



April 10, 2023

To: Council on Environmental Quality

Re: National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 88 Fed. Reg. 1196 (Jan. 9, 2023)

The Institute for Policy Integrity at New York University School of Law (“Policy Integrity”)¹ respectfully submits the following comments to the Council on Environmental Quality (“CEQ”) regarding the interim guidance (“Interim Guidance”) to assist agencies in analyzing greenhouse gas (“GHG”) and climate change effects of their actions under the National Environmental Policy Act (“NEPA”).² Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

The Interim Guidance provides helpful direction and clarity for agencies’ analysis of how proposed actions and their alternatives (1) will contribute to climate change through their GHG emissions (including issues of GHG quantification, contextualization, and mitigation);³ and (2) will potentially be affected or have their environmental consequences exacerbated by climate change impacts (including issues of reducing climate vulnerability and increasing climate resilience).⁴ However, the guidance could be improved in several key areas.

CEQ should take the following actions to improve its guidance on GHG emission quantification, contextualization, and mitigation:

- To minimize any potential confusion, CEQ should **clarify that the rule of reason and the concept of proportionality should not be cited to truncate a GHG emissions analysis for projects that produce substantial and long-term GHG emissions on a gross basis, such as fossil-fuel infrastructure projects.**
- CEQ should **provide additional guidance on best practices for energy substitution analysis to ensure that such analyses do not inappropriately minimize climate impacts or apply inconsistent treatment that favors fossil-fuel projects.** In particular, CEQ should recommend that substitution analyses be sensitive to long-term trends and policies, and not simply assume continued fossil-fuel reliance into the distant future at relatively constant levels. Additionally, CEQ should advise agencies to use substitution analysis consistently—that is, when agencies use substitution analysis to measure the

¹ This document does not purport to present the views, if any, of New York University School of Law.

² National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 88 Fed. Reg. 1196 (Jan. 9, 2023) (“Interim Guidance”).

³ *See id.* at 1200–07. As a shorthand, this letter uses the term “GHG quantification, contextualization, and mitigation” to refer the subject matter of Section IV of the Interim Guidance.

⁴ *See id.* at 1207–10. As a shorthand, this letter uses the term “climate adaption and resilience” to refer the subject matter of Section V of the Interim Guidance.

climate costs of a project, they should incorporate the same analysis into their assessment of the project's benefits.

- CEQ should **direct agencies to consider federal, state, and local policy objectives, the social needs that the project is intended to address, and other factors besides the applicant's goals in their consideration of project purpose and need.** This will align CEQ's guidance with 2022 revisions to the NEPA implementing regulations and better ensure that agencies consider long-term changes in the energy sector when defining project need, assessing alternatives, and designing mitigation strategies.
- While CEQ rightly directs agencies to apply the social cost of greenhouse gases in NEPA analysis, it should **expressly disavow the use of a 7% discount rate for assessing climate impacts and consider endorsing the latest climate-damages estimates from the Environmental Protection Agency (EPA),** which mark a substantial improvement on prior federal estimates.

CEQ should take the following actions to improve its guidance on climate vulnerability and resilience:

- CEQ should **caution agencies not to treat climate change impacts as insignificant merely because they are uncertain or difficult to analyze.** CEQ should clarify that risks associated with climate change may be significant despite the presence of uncertainty regarding their precise magnitude and the agencies should not treat the presence of some uncertainty as a reason to forgo their careful evaluation.
- CEQ should **provide more detailed guidance on assessing climate change impacts on the affected area, including use of data that has been “downscaled” to the local or regional level, and help agencies identify the latest high-quality information.**⁵ CEQ should regularly update its identification of this information for the agencies and share it publicly. CEQ should also provide direction that when agencies are relying on a previously conducted environmental review or a project-level environmental review for a subsequent site-specific project (i.e., tiering), they evaluate relevant developments in the climate impact information and more localized information on climate impacts.
- CEQ should **recommend that federal agencies consider a range of potential climate change scenarios in their evaluations, focusing particularly on the most plausible scenarios and including scenarios with more severe climate impacts when supported by credible scientific evidence.** To prevent systematic underestimation of the risks associated with climate change, CEQ should recommend a practice of evaluating future climate change impacts based on the latest understanding of climate sensitivity and the resultant on-the-ground outcomes of a warmer world.

Following a short background section, we expand upon these points below.

⁵ For further discussion of downscaling see Part II.B.

Background

CEQ issued the Interim Guidance in January 2023 “to assist agencies in analyzing [GHG] and climate change effects of their proposed actions under” NEPA.⁶ The Interim Guidance builds upon an earlier CEQ guidance document from August 2016⁷ that the agency withdrew the following year.⁸

As noted above, the Interim Guidance directs agencies to analyze both how proposed actions will contribute to climate change and how climate change may affect a proposed action and potentially exacerbate its environmental consequences. The first category—GHG emissions effects—is addressed in Section IV of the Interim Guidance. There, CEQ provides extensive guidance on quantifying GHG emissions, contextualizing those emissions, and assessing options to mitigate those emissions. With respect to quantification, the Interim Guidance advises agencies to “quantify the reasonably foreseeable direct and indirect GHG emissions of their proposed actions and reasonable alternatives.”⁹ On contextualization, CEQ recommends that agencies apply the social cost of greenhouse gases and apply other tools to “allow decision makers and the public to make comparisons, help evaluate the significance of an action’s climate change effects, and better understand the tradeoffs associated with an action and its alternatives.”¹⁰ And regarding mitigation, the Interim Guidance instructs agencies to consider “reasonable alternatives and mitigation measures”¹¹ that “avoid, minimize, or compensate for GHG emissions and climate change effects.”¹²

The second category—climate change vulnerability and resilience—is addressed in Section V of the Interim Guidance. There, CEQ recognizes that climate change will impact federal actions and their alternatives “into the future, even with current or future emissions control efforts” and can exacerbate these actions’ environmental consequences.¹³ The guidance reaffirms the need for agencies to assess these climate impacts during environmental review and consider avenues to mitigate their associated harms. The Interim Guidance also stresses the importance of identifying climate impacts on the future state of the environment affected by the proposed action and its alternatives and factoring climate impacts into the analysis of the environmental consequences of those options. It further directs agencies to use the most up-to-date scientific projections available and remain aware of the evolving body of scientific information. Additionally, it reminds agencies to consider vulnerability and issues of climate resilience throughout the NEPA process including when they “consider siting issues, the initial project design and consistency with existing State, Tribal, and local adaptation plans, as well as reasonable alternatives with

⁶ Interim Guidance, 88 Fed. Reg. at 1196.

⁷ Council on Env’t Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (Aug. 1, 2016).

⁸ Withdrawal of Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, 82 Fed. Reg. 16,576 (Apr. 5, 2017).

⁹ Interim Guidance, 88 Fed. Reg. at 1201; *see also id.* at 1204–05 (calling on agencies to assess both direct and indirect emissions).

¹⁰ *Id.* at 1198.

¹¹ *Id.*

¹² *Id.* at 1206.

¹³ *Id.* at 1207.

preferable overall environmental outcomes and improved resilience to climate effects.”¹⁴ Lastly, the Interim Guidance emphasizes the importance of weighing environmental justice in the consideration of climate vulnerabilities and resilience.¹⁵

I. CEQ Should Expand Upon Section IV of the Interim Guidance to Limit Potential Misuse of the Rule of Reason, Ensure Best Practices for Substitution Analysis, Clarify the Factors to Consider When Evaluating Project Purpose and Need, and Ensure Proper Valuation of the Social Cost of Greenhouse Gases

Section IV of the Interim Guidance provides detailed direction on assessing how proposals and alternatives affect climate change. As noted above, the guidance appropriately instructs agencies to quantify, contextualize, and attempt to mitigate GHG emissions.

CEQ can improve upon Section IV of the Interim Guidance in several respects. First, CEQ should clarify that the rule of reason and concept of proportionality should not be used to truncate the climate analysis of a fossil-fuel project. Second, CEQ should expand upon its discussion of substitution analysis to ensure that agencies observe best practices and avoid common pitfalls. Third, CEQ should expand upon its discussion of project purpose and need to ensure that agencies do not define purpose and need too narrowly and, by doing so, fail to consider project alternatives and mitigation measures that minimize GHG emissions. And fourth, while CEQ rightly directs agencies to apply the social cost of greenhouse gases in NEPA analysis, it should provide more prescriptive guidance on discounting and consider endorsing the latest climate-damages estimates from the Environmental Protection Agency.

A. CEQ should clarify that the rule of reason and concept of proportionality should not be used to truncate a GHG emissions analysis for projects that produce substantial and long-term GHG emissions on a gross basis, such as fossil-fuel infrastructure projects.

The Interim Guidance appropriately states that “[t]he rule of reason¹⁶ and the concept of proportionality¹⁷ caution against providing an in-depth analysis of emissions regardless of the insignificance of the quantity of GHG emissions that the proposed action would cause.”¹⁸ CEQ provides the appropriate example of a renewable energy project that results in “GHG emission reductions,” explaining that “the relative minor and short-term GHG emissions associated with construction” of such a project “should not warrant a detailed analysis of lifetime GHG

¹⁴ *Id.* at 1208.

¹⁵ *Id.* at 1209.

¹⁶ As CEQ explains, the “rule of reason . . . allows agencies to determine, based on their expertise and experience, how to consider an environmental effect and prepare an analysis based on the available information.” *Id.* at 1199.

¹⁷ The concept of proportionality is defined in 40 C.F.R. § 1502.2(b), which provides: “Environmental impact statements shall discuss impacts in proportion to their significance. There shall be only brief discussion of other than significant issues. As in a finding of no significant impact, there should be only enough discussion to show why more study is not warranted.”

¹⁸ Interim Guidance, 88 Fed. Reg. at 1202. CEQ defines the rule of reason as a concept “that allows agencies to determine, based on their expertise and experience, how to consider an environmental effect and prepare an analysis based on the available information.” *Id.* at 1199.

emissions.”¹⁹ This makes sense: As CEQ explains, when an action clearly provides a climate benefit or results in de minimis climate impact, exacting precision to quantify GHG emissions and emissions reductions should “not come at the expense of efficient and accessible analysis.”²⁰

But CEQ should clarify the limits of this principle by explicitly stating that the rule of reason and concept of proportionality should not be cited to truncate the analysis of any project that produces substantial and long-term GHG emissions on a gross basis, including fossil-fuel projects. This distinction is important because in the past agencies have sometimes (and often erroneously) claimed that major fossil-fuel infrastructure or extraction projects would have beneficial or de minimis climate impacts.²¹ Without clearer guardrails, therefore, agencies may erroneously interpret the Interim Guidance to permit a limited analysis of projects that produce substantial and long-term GHG emissions on a gross basis, such as fossil-fuel projects.

CEQ can solve this problem easily by explicitly stating that the rule of reason and the concept of proportionality should not be used to truncate the analysis that the guidance requires of any projects that produce substantial and long-term GHG emissions on gross basis, including fossil-fuel projects.

B. CEQ should outline best practices for substitution analysis to ensure that agencies do not misuse such an analysis to disregard GHG emissions.

Energy substitution analysis considers how the addition of a particular energy source affects the energy market as a whole, and how these various changes ultimately affect GHG emissions. The Interim Guidance appropriately “encourages agencies to conduct substitution analysis to provide more information on how a proposed action and its alternatives are projected to affect the resulting resource or energy mix, including resulting GHG emissions.”²² In making this recommendation, CEQ rightly cautions agencies against assuming perfect substitution²³—that is, assuming that one energy source will entirely substitute for another. CEQ also appropriately advises agencies to transparently disclose “any assumptions and inputs used in substitution analysis.”²⁴ Still, CEQ can improve upon its suggestions regarding substitution analysis in two key ways.

First, CEQ should expressly recommend that agencies not assume continued fossil-fuel reliance into the distant future when conducting a substitution analysis, but instead apply a baseline that incorporates likely long-term trends and policies.²⁵ The guidance already contains some helpful

¹⁹ *Id.* at 1202.

²⁰ *Id.*

²¹ *See, e.g.*, *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003) (rejecting agency analysis finding that coal railroad would have no impact on climate change); *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 736–40 (9th Cir. 2020) (rejecting agency’s analysis that offshore oil and gas extraction would reduce GHG emissions on net).

²² Interim Guidance, 88 Fed. Reg. at 1205.

²³ *Id.* Court have rejected numerous agency analyses that assume perfect substitution. PETER H. HOWARD & MAX SARINSKY, INST. FOR POL’Y INTEGRITY, BEST PRACTICES FOR ENERGY SUBSTITUTION ANALYSIS 3 (2022) (enclosed).

²⁴ Interim Guidance, 88 Fed. Reg. at 1205.

²⁵ Howard & Sarinsky, *supra* note 23, at 5–7.

language to this effect, as it recommends that agencies include a substitution analysis “that compares the proposed action’s and reasonable alternatives’ energy use against scenarios or energy use trends that are consistent with achieving science-based GHG reduction goals.”²⁶ But some of the guidance’s related recommendations undercut this point. In particular, the guidance suggests that agencies use existing models whose inputs and assumptions fail to capture these long-term trends.²⁷ In fact, the very agencies that developed the substitution models that the Interim Guidance endorses—namely the Department of Energy²⁸ and the Bureau of Ocean Energy Management²⁹—have recognized that these models likely understate the pace of decarbonization and thus could drastically understate the climate harms of fossil-fuel projects. To better ensure that substitution analysis does not minimize an agency’s assessment of climate impacts, CEQ should further qualify its endorsement of existing substitution models and more prominently assert the need for substitution analysis that considers a realistic range of long-term changes in the energy sector.

Second, CEQ should recommend that agencies choosing to perform a substitution analysis for climate costs also do the same for the economic benefits of proposed projects. With rare exception, agencies that have used substitution analysis to report the net climate costs of a project have ignored that same analysis when quantifying economic benefits, inconsistently reporting those benefits as gross rather than net figures.³⁰ For example, the Bureau of Land Management’s (“BLM”) recent NEPA analysis for the Willow Plan found that a significant percentage of the proposal’s gross GHG emissions would occur even if the project was not implemented because of alternative fossil-fuel production.³¹ Based on this analysis, BLM concluded that the net climate costs of the project were a fairly small percentage of its gross climate costs.³² Yet when assessing the economic benefits of the project such as royalties and revenues, BLM reported only gross figures and entirely disregarded the economic benefits that energy substitutes would provide in the project’s absence.³³ Accordingly, BLM’s analysis was

²⁶ Interim Guidance, 88 Fed. Reg. at 1205.

²⁷ *Id.* at 1205 & n.98 (recommending, inter alia, the Bureau of Ocean Energy Management’s MarketSim and the U.S. Energy Information Administration’s National Energy Modeling System).

²⁸ In a recent analysis, the Department of Energy explained that the Energy Information Administration’s Annual Energy Outlook—which serves as the basis for substitution models recommended in footnote 98 such as MarketSim and NEMS—“does not account for goals or plans to green the grid in an accelerated manner” and therefore “represents a ‘business as usual’ case and lower boundary” of future emissions reductions. Dep’t of Energy, Technical Support Document: 10 CFR Parts 433 and 435, Clean Energy for New Federal Buildings and Major Renovations of Federal Buildings ES-6, 1-22 (Dec. 7, 2022).

²⁹ In its proposed offshore leasing program from July 2022, the Bureau of Ocean Energy Management explained that “substitutions could vary dramatically based on the future energy scenario and pathway,” and recognized that “a net-zero or similar pathway” could make “the impact of substitutions in the absence of [the proposed offshore] production . . . look very different” than projected using MarketSim, which incorporates the Annual Energy Outlook reference case discussed in the prior footnote. Bureau of Ocean Energy Mgmt., 2023–2028 National Outer Continental Shelf Oil and Gas Leasing Proposed Program 5-28 (2022).

³⁰ Howard & Sarinsky, *supra* note 23, at 9–10.

³¹ Bureau of Land Mgmt., Willow Master Development Plan Supplemental Environmental Impact Statement 45–49 (Jan. 2023) (projecting substitute energy sources and the greenhouse gas emissions and monetized climate damages from those substitute sources, and then factoring those values into its analysis of the project’s net climate costs).

³² *See id.*

³³ *Id.* at 298 tbl.3.15.5 (analyzing project’s gross taxes and royalties without any reference to substitution effects discussed in the document’s climate analysis).

lopsided: It assessed climate costs on a net basis, but assessed economic benefits on a gross basis. Guiding agencies to consider the results of substitution analysis when assessing both sides of the ledger will better ensure consistency and rationality in agency decisionmaking.

The enclosed Institute for Policy Integrity report titled “Best Practices for Substitution Analysis” describes these points in further detail.

C. CEQ should direct agencies to consider policy objectives, the social needs addressed by the project, and other factors besides the applicant’s goals in their consideration of project purpose and need.

The purpose and need statement of NEPA analysis “informs the range of reasonable alternatives that the agency analyzes and considers.”³⁴ The Interim Guidance frames the purpose and need of the proposed action as a key ingredient to establishing (and cabining) the “range of reasonable alternatives, as well as reasonable mitigation measures,”³⁵ but provides minimal guidance on how agencies should define the purpose and need of proposed projects.³⁶ Without further guidance on defining purpose and need, agencies may define purpose and need too narrowly and such treatment could undercut implementation of the guidance’s other recommendations on alternatives and mitigation.

To avoid this potential issue, CEQ should direct agencies to define the purpose and need of a proposed action broadly—not by considering simply the applicant’s own goals, but also by considering federal, state, and local policy objectives of the affected regions (e.g., state decarbonization policies and targets) as well as the social needs that the project aims to address (e.g., to satisfy regional energy demand).³⁷ This would align the Interim Guidance with CEQ’s rulemaking last year that restored pre-2020 language on purpose and need. Specifically, the 2022 Rule removed regulatory language added in 2020 stating that purpose and need assessments should be based exclusively on the agency’s statutory goals and the applicant’s goals.³⁸

In particular, CEQ should direct agencies to broadly consider the public need for energy when defining the purpose and need of energy-related projects, taking into account the potential for alternative energy sources that could fulfill that purpose and any relevant state or local policies (such as decarbonization policies) that could help facilitate one energy source over another. As an example, if an agency is considering a project that will deliver natural gas to a particular region for personal consumption, the agency should define the purpose and need of the project as

³⁴ National Environmental Policy Act Implementing Regulations Revisions, 87 Fed. Reg. 23,453, 23,457 (Apr. 20, 2022) (“2022 Rule”); *see also* 40 C.F.R. §§ 1502, 1507, 1508.

³⁵ Interim Guidance, 88 Fed. Reg. at 1204.

³⁶ *See id.* at 1204 n.76 (“The purpose and need for action usually reflects both the extent of the agency’s statutory authority and its policies.”).

³⁷ *See* 2022 Rule, 87 Fed. Reg. at 23,458 (stating that agencies should not exclusively “base the purpose and need on the goals of the applicant”).

³⁸ *Id.* (“CEQ finds that removing the language on applications for authorization and restoring the 1978 regulatory text is appropriate. The language of the 2020 rule could be misconstrued to inappropriately constrain the discretion of agencies in formulating a purpose and need statement, which would be inconsistent with fully informed decisionmaking.”).

delivering energy that could fulfill that purported demand—including non-gas energy substitutes.³⁹ In this example, the agency should also consider the likelihood that those potential substitutes could meet local demand within the relevant timeframe, accounting for any state or local policies that may require or could facilitate the development of particular energy sources.⁴⁰

Explicit guidance on this front is important because in numerous instances agencies have defined purpose and need narrowly without consideration of public need or local energy policy—sometimes disregarding states themselves who advised the agency that the project could jeopardize compliance with the state’s decarbonization targets. For instance, the attorneys general of California, Oregon, and Washington recently filed a joint motion to intervene and protest the GTN Xpress project pipeline before the Federal Energy Regulatory Commission because the agency failed to consider “state laws to reduce emissions and transition to renewable energy” when assessing project need.⁴¹

Clearer guidance on the need to consider state policies would also be consistent with federal caselaw. For instance, in *Sierra Club v. United States Forest Service*, the U.S. Court of Appeals for the Ninth Circuit held that the defendant agency violated NEPA when it failed to consider potential violations of California’s water quality standards.⁴² The court highlighted testimony from the state’s Department of Fish and Game that the agency had disregarded,⁴³ emphasizing the importance of considering state law and, in particular, determinations from the state itself that the project may be inconsistent with that state law.

Providing a robust definition of purpose and need is critical since that definition informs the analysis of alternatives and mitigation measures. Defining it too narrowly—which agencies have often done in the past—could limit the scope of alternatives and mitigation measures.⁴⁴ To help ensure that agencies adequately consider project alternatives and mitigation that would limit GHG emissions in accordance with other recommendations in the Interim Guidance, CEQ should provide further direction on the consideration of purpose and need.

³⁹ See *id.* (explaining that agencies should consider “a variety of factors” in defining purpose and need, including “national, agency, or other policy objectives applicable to a proposed action” and “local needs”).

⁴⁰ NEPA regulations require agencies to consider “[e]ffects that would violate Federal, State, Tribal, or local law protecting the environment.” 40 C.F.R. 1501.3(b)(2)(iv).

⁴¹ See *e.g.*, Gas Transmission Northwest, LLC, Docket No. CP22-2-000 (discussing a conflict between a proposed Canadian-owned pipeline, GTN Xpress Project, and state statutes in Washington, Oregon, and California which had placed statutory limits on GHG emissions, specifically methane, which would increase as a result of the project).

⁴² 843 F.2d 1190, 1195 (9th Cir. 1988).

⁴³ *Id.*

⁴⁴ See *Simmons v. U.S. Army Corps of Eng’rs*, 120 F.3d 664 (7th Cir. 1997) (holding that the U.S. Army Corps of Engineers failed to consider all reasonable alternatives by constricting the purpose and need of a proposed dam excessively and tilting it in favor of the applicant’s goals); *Nat’l Parks & Conservation Ass’n v. Bureau of Land Mgmt.*, 606 F.3d 1059 (9th Cir. 2010) (holding that Bureau of Land Management’s NEPA analysis contained an unreasonably narrow purpose and need statement, constraining itself to an unreasonably narrow range of alternatives, again tilted in favor of the applicant’s goals).

D. CEQ rightly directs agencies to apply the social cost of greenhouse gases, but should disavow the use of a 7% discount rate for that valuation and consider endorsing recently updated EPA valuations.

The Interim Guidance directs agencies “in most circumstances” to “apply the best available estimates” of the social cost of greenhouse gases (SC-GHG), noting that this monetization tool “gives decision makers and the public useful information and context about a proposed action’s climate effects.”⁴⁵ The Interim Guidance provides numerous helpful insights on the SC-GHG, but CEQ should, provide further direction on discounting and endorsing the latest valuations from the Environmental Protection Agency (EPA).

CEQ correctly advises agencies to “focus on SC–GHG estimates that capture global climate damages” in light of NEPA’s requirement that agencies consider “the worldwide . . . character of environmental problems.”⁴⁶ Considering transboundary environmental effects is consistent with longstanding NEPA practice. For instance, Executive Order 12114, issued in 1979, instructs agencies to “take into consideration in making decisions” effects of their actions on the “environment of the global commons outside the jurisdiction of any nation” and “the environment of a foreign nation.”⁴⁷ Likewise, current CEQ guidance issued in 1997 directs agencies “to include analysis of reasonably foreseeable transboundary effects of proposed actions in their analysis.”⁴⁸

The Interim Guidance also correctly advises agencies to “discount future effects at rates that consider future generations,”⁴⁹ but could offer more prescriptive guidance on this front. In particular, the Interagency Working Group on the Social Cost of Greenhouse Gases (Working Group) has expressly rejected the use of a 7% discount rate for climate impacts, finding that this capital-based rate severely and inappropriately devalues intergenerational effects.⁵⁰ The Working Group has endorsed a central discount rate of 3% or lower for the SC-GHG,⁵¹ while EPA has endorsed a central short-term discount rate of 2%.⁵² Moreover, the Office of Management and Budget’s proposed updates to Circular A-4 would eliminate the use of a 7% discount rate in regulatory analysis while endorsing the use of discount rates below 2%.⁵³ CEQ should follow suit by expressly disavowing the use of the 7% discount rate for the social cost of greenhouse gases and endorsing the use of lower discount rates consistent with the best available research.

⁴⁵ Interim Guidance, 88 Fed. Reg. at 1202.

⁴⁶ *Id.* at 1203 & n.68 (quoting 42 U.S.C. 4332(2)(F)).

⁴⁷ Exec. Order No. 12114 § 2-3, 44 Fed. Reg. 1957 (Jan. 4, 1979)

⁴⁸ Council on Env’t Quality, Guidance on NEPA Analyses for Transboundary Impacts (July 1, 1997).

⁴⁹ Interim Guidance, 88 Fed. Reg. at 1203.

⁵⁰ Interagency Working Grp. on the Social Cost of Carbon, Technical Support Document: Social Cost of Carbon and Nitrous Oxide 18–19 (2021).

⁵¹ *See id.* at 5.

⁵² Env’t Prot. Agency, External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances 52–61 (2022) (“Draft Update”).

⁵³ Off. Of Mgmt. & Budget, Circular A-4 at 75–76 (draft for public review) (Apr. 6, 2023) (endorsing a short-term discount rate of 1.7% corresponding to the social rate of time preference).

Moreover, as CEQ acknowledges that the Working Group’s climate-damage estimates provide “conservative underestimates,”⁵⁴ it should consider endorsing EPA’s recently updated (and substantially higher) valuations. EPA’s valuations faithfully implement the roadmap laid out in 2017 by the National Academies of Sciences for updating the social cost of greenhouse gases⁵⁵ and apply recent advances in the science and economics on the costs of climate change. While EPA’s valuations remain underestimates,⁵⁶ they more fully account for the costs of climate change by incorporating the latest available research on climate science, damages, and discount rates. Accordingly, CEQ should consider expressly endorsing EPA’s climate-damage valuations as the best estimates available.

II. CEQ Should Expand Upon Section V of the Interim Guidance to Improve Consideration of the Effects of Climate Change on a Proposed Action and Its Environmental Consequences

In Section V of the Interim Guidance, CEQ appropriately explains that when agencies consider the effects of climate change on the environment and proposed federal actions, they should assess the projected future state of the environment and ground their assessment on the “best available climate change reports” and “most up-to-date scientific projections,”⁵⁷ including identification of the localized impacts for the affected area.

However, CEQ should offer more guidance on these fronts to ensure that agencies robustly and consistently analyze climate vulnerability and resilience effects. Surveys have demonstrated that agencies have engaged in a pattern of minimal and superficial consideration of climate vulnerability and resilience effects that rarely appear to influence decisionmaking.⁵⁸ In particular, agencies have sometimes cited uncertainty as a basis for failing to meaningfully analyze climate

⁵⁴ Interim Guidance, 88 Fed. Reg. at 1203.

⁵⁵ Nat’l Acad. Sci., Engineering & Med., *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide* (2017).

⁵⁶ Draft Update, *supra* note 52, at 4 (“[B]ecause of data and modeling limitations . . . estimates of the SC-GHG are a partial accounting of climate change impacts and, as such, lead to underestimates of the marginal benefits of abatement.”); *id.* at 72.

⁵⁷ Interim Guidance, 88 Fed. Reg. at 1208.

⁵⁸ See ROMANY M. WEBB ET AL., SABIN CTR. FOR CLIMATE CHANGE LAW, *EVALUATING CLIMATE RISK IN NEPA REVIEWS: CURRENT PRACTICES AND RECOMMENDATIONS FOR REFORM* (2022), https://scholarship.law.columbia.edu/sabin_climate_change/185; see also JESSICA WENTZ ET AL., SABIN CTR. FOR CLIMATE CHANGE LAW & ENV’T DEF. FUND, *SURVEY OF CLIMATE CHANGE CONSIDERATIONS IN FEDERAL ENVIRONMENTAL IMPACT STATEMENTS, 2012–2014* (2016), https://scholarship.law.columbia.edu/sabin_climate_change/15/; SALONI JAIN ET AL., SABIN CTR. FOR CLIMATE CHANGE LAW, *HOW DID FEDERAL ENVIRONMENTAL IMPACT STATEMENTS ADDRESS CLIMATE CHANGE IN 2016?* (2017), https://scholarship.law.columbia.edu/sabin_climate_change/104/; Jessica Wentz, *Assessing the Impacts of Climate Change on the Built Environment Under NEPA and State EIA Laws: A Survey of Current Practices and Recommendations for Model Protocols*, 35 ENV’T L. REP. 11,105 (2015), https://scholarship.law.columbia.edu/sabin_climate_change/120/; PATRICK WOOLSEY, SABIN CTR. FOR CLIMATE CHANGE LAW, *CONSIDERATION OF CLIMATE CHANGE IN FEDERAL EISS, 2009-2011* (2012), https://scholarship.law.columbia.edu/sabin_climate_change/158/; AIMEE DELACH ET AL., DEFENDERS OF WILDLIFE, *REASONABLY FORESEEABLE FUTURES: CLIMATE CHANGE, ADAPTATION AND NEPA* (2013), <https://defenders.org/publications/reasonably-foreseeable-futures-climate-changeadaptation-and-national-environmental>.

vulnerability and resilience effects, and even where agencies did analyze those climate impacts, they often relied on outdated or incomplete data.⁵⁹ Courts have typically upheld minimal climate review conducted by agencies in the absence of guidance more clearly delineating what constitutes adequate review.⁶⁰

CEQ can improve upon the Interim Guidance in several key ways to address these recurring issues. First, CEQ should clearly specify that uncertainty regarding the magnitude of climate vulnerability and resilience effects does not offer a basis to treat those effects as insignificant and avoid a more fulsome review. Second, CEQ should provide agencies with more concrete guidance on using downscaled climate projections to better estimate local and regional impacts and further support agencies in identifying the latest high-quality information.⁶¹ Third, CEQ should recommend that agencies consider a range of potential climate change scenarios in their analyses, including high-emissions scenarios supported by credible scientific evidence, to more adequately account for climate risks.

A. CEQ should caution agencies not to treat climate change impacts as insignificant merely because they are uncertain or difficult to analyze.

NEPA’s implementing regulations require agencies to evaluate the significance of environmental impacts in order to determine which issues to “analyze[] in depth”⁶² and whether an environmental impact statement is needed (rather than a less-intensive environmental assessment).⁶³ In the past, however, agencies have failed to meaningfully consider the significance of climate change impacts when confronted with uncertainties that complicate such an assessment.⁶⁴ While the Interim Guidance recommends that “NEPA reviews should consider the ongoing impacts of climate change and the foreseeable state of the environment” and flags the importance of “climate change resilience and adaptation” considerations for “agencies contemplating and planning actions,”⁶⁵ it does not provide agencies with directions on determining the significance of climate change impacts.

Climate change projections have rapidly improved and offer critical data for environmental review, but uncertainties about the magnitude of particular effects still exist. Treating such uncertainties as a basis to avoid closer assessment—as agencies have sometimes done in the past—would run contrary to the goals of NEPA by forgoing a hard-look evaluation of potentially

⁵⁹ Webb et al., *supra* note 58, at iv.

⁶⁰ See *infra* nn. 75–77 and accompanying text.

⁶¹ As explained by the U.S. Geological Service (USGS), “[s]tatistical downscaling is a technique used to translate large-scale Global Climate Models (GCM) data into smaller spatial scales (e.g. a single watershed) which can be better utilized by regional and local stakeholders to address their specific needs.” U.S. Geological Survey, Data Spotlight: Downscaled Climate Projections to Inform Climate Research in the South-Central U.S. Region, <https://www.usgs.gov/news/data-spotlight-downscaled-climate-projections-inform-climate-research-south-central-us-region> (Mar. 24, 2021) [hereinafter “USGS Data Spotlight on South-Central U.S. Downscaled Climate Projections”]. See nn. 89–92 and accompanying text for further discussion of statistical and other downscaling methods.

⁶² 40 C.F.R. § 1501.9(e).

⁶³ *Id.* § 1501.3.

⁶⁴ See *infra* nn. 75–77 and accompanying text.

⁶⁵ Interim Guidance, 88 Fed. Reg. at 1207–08.

significant effects. More concrete guidelines for agencies to account for uncertainty in evaluating the significance of climate change impacts would help prevent such an outcome. It will additionally guide federal agencies in accomplishing NEPA’s statutory purpose to advance a healthful environment for present and future generations⁶⁶ and fulfill NEPA’s obligations to collect “detailed information concerning significant environmental impacts.”⁶⁷

CEQ can draw upon its former regulations in offering those guidelines. While the agency’s current regulations direct agencies to analyze the “degree” of effects, including “both short- and long-term effects,”⁶⁸ they do not define significance explicitly. In contrast, CEQ’s longstanding pre-2020 regulations directed agencies to evaluate the “significance” of the environmental impacts of a proposed action with regard to “both context and intensity.”⁶⁹ Under that definition, both “highly controversial” and “highly uncertain” potential effects were relevant to the consideration of intensity.⁷⁰ With that definition now removed from regulations—and the Interim Guidance offering limited insight on how agencies should assess the significance of climate change effects—there is a substantial risk that agencies will continue to treat uncertainties in this area as a basis to avoid closer assessment. Such a risk is exacerbated by language added to the regulations in 2020 that an environmental assessment can be “appropriate” when the “significance of the effect is unknown.”⁷¹ But agency practice and case law have long made clear that effects can be significant and deserving of careful assessment under NEPA even when there are uncertainties regarding the full scope of these effects.⁷²

Drawing upon its longstanding pre-2020 regulations, CEQ can clarify that climate effects should not be treated as insignificant merely because they are uncertain or difficult to analyze. To the contrary, the fact that these effects may be uncertain suggests that agencies should evaluate them more carefully (not less). Agencies must ensure that they consider these potentially significant effects in their decisionmaking and do not routinely overlook them. Indeed, agencies have a long history of grappling with significant but difficult-to-quantify effects, and in the context of cost-benefit analysis, courts have found regulatory review that ignores potentially significant problems on the basis that they are difficult to measure to be arbitrary and capricious.⁷³

⁶⁶ 42 U.S.C. § 4331(a).

⁶⁷ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).

⁶⁸ 40 C.F.R. § 1501.3(b)(2)(i).

⁶⁹ 40 C.F.R. § 1508.27 (2019). This language was in the original 1978 implementing regulations and remained in the books until the finalization of the 2020 revisions.

⁷⁰ *Id.* at § 1508.27(b)(5) (2019).

⁷¹ 40 C.F.R. § 1501.3(a)(2) (2019).

⁷² *See, e.g., Env’t Def. Ctr. v. Bureau of Ocean Energy Mgmt.*, 36 F.4th 850, 880–81 (9th Cir. 2022) (“An agency must prepare an EIS where uncertainty regarding the environmental effects of a proposed action may be resolved through further data collection... We concluded that the agency’s statement of reasons for why the missing information could not be obtained was unconvincing, and we explained that an agency’s ‘lack of knowledge does not excuse the preparation of an EIS; rather it requires the [agency] to do the necessary work to obtain it.’”) (quoting *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 732–33 (9th Cir. 2001), *abrogated on other grounds by* *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 130 S. Ct. 2743 (2010)).

⁷³ *See, e.g., Public Citizen v. Fed. Motor Carrier Safety Admin.*, 374 F.3d 1209, 1219 (D.C. Cir. 2004) (“The mere fact that the magnitude of [an effect] is *uncertain* is no justification for *disregarding* the effect entirely.”) (emphasis in original).

In short, despite uncertainties, climate change effects such as an increase in the frequency and severity of extreme weather events are likely to have both short-and long-term effects on public health and safety that may be significant. Agencies should not be disregarding these effects in their analyses merely because they require projection and are subject to uncertainty. Clarifying that agencies must account for these risks despite potential uncertainty will better ensure that agencies take a “hard look”⁷⁴ at these environmental impacts.

B. CEQ should provide more detailed guidance on assessing local climate change impacts on the affected area, including use of downscaled data, and help agencies identify the latest high-quality information.

As noted above, surveys of climate change considerations in environmental impact statements have demonstrated a pattern of minimal and superficial consideration of climate vulnerability and resilience effects that rarely appear to influence decisionmaking. In upholding “minimalist review” of climate change impacts, several courts have pointed to the lack of more precise instructions or the identification of more specific climate change information as a basis to uphold the agency’s limited analysis.⁷⁵ In particular, this has led some courts to be deferential to agencies choosing to generally describe regional or national trends without assessing how those trends could alter the affected environment and the environmental consequences of the proposed action.⁷⁶ For example, one court deferred to the Army Corps of Engineers after the agency argued that predicting climate change impacts was not “realistic or feasible” due to “general uncertainty surrounding local impacts” as to the “magnitude, timing, and patterns of change.”⁷⁷ Another court was similarly deferential after the Bureau of Land Management made similar claims.⁷⁸

⁷⁴ *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976).

⁷⁵ *See, e.g., Kunaknana v. U.S. Army Corps of Engineers*, 2015 WL 3397150, at *12 (D. Alaska 2015) (acknowledging that the Corps “performed only a minimalist review” of climate change impacts in the Arctic, but concluding that without more precise instructions or the identification of more specific climate change information, the Corps’ “limited consideration of the topic was adequate”).

⁷⁶ *See, e.g., Ctr. for Biological Diversity v. U. S. Bureau of Land Mgmt.*, No. 2:14-cv-00226-APG-VCF, 2017 WL 3667700 (D. Nev. Aug. 23, 2017) (concluding that the agency’s qualitative analysis of global and regional climate change trends was sufficient, finding that nothing in NEPA or the case law indicated more was needed and pointing out that the CEQ 2016 Final Climate Guidance did not indicate that agencies must quantify climate change impacts or specifically predict precise changes); *Idaho Rivers United*, 2016 WL 498911, at *17 (“The Corps emphasizes that there is general uncertainty surrounding local impacts from climate change. . . . The court must defer to an agency’s determination as to predictions within its area of special expertise, especially when those predictions are at the frontiers of science. . . . Based on the foregoing, the court cannot conclude that the Corps’ assessment of the effects of climate change in the FEIS violated NEPA.”) (internal quotation marks omitted).

⁷⁷ *Idaho Rivers United v. U.S. Army Corps of Engineers*, 2016 WL 498911, at *17 (W. D. Wash. 2017).

⁷⁸ *See Bureau of Land Management, Richfield Field Office Planning Area Proposed Resource Management and Final Environmental Impact Statement 4-4 (2008)* (“The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts.”); *S. Utah Wilderness All. v. Burke*, 981 F. Supp. 2d 1099, 1111 (D. Utah 2013), vacated sub nom. *S. Utah Wilderness All. v. U.S. Dep’t of the Interior*, No. 2:12CV257 DAK, 2017 WL 11516766 (D. Utah May 17, 2017) (“BLM is limited in its ability to predict specific climate change on a regional and local scale because of a lack of scientific tools designed for such purposes.”).

This limited assessment runs contrary to the requirements of NEPA. NEPA implementing regulations require agencies to provide “high quality information” and “accurate scientific analysis.”⁷⁹ They further clarify that for “site-specific action[s],” “the effects in the local area” are relevant for the evaluation of environmental impacts.⁸⁰ The Interim Guidance generally reinforces the importance of following these directives in the climate change context. Notably, it recommends that agencies “remain aware of the evolving body of scientific information as more refined estimates of the effects of climate change, both globally and at a localized level, become available” and “use information on future projected GHG emissions scenarios to evaluate potential future impacts (such as flooding, high winds, extreme heat, and other climate change-related impacts) and what those impacts will mean for the physical and other relevant conditions in the affected area.”⁸¹

But given the limited assessment of downscaled projections on the affected environment in prior analyses—and the rapidly evolving nature of the science—agencies would benefit from clearer CEQ guidance on the state of the latest and best-available information. Agencies would also benefit from clearer guidance on what constitutes adequate analysis of that information and treatment of remaining uncertainties, particularly with regard to analyzing local and regional impacts.

First, CEQ can provide clarity on the availability of downscaling techniques and information on more localized climate change impacts. Datasets that predict climate change effects at a “finer spatial scale than global climate models” for specific regional and local areas are now available.⁸² As early as 2013, the literature recognized a “proliferation of high-resolution climate projections derived with differing downscaling methods.”⁸³ Additionally, the Biden Administration has released a number of new climate resilience tools with additional information relevant to agency analysis,⁸⁴ which CEQ can direct agencies to employ. In addition to the global and national reports listed in the Interim Guidance,⁸⁵ CEQ should provide a list of federal and state resources for high-quality downscaled projections to be updated regularly as additional information becomes available.

Beyond providing additional downscaled projections, CEQ should also supplement its guidance to better ensure appropriate use of available projections to assess localized impacts on the affected area. Available literature highlights how different methods of downscaling, with varying degrees of difficulty to implement, may be appropriate for different goals.⁸⁶ For example, the change factor method is relatively easy to implement by scaling global models to a more

⁷⁹ 40 C.F.R. § 1500.1.

⁸⁰ *Id.* at § 1501.3(b)(1).

⁸¹ Interim Guidance, 88 Fed. Reg. at 1208.

⁸² *See, e.g.*, USGS Data Spotlight on South-Central U.S. Downscaled Climate Projections, *supra* note 61.

⁸³ Joseph J. Barsugli et al., *The Practitioner’s Dilemma: How to Assess the Credibility of Downscaled Climate Projections*, 94(46) *Eos* 421 (2013).

⁸⁴ *See, e.g.*, Climate Mapping for Resilience & Adaptation, <https://resilience.climate.gov/> (last visited Mar. 29, 2023).

⁸⁵ *See* Interim Guidance, 88 Fed. Reg. at 1199 n.28.

⁸⁶ Marie Ekstrom, Michael R. Grose & Penny H. Whetton, *An Appraisal of Downscaling Methods Used in Climate Change Research*, 6(3) *WIREs CLIMATE CHANGE* 301, 309–14 (2015).

granular historical dataset.⁸⁷ Such a method may offer sufficient data for certain environmental decisionmaking, particularly when the impact of concern is occurring in the near-term future and less influenced by local features or extreme events.⁸⁸ Statistical and dynamical downscaling require additional expertise and resources, but may offer additional clarity when these or other influences are more consequential.⁸⁹ CEQ should better direct agencies to consider downscaled data when it is available and advise them on the relative advantages of the available methods. Even when downscaled data is not available, there are uncertainties in the data, or discrepancies between the results of different methods, agencies can still factor future change into their analysis. In these cases, CEQ should suggest that agencies still qualitatively assess how projected regional climate effects may impact the affected area, and not rely solely on a historical baseline.

Providing such detailed information can better ensure that agencies conduct more robust analyses in the future. For instance, CEQ's 2016 guidance informed a decision by the Eastern District of California that the government's failure to better account for future climate effects on a hydrological project was arbitrary and capricious.⁹⁰ The role that the 2016 guidance played in this decision highlights the importance of CEQ offering further clarity in its guidance on what climate information is available and how best to use it.

CEQ could also offer more precise guidance on the use of the latest climate information, particularly on a more localized level, in the agency practice of "tiering" environmental review of new actions to earlier, broader environmental reviews. Regulations provide that "[a] NEPA document that tiers to another broader NEPA document . . . must include a finding that the conditions and environmental effects described in the broader NEPA document are still valid or address any exceptions."⁹¹ The evolving state of climate science and additional information on localized impacts may mean that findings in the original analysis are no longer valid. Accordingly, CEQ should direct federal agencies to freshly consider when new climate information may require updating existing analyses rather than defaulting to relying on existing analyses through tiering. CEQ should also recommend that agencies take into account the availability of new downscaled projections when determining whether to produce supplemental environmental assessment. Because tiering environmental review for "site-specific" assessment of "narrower scope"⁹² than original projects may require climate projections at a more localized spatial scale, it may be inappropriate for agencies to deem its analysis complete based on the original analysis and fail to conduct a more site-specific review.

⁸⁷ *Id.* at 306–07.

⁸⁸ *Id.* at 307–09.

⁸⁹ *Id.*

⁹⁰ *See* *AquAlliance v. United States Bureau of Reclamation*, 287 F. Supp. 3d 969, 1028–29 (E.D. Cal. 2018).

⁹¹ 43 C.F.R § 46.140.

⁹² *Id.* § 1501.11(c)(1).

C. CEQ should recommend that federal agencies consider a range of potential climate change scenarios, focusing particularly on the most plausible scenarios and including scenarios with more severe climate impacts when supported by credible scientific evidence.

As the Interim Guidance acknowledges, the best available climate reports typically rely on a range of emissions scenarios and other assumptions to project future climate change impacts.⁹³ CEQ should direct agencies to use realistic baselines when assessing climate vulnerability that incorporate the most plausible emissions scenarios.⁹⁴ Different global climate models estimate a range of potential impacts based on these scenarios and downscaling this data under different models widens the range of possible outcomes.⁹⁵ CEQ should specifically recommend that agencies account for the range of plausible climate impact scenarios, including more severe climate impacts when supported by credible scientific evidence. This would better ensure that agencies, consistent with the NEPA implementing regulations, evaluate the incomplete or unavailable information associated with “reasonably foreseeable significant adverse effects,” which include the “catastrophic consequences . . . supported by credible scientific evidence.”⁹⁶

Such a directive can also help counterbalance societal norms within and outside of the scientific community that have resulted in a bias toward underestimation of climate change impacts.⁹⁷ In fact, high-quality models generally underestimate climate change risks from more extreme outcomes.⁹⁸ This possibility of underestimating risk can potentially be balanced by analyzing a range of plausible outcomes, including more severe potential outcomes. As noted above, CEQ regulations require consideration of reasonably foreseeable “catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence.”⁹⁹ While this requirement does not obligate agencies to consider the implications of implausibly high emissions scenarios merely because they are used in some models, it also does not allow them to rely on implausibly optimistic scenarios of negligible climate impacts when that contradicts the best available information. When agencies have failed to consider climate impacts on the affected environment citing uncertainty, they have effectively relied on overly optimistic scenarios of negligible impacts without scientific support. CEQ

⁹³ See Interim Guidance, 88 Fed. Reg. at 1208 n.126.

⁹⁴ As discussed above, agencies should also use realistic baselines when performing substitution analysis. See *supra* Sec. I.B. Assumptions used in substitution analysis and for assessing climate vulnerability and resilience should be consistent with one another.

⁹⁵ For example, see the USGS’s discussion of downscaled climate projections for the South-Central U.S. region. The USGS discusses 81 sets of projections produced on a 10 km by 10 km grid covering the South-Central U.S. region that account for different emissions scenarios, global climate models, and downscaling techniques and make some recommendations for how to decisionmakers can best use these different sets of outcomes. See USGS Data Spotlight on South-Central U.S. Downscaled Climate Projections, *supra* note 61.

⁹⁶ 40 C.F.R. § 1502.21.

⁹⁷ See Keynyn Brysse et al., *Climate change prediction: Erring on the side of least drama?*, 23(1) GLOBAL ENV’T & CHANGE 327 (2013); Naomi Oreskes, Michael Oppenheimer & Dale Jamieson, *Scientists Have Been Underestimating the Pace of Climate Change*, SCI. AM. (Aug. 19, 2019).

⁹⁸ See e.g., Jacob Schewe et al., *State-of-the-art global models underestimate impacts from climate extremes*, 10 NATURE COMM’N 1005 (2019).

⁹⁹ 40 C.F.R. § 1502.21(d). See also 50 Fed. Reg. 32237 (1985) (explaining that agencies “retain[the duty to describe the consequences of a remote, but potentially severe impact” while “ground[ing] the duty in evaluation of scientific opinion.”).

should make clear that such reliance on implausibly optimistic scenarios does not fulfill NEPA's requirements when it is not supported by the best available information.

Additionally, CEQ can again clarify that uncertainties intrinsic to the analysis¹⁰⁰ that result in a range of plausible outcomes do not excuse agencies from conducting a review of climate impacts and considering them in environmental decisionmaking. As noted above, an agency's selection of appropriate emissions scenarios and global circulation models to predict the effects of greenhouse gas emissions inherently involves some uncertainty around the precise magnitude of the impact. The use of localized predictions can layer in additional uncertainty through statistical downscaling models to predict the effects of global change at a local scale because these models can result in a range of outcomes. Researchers have developed techniques to better account for some of these differences.¹⁰¹ Grappling with these uncertainties is a critical part of an analysis based on the best climate information and should not be treated as a barrier to review. Agencies are well-accustomed to technical decisionmaking that navigates uncertainty and considers a range of possible outcomes.

CONCLUSION

The Interim Guidance provides helpful and much-needed direction to agencies on the consideration of climate impacts under NEPA. This letter offers various avenues for CEQ to expand and improve upon its guidance. With respect to climate quantification, contextualization, and mitigation in Section IV of the Interim Guidance, this letter offers several suggestions to ensure that agencies reasonably consider, and not inappropriately minimize, effects on climate change. The letter offers several broader suggestions with respect to climate resilience and vulnerability in Section V of the Interim Guidance, recommending that CEQ provide additional guidance in several key areas to help ensure that agencies more robustly and consistently analyze climate vulnerability and resilience effects in NEPA review.

Sincerely,

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Enclosure: PETER H. HOWARD & MAX SARINSKY, INST. FOR POL'Y INTEGRITY, BEST PRACTICES FOR ENERGY SUBSTITUTION ANALYSIS (2022)

¹⁰⁰ See, e.g., Ekstrom et al. *supra* note 86, at 302–03 (discussing the types of uncertainty intrinsic to climate modeling).

¹⁰¹ See, e.g., Veronika Eyring et al., *Taking climate model evaluation to the next level*, 9 NATURE CLIMATE CHANGE 102 (2019).