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The Wilderness Society

June 20, 2023

To: Office of Management and Budget

Submitted By: Center for Climate and Energy Solutions, Center for Environmental Health, Clean Air Task Force, Earthjustice, Environmental Defense Fund, Federation of American Scientists, Institute for Policy Integrity at New York University School of Law, Montana Environmental Information Center, National Audubon Society, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, Western Environmental Law Center, The Wilderness Society

Subject: Proposed OMB Circular No. A-4, “Regulatory Analysis,” 88 Fed. Reg. 20,915 (Apr. 7, 2023)

The undersigned organizations¹ respectfully submit the following comments in response to the Office of Management and Budget’s (OMB) draft update to Circular A-4 (Draft Update).²

The Draft Update would mark the first revision to Circular A-4—OMB’s guidance document for conducting regulatory benefit-cost analysis—since the document’s 2003 publication. Those twenty years have seen vast improvements in the economic literature on the assessment of regulatory effects on numerous topics including discounting future effects, assessing the distribution of regulatory impacts, and valuing environmental amenities. The current Circular A-4 fails to reflect these key developments and is overdue for an update.

The Draft Update reflects the evolving state of economic and scientific knowledge and marks a substantial improvement over the existing and outdated Circular A-4. Nonetheless, OMB can improve upon the Draft Update in numerous key respects as it finalizes the guidance. This comment letter commends particular aspects of the Draft Update, offers

¹ Our organizations may separately and independently submit other comments to this docket. This document does not purport to represent the views, if any, of New York University School of Law.

² OFF. OF MGMT. & BUDGET, CIRCULAR A-4: DRAFT FOR PUBLIC REVIEW (Apr. 6, 2023) [hereinafter Draft Update]; Request for Comments on Proposed OMB Circular No. A-4, “Regulatory Analysis,” 88 Fed. Reg. 20,915 (Apr. 7, 2023).

suggestions for improvement, and responds to several questions that OMB poses in the preamble accompanying the Draft Update (“Preamble”).³

In particular, this letter makes the following points:

- The Draft Update’s **approach to discounting** appropriately reflects recent data and analytical advancements. OMB should further improve upon its guidance by **lowering the discount rate for environmental goods and services to account for their increasing relative value over time**, adopting a **declining risk-adjusted discount rate schedule**, providing **updated capital rates** for use only in sensitivity analysis for short-run effects, and **regularly adjusting the risk-free social discount rate** based on the latest available data.
- The Draft Update also greatly improves upon the existing Circular by **calling for the consideration of distributional impacts in a manner that is consistent with existing guidance and practice**. OMB can further improve its guidance by instructing agencies to **conduct distributional analysis as the default**, assess regulatory effects on a **granular scale**, and apply **economic tools that identify underserved populations** based on multiple datasets.
- The Draft Update **appropriately calls for agencies to consider a range of transboundary impacts** that directly or indirectly affect the welfare of U.S. citizens and residents. This approach is **consistent with existing agency practice** across a wide range of regulatory contexts; in fact, agencies have considered transboundary effects in various contexts dating back decades. OMB’s proposed approach is also **consistent with judicial precedent** endorsing the consideration of transboundary impacts in regulatory decisionmaking.
- The Draft Update **appropriately emphasizes the importance of monetizing environmental services** so as not to shortchange these critical benefits in the context of regulatory impact analyses, developing robust analytical baselines, accounting for learning-by-doing in assessing compliance costs, **and considering unquantified impacts**. To further improve its guidance, OMB should expand upon the need to consider a **sufficient analytical timeframe** that captures all important impacts, provide **additional guidance around break-even analysis**, and highlight the potential utility of **expert elicitation in developing an analytical baseline**.

We expand upon these points below.

³ OFF. OF MGMT. & BUDGET, PREAMBLE: PROPOSED OMB CIRCULAR NO. A-4, “REGULATORY ANALYSIS” (Apr. 6, 2023) [hereinafter Preamble].

I. The Draft Update Greatly Improves Upon the Existing Circular’s Approach to Discounting, and OMB Should Provide More Express Guidance in Key Areas

A social discount rate is used in economic analysis to place impacts that occur at different future times into a common present value.⁴ In its current form, Circular A-4 advises agencies normally to apply social discount rates of 3% and 7%.⁵ The 3% rate, known as the consumption rate, reflects the estimated rate (as of 2003) at which society discounts consumption in the future compared to consumption today; the 7% rate, known as the capital rate, reflects the then-anticipated rate of return to capital.⁶ These rates, particularly the 7% figure, have the effect of substantially devaluing impacts that accrue to future generations,⁷ and experts have increasingly recognized that they are outdated and inflated.

Reflecting that expert consensus, the Draft Update proposes to lower the default, risk-free consumption discount rate used in regulatory impact analysis from the current 3% to 1.7%, based on updated data and extensive economic scholarship. Also reflecting current economic research, the update would eliminate the use of the capital discount rate (currently estimated at 7%) and replace it with the shadow price of capital approach. This proposed update is both consistent with the best available evidence and widely supported by the leading experts in the field.

While the Draft Update marks a major improvement in discounting, OMB should provide further direction to agencies in several areas. First, OMB should suggest that agencies adjust the discount rate downwards when regulations affect environmental goods and services to account for their rise in relative value over time due to scarcity. Second, OMB should adopt a risk-adjusted discount rate schedule that declines over time. Third, OMB should provide an updated upper-bound capital discount rate near 3%, to apply only in sensitivity analysis for short-term impacts, and a lower-bound capital rate below 1.7%, reflecting the potential that net regulatory benefits (and not just net costs) fall on capital. And fourth, OMB should regularly update the risk-free consumption discount rate as the 30-year average Treasury rate changes over time.

A. The Draft Update’s Approach to Discounting Reflects the Best Available Evidence and Scholarship

OMB’s update to the discount rate—including both the reduction in the risk-free social discount rate and the elimination of the capital rate in favor of the shadow price of capital approach—reflects the latest available evidence and scholarship. Therefore, the proposed update is supported by the world’s preeminent discounting experts. In a recent article in *Science*—which is enclosed to this letter for reference—nearly 20 experts (Howard et al.) expressed strong support for OMB’s proposed discounting update, explaining that the proposal is consistent with the leading research in the field.⁸

⁴ A social discount rate is used for measuring social value. When modeling private behavior, regulators use private discount rates consistent with the observed behavior of the private entity and then calculate the social value of that private behavior using a social discount rate.

⁵ OFF. OF MGMT. & BUDGET, CIRCULAR A-4: REGULATORY ANALYSIS 33–34 (2003).

⁶ *Id.* at 33–34.

⁷ For instance, applying the 7% discount rate to an effect that accrues in 50 years devalues the effect by more than 97%. Applying it to an effect that accrues in 100 years devalues that effect by over 99.9%.

⁸ Peter H. Howard et al., *U.S. Benefit-Cost Analysis Requires Revision*, 380 *SCIENCE* 803 (2023). Dr. Howard and Max Sarinsky, the other corresponding author of the *Science* letter, are signatories on this comment.

1. Consistent with empirical evidence, OMB correctly sets the risk-free social discount rate below 2%

OMB's approach to setting the risk-free social discount rate—which it pegs at 1.7%—is consistent with both the agency's past practice and recent economic evidence.

The existing Circular A-4 calculates the consumption discount rate by taking the average real yield on 10-year Treasury notes from 1973–2002.⁹ But real rates of return have steadily declined in recent decades¹⁰ following a structural break in the early 1990s.¹¹ Consequently, applying Circular A-4's methodology with data from the past 30 years now yields a risk-free social discount rate below 2%.¹² In revising the discount rate from 3% down to 1.7%, OMB now applies the same basic methodology that was used to calculate the 3% rate back in 2003: averaging the 10-year Treasury rate over the last 30 years.¹³

While OMB's approach to updating the risk-free social discount rate is reasonable, other approaches support similar or even lower risk-free social discount rates. For instance, more sophisticated models based on Treasury yields identify a range of 0.5% to 1.3% with a central estimate of 0.7%.¹⁴ Medium-run forecasts from the Congressional Budget Office and Council of Economic Advisors also support rates lower than 2%.¹⁵ Expert elicitations peg the median risk-free social discount rate at about 2%¹⁶ and support a central discount rate of 1% when accounting for the effects of relative prices.¹⁷

In short, OMB's proposed update to the risk-free social discount rate is consistent with multiple lines of evidence. Accordingly, in their *Science* letter, Howard et al. offered strong support for lowering the risk-free social discount rate.¹⁸

⁹ CIRCULAR A-4 at 33–34.

¹⁰ Peter Howard & Jason Schwartz, *Valuing the Future: Legal and Economic Considerations for Updating Discount Rates*, 39 YALE J. ON REG. 595, 617 & fig.1 (2022); see also COUNCIL OF ECON. ADVISERS, DISCOUNTING FOR PUBLIC POLICY: THEORY AND RECENT EVIDENCE ON THE MERITS OF UPDATING THE DISCOUNT RATE 4 (2017) (observing that “long-term rates had fallen worldwide for nearly 20 years”).

¹¹ E.g. Michael D. Bauer & Glenn D. Rudebusch, *The Rising Cost of Climate Change: Evidence from the Bond Market*, REV. ECON. & STAT. 12 tbl.1 (2021).

¹² Howard & Schwartz, *supra* note 10, at 617; COUNCIL OF ECON. ADVISERS, *supra* note 10, at 4–7.

¹³ Draft Update at 76. As OMB explains in the Preamble, it adjusted its methodology slightly by applying the 10-year Treasury Inflation-Protected Securities (TIPS) yield for the years it is available (2003–2022). Preamble at 19. Had OMB used the *exact* same methodology that it applied in the current Circular A-4—that is, “continuing to use 10-year Treasury rates and CPI even in the years when TIPS data is available,” then “the estimated social rate of time preference would have instead been 1.4%” rather than 1.7%. *Id.* at 21.

¹⁴ Bauer & Rudebusch, *supra* note 11, at 12 tbl.1 (finding an average equilibrium real rate of interest over the past decade of 1.3% using ten-year Treasury notes and 0.7% using one-year Treasury notes).

¹⁵ CONG. BUDGET OFFICE, THE 2021 LONG TERM BUDGET OUTLOOK 43 tbl.A-2 (2021) (calculating average forecasts of 1.3% to 1.5% over the next 30 years); COUNCIL OF ECON. ADVISERS, *supra* note 10, at 6 (citing forecasts from Congressional Budget Office and Blue Chips of 1.2% and 1.5%, respectively).

¹⁶ Moritz Drupp et al., *Discounting Disentangled*, 10 AM. ECON. J.: ECON. POL'Y 109, 111 (2018); Peter H. Howard & Derek Sylvan, *Wisdom of the Experts: Using Survey Responses to Address Positive and Normative Uncertainties in Climate-Economic Models*, 162 CLIMATIC CHANGE 213, 219 (2020); Robert S. Pindyck, *The Social Cost of Carbon Revisited*, 94 J. ENV'T ECON. & MGMT. 140 (2019).

¹⁷ Drupp et al., *supra* note 16, at 123 (supporting a discount-rate range of 0% to 2% with a central estimate of 1%).

¹⁸ Howard et al., *supra* note 8.

2. OMB correctly shifts from a social opportunity cost of capital approach to the shadow price of capital approach

The Draft Update would also appropriately drop the opportunity cost of capital approach (i.e., the 7% rate in the current Circular A-4) in favor of the shadow price of capital approach. Leading discounting experts also support this change.¹⁹

The opportunity cost of capital approach assumes that the “main effect of a regulation is to displace . . . the use of capital in the private sector.”²⁰ But recent economic scholarship finds that this assumption rarely holds true in practice, for two essential reasons. First, the costs of agency actions are often borne through displaced consumption rather than displaced investment, particularly given the open nature of the U.S. economy.²¹ And second, while the opportunity cost of capital approach assumes that the *costs* of regulation fall on capital, the *benefits* of regulation may often fall on capital as well.²² When a regulation benefits capital, as Li and Pizer (2021) explain, the use of a risk-free social discount rate *lower* than the real interest rate could be warranted to ensure that the regulatory impact analysis “capture[s] the social benefits from tax revenues generated from capital income.”²³

The shadow price of capital approach that OMB adopts in the Draft Update bounds the potential impacts of regulation on capital consistent with this body of literature. In essence, the shadow price of capital approach translates capital into consumption equivalents. Regulators then apply sensitivity analysis to their regulatory benefit and cost estimates to produce a lower-bound estimate of net benefits assuming that the *costs* of regulation fall on capital and an upper-bound estimate of net benefits assuming that the *benefits* of regulation fall on capital.²⁴ Thus, the shadow price of capital appropriately centralizes the consumption discounting approach (i.e., the 1.7% rate in the Draft Update) as the default risk-free social discount rate, consistent with the economic scholarship.

Indeed, centralizing the use of consumption discount rates and applying the shadow price of capital approach is widely supported, particularly over longer time horizons. For instance, recent scholarship from Dr. Qingran Li and Dr. William Pizer finds that, given their best estimate of the shadow price of capital, the appropriate social discount rate collapses to the consumption-based rate within just several decades. Consequently, the longer the time horizon of analysis, the less the capital-based rate is applicable.²⁵ Another recent paper from Dr. Richard Newell and co-authors concludes that the shadow price of capital approach is more appropriate for regulatory benefit-cost analysis than using the capital-based discount rate provided in the current Circular

¹⁹ *Id.*

²⁰ Circular A-4 at 33.

²¹ Howard & Schwartz, *supra* note 10, at 621–22.

²² Qingran Li & William A. Pizer, *Use of the Consumption Discount Rate for Public Policy Over the Distant Future*, 107 J. ENV'T ECON. & MGMT. 1 (2021).

²³ Qingran Li & William A. Pizer, *Discounting for Public Benefit-Cost Analysis*, RES. FOR THE FUTURE 4 (2021), <https://www.rff.org/publications/issue-briefs/discounting-for-public-benefit-cost-analysis/>.

²⁴ Draft Update at 79–80.

²⁵ Qingran Li & William A. Pizer, *Use of the Consumption Discount Rate for Public Policy Over the Distant Future*, 107 J. ENV'T ECON. & MGMT. 1 (2021); Qingran Li & William A. Pizer, *Discounting for Public Benefit-Cost Analysis*, RES. FOR THE FUTURE 3 (2021).

A-4.²⁶ In fact, that current guidance already acknowledges the shadow price of capital as the conceptually correct approach, but it does not prioritize that approach due to data limitations that existed in 2003 and because the bias resulting from using the opportunity cost of capital approach was not well understood then.²⁷

By removing the social opportunity cost of capital approach in favor of the shadow price of capital, the Draft Update is consistent with these key principles of economic theory. Experts broadly support this change.²⁸

B. OMB Should Expand Its Discounting Guidance in Several Ways

While the Draft Update greatly improves upon the existing Circular's approach to discounting, OMB should expand its discounting guidance in several key ways. These include providing further guidance on accounting for relative prices of environmental services, a declining discount rate schedule, and an updated capital rate for limited use only in sensitivity analysis. Additionally, OMB should commit to updating the risk-free consumption discount rate at regular intervals.

1. OMB should suggest that agencies adjust the discount rate downward to account for the rise in relative value of environmental goods and services over time, or at least provide additional guidance on valuing environmental scarcity

It has been well-known for almost 50 years that the growing scarcity of environmental goods and services, particularly with respect to market goods, increases their relative value to society.²⁹ These relative prices can be modeled explicitly or by lowering discount rates over longer time horizons. However, because explicit modeling may be beyond the capacity of most agencies,³⁰ OMB should consider either making simplifying assumptions, such that the relative price change is similar to the growth of the VSL over time,³¹ or adjusting downwards the risk-free discount rate of environmental goods and services.³² The latter methodology, which we address further below, would mean in practice that agencies would apply lower discount rates for environmental goods and services than they would for other costs and benefits, which is consistent with economic theory and literature.

There is a growing empirical work estimating the gap between market and non-market discount rates. A literature survey indicates that a one percentage point lower rate for environmental goods and services would be relatively conservative, as peer-reviewed estimates

²⁶ Richard G. Newell, Brian C. Prest & William Pizer, *The Shadow Price of Capital: Accounting for Capital Displacement in Benefit-Cost Analysis*, RES. FOR THE FUTURE (2023).

²⁷ CIRCULAR A-4, *supra* note 9, at 33.

²⁸ Howard et al., *supra* note 8.

²⁹ Anthony C. Fisher & John V. Krutilla, *Resource Conservation, Environmental Preservation, and the Rate of Discount*, 89 Q.J. ECON. 358 (1975).

³⁰ See generally Thomas Sterner & U. Martin Persson, *An Even Sterner Review: Introducing Relative Prices into the Discounting Debate*, 2 REV. ENV'T ECON. & POL'Y 61 (2008).

³¹ Comments submitted on this docket by Dr. Moritz A. Drupp and other economists lay out this methodology and derive an upward annual adjustment of 1.7%. See Moritz A. Drupp et al., Public Consultation Response on Proposed Revisions to Circular A-4: Adjusting Relative Prices of Non-Market Environmental Goods (June 9, 2023).

³² Christian Gollier, *Ecological Discounting*, 145 J. ECON. THEORY, 812 (2010); Christian P. Traeger, *Sustainability, Limited Substitutability, and Non-Constant Social Discount Rates*, 62 J. ENV'T ECON. & MGMT. 215 (2011).

range from 0.6 percentage points to 1.8 percentage points below market rates.³³ A discount rate that is one percentage point lower would also be consistent with recent expert elicitation.³⁴ Accordingly, consistent with its 1.7% risk-free social discount rate, OMB should endorse a risk-free discount rate of about 0.7% for environmental goods and services.

Even if OMB does not suggest explicitly accounting for relative prices or lowering the discount rate for environmental goods and services, it should clearly acknowledge that agencies will undervalue environmental goods and services if they do not account for the relative scarcity of those goods and services over time. In this case, OMB (perhaps working with other agencies such as EPA) should provide agencies with additional guidance on explicitly modeling relative scarcity to ensure that long-term environmental goods and services are appropriately valued.

2. OMB should adopt a declining discount rate schedule

The current Circular A-4 recommends that agencies apply lower discount rates over longer time horizons³⁵—which is consistent with longstanding economics literature³⁶ and expert consensus.³⁷ In practice, however, agencies have rarely applied lower discount rates in intergenerational settings, perhaps because Circular A-4 does not provide a long-term schedule.

The Draft Update once again endorses applying lower discount rates over longer time horizons,³⁸ and the Preamble even proposes a schedule of declining discount rates from Bauer and Rudebusch (2021) starting at 1.7% in the short-run.³⁹ However, the Draft Update itself does not provide a declining discount rate schedule. Without further guidance, agencies may continue to rarely use lower discount rates for intergenerational settings. Accordingly, OMB should adopt the declining rate schedule from Bauer and Rudebusch (2021) or another appropriate long-term schedule based on market rates.

OMB also should clarify that a declining discount rate schedule should not be used when agencies apply a certainty-equivalent approach, since the calculation of certainty-equivalent net

³³ Gollier, *supra* note 32; Stefan Baumgärtner et al., Ramsey Discounting of Ecosystem Services, 61 ENV'T & RES. ECON., 273 (2015); Moritz A. Drupp, *Limits to Substitution Between Ecosystem Services and Manufactured Goods and Implications for Social Discounting*, 69 ENV'T & RES. ECON. 135 (2018); Moritz A. Drupp & Martin C. Hänsel, *Relative Prices and Climate Policy: How the Scarcity of Nonmarket Goods Drives Policy Evaluation*, 13 AM. ECON. J.: ECON. POL'Y 168 (2021).

³⁴ Moritz A. Drupp, Mark C. Freeman, Ben Groom & Frikk Nesje., *Discounting Disentangled*, 10 AM. ECON. J.: ECON. POL'Y 109, 111 (2018); (estimating a 2% discount rate for market goods and 1% discount rate for non-market goods).

³⁵ CIRCULAR A-4, *supra* note 9, at 35–36.

³⁶ Kenneth Arrow et al., *Determining Benefits and Costs for Future Generations*, 341 Science 6144 (2013); Maureen L. Cropper et al., *Declining Discount Rates*, 104 AM. ECON. REV. 538 (2014); Christian Gollier, *Discounting and Growth*, 104 Am. Econ. Rev. 534 (2014); Ben Groom, Cameron Hepburn, Phoebe Koundouri & David Pearce, *Declining Discount Rates: The Long and the Short Of It*, 32 ENV'T & RES. ECON. 445 (2005); Richard G. Newell & William A. Pizer, *Discounting the Distant Future: How Much Do Uncertain Rates Increase Valuations?*, 46 J. ENV'T ECON. & MGMT. 52 (2003).

³⁷ Howard et al., *supra* note 8 (“[L]ower discount rates are appropriate for valuing long-term effects.”).

³⁸ Draft Update at 80–82.

³⁹ Preamble at 30.

benefits implicitly assumes an underlying extended Ramsey equation⁴⁰ and will thus naturally decline over time reflecting an expected slowdown in long-term economic growth.⁴¹

3. While OMB correctly removes the 7% rate, it should adopt updated capital rates explicitly for the purpose of sensitivity analysis focused on the short-run

As discussed above, economic scholarship supports the shadow price of capital approach over capital-based discount rates, especially over the long term. Nonetheless, it is possible that some agencies—in this or a future presidential administration—may wish to continue using a capital rate in certain contexts.⁴² Because the Draft Update omits a capital rate, agencies in such circumstances may turn to the 7% rate in the existing Circular A-4, which is long outdated and incompatible with the 1.7% consumption rate.⁴³

To avoid this possibility, OMB should provide recent calculations of the risk-free social opportunity cost of capital. As explained above, economic scholarship finds that regulation may benefit capital, and not necessarily displace it. Accordingly, a correct application of the opportunity cost of capital in the short-run requires the use of an upper-bound rate (above 1.7%), assuming the costs of regulation fall on capital, and a lower-bound rate (below 1.7%), assuming the benefits of regulation fall on capital.⁴⁴ For the upper-bound rate, OMB should provide a rate lower than 3%, consistent with a recent paper from Newell et al.⁴⁵ These updated rates are clearly superior to the current 7% capital rate, which naively assumes that all benefits go to consumption rather than capital and reflects a private (instead of social) risk premium, land and resource rents, private returns to social externalities, and market power.⁴⁶

If OMB provides updated capital rates, it should explain that those rates should be used only for sensitivity analysis involving short-run time horizons. OMB should also explain that an agency choosing to apply this approach should also perform sensitivity analysis using both the upper-bound rate and a lower-bound rate below 1.7% assuming that regulatory benefits fall on capital, consistent with the approach laid out in Li and Pizer (2021).

4. OMB should regularly update the risk-free social discount rate

As illustrated by the discussion above, the proper discount rates to apply in regulatory impact analysis should be informed by the latest available evidence and not remain static over time. But the publication of Circular A-4 two decades ago froze discount rates in time. Despite overwhelming evidence supporting the use of lower discount rates, agencies continue to use discount rates from a 2003 guidance document derived from 1970s data.

While updating the discount rates in Circular A-4 would correct this time lag for now, it would not prevent it from recurring in the future. Accordingly, OMB should regularly update its

⁴⁰ See Draft Update at 82–83 (endorsing the use of certainty equivalents “where risk is material to the regulation”).

⁴¹ E.g. Kevin Rennert et al., *Comprehensive Evidence Implies a Higher Social Cost of CO₂*, 610 NATURE 687, 688 (2022) (projecting long-term decline in average per-capital GDP growth rate based on expert elicitation).

⁴² Li & Pizer, *supra* note 25.

⁴³ Newell et al., *supra* note 26. This paper derives a 3% capital rate based off of a 2% consumption rate. Shifting the consumption rate down to 1.7%, consistent with the Draft Update, would yield a capital rate below 3%.

⁴⁴ Li & Pizer, *supra* note 25.

⁴⁵ *Id.*

⁴⁶ Howard & Schwartz, *supra* note 10, at 619–20.

recommended discount rates consistent with the current 30-year rolling average of real treasury yields. Those updates should occur on a regular basis every several years.⁴⁷ In fact, OMB already engages in a similar process through its annual update to Circular A-94, Appendix C.⁴⁸ For simplicity, OMB could peg the timing of the update to the risk-free social discount rate to the triennial adjustment to the monetary threshold for the definition of “significant regulatory action” called for in Executive Order 14094.⁴⁹

There may be future circumstances in which Treasury notes would no longer be an appropriate measurement of the risk-free rate of return (e.g., if the United States were to default on its debt). The risk-free status of U.S. government assets could be undermined if investors perceive risk, such that OMB may want to consider switching its calculation method if perceptions of U.S. government assets substantially change.⁵⁰

II. OMB’s Guidance on Distributional Effects Has Extensive Regulatory Precedent but Would Benefit from Additional Detail in Some Key Areas

The Draft Update expands considerably upon Circular A-4’s existing guidance regarding distributional analysis. The current Circular A-4 calls for agencies to “provide a separate description of distributional effects” in their regulatory analysis—“divided up in various ways” such as by “income groups, race, sex, industrial sector, geography,” or others—but offers little guidance on how to perform such an analysis.⁵¹ The Draft Update supplies additional guidance, providing five pages of discussion about performing a qualitative or quantitative distributional analysis touching on such issues as group identification and distributional weights.⁵² The Draft Update supplies useful detail and is consistent with current guidance and executive orders calling on agencies to assess distributional impacts.

OMB can further expand its distributional guidance in several key ways. First, OMB should clarify when agencies should conduct a distributional analysis. Second, OMB should suggest that agencies consider using economic tools that identify disadvantaged groups along multiple dimensions. Third, OMB should further endorse the assessment of regulatory impacts on a granular scale, which can assist agencies in both assessing distributional impacts and measuring aggregate benefits and costs. And fourth, OMB should consider a wider range of income-elasticity estimates.

⁴⁷ As an analogous example, the National Academies of Sciences has recommended that the federal government update the social cost of greenhouse gases at “regular intervals of approximately 5 years.” A similar five-year timeframe is appropriate here. NAT’L ACADS. SCIS., VALUING CLIMATE DAMAGES: UPDATING ESTIMATION OF THE SOCIAL COST OF CARBON DIOXIDE 3 (2017).

⁴⁸ See OFF. OF MGMT. & BUDGET, CIRCULAR A-94: GUIDELINES AND DISCOUNT RATES FOR BENEFIT-COST ANALYSIS OF FEDERAL PROGRAMS 11 (1992) (instructing agencies to apply discount rates in this context “using a comparable-maturity Treasury rate”); see also OFF. OF MGMT. & BUDGET, CIRCULAR A-94: APP. C (last updated Mar. 15, 2022).

⁴⁹ Exec. Order No. 14094 § 1(b), 88 Fed. Reg. 21,879 (Apr. 11, 2023).

⁵⁰ Wendy Edelberg & Louise Sheiner, *How Worried Should We Be if the Debt Ceiling Isn’t Lifted?*, BROOKINGS INST. (updated Apr. 24, 2023); Council of Econ. Advisers, *The Potential Economic Impacts of Various Debt Ceiling Scenarios* (May 3, 2023).

⁵¹ Circular A-4 at 14.

⁵² Draft Update at 61–66.

A. Distributional Analysis Has Longstanding Precedent in Regulatory Guidance and Executive Orders

For at least 30 years, executive orders and guidance documents have directed agencies to consider distributional impacts in regulatory decisionmaking. Executive Order 12866, issued by President Clinton in 1993, instructs agencies to incorporate equity considerations, including “distributive impacts,” into their benefit-cost analyses and regulatory decisions.⁵³ The current Circular A-4, issued in 2003, itself instructs agencies to “provide a separate description of distributional effects (i.e., how both benefits and costs are distributed among sub-populations of particular concern) so that decision makers can properly consider them along with the effects on economic efficiency,” and to do so “quantitatively to the extent possible.”⁵⁴ And in 2011, President Obama issued Executive Order 13563, which reaffirmed Executive Order 12866 and further emphasized the importance of considering “equity, human dignity, fairness, and distributive impacts” when issuing regulations.⁵⁵

In addition to these precedents for distributional analysis generally, numerous executive orders call on agencies to consider impacts on specific subpopulations in regulatory decisions. Executive Order 12898, issued by President Clinton in 1994, requires agencies to identify and seek to address the adverse environmental and human-health impacts of all federal administrative programs (including regulations) on minority and low-income populations.⁵⁶ Executive Order 13045, issued by President Clinton in 1997, requires agencies “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that [their] policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”⁵⁷ And Executive Order 13272, issued by President George W. Bush in 2002, requires agencies to “thoroughly review draft rules to assess and take appropriate account of the potential impact on small businesses, small governmental jurisdictions, and small organizations.”⁵⁸ As these executive orders illustrate, agencies have long considered the impacts of their regulations on particular subgroups.

Consistent with these executive orders, agencies have sometimes relied upon distributional equity as a basis for rulemaking. For instance, in 2014 the National Highway Traffic Safety Administration relied on equity and justice concerns in promulgating a regulation mandating backup cameras on all new vehicles, highlighting the rule’s benefits for children, people with disabilities, and the elderly.⁵⁹ More recently, the Department of Energy set efficiency standards for manufactured housing at a lower level than its cost-benefit analysis

⁵³ Exec. Order No. 12,866 § 1(b)(5), 58 Fed. Reg. 51,735, 51,736 (Oct. 4, 1993).

⁵⁴ Circular A-4 at 14.

⁵⁵ Exec. Order No. 13,563, 76 Fed. Reg. 3821 (Jan. 21, 2011).

⁵⁶ Exec. Order No. 12,898 § 1-101, 59 Fed. Reg. 7629, 7629 (Feb. 16, 1994) (“To the greatest extent practicable and permitted by law, . . . each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations . . .”).

⁵⁷ Exec. Order No. 13045 § 1(a), 62 Fed. Reg. 19,885 (Apr. 21, 1997).

⁵⁸ Exec. Order No. 13272 § 1, 67 Fed. Reg. 53,461 (Aug. 16, 2002).

⁵⁹ Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19,178, 19,236 (Apr. 7, 2014).

found to be most net-beneficial in order to address alleged affordability concerns for low-income consumers.⁶⁰

B. OMB Should Expand Upon Its Distributional Guidance in Several Key Ways

OMB can expand upon its distributional guidance in several key ways. First, OMB should provide further guidance on when agencies should conduct distributional analysis. Second, in response to OMB’s request for input on data sources to conduct distributional analysis focused on underserved populations, we suggest available economic tools that identify disadvantaged groups along multiple dimensions. Third, OMB should provide further guidance on assessing regulatory impacts on a granular scale. And fourth, OMB should consider a wider range of income-elasticity estimates.

1. OMB should clarify that conducting distributional analysis should be the default, with any limited exceptions justified.

The Draft Update correctly identifies that “distributional effects exist whether or not a distributional analysis is produced” and that “production of a distributional analysis therefore may ... allow for more effective consideration of regulatory alternatives.”⁶¹ The Draft Update further states that agencies may determine whether distributional analysis “is practical, appropriate, permitted by law, and will produce relevant and useful information” based on the availability of “available methodologies and data, as well as input from experts and the public.”⁶² Despite relatively similar guidelines in the current Circular A-4, however, regulatory analyses generally provide little information on distributional impacts.⁶³ Whatever the reasons for this, the omission raises concern that federal agencies may not adequately assess distributional impacts without more explicit directions about when and how to do so.

OMB should clarify that conducting distributional analysis should be the default. While there may be circumstances where distributional analysis is impractical—such as due to a lack of available information or persuasive evidence that will there not be significant distributional consequences—federal agencies should provide a credible and detailed justification when they do not conduct distributional analysis.

OMB should also work with agencies to identify data gaps and improve distributional analysis over time. An important consideration of benefit-cost analysis and distributional analysis is being transparent about whether the list of inputs to the analysis is comprehensive and whether each input value has been rigorously determined. Where quantified values of critical parameters are not well known, the agency should identify the limits of its benefit-cost and distributional analysis and identify avenues to solicit the relevant information, soliciting public input especially from affected communities.

⁶⁰ Energy Conservation Standards for Manufactured Housing, 87 Fed. Reg. 32,728, 32,742–46 (May 31, 2022).

⁶¹ Proposed Updated at 62.

⁶² *Id.*

⁶³ Lisa A. Robinson, James K. Hammitt & Richard Zeckhauser, *The Role of Distribution in Regulatory Analysis and Decision Making* (Mossavar-Rahmani Ctr. for Bus. and Gov’t, Harvard Kennedy Sch., Working Paper No. 2014-02, 2014); Richard L. Revesz & Burçin Ünel, *Just Regulation: Improving Distributional Analysis in Agency Rulemaking*, 49 *ECOLOGY L. Q.* (forthcoming 2023) (manuscript at 4).

2. OMB should recommend that agencies apply analytical tools that identify disadvantaged subpopulations along multiple dimensions

OMB has requested input on identifying useful data sources for performing distributional analysis, particularly focusing on underserved populations.⁶⁴ There are a wealth of high-quality data sources that agencies should draw upon when designing distributional analyses. At the finest scale and highest resolution, Census data (both in the form of the decennial Census and American Community Survey) covers a wide range of indicators required to perform a robust analysis. Much of this data can (and should) be used at small geographic scales relevant to the regions of interest.

OMB may also wish to specifically endorse available economic tools that aggregate numerous data sources to identify underserved subpopulations. This will better enable agencies to efficiently and consistently perform distributional analysis that identifies subpopulations of particular concern. For instance, one tool that OMB could consider is the Council on Environmental Quality's Climate and Economic Justice Screening Tool (CEJST), which identifies underserved communities for purposes of the Justice40 Initiative.⁶⁵ Agencies may also wish to use the datasets and subgroups underlying the tool that are not discussed in the Draft Update; for example, agencies may want to identify subgroups based on education, English proficiency, unemployment, or health.

Beyond CEJST itself, agencies could benefit from combining various metrics to identify underserved populations. Other metrics used by government agencies may be useful. For instance, OMB could suggest using the Center for Disease Control and Prevention's Social Vulnerability Index⁶⁶ or the Energy Justice Mapping Tool from the Department of Energy.⁶⁷ OMB could also consider recommending tools developed by experts outside government.⁶⁸

3. OMB should instruct agencies to assess regulatory effects at a granular scale

A critical first step in addressing the distributional impacts of regulation is to identify which groups are affected by a rule and to what degree. Measuring impacts at aggregate scales can hinder this objective, as population-wide averages often mask disparate effects across groups and fail to accurately capture total regulatory impacts. Granular measurements could unmask disparities in the intensity of regulatory impacts, account for different risk factors of affected

⁶⁴ Preamble at 16.

⁶⁵ A potential benefit of using CEJST is that it identifies underserved communities using numerous datasets, and thus could be more efficient and prescriptive than disaggregating data individually along the numerous metrics identified by OMB. But the tool is imperfect and may not fully identify underserved communities. As one example, because CEJST uses census block groups, which are a relatively large unit of analysis, it may mask the existence of underserved populations that are smaller in size.

⁶⁶ Agency for Toxic Substances and Disease Registry, CDC/ATSDR Social Vulnerability Index, <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html> (last updated Nov. 16, 2022).

⁶⁷ Dep't of Energy, Energy Justice Mapping Tool—Disadvantaged Communities Reporter, <https://energyjustice.egs.anl.gov/>.

⁶⁸ For example, OMB may consider EDF/Texas A&M University's Climate Vulnerability Index. See P. Grace Tee Lewis et al., *Characterizing Vulnerabilities to Climate Change Across the United States*, 172 ENV'T INT'L 107772 (2023).

groups, and generate more accurate analyses of regulatory benefits and costs.⁶⁹ Thus, OMB should clarify that regulators should measure effects as granularly as feasible, including consideration of different levels of exposure and risk factors of affected groups.

For example, recent research in public health and economics that applies novel modeling techniques and disaggregated demographic data highlights how a granular analysis of impacts might better reveal environmental injustices. In one study, for instance, a team of researchers led by Andrew L. Goodkind measures PM_{2.5}-related health damages at a fine geographical scale (down to one kilometer).⁷⁰ They find that a large share of damages⁷¹ is borne by populations living very close to emission sources: a third of total damages happen within five miles of the source of pollution. As a result, health damages associated with one more unit of emissions can vary by an order of magnitude within a single county.

More granular data will not only aid agencies in conducting an accurate distributional analysis, but also in more accurately assessing total regulatory benefits and costs. This is due to data non-linearities such as tipping points and cumulative burden. For example, groups that are exposed to the highest levels of pollution also tend to suffer from risk factors that increase their vulnerability to pollution, such as underlying health conditions or low healthcare access. Relying on population-wide averages overlooks this dynamic and thus generally underestimates the benefits that these groups—and society in the aggregate—receive from pollution reductions.⁷²

Accordingly, to ensure a robust distributional analysis and accurate aggregate results, OMB should recommend that agencies assess regulatory impacts on a granular scale. This should include incorporating data on group risk factors and exposure where relevant and feasible.

4. OMB should consider a wider range of estimates for the elasticity of marginal utility of consumption

The Draft Update usefully provides an estimate of the income elasticity of marginal utility for agencies to apply as part of a weighted benefit-cost analysis.⁷³ The elasticity of marginal utility of consumption reflects the principle that “an additional unit of a good is more valuable to a person if they have less of it than if they have more of it.”⁷⁴ OMB samples the literature and estimates the income elasticity of the marginal utility of consumption at 1.4 using market data.⁷⁵

To ensure analytical completeness, OMB should conduct a complete literature survey. For instance, estimates of the income elasticity of marginal utility of consumption from De

⁶⁹ Jack Lienke et al., *Making Regulations Fair: How Cost-Benefit Analysis Can Promote Equity and Advance Environmental Justice*, INST. POL’Y INTEGRITY 6–9 (2021).

⁷⁰ Andrew L. Goodkind et al., *Fine-Scale Damage Estimates of Particulate Matter Air Pollution Reveal Opportunities for Location-Specific Mitigation of Emissions*, 116 PROCS. NAT’L ACAD. SCIS. 8775 (2019).

⁷¹ Here, damages are defined as the monetary valuation of premature mortality attributable to exposure to fine particulate matter.

⁷² Elisheba Spiller, *Mortality Risk from PM_{2.5}: A Comparison of Modeling Approaches to Identify Disparities Across Racial/Ethnic Groups in Policy Outcomes*, 129 ENV’T HEALTH PERSP. 127004-1 (2021).

⁷³ Draft Update at 65–66.

⁷⁴ *Id.* at 65.

⁷⁵ *Id.* at 65–66; *see also* Preamble at 12–15.

Carvalho (2015), Tol (2010), and Proctor et al. (2016) are not included in OMB's survey.⁷⁶ OMB should also give further thought to whether an averaging approach is the proper method for estimating marginal elasticity of income,⁷⁷ as an average will depend in part on the relative representation of various interpretations in the underlying dataset. Moreover, several of the included estimates are themselves derived from meta-analyses, which implies that they represent multiple studies and thus should not be treated like point estimates. As an alternative to averaging, OMB could apply a meta-regression along the lines of the approach used for a different context in Howard and Sterner (2022),⁷⁸ or consider down-weighting outlier estimates.⁷⁹

As an alternative or supplement to using available estimates in the literature, OMB could derive the marginal elasticity of income based on the Ramsey equation and using OMB's estimated 1.7% risk-free social discount rate,⁸⁰ as the income elasticity of marginal consumption is a parameter in the Ramsey equation for estimating the risk-free social discount rate.⁸¹ Regardless, OMB should ensure analytical consistency between the elasticity of marginal utility of consumption and the risk-free social discount rate.⁸²

III. The Draft Update Provides Appropriate Guidance on Considering Transboundary Effects

The Draft Update appropriately expands on Circular A-4's current guidance that analyses normally "focus on benefits and costs that accrue to citizens and residents of the United States."⁸³ In particular, the Draft Update recognizes that such impacts include both effects that "result directly from a regulation's domestic applicability" and those that result "indirectly from a regulation's impact on foreign entities."⁸⁴ With regard to the latter category, the Draft Update

⁷⁶ See David Anthoff & Johannes Emmerling, *Inequality and The Social Cost of Carbon*, 6 J ASS'N ENV'T RES & ECON 243, 263 (2018) (citing Mateus De Carvalho, An Investigation on Societal Inequality Aversion in Western Europe (Unpublished Manuscript, University of Birmingham, 2015); Richard S.J. Tol, *International Inequality Aversion and the Social Cost of Carbon*, 1 CLIMATE CHANGE ECON 21 (2010); Bernadette D. Proctor et al., *Income and Poverty in the United States: 2015*, Technical report, U.S. Census Bureau, BLS Income Statistics (2016)).

⁷⁷ See Preamble at 15 (providing "[t]he simple average of estimates across the[] studies" surveyed).

⁷⁸ See Peter H. Howard & Thomas Sterner, *Between Two Worlds: Methodological and Subjective Differences in Climate Impact Meta-Analyses* (Res. for the Future Working Paper 22-10, 2022).

⁷⁹ In particular, the two highest estimates are also the two oldest. See Preamble at 15 (presenting Pindyck (1988) and Szpiro (1986) as the two highest estimates).

⁸⁰ Several papers apply this approach. See, e.g., Kevin Rennert et al., *The Social Cost of Carbon: Advances in Long-Term Probabilistic Projections of Population, GDP, Emissions, and Discount Rates* 32 (Res. for the Future Working Paper 21-28, 2021) (deriving a 1.24% income elasticity of marginal consumption based on a near-term social discount rate of 2%).

⁸¹ The simple Ramsey equation is: $r = \rho + \eta g$. Draft Update at 77. In that equation, r is the risk-free consumption discount rate (1.7% according to OMB), ρ is the pure rate of time preference (which must be greater than or equal to zero), η is the elasticity of marginal utility of consumption (1.4 according to OMB), and g is the annual growth rate of per capita income.

⁸² The current elasticity of marginal utility of consumption of 1.4 suggests a risk-free social discount rate above 2%. This is based on an annual growth rate of per capita income of 1.6% until 2100, which EPA used in its recent draft update to the social cost of greenhouse gases. ENV'T PROT. AGENCY, EXTERNAL REVIEW DRAFT OF REPORT ON THE SOCIAL COST OF GREENHOUSE GASES 22 (2022).

⁸³ Circular A-4 at 15.

⁸⁴ *Id.*

explains that relevant impacts “include the effects of a regulation on U.S. strategic interests, including the potential for inducing strategic reciprocity or other policy changes from actors abroad or effects on U.S. government assets located abroad,” which “are particularly likely to occur when [a] regulation bears on a global commons or a public good.”⁸⁵ Additionally, the Draft Update states that relevant impacts include “those that occur entirely outside the United States when they affect U.S. citizens and residents.”⁸⁶

As detailed further below, the Draft Update’s guidance on considering transboundary impacts is consistent with agency practice and judicial precedent. Accordingly, the proposed revision reflects an appropriate expansion on Circular A-4’s existing guidance on analytical scope.

A. OMB’s Draft Guidance on Assessing Transboundary Effects Is Consistent With Agency Practice and Judicial Precedent

OMB offers extensive justification for guidance on considering transboundary impacts. In fact, agencies already often consider the extraterritorial effects of their actions—including effects on international reciprocity, international cooperation, and transboundary spillovers. And courts have endorsed this practice on numerous occasions.

For one, the National Environmental Policy Act (NEPA) requires all agencies to administer and interpret the nation’s law to “recognize the worldwide and long-range character of environmental problems” and to “lend appropriate support” to help “maximize international cooperation.”⁸⁷ This is a context in which, as the Draft Update identifies, domestic law requires consideration of effects beyond U.S. borders.⁸⁸ Numerous court decisions—including one from the U.S. Court of Appeals for the D.C. Circuit—have held that reasonably foreseeable transboundary effects must appear in NEPA analyses.⁸⁹ And consistent with those decisions, agencies have assessed transboundary impacts under NEPA for over forty years under Executive Order 12,114.⁹⁰ In other words, OMB’s draft guidance on the consideration of extraterritorial impacts is consistent with decades of agency practice.

Beyond NEPA, agencies have considered key effects on international reciprocity in their regulatory benefit-cost analyses and decisionmaking. A key example is EPA’s 1988 regulations to protect stratospheric ozone, a global pollutant that requires international cooperation to effectively mitigate. In issuing those regulations, EPA recognized that it could “consider other countries’ willingness to take regulatory action” in “deciding whether and how to regulate.”⁹¹ EPA also took “[c]onsideration of the international ramifications of United States action” into

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ 42 U.S.C. § 4332(2)(F).

⁸⁸ Draft Update at 9–10 (explaining that “it may be particularly appropriate to include effects experienced by noncitizens residing abroad in your primary analysis” when “domestic legal obligations require or support a global calculation of regulatory effects”).

⁸⁹ *E.g.* *Env’t Def. Fund, Inc. v. Massey*, 986 F.2d 528 (D.C. Cir. 1993); *Gov’t of Man. v. Salazar*, 691 F. Supp. 2d 37, 51 (D.D.C. 2010).

⁹⁰ See Exec. Order No. 12,114 § 2-3, 44 Fed. Reg. 1957 (Jan. 4, 1979) (advising agencies to “take into consideration in making decisions” effects of their actions on the “environment of a foreign nation” and “the global commons”).

⁹¹ Protection of Stratospheric Ozone, 53 Fed. Reg. 30,566, 30,569 (Aug. 12, 1988).

account when “analyzing the cost and feasibility of controls.”⁹² And in its regulatory impact analysis, EPA modeled alternative regulatory stringency levels based on potential international participation rates and the influence that EPA regulation would have on reciprocal international actions.⁹³ By adopting a global approach to assessing regulatory impacts, OMB draws on the insights from agency practices dating back to the Reagan administration.

Courts have upheld agencies’ authority to consider effects on international reciprocity and cooperation. In one case, for instance, the D.C. Circuit affirmed EPA’s decision to set an interim tolerance for the chemical ethylene dibromide under the Food, Drug, and Cosmetic Act—rather than ban the chemical altogether—after EPA concluded that a ban “could damage cooperative [food-safety] efforts,” reasoning that “[s]ince effective enforcement of food safety laws depends upon such cooperation, a ban might increase the risk that fruit and vegetables would enter the U.S. treated with unsafe levels of pesticides or infested with pests or diseases.”⁹⁴ The D.C. Circuit similarly upheld EPA’s consideration of international harmonization in setting emissions standards for commercial aircraft gas turbine engines.⁹⁵

Agencies have likewise considered transboundary spillover effects and direct impacts on U.S. citizens abroad in making key decisions. Dating back more than a decade, agencies have recognized that an assessment of climate damages requires a global scope because climate impacts occurring outside U.S. borders can directly and indirectly affect U.S. welfare.⁹⁶ As another example, the Food and Drug Administration also frequently considers international effects as part of its regulatory decisionmaking, and has recognized that such costs are particularly relevant because “a portion of foreign costs could be passed on to domestic consumers.”⁹⁷ And when considering the “public interest” in the certification of natural gas exports under the Natural Gas Act,⁹⁸ the Department of Energy routinely “consider[s] international trade policy, foreign policy, and national security interests.”⁹⁹

Courts have confirmed that agencies may—and, in some cases, must—take into account international spillover effects. In 2016, the U.S. Court of Appeals for the Seventh Circuit upheld the Department of Energy’s (DOE) consideration of global spillover impacts in estimating the climate benefits of strengthening energy efficiency requirements for refrigeration

⁹² *Id.* (“Certainly other nations’ ozone-depleting emissions or control of emissions affect the cost of United States’ controls, and the need for other nations to limit their emissions may make appropriate United States action that encourages, or does not discourage, other nations to agree to such limits.”).

⁹³ Env’t Prot. Agency, *Regulatory Impact Analysis for the Protection of Stratospheric Ozone* (1988).

⁹⁴ *National Coalition Against the Misuse of Pesticides v. Thomas*, 815 F.2d 1579, 1582 (D.C. Cir. 1987).

⁹⁵ *National Ass’n of Clean Air Agencies v. EPA*, 489 F.3d 1221 (D.C. Cir. 2007).

⁹⁶ *E.g.* INTERAGENCY WORKING GRP., TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS 10–11 (2010); EPA External Review Draft of Report on the Social Cost of Greenhouse Gases 10–15 (2022).

⁹⁷ *Requirements for Additional Traceability Records for Certain Foods*, 87 Fed. Reg. 70,910, 71,071 tbl.2 (Nov. 21, 2022).

⁹⁸ 15 U.S.C. § 717b(a).

⁹⁹ *New Policy Guidelines and Delegation Orders from Secretary of Energy to Economic Regulatory Administration and Federal Energy Regulatory Commission Relating to the Regulation of Imported Natural Gas*, 49 Fed. Reg. 6,684 (Feb. 22, 1984).

equipment.¹⁰⁰ The court noted that DOE found that “climate change ‘involves a global externality,’ meaning that carbon released in the United States affects the climate of the entire world.”¹⁰¹ Moreover, the court credited DOE’s finding that because “national energy conservation has global effects, . . . those global effects are an appropriate consideration.”¹⁰² Therefore, the court concluded, DOE acted “reasonably” in considering global spillover impacts.¹⁰³

In 2020, the U.S. Court of Appeals for the Ninth Circuit rejected an Interior approval of an offshore oil drilling and production facility after the agency concluded that domestic extraction would not affect international fossil-fuel consumption.¹⁰⁴ As the court explained, because domestic production causes “foreign consumers [to] buy and consume more oil”—and because that consumption “can be translated into estimates of greenhouse gas emissions” that harms the United States—the agency had to consider those increased foreign emissions resulting from domestic action.¹⁰⁵ Two subsequent district court opinions similarly faulted Department of Interior analyses.¹⁰⁶ The fact that courts have required agencies to consider the spillover impacts of their actions supports OMB’s approach here.

As these examples illustrate, OMB’s proposed guidance on considering transboundary impacts is consistent with agency practice and judicial precedent in numerous contexts.

B. The Draft Update Is Consistent With the Presumption Against Extraterritoriality

The Draft Update is also consistent with the presumption against extraterritoriality. This canon of statutory interpretation presumes that U.S. laws do not have extraterritorial effect, meaning that they do not apply to “events occurring and injuries suffered outside the United States.”¹⁰⁷

The presumption has no applicability in the context of agency analysis and decisionmaking involving domestic standards. Rather, the presumption is only concerned with the applicability of substantive provisions and causes of action to conduct occurring outside the United States.¹⁰⁸ The Supreme Court has applied the presumption in the context of criminal cases involving conduct occurring abroad under the Racketeer Influenced and Corrupt Organizations Act,¹⁰⁹ the Securities Exchange Act,¹¹⁰ and the Alien Tort Statute.¹¹¹ These are all contexts in

¹⁰⁰ *Zero Zone, Inc. v. United States Dep’t of Energy*, 832 F.3d 654 (7th Cir. 2016).

¹⁰¹ *Id.* at 679 (citing Energy Conservation Program: Energy Conservation Standards for Commercial Refrigeration Equipment, 79 Fed. Reg. 17726-01 (Mar. 28, 2014)).

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 738 (9th Cir. 2020).

¹⁰⁵ *Id.*

¹⁰⁶ *Sovereign Inupiat for a Living Arctic v. Bureau of Land Mgmt.*, 555 F. Supp. 3d 739, 764–67 (D. Alaska 2021); citing *Friends of the Earth v. Haaland*, No. CV 21-2317 (RC), 2022 WL 254526, at *14–15 (D.D.C. Jan. 27, 2022).

¹⁰⁷ *RJR Nabisco, Inc. v. Eur. Cmty.*, 579 U.S. 325, 329 (2016).

¹⁰⁸ *WesternGeco LLC v. ION Geophysical Corp.*, 138 S. Ct. 2129, 2137 (2018) (“If the conduct relevant to the statute’s focus occurred in the United States, then the case involves a permissible domestic application of the statute.” (quotation omitted)).

¹⁰⁹ *Nabisco*, 579 U.S. at 329.

¹¹⁰ *Morrison v. National Australia Bank Ltd.*, 561 U.S. 247 (2010).

¹¹¹ *Kiobel v. Royal Dutch Petroleum Co.*, 569 U.S. 108 (2013).

which courts assessed whether federal laws applied to conduct and events occurring in foreign countries. Circular A-4, in contrast, instructs federal agencies *acting* domestically on assessing the *effects* of domestic regulations.

Indeed, courts have confirmed that the presumption against extraterritoriality does not limit federal agencies from assessing the effect of their actions beyond U.S. borders—even when those agencies engage in direct conduct abroad. In *Massey v. Environmental Defense Fund*, the D.C. Circuit held that NEPA required the National Science Foundation to consider extraterritorial environmental impacts before proceeding with plans to incinerate food waste in Antarctica, rejecting the agency’s invocation of the presumption against extraterritoriality.¹¹² As the court explained, “[e]ven where the significant effects of the regulation of conduct are felt outside U.S. borders, the [regulation] itself does not present a problem of extraterritoriality” so long as the regulated conduct “occurs largely within the United States.”¹¹³

IV. OMB Should Supplement Its Guidance in Several Other Key Areas

The Draft Update reflects key advancements in many other areas, including the monetization of environmental services,¹¹⁴ development of analytical baselines,¹¹⁵ analysis of industry adaptation and learning-by-doing in developing cost estimates,¹¹⁶ and consideration of unquantified impacts.¹¹⁷ In particular, the Draft Update appropriately emphasizes the importance of accounting for key environmental benefits including effects on ecosystem services, natural capital, and option value, and for appropriately considering effects that are not monetized.

In several of these areas, OMB can provide additional guidance to further improve the Circular. In particular, this section offers three recommendations. First, OMB should expand its guidance on analytical timeframes to ensure that agencies do not inappropriately disregard important long-term effects. Second, OMB should provide additional guidance on conducting break-even analysis. And third, OMB should highlight the potential value of expert elicitation in developing analytical baselines under uncertainty.

A. OMB Should Expand Its Guidance on Analytical Timeframes to Better Ensure that Agencies Account for Important Long-Term Impacts

When conducting benefit-cost analysis, agencies should select an analytical time frame long enough to encompass the full stream of benefits and costs. The Draft Update articulates this intuitive concept, explaining that “[t]he time frame for [an agency’s] analysis should include a period before and after the date of compliance that is long enough to encompass all the important benefits and costs likely to result from the regulation.”¹¹⁸

¹¹² 986 F.2d 528, 531, 533 (D.C. Cir. 1993) (concluding that presumption does not apply when “the conduct regulated by the government occurs within the United States”).

¹¹³ *Id.* at 531.

¹¹⁴ For instance, the Draft Update calls upon agencies to monetize key environmental benefits including effects on ecosystem services, natural capital, and option value. *See* Draft Update at 51–52, 68.

¹¹⁵ *See id.* at 12–15.

¹¹⁶ *See id.* at 53.

¹¹⁷ *See id.* at 45–47.

¹¹⁸ Draft Update at 11.

But the Draft Update, like the existing Circular A-4,¹¹⁹ does not offer further guidance on how agencies should ensure a sufficient analytical timeframe. Further guidance is needed because agencies often choose an endpoint for their regulatory analyses that fails to capture the sufficient stream of a regulation’s benefits and costs.¹²⁰ As explained in an Institute for Policy Integrity report, agencies frequently either truncate benefits or costs, or present the analysis in a way that prevents comprehension of whether any costs or benefits had been truncated.¹²¹

When a benefit-cost analysis uses an analytical time frame that ends before a sufficient stream of benefits and costs have materialized, the agency is effectively placing no value on benefits and costs beyond the analytical end date.¹²² Truncated analytical time frames tend to disproportionately shortchange the benefits of regulations, as regulatory costs are often expended upfront in order to prevent some future harm or obtain some other future benefit.¹²³ This is particularly true in the environmental context given the long-range character of much pollution.¹²⁴

To better ensure that agencies account for significant long-term impacts, OMB should expand upon the Draft Update’s guidance on analytical timeframes. To begin, OMB should provide some examples where a longer time frame may be necessary. For example, when considering regulations involving durable goods such as pipelines, power plants, or vehicles, the analytical timeframe should cover the lifespan of that capital. A similar logic applies to government leases and capital investment. When considering pollution, the analytical timeframe should likewise cover the lifespan of the pollution—which could be hundreds of years in the case of a long-lasting pollutant such as greenhouse gases. Of course, if multiple factors overlap for determining the relevant time frame, the factor implying the longest time frame should be considered the most relevant.

In addition to providing these general principles and examples, OMB should also incorporate three broader recommendations outlined in the aforementioned report.¹²⁵ First, OMB should recommend that agencies discuss the analytical timeframe in a dedicated section and detail any limitations affecting the choice of analytical timeframe therein. Within this section, the

¹¹⁹ CIRCULAR A-4 at 15 (stating that “[t]he time frame for [an agency’s] analysis should cover a period long enough to encompass all the important benefits and costs likely to result from the rule”).

¹²⁰ Lance Bowman, *Enhancing Consideration of Time Frames in Cost-Benefit Analysis*, INST. FOR POL’Y INTEGRITY (2022), https://policyintegrity.org/files/publications/Enhancing_Consideration_of_Time_Frames_v3.pdf.

¹²¹ *Id.* at 5–6; *see also id.* at 6–9 (analyzing two case studies).

¹²² *See* Arden Rowell, *Time in Cost-Benefit Analysis*, 4 U.C. IRVINE L. REV. 1215, 1232 (2014) (“When a period of time is omitted from a cost-benefit analysis, it is like valuing all costs and benefits after that period at zero dollars.”).

¹²³ *See* Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. PA. L. REV. 1553, 1559 (2002) (“Often, [regulatory] costs are incurred today, or in the near future, to prevent harm in the more remote future.”).

¹²⁴ *See* Arden Rowell, *Regulating Best-Case Scenarios*, 50 ENV’T L. 1105, 1154 (2020) (“Th[e] temporal separation of costs and benefits—with costs frontloaded and benefits backloaded—is familiar in many policy contexts and is particularly common in environmental regulation.”); RICHARD L. REVESZ & MICHAEL A. LIVERMORE, *RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH* 108 (2010) (“The costs of climate change mitigation will be borne up front, while the benefits will not accrue until much later.”); *see also* 42 U.S.C. § 4332(F) (requiring all agencies to “recognize the . . . long-range character of environmental problems”).

¹²⁵ These recommendations also appear in substantially similar form in Bowman, *supra* note 120, at 12–13.

agency should explicitly identify how far into the future a rule and its alternatives are expected to continue to generate significant costs and benefits and explain the basis for that expectation.

Second, OMB should recommend that agencies address whether the analysis is sensitive to the choice of analytical timeframe. If there are significant long-term benefits or costs the agency cannot analyze due to data limitations, the agency should describe those limitations. Regulatory analyses should discuss the extent to which the sign of net benefits or the ranking of policy alternatives are sensitive to the choice of analytical time frame.¹²⁶ This might entail conducting a sensitivity analysis of the policy and alternatives using longer time frames or a break-even analysis that assesses how many additional years one alternative would need to produce net benefits at its projected trajectory in order to be more net beneficial than another alternative (including the no-action alternative).¹²⁷

And third, OMB should recommend that agencies maintain the analytical timeframe's length, at minimum, in subsequent rulemaking when rulemakings concern the same or similar subjects. For instance, if a regulation issued ten years ago analyzed costs and benefits out to 2050, a new regulation of the same kind should analyze costs and benefits out to at least 2060, unless there is a particularly compelling reason otherwise.

B. OMB Should Provide Additional Guidance on Accounting for Unquantified Impacts Through Break-Even Analysis

The Draft Update provides helpful guidance on conducting break-even analysis, which “asks what magnitude non-monetized benefits and costs would need to have for the regulation at issue to yield positive net benefits or to change which regulatory alternative is most net beneficial.”¹²⁸ In response to OMB's request for “practical guidance related to the presentation of break-even comparisons in the regulatory context,”¹²⁹ we offer several suggestions.

Break-even analysis can be used in a variety of scenarios in which significant benefits and/or costs cannot be quantified.¹³⁰ It can be particularly helpful to weigh the effects of low-probability, high-impact events with significant uncertainties, such as regulations meant to reduce the risk of terrorist attacks or catastrophic oil spills. In such circumstances, break-even analysis may need to address a skewed distribution of events, including “long tails” of uncommon, but catastrophic risks.

Agencies should be sensitive to these potential data skews when presenting and assessing the results of a break-even analysis. When a regulation predominantly mitigates the risk of low-probability, high-impact events, for instance, a useful way to frame the break-even point is by reference to those risks. For example, when the Transportation Security Administration has used

¹²⁶ ENV'T PROT. AGENCY, GUIDELINES FOR PREPARING ECONOMIC ANALYSES 6-6 (2010).

¹²⁷ Rowell, *supra* note 122, at 1238 (proposing that agencies “include an end point to their [analytical] time scope that extends at least to the ‘temporal break-even point’”).

¹²⁸ Draft Update at 46–47.

¹²⁹ Preamble at 9.

¹³⁰ See Cass R. Sunstein, *The Limits of Quantification*, 102 CAL. L. REV. 1369, 1406–13 (2014) (listing 25 federal regulations that use break-even analysis).

break-even analysis to assess regulations aimed at preventing terrorist attacks,¹³¹ it has estimated the break-even point based on the benefits of avoiding a 9/11-like attack.¹³² In contrast, when a regulation predominantly mitigates the risk of smaller and more common events with less underlying data heterogeneity, a breakeven point could be assessed based on an average of past events.¹³³ This is how the Federal Railroad Administration has applied break-even analysis to regulations aimed at preventing railroad-related injuries and deaths.¹³⁴

When a regulation meaningfully reduces the risk of both common and catastrophic events, both forms of break-even analysis may be informative to discuss in the analysis. For the reasons explained above, an agency should not conduct break-even analysis in these cases based only on average or median incidents.¹³⁵

Several regulatory features may help the agency to identify a situation where it would not be appropriate to use only an average distribution of past events to estimate the break-even point. First, in some cases the statutory purpose or framework may indicate the need to consider worst-case scenarios. A second indicator may be the distribution of events, such as when a small minority of accidents are responsible for the vast majority of costs.¹³⁶ More generally, agencies should pay attention to long tails or situations with “unusual probability distributions, when the likelihood of bad outcomes is unusually high at the extremes, including cases in which the likelihood of terrible outcomes is unusually high on the left-hand side.”¹³⁷ As Cass Sunstein explains, under such circumstances—or circumstances of Knightian uncertainty, i.e. “unknown unknowns,” where probabilities cannot be assigned to unknown outcomes—it can be more rational to regulate in a manner to prevent the worst-case scenario.¹³⁸ In such cases, using an average of past events may not capture relevant worst-case scenarios.

Other circumstances may also require an adjustment of a past average, such as changing baseline conditions or data gaps, which affect the distribution of events. For example, climate change may increase the frequency and magnitude of certain types of events, which should

¹³¹ See Passenger Screening Using Advanced Imaging Technology, 81 Fed. Reg. 11363, 11366 (Mar. 3, 2016) [AIT]; Aircraft Repair Station Security, 79 Fed. Reg. 2119, 2136 (Jan. 13, 2014) [Aircraft Repair Station Security]; Air Cargo Screening, 76 Fed. Reg. 51848, 51865 (Aug. 18, 2011) [Air Cargo Screening].

¹³² See AIT, 81 Fed. Reg. at 11366; Aircraft Repair Station Security, 79 Fed. Reg. at 2136; Air Cargo Screening, 76 Fed. Reg. at 51848.

¹³³ See FED. R.R. ADMIN., CROSSING INVENTORY: NATIONAL HIGHWAY-RAIL CROSSING INVENTORY REPORTING REQUIREMENTS FINAL RULE REGULATORY EVALUATION 24–25 (2015); FED. R.R. ADMIN., TRAINING STANDARDS REGULATORY IMPACT ANALYSIS, at iv-v, 57 (2014).

¹³⁴ See Training, Qualification, and Oversight for Safety-Related Railroad Employees, 79 Fed. Reg. 66460, 66460 (Nov. 7, 2014); National Highway-Rail Crossing Inventory Reporting Requirements, 80 Fed. Reg. 746, 746 (Jan. 6, 2015).

¹³⁵ See Inst. for Pol’y Integrity, Comment Letter on Safer Communities by Chemical Accident Prevention, at 22 (Oct. 31, 2022),

https://policyintegrity.org/documents/Institute_for_Policy_Integrity_RMP_Comments_10.31.2022.pdf (criticizing EPA for performing break-even analysis using only average chemical accident when rule was largely designed to mitigate risk of catastrophic events and the majority of costs came from a small percentage of the largest accidents).

¹³⁶ In the RMP Rule, the vast majority of past accident costs come from a small subset of the largest U.S. accidents. Policy Integrity Comments on the RMP Rule, *supra* note 135, at 22.

¹³⁷ See Cass R. Sunstein, *Maximin*, 37 YALE J. ON REGULATION 940, 953 (2020). See generally *id.* (arguing that the maximin rule should counsel for preventing the worst-case scenario in the situations discussed above).

¹³⁸ *Id.*

inform estimates of the costs of average future disasters. With regard to data gaps, agencies should be aware of how underreporting and reporting delays may lead to systemic underestimation of the past average cost and total cost¹³⁹—and may accordingly necessitate an adjustment to estimates of the average. Agencies should also consider whether changing baseline conditions and data gaps affect the distribution and extremes of worst-case scenarios, resulting in the situations described above.

OMB can further advise agencies to consider regulatory effects and goals when deciding the most effective way to communicate the break-even point. In the risk mitigation context, the break-even point can be expressed in a multitude of ways (e.g. reduced costs, reduced accident frequency or magnitude, avoided fatalities or injuries, etc.). For example, one rule may reduce the frequency of accidents while another may reduce injuries and fatalities when accidents do occur. In such a scenario, it may make sense to discuss how many accidents the first rule must avoid to break even and how many injuries and/or fatalities the latter must avoid to break even.

C. OMB Should Highlight the Value of Expert Elicitation for Developing Analytical Baselines When Future Conditions Are Uncertain

In the Preamble, OMB “seek[s] comment on whether and how to incorporate subjective probability” into Circular A-4.¹⁴⁰ While OMB recognizes in the Draft Update that expert elicitation is “helpful in bridging the gap between existing evidence and the information required to produce [uncertain] estimates,”¹⁴¹ it can expand upon this discussion by highlighting the potential for expert elicitation to also be used to develop an analytical baseline.

Developing a proper analytical baseline can be challenging. As OMB explains in the Draft Update, an analytical baseline should consider numerous factors such as the “evolution of the market,” “changes in regulations promulgated by the agency or other government entities,” and “the likely path of future government programs and policies.”¹⁴² Accounting for all of these factors can be particularly challenging when an industry is in long-term flux.

For example, agencies have struggled in recent years to develop an analytical baseline that realistically estimates the trajectory of different energy sources decades into the future in a decarbonizing world. Benefit-cost analyses can be highly sensitive to such baseline assumptions: For its recently proposed five-year plan, for instance, the Bureau of Ocean Energy Management acknowledged that the sign of net benefits could depend on the agency’s assumptions about the long-term baseline energy mix.¹⁴³ Due to a lack of data, however, BOEM did not model a

¹³⁹ For example, in the RMP rule, EPA acknowledged that the data set was likely incomplete due to underreporting and reporting delays. *See* U.S. Env’t Prot. Agency, Regulatory Impact Analysis, Safer Communities by Chemical Accident Prevention Proposed Rule 87 (2022).

¹⁴⁰ Preamble at 17.

¹⁴¹ Draft Update at 69; *see also id.* at 70 (“Expert judgment is often elicited through a survey process which eliminates certain interactions between experts, and may be a useful way to fill key gaps in your ability to assess uncertainty.127 These expert elicitations, along with other sources of data, can be combined in Monte Carlo simulations to derive a probability distribution of benefits and costs. Such a formal analytical approach is often appropriate for complex regulations where there are large, multiple uncertainties whose analysis raises technical challenges, or where the effects cascade.”).

¹⁴² *Id.* at 12.

¹⁴³ BUREAU OF OCEAN ENERGY MGMT., 2023–2028 NATIONAL OUTER CONTINENTAL SHELF OIL AND GAS LEASING PROPOSED PROGRAM 7 (2022) (“Based on current demand and consumption patterns, a National OCS Program with

realistic decarbonization baseline¹⁴⁴ that would have shown the proposed program to be far more costly than the agency’s benefit-cost analysis concluded.¹⁴⁵

Expert elicitation could bridge this analytical gap and enable agencies to develop more realistic estimates when long-term baseline conditions are uncertain. As the Draft Update already acknowledges, expert elicitation is a widely accepted tool for estimating uncertain parameters.¹⁴⁶ As one notable example, under the George W. Bush administration the Environmental Protection Agency used elicitation to develop dose-response functions for particulate matter.¹⁴⁷ EPA also used a peer-reviewed elicitation to forecast long-term socioeconomic and emissions projections as the analytical baseline for estimating the social cost of greenhouse gases.¹⁴⁸ Accordingly, OMB should recommend expert elicitation as a potential methodology for forecasting analytical baselines under uncertainty.

Conclusion

Economic research on accounting for regulatory impacts has advanced considerably since Circular A-4’s publication twenty years ago. The Draft Update reflects these developments and provides greatly improved guidance on a range of issues including discounting, distributional analysis, transboundary impacts, and many others.

Nonetheless, the Draft Update could be more prescriptive on various fronts. With respect to discounting, for instance, OMB should provide a lower discount rate for environmental goods and services, a declining rate schedule, and a capital rate for use only in sensitivity analysis for short-term effects. As discussed in further detail above, OMB should also provide additional guidance on distributional analysis, analytical timeframes, unquantified benefits, and analytical baselines.

Enclosures:

- 1) Peter H. Howard et al., *U.S. Benefit-Cost Analysis Requires Revision*, 380 SCIENCE 803 (2023).
- 2) Lance Bowman, *Enhancing Consideration of Time Frames in Cost-Benefit Analysis*, INST. FOR POL’Y INTEGRITY (2022).

no lease sales for 2023–2028 would reduce net benefits as substitute energy sources increase to meet the largely unchanged energy demand. But in a net-zero emissions pathway — where substitutions rely less on imports and domestic onshore oil and gas and more on renewable energy and electrification, as well as reduced demand—the net benefits of no lease sales could change.”)

¹⁴⁴ *Id.* (“In the absence of adequate data at this stage of the Program’s development, BOEM has not performed a quantitative net benefits analysis that assumes a net-zero emissions pathway.”).

¹⁴⁵ Peter Howard, Max Sarinsky & Minhong Xu, *The Real Costs of Offshore Oil and Gas Leasing*, INST. FOR POL’Y INTEGRITY 15–22 (2022), <https://perma.cc/7DSD-FH2U>.

¹⁴⁶ Draft Update at 69–70.

¹⁴⁷ See Industrial Economics, Inc., *Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between PM2.5 Exposure and Mortality* (2006).

¹⁴⁸ ENV’T PROT. AGENCY, EXTERNAL REVIEW DRAFT OF REPORT ON THE SOCIAL COST OF GREENHOUSE GASES 19–25 (2022) (citing Rennert et al., *supra* note 41).

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