread effect may be especially relevant during the latency period after the detection of a life-threatening disease but prior to mortality, when dread may be extreme. Therefore, to accurately approximate people's actual risk preferences, any discounting of adverse consequences during a

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[41] 2000 Guidelines, *supra* note 11, at 63.

[42] *Id.*

[43] 2008 External Review Draft, *supra* note 1, at 7-17.

[44] *See, e.g.*, Maureen L. Cropper & Frances G. Sussman, *Valuing Future Risks to Life*, 19 J. ENVTL. ECON. & MGMT. 160 (1990); Anna Alberini et al., *Willingness to Pay for Mortality Risk Reductions: Does Latency Matter?* (Resources for the Future Working Paper 04-13, 2004), *available at* http://www.rff.org/Documents/RFF-DP-04-13.pdf.

[45] In scientific studies, when subjects are faced with a choice between receiving identical, low-voltage shocks at different times, nearly 80% of participants choose to take the painful shock sooner. Some are even willing to endure more painful shocks in order to reduce the delay. Gregory S. Berns et al., *Neurobiological Substrates of Dread*, 312 Science 754 (May 5, 2005).

risk's latency period must be coupled with an increase in the estimate of those consequences as a result of dread.

The guidelines already acknowledge that "[p]lacing effects properly in time is essential for net present value calculations to characterize efficiency outcomes." But while the guidelines note the importance of accounting for latency and cessation lag, they fail to balance the advice with a discussion of dread.[46] Instead, the discount rates currently recommended by the guidelines are those developed by the federal Office of Management and Budget.[47] However, those rates are based on the standard assumption that people always prefer to delay adverse events and, as such, do not account for the powerful and opposite time preference represented by dread. IPI recommends that the guidelines on intra-generational discounting mandate the consideration of dread and caution analysts specifically against using the OMB rates without any additional analysis or justification.

Inter-generational discounting. While the guidelines recognize that inter-generational discounting is ethically and empirically distinct from intra-generational discounting, they do not go nearly far enough. Analysts should not merely consider a lower discount rate for the inter-generational context along with the standard, higher intra-generational rates.[48] Instead, the guidelines should instruct analysts never to discount in such a fashion.

Inter-generational discounting requires us to compare risks faced by different individuals and choose to value one individual's preferences more just because he or she is alive first.[49] Especially over long time horizons, inter-generational discounting leads to absurd conclusions, such as an unwillingness to spend even relatively trivial sums now to avoid even catastrophic results in the future.[50]

Additionally, there is no defensible justification for using inter-generational discounting. One argument proposes that since current rates of technological development and economic growth will lead to greater productivity and consumption opportunities for future generations, the same benefit will produce less utility in the future than it would if delivered to today's poorer population. The guidelines seem to rely heavily on this argument.[51] However, this argument assumes an even

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[46] 2008 External Review Draft, *supra* note 1, at 6-6); *see also id.* at 7-9 ("Environmental contamination may cause immediate or delayed health effects, and the value of avoiding a given health effect likely depends on whether it occurs now or in the future. Recent empirical research confirms that workers discount future risks of fatal injuries on the job; that is, they are willing to pay less to reduce a future risk than a present risk of equal magnitude.").

[47] *See id.* at 6-22 (directing analysts to use OMB's 7% rate.

[48] The guidelines set general directions for all discounting procedures – including use of 3% and 7% rates – and then says analysts should "*also*" use a stochastic random walk model "if the policy has a long time horizon." *Id.* at 6-21 to 6-22.

[49] The guidelines acknowledge that "[t]he analytical and ethical foundation of the social discounting literature rests on the traditional test of a 'potential' Pareto improvement in social welfare, in other words, the tradeoff between the gains to those who benefit and the losses to those who bear the costs. This framework casts the consequences of government policies in terms of *individuals contemplating changes in their own consumption* (broadly defined) over time." *Id.* at 6-7. In other words, when considering different individuals' consumption (inter-generational) instead of the same individuals' consumption (intra-generational), the "analytical and ethical foundation of the social discounting literature" does not apply.

[50] For example, if greenhouse gas buildup is predicted to impose a net cost of $1 trillion in 400 years' time (a sum representing approximately one-tenth of the current United States gross domestic product), applying a discount rate of 4% yields a present value of those future net costs of only $113,000. ANTHONY E. BOARDMAN ET AL., COST-BENEFIT ANALYSIS: CONCEPTS AND PRACTICE 262 (3d ed. 2006).

[51] *See* 2008 External Review Draft, *supra* note 1, at 6-15 ("Note that if consumption grows over time—as it has at a fairly steady rate at least since the industrial revolution (e.g., Valdés 1999)—then future generations

distribution of the costs and benefits of regulations, which rarely occurs. For example, the negative consequences of climate change are more likely to impact developing countries, while the costs of climate change regulations will be borne primarily by developed nations. Thus, the argument only works if, for example, future Bangladeshis will be better off than today's U.S. residents burdened by environmental regulation.[52]

Another justification offered for inter-generational discounting is the chance that a major catastrophe will destroy human civilization. In short, future benefits should be discounted by the probability that nobody will be around to enjoy them. Although it makes sense to discount by the probability of nonoccurrence, given the low probability rates for natural and human-caused disasters of this scale,[53] the appropriate discount rate to apply would be tiny, nowhere near the 3% or 7% rates the guidelines permit.

A third argument for inter-generational discounting states: "If a smaller discount rate were to be applied to health [i.e., future benefits] than to money [i.e., future costs], it would always make sense to postpone adoption of public health programs that invest money now for deferred health improvements."[54] This argument is specious. First, regardless of whether future benefits are discounted at the market rate, it would always be desirable to undertake regulatory investments that yielded more than a market rate of return. Second, for some threats, the cost of addressing the problem will increase over time.[55] Finally, it may not always be possible in the future to transfer resources across projects and investments.[56]

The draft guidelines also raise the possibility that failure to discount will lead to an "unethical shortchanging of current and close generations."[57] This argument is insufficient to support discounting at a constant rate; it only points to one of many possible normative implications of any

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will be richer than the current generation and therefore increments to consumption will be valued less highly in the future than today due to the diminishing marginal utility of consumption. Thus, in a growing economy changes in future consumption would be given a lower weight (i.e., discounted at a positive rate) than changes in present consumption in this framework.").

[52] In 2006, the GNPs of the United States and Bangladesh differed by a factor of nearly 100. United Nations Statistics Division, *Social Indicators, Indicators on Income and Economic Activity*, http://unstats.un.org/UNSD/demographic/products/socind/inc-eco.htm (last visited August 12, 2008). Bangladesh would very likely experience serious impacts from global warming much sooner than it could bridge that gap in productivity and standard of living.

[53] For example, a major asteroid strike occurs every half-million years. Nick Bostrom, *Existential Risk*, 9 J. EVOLUTION AND TECH. 1 (2002), *available at* http://www.jetpress.org/volume9/risks.html. The risk of all-out nuclear war or other human-caused disasters is certainly non-negligible, but still incredibly small compared to the suggested discount rates.

[54] Susan W. Putnam & John D. Graham, *Chemicals Versus Microbials in Drinking Water: A Decision Science Perspective*, 85 J. AM. WATER WORKS ASS'N 57, 60 (1993).

[55] For example, a leaking Superfund site may be relatively cheap to clean up, until it pollutes an aquifer. If there is a future risk of catastrophic irreversible damage, reasonable risk aversion would suggest that we eliminate the threat as much as possible now, even if the current benefits are outweighed by the current costs.

[56] For example, an investment in education might pay off more in the short run, whereas an investment in an environmental program would have higher returns over the long term. Yet it might be impossible to transfer money out of education and into the environmental program in the future: public sentiment, a powerful teacher's union, or the difficulty of converting infrastructure could all serve to obstruct the transfer.

[57] 2008 External Review Draft, *supra* note 1, at 6-16 (also a particularly harsh and groundless attack on the benefits of climate change regulations). Notably, the 2000 version of the guidelines came to exactly the opposite conclusion: "Most assume that the rate of pure time discount is zero, adhering to the ethical precept that the policy maker ought not to inherently favor present generations' consumption over that of future generations." 2000 Guidelines, *supra* note 11, at 49.

system of valuation that attempts to balance the distribution of goods between the present and the future. It also fails to consider that the standard of living for future generations will greatly depend on the flourishing of the present ones in areas such as technological knowledge, educational attainment, and productive capacity.[58]

Discounting is not the only option for defining our moral obligations to future generations. Sustainable development, utilitarianism, corrective-justice, and other ethical theories all offer social decision-makers a model for how to treat future costs and benefits. To their credit, the guidelines recognize these options exist,[59] but they do not sufficiently highlight these tools as real alternatives that decision-makers can use in place of inter-generational discounting. Choosing between these ethical theories remains a difficult task, but the key point is that our obligation to future generations is a moral question and cannot be addressed by inapposite economic tools.[60]

Procedure. If EPA insists on the continued use of inter-generational discounting, the procedure described in the guidelines at the very least needs adjustment and clarification. The guidelines seem to make two sets of recommendations on discounting: recommendations for all cases of discounting, and recommendations specific to the inter-generational context. Both sets are in need of revision.

For all cases of discounting, the updated guidelines now recommend using "the shadow price of capital" as the "analytically preferred" method of discounting. Though the guidelines suggest analysts wait until EPA has released additional research and guidance on the subject, it seems the procedure will soon become the default practice.[61] This is a surprising change from the 2000 version of the guidelines, which had set the exact opposite default: "no adjustments using the shadow price of capital [should be made] unless there are strong reasons to believe that a particular policy will affect the level of U.S. private sector investment."[62] The change is especially surprising given that the new guidelines discuss how the current literature on the subject is at best "not conclusive" and how some empirical evidence suggests that the assumptions supporting the practice are in fact incorrect.[63] Considering how "difficult to implement" the practice is,[64] the guidelines should not establish the shadow price of capital as a default technique.

Additionally, for all cases of discounting, the guidelines now recommend calculating discounted costs and benefits based on a consumption rate of interest of 3% (as well as at a higher 7% rate).[65] Previously, in the 2000 version of the guidelines, the recommendation was to use a

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[58] *See* Robert Solow, *An Almost Practical Step Toward Sustainability*, 19 RESOURCES POL'Y 162, 168 (1993).

[59] 2008 External Review Draft, *supra* note 1, at 6-15 ("It is worth noting, however, that the optimal growth literature is only one strand of the substantial body of research and writing on inter-temporal social welfare. This literature extends from the economics and ethics of interpersonal and intergenerational wealth distribution to the more specific environment-growth issues raised in the "sustainability" literature, and even to the appropriate form of the social welfare function, e.g., utilitarianism, or Rawls' maxi-min criterion.").

[60] Though we disagree with its ultimate conclusion that annihilation risk and marginal utility of consumption justify inter-generational discounting, the Stern Review is notable for arguing that inter-generational discounting is not a strict economic question and that "one can confront [the decision] only by looking carefully at the ethical issues." NICHOLAS STERN, CABINET OFFICE, HER MAJESTY'S TREASURY, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 51 (2006).

[61] 2008 External Review Draft, *supra* note 1, at 6-20.

[62] 2000 Guidelines, *supra* note 11, at 48.

[63] 2008 External Review Draft, *supra* note 1, at 6-12.

[64] *Id.*

[65] *Id.* at 6-20.

consumption rate of interest of "two to three percent rate."[66] This upward departure from past practices is not explained.

For the inter-generational context, the guidelines recommend following the standard steps (shadow price of capital, 3% discounting, 7% discounting) and then "also" using a lower discount rate more tailored to the inter-generational context.[67] Given the ethical dilemmas presented by inter-generational discounting, the suggestion that rates as high as 7% - which were developed for the intra-generational context – would ever be appropriate in the inter-generational context is troubling. Indeed, the guidelines explicitly note that "[o]ne possible approach is to simply make no distinction between inter-generational and intra-generational social discounting."[68] This approach should in fact never be an option, since it ignores the significant differences in the ethical and empirical basis for discounting in the intra-generational versus the inter-generational contexts.[69]

Though the guidelines allude to a range of lower discount rates available in the inter-generational context and refer to an external source for such rates,[70] the updated version of the guidelines has removed the explicit instructions that rates developed for the inter-generational context "generally range from one-half percent to three percent."[71] The guidelines also seem to leave no room for analysts to decide, at least in certain situations, against a discount rate for the inter-generational context. Here the strict nature of the guidelines' recommendations seems to undermine the purported goal of flexibility: "Which option is utilized in the analysis is left to expert judgment."[72] The guidelines should instead make clear that 0%-3% rates are available for use in the inter-generational context.

Finally, the updated version of the guidelines has removed a discussion of discounting non-monetized benefits. The 2000 guidelines stated that: "Because linking quantified physical harms to a unit of emissions is a difficult task, discounting greenhouse gas emissions would be a premature and problematic step in determining the cost-effectiveness of two alternative emission reduction strategies."[73] Given the increasing importance of considering the effects of regulations on greenhouse gas emissions, such advice to analysts is more crucial than ever.

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[66] 2000 Guidelines, *supra* note 11, at 48.

[67] 2008 External Review Draft, *supra* note 1, at 6-22 ("If the policy has a long time horizon (more than 50 years or so) where net benefits vary substantially over time – e.g., most benefits accrue to one generation and most costs to another -- then also calculate the expected present value of net benefits using the schedule of discount factors estimated by Newell and Pizer (2003) based a stochastic "random walk" model of interest rates.").

[68] *Id.* at 6-19. This is truly a remarkable claim for the guidelines to make, given that one page later the guidelines note just how inappropriate and inaccurate an intra-generational discount rate is in the inter-generational context: "Their results illustrate that a constant discount rate could substantially undervalue net present benefits when compared to one that accounts for uncertainty. For instance, a constant discount rate of seven percent could undervalue net present benefits by between 21 and 95 percent depending on the way in which uncertainty is modeled." *Id.* at 6-20.

[69] *See* 2000 Guidelines, *supra* note 11, at 39 (discussing the different analytical and ethical foundations for intra-generational and inter-generational discounting).

[70] *See* 2008 External Review Draft, *supra* note 1, at 6-20 ("Combining these parameter values reveals an estimated equilibrium real interest rate of 1.4% [from the Stern Report], a rate arguably lower than most returns to standard investments, but not outside the range of values suggested in these Guidelines for intergenerational discount rates.").

[71] 2000 Guidelines, *supra* note 11, at 50.

[72] 2008 External Review Draft, *supra* note 1, at 6-19.

[73] 2000 Guidelines, *supra* note 11, at 54.

Conclusion

IPI appreciates the tremendous difficulties involved in designing prescriptive yet flexible guidelines for accurate, fair, and transparent economic analysis. EPA must be commended on its extremely admirable effort to achieve this objective. One challenging subjects like equity assessments and the presentation of uncertainty, the guidelines will be a tremendously beneficial resource for economic analysts in all government agencies.

But there still is room for further refinement. We hope that after additional public comment and review, EPA will be able to produce a set of guidelines that will: provide additional guidance to ensure consistency; cover deregulatory and non-regulatory decisions; improve the accuracy of cost and benefit estimations; and end immoral practices like the discounting of future generations' costs and benefits. We hope that this initial set of comments will prove useful, and we hope to continue to play a role in the discussions as these revisions move forward.

Sincerely,

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