COMMENTS OF THE
CENTER FOR ENVIRONMENTAL ACCOUNTABILITY

Comments on the Notice of Extended Opportunity to Comment

Notice of Public Hearing
and Opportunity to Comment
Docket 2024.03.028 (March 19, 2024)

SUBMITTED JULY 1, 2024

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I. Introduction

The Montana Public Service Commission ("PSC" or "Commission") has issued a Notice of Extended Opportunity to Comment ("NEOC") that asks a series of questions about Earth Justice and its fellow petitioners' ("Petitioners") petition for rulemaking ("Petition"). Among other issues, the Commission's additional questions focus on potential issues with using the social cost of greenhouse gases ("SCC") in the Commission's ratemaking proceedings, as well as queries over how to select the appropriate discount rate. The NEOC also asks for feedback on several potential legal obstacles to the Commission adopting the Petition.

In its initial comment, the Center for Environmental Accountability ("CEA") raised concerns with the Petition that mirror the concerns the PSC raises in the NEOC.[1] CEA argued that *Held v. State* does not compel the PSC to adopt the Petition,[2] that Montana law and PSC practice are already consistent with the Montana Constitution's concern for the environment,[3] and that the SCC has inherent methodological flaws that mean any choice in value is inevitably more a reflection of the political beliefs of its creators than an objective assessment of the harms of emitting greenhouse gases.[4]

As CEA's comment explained, the flawed SCC methodology urged on the PSC by Petitioners is transparently political. Petitioners' proposed SCC figures rely on a fundamentally flawed emission scenario, RCP8.5, in a way that dramatically increases long-term projections of damage from climate change.[5] These damages are then further inflated by the choice of an artificially low "discount rate"—a number used to account for the difference between the present and future value of money—that can be more accurately characterized as a political statement than any sort of scientifically objective number.[6] The concatenation of these errors led CEA to conclude "that it is impossible to use the SCC to represent the costs of current carbon emissions."[7]

Recent public discourse has only strengthened that conclusion. In May 2024, economists Adrien Bilal and Diego Känzig released a study claiming to identify a SCC of $1,056 per ton of carbon dioxide—more than five times the value urged by Petitioners.[8] This proved to be a bridge too far

[1] CEA, Comment on the Petition for Adoption of New Rule I and Declarations Pertaining to the Commission's Consideration of the Adverse Climate Impacts of Greenhouse Gas Emissions (April 12, 2024) ("CEA Comment").
[2] CEA Comment at 3.
[3] *Id.* at 6.
[4] *Id.* at 8.
[5] *Id.* at 10.
[6] *Id.* at 16.
[7] *Id.* at 19.
[8] Adrien Bilal & Diego Känzig, *The Macroeconomic Impact of Climate Change: Global vs. Local Temperature* 1 (Nat'l Bureau of Econ. Rsch, Working Paper No. 32450, 2024).

for many, and in the online debate that ensued, several prominent climate economists admitted that the SCC is the product of politics, not science.[9]

This second comment discusses these recent developments and responds to several of the PSC's additional questions. CEA's conclusion has not changed from its first comment. Given the significant methodological flaws with the SCC, the Petition would result in rates that are neither just nor reasonable, and would result in Montana ratepayers footing the bill for fictitious global benefits. Montana law does not permit that result.

II. Climate economists say the quiet part out loud

A recent imbroglio over the Bilal and Känzig paper that said that the SCC should be set at $1,056 per ton of carbon dioxide (or its equivalent) pulls back the curtain on how the SCC is more of a political tool than a figure representing any sort of science—"settled" or otherwise. The episode shows that the SCC is certainly *not* a measure of "real economic harm" that allows "decision makers such as utilities and the Commission to account for the costs of greenhouse gas emissions that were previously unquantified."[10]

Using novel methodologies, Bilal and Känzig's paper argues that "the macroeconomic impacts of climate change are six times larger than previously documented."[11] On this basis, the paper generates a much higher SCC than either the Environmental Protection Agency ("EPA") or the Intergovernmental Working Group ("IWG"). Among other problems, the paper suffers from the flaw of relying on damage inputs derived using RCP8.5 as a baseline emissions scenario. CEA's initial comment explains how this produces implausibly high damage calculations.[12] This did not stop media outlets from hyping the study's conclusions.[13]

The Breakthrough Institute offered its own critique of this paper in its online journal, arguing that the activist commitments of the paper's authors led them to "rely on conceptually bizarre, poorly justified economic methods."[14] This critical review led to a great deal of backlash on X. However, in the ensuing discourse, a number of prominent climate economists and researchers

[9] *See,* Sec. II, *infra.*
[10] Petition at 13–14.
[11] Bilal & Känzig, *supra* note 8.
[12] CEA Comment at 8.
[13] Oliver Milman, *Economic damage from climate change six times worse than thought – report,* The Guardian (May 17, 2024), https://www.theguardian.com/environment/article/2024/may/17/economic-damage-climate-change-report.
[14] Alex Trembath & Patrick Brown, *When Activist Research Contradicts the* Consensus, Breakthrough Institute (Jun. 3, 2024), https://thebreakthroughjournal.substack.com/p/when-activist-research-contradicts.

stated publicly that the SCC is less the product of rigorous economic analysis than it is of political priorities and value judgments.

For instance, Noah Kaufman, who has served under President Obama and President Biden and in senior White House positions, including on the Council on Environmental Quality and the Council of Economic Advisors, stated that "[t]he value of climate damages is not a thing we can estimate. There is no consensus. Never will be."[15] Following up on his point, he said that "[t]he use of SCCs to make whatever point one would make without SCCs remains undefeated."[16]

Similarly, Arvind Ravikumar, a professor of engineering at the University of Texas and the co-director of the university's Energy Emissions Modeling and Data Lab, called the SCC a "useless metric." Any notion of a "consensus" figure for the SCC, he argues, "is a fool's errand" as it is "90% value judgment."[17]

Zeke Hausfather, a climate scientist with Berkeley Earth and an author at Carbon Brief, laid bare what CEA hopes its initial comment made obvious: "The SCC is, generally speaking, just a thin veneer of objectivity covering what is ultimately a naked value judgement."[18]

The consensus from these and other economists and climate researchers is that however important climate change may be, the SCC is not an appropriate tool for assessing tradeoffs among different policy options. Indeed, the framing of the Petition suggests that this isn't Petitioners' intent. The Petition would have the Commission "at a minimum":

> Apply the higher of the social cost of greenhouse gases established by (a) the U.S. Environmental Protection Agency or (b) the federal Interagency Working Group on the Social Cost of Greenhouse Gases as of the time of the Commission's determination (except that in no case shall the costs of greenhouse gases be lower than those at a 2-percent near-term Ramsey discount rate from the U.S. Environmental Protection Agency's November 2023 "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances," adjusted for inflation).[19]

Thus, should the methodological flaws with the IWG and EPA's calculation of the SCC ever be resolved so that it *could* be developed in a non-political way, the PSC would be forbidden from using that number. Instead, it would fix in Montana regulations a ratchet, whereby estimates of

[15] Noah Kaufman (@noahqk), X (Jun. 3, 2024, 10:26 PM), https://x.com/noahqk/status/1797817256493412800.
[16] Noah Kaufman (@noahqk), X (Jun. 4, 2024, 8:52 AM), https://x.com/noahqk/status/1797974627832205575.
[17] Arvind Ravikumar (@arvindpawan1), X (Jun. 4, 2024, 2:48 PM), https://x.com/arvindpawan1/status/1798064300130779553.
[18] Zeke Hausfather (@hausfath), X (Jun. 4, 2024, 2:25 PM), https://x.com/hausfath/status/1798058427274658291.
[19] Petition at 1–2.

SCC could only go up and never go down, no matter what the science says. The only explanation for this language is that the Petitioners wish to pursue a particular outcome rather than employ credible scientific metrics.

Given this, CEA urges the PSC to reject the Petitioners' claim that the PSC is required to incorporate the SCC into utility ratemaking. Such an incorporation would distort, rather than enhance, the Commission's performance of its statutory duty to ensure just and reasonable rates for Montana's rate payers.

III. CEA's responses to the PSC's questions

The NEOC also asks for feedback on several potential legal obstacles to the Commission adopting the Petition. CEA provides answers to several of those questions below.

> **4. The proposed rule would require the Commission to consider "quantitative and qualitative impacts of its decisions on the environment and human health, including impacts on climate change." Petition 25. The proposed rule provides a quantitative method of measuring of the social cost of greenhouse gas emissions ("SC-GHG"). Id. Are any qualitative impacts of greenhouse gas emissions effectively quantified in the proposed sources of the SC-GHG? If not, how would specific qualitative impacts be accounted for in Commission decisions, if the proposed rule was adopted as written?**

As the NEOC notes, the Petitioners urge the Commission to consider both the quantitative and qualitative impacts of its decisions on the environment. If the Petition were adopted, the SCC—flawed as it is—would be part of the way the PSC quantifies environmental impacts. But the SCC provides no qualitative metric.

CEA suggests that in a state like Montana, which is renowned for its natural beauty and strong tourism economy, a qualitative assessment of different forms of energy is of particular importance. Consideration of the SCC might counsel Montana to shift its resource mix from one that uses dense primary energy sources to much more diffuse primary energy, like wind and solar. But this shift would result in what some have described as "energy sprawl"—meaning that the physical footprint of the area required to provide Montana's energy needs would grow significantly. This would mean much larger areas of the state would feature wind farms and utility scale solar facilities. In addition to the sprawling nature of the generation facilities themselves, hundreds of miles of high voltage transmission lines would have to be built to connect these facilities to the state's load pockets. Unlike gas and oil pipelines, which are generally buried underground, transmission towers can rise over a hundred feet tall.

The effect this would have on Montana's landscape would be profound. According to a Montana Department of Fish Wildlife and Parks's biologist, "the construction and operation of wind facilities can displace terrestrial wildlife and kill birds and bats as they collide with the rotor blades, whose tips rip through the sky at up to 180 miles per hour."[20] The same "infamous winds" that make much of Montana a target for wind turbine developers also make the state attractive to migratory birds,[21] some of which, like golden eagles or bald eagles, are endangered or protected.[22] But, the developers of wind farms, happy to tout their green bona fides,[23] are not always the environmental stewards they purport to be.

In 2022, a subsidiary of NextEra Energy, the nation's largest utility and largest developer of "wind, solar and battery storage," plead guilty to criminal violations of the Endangered Species Act in federal court in Wyoming.[24] As part of the guilty plea, NextEra "acknowledged that at least 150 bald and golden eagles have died" in connection with its facilities and that "136 of those deaths have been affirmatively determined to be attributable to the eagle being struck by a wind turbine blade."[25] The Justice Department's press release strongly suggests that NextEra operated its facilities "on a schedule intended to meet, among other things, power purchase agreement commitments and qualifying deadlines for particular tax credit rates for renewable energy," rather than with "avoidance and minimization measures" that might have minimized bird kills.[26] NextEra "received hundreds of millions of dollars in federal tax credits for generating electricity from wind power at facilities that it operated, knowing that multiple eagles would be killed and wounded without legal authorization."[27] Renewable developers prioritize harvesting tax credits over enhancing the environment. That their business model depends on harvesting tax credits gives them every incentive to shirk their duties to protect the environment, even when such violations may come with criminal penalties.[28]

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[20] Montana Department of Fish, Wildlife and Parks, *The Trouble with Turbines* 28, https://fwp.mt.gov/binaries/content/assets/fwp/montana-outdoors/2023/windpower.pdf.
[21] Mont. Dep't of Fish, *supra* n. 20 at 28; *see also* Montana Audubon, *Raptor Migration*, https://mtaudubon.org/events/hawk-watch/ (last visited Jul. 1, 2024).
[22] U.S. Fish & Wildlife Service, *Eagle Management*, https://www.fws.gov/program/eagle-management#:~:text=Our%20Laws%20and%20Regulations,eagles%20(50%20CFR%2022) (last visited Jul. 1, 2024).
[23] NextEra Energy, *NextEra Energy is once again recognized as No. 1 in its industry on Fortune's list of 'World's Most Admired Companies'*, NextEra Energy Newsroom (Feb. 2, 2023), https://newsroom.nexteraenergy.com/2023-02-02-NextEra-Energy-is-once-again-recognized-as-No-1-in-its-industry-on-Fortunes-list-of-Worlds-Most-Admired-Companies?l=12.
[24] Press Release, U.S. Department of Justice, ESI Energy LLC, Wholly Owned Subsidiary of Nextera Energy Resources LLC, is Sentenced After Pleading Guilty to Killing and Wounding Eagles in Its Wind Energy Operations, in Violation of the Migratory Bird Treaty Act (Apr. 5, 2022) (on file with author).
[25] Press Release, U.S. Dep't of Just., *supra* note 24.
[26] *Id*.
[27] *Id*.
[28] *Id*.

For both its residents and its visitors, Montana is a place of rugged, pristine beauty. The massive space requirements of resources like wind and solar, the Petitioners' preferred resources, risks permanently disfiguring Montana's "Big Sky" vistas. The accompanying transmission lines would further blight the landscape and pose additional risks to Montana's birds.[29]

Though these costs are not captured in anything like the SCC—nor could they be—the Petition would require the PSC to weigh them in the balance as it evaluates the pros and cons of different types of energy generation. If the PSC believes it cannot accurately weigh these qualitative costs within the bounds of its legal authority, the Petition should be rejected.

> **5. To the extent that the sources specified in the proposed rule for estimates of the SC-GHG (i.e., the U.S. Environmental Protection Agency ("EPA"), the federal Interagency Working Group ("IWG")) provide calculations using a range of social discount rates, why does the proposed rule specify a particular discount rate of 2%? To the extent the sources identified in the proposed rule acknowledge uncertainty regarding the true social discount rate, would it be reasonable for any consideration of quantitative impacts inclusive of the SC-GHG to consider a range of potential discount rates?**

As the response from climate economists to the Breakthrough Institute's critique of Bilal and Känzig shows, there is no such thing as a "true social discount rate." IWG and EPA do not use a range of discount rates or other economic factors, even though the different rates represent different value judgments that cannot be resolved using the scientific method. At the risk of stating the obvious, even this range of value judgments is heavily curated, reflecting the insularity of the IWG and the narrow preoccupations of the EPA technocracy. A broader, more representative process would include a wider range of discount rates that also reflect the values of those on the lower end of the socioeconomic spectrum.[30]A lower discount rate, like the two percent rate that the Petitioners advance, places a greater value on avoided future harms, which generally only reflect the values of those with higher incomes.[31]

Choosing the discount rate boils down to a value judgment about how much people living today should value benefits to those living in the future relative to costs born in the present. As MIT climate economist Robert Pindyck explains, "there is no general agreement over whether the dis-

[29] J. Bernardino, et al., *Bird collisions with power lines: State of the art and priority areas for research*, 222 Biological Conservation 1 (2018), https://www.sciencedirect.com/science/article/abs/pii/S0006320717317925.
[30] Jinchi Dong et al., *Towards a Representative Social Cost of Carbon*, arxiv.org (Apr. 7, 2024), https://arxiv.org/pdf/2404.04989.pdf.
[31] CEA Comment at 18.

count rate should be based on how much people *should*, as an ethical matter, discount the consumption of future generations or instead on the basis of current rates of return to capital investments that people *actually require* before investing."[32] That the Biden Administration uses different discount ranges than the preceding administrations reflects a *value judgment* on the part of the administration, not any advance in climate science, damage attribution, or macroeconomic modeling.

The Petitioners' sources—the IWG and the EPA—admit as much in their technical documents. The IWG concedes that the discount rate is a subjective value judgment, not a figure that "science" can settle on. Rather, "the choice of a discount rate also raises highly contested and exceedingly difficult questions of science, economics, ethics, and law."[33] The EPA explains that "[t]he selection of rates on the lower end of that range tend to emerge from ethical concerns."[34] In other words, selection from the lower end of higher discount rates does not reflect a way of dealing with uncertainty; instead, it is a reflection of the different ways that the (flawed) damage functions value future costs. But contrary to the EPA, a *higher* discount rate would also emerge from ethical concerns, just different ones from those dominant in the milieu of the environmental bureaucracy.

It is within the damage functions that the enormous uncertainty associated with predictions of future climate harm lurks. As Pindyck explains, "the physical mechanisms that determine climate sensitivity involve crucial feedback loops, and the parameter values that determine the strength (and even the sign) of those feedback loops are largely unknown, and for the foreseeable future may even be unknowable."[35] The damage functions are attempts to predict the unknowable.

The "published estimates [of the SCC] range from [negative $]771 [per ton of carbon dioxide] to [positive $]216,035 [per ton of carbon dioxide]. Research cannot reduce the span of credible estimates by much, as the future is uncertain and ethical parameters are key."[36] The range of SCC estimates and the innumerable variations in how different economists and researchers approach the issue are the products of this inherent uncertainty involved in forecasting changes hundreds of years into the future that will turn on the independent actions of the billions of people who live

[32] Robert S. Pindyck, *Climate Change Policy: What Do the Models Tell Us?*, 51 Journal of Economic Literature 860, 863-865 (Sept. 2013).
[33] Interagency Working Grp. On Social Cost of Greenhouse Gases, Technical Support Document, Social Cost of Carbon, Methane, and Nitrous Oxide (Feb. 2021), https://perma.cc/XBQ9-K3QB.
[34] EPA, Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances (Nov. 2023), https://perma.cc/5M3R-YACH.
[35] Pindyck, *supra* note 19, at 862.
[36] Richard Tol (@RichardTol), X (Feb. 22, 2021, 2:12 AM), https://perma.cc/3BYS-983D.

and will live upon the earth. The PSC is, to put it mildly, ill-suited to incorporate into its proceedings predictions about distributed human behaviors on a global scale across a centuries-long time horizon.

The SCC may be an interesting academic exercise that allows researchers to explore how different variables affect outcomes in their models, but the SCC in no way reflects the true cost of emitting a marginal unit of greenhouse gas emissions into the world's atmosphere. The value-laden nature of discount rates shows just how fraught using such a figure in utility ratemaking would be.

6. The Petition asserts that the Commission must always use "the best and most up-to-date quantitative and qualitative methods." Petition 23. As written, does subpart 1 of the proposed rule establish a floor on the SC-GHG of $190 per ton, in 2023 dollars, regardless of future updates by the EPA and IWG on the SC-GHG? If so, why is adopting a floor reasonable?

As stated above and in CEA's previous comments, Petitioners' proposed floor for the SCC is proof that the Petition is driven by a political and ideological vision to eliminate the use of fossil fuels. While Petitioners ask the PSC to use "the best and most up-to-date quantitative and qualitative methods," the proposed floor acts as an insurance policy against any changes of the sort Känzig and Bilal brought to the fore. The Petition would fix in Montana regulations a ratchet, whereby estimates of SCC could only go up and never go down, no matter what the science says. The only explanation for this language is that Petitioners wish to pursue a particular outcome rather than employ credible scientific metrics.

7. What sources could the Commission and parties in contested cases use to identify communities that are disproportionately affected by the impacts of greenhouse gas emissions? What sources could the Commission and parties in contested cases use to identify communities that are subject to historical inequalities?

The EPA's Environmental Justice Screen is a tool routinely used at the federal level to identify historically disadvantaged communities. But the idea that greenhouse gas emissions might disproportionately impact certain communities misunderstands the supposed threat of climate change. Climate change is a global phenomenon. Taken in isolation, emitting greenhouse gases does not have localized environmental impacts, as carbon dioxide, the GHG that is generally the focus of reduction strategies, is an inert gas that does not cause local air pollution impacts in a way that criterion pollutants do. Rather, greenhouse gas emissions are a concern insofar as they

cause *global* effects on the earth's climate. Predicting localized effects from a global phenomenon like climate change is even more fraught with uncertainty than attempting to ballpark the macroeconomic effects as the SCC attempts to do.

In an effort to assess the harms climate change might have in specific geographic regions, on specific economic sectors, and upon specific population demographics, the EPA has developed a tool called FrEDI, the "Framework for Evaluating Damages and Impacts."[37] Among other things, the tool purports to model impacts on environmental justice communities.[38] EPA advertises the tool as a "quantitative storyline of physical and economic impacts of climate change in the U.S., by degree of warming or custom temperature trajectory, region, and sector."[39] But, like the SCC, the tool is fundamentally flawed.

CEA prepared a comprehensive critique of FrEDI that it filed as a comment on the EPA's most recent revision of the tool.[40] As with the EPA and IWG's SCC calculation, FrEDI's fatal flaw is the use of the RCP8.5 emissions scenario as its means of predicting future harms. Using this fatally flawed scenario as the base case undermines FrEDI's scientific validity from the outset, calling into question its use in the policymaking context. CEA explains the multiple egregious flaws in EPA's approach in its comment, which is attached as Exhibit A to this comment. To the extent to which the Petitioners propose the use of FrEDI in their response to the NEOC, CEA's critique of FrEDI should prove useful for the PSC.[41]

The GHG emissions resulting from activities within the Commission's jurisdiction are vanishingly small compared to global emissions, and any effort to predict the effect that the global phenomenon of climate change will have on specific communities within Montana would be a fool's errand. As a result, the Commission should reject any call for it to do so.

8. If the consideration of communities that are disproportionately affected by the impacts of greenhouse gas emissions and/or historical inequalities weighs against the selection of a least-cost resource, would the proposed rule require the selection of a more expensive resource?

It is not at all clear what the Petition's proposal that the PSC "[c]onsider any adverse climate impacts of greenhouse gas emissions on communities that are disproportionately impacted by such

[37] EPA, Draft Technical Documentation for the Framework for Evaluating Damages and Impacts (FrEDI) (Feb. 2024), https://www.epa.gov/system/files/documents/2024-02/technical-documentation-for-fredi_feb2024_0.pdf.
[38] EPA, *supra* n. 37 at 30.
[39] *Id*. at 2.
[40] CEA, Comment on Technical Documentation for the Framework for Evaluating Damages and Impacts (FrEDI) (April 24, 2024), https://www.regulations.gov/comment/EPA-HQ-OAR-2023-0614-0005.
[41] CEA, *supra* n. 40.

emissions and/or subject to historical inequalities" actually means.[42] As noted previously, climate change is a global phenomenon, and its effects on Montana are likely to be *de minimus*. But that doesn't mean the Petition would have no impact on low-income communities or others that have faced historical inequalities.

The implementation of aggressive climate policies—like those encouraged by the consideration of an inflated SCC—has had disproportionately negative consequences on poor and middle-class communities in other states. For example, environmental lawyer Jennifer Hernandez has documented the disastrous consequences of California's climate policies in her article, *Green Jim Crow: How California's Climate Policies Undermine Civil Rights and Racial Equity*.[43] There she explains how the state's predominantly white managerial class has pushed ruinous climate policies onto the state at the expense of the state's poorest residents:

> [California] leads the world in renewable energy and electric vehicle ownership. But its industrial and manufacturing sectors have been decimated, and it boasts the highest housing, transportation, and electricity costs in the country. Its climate accomplishments are illusory, a product of deindustrialization, high energy costs, and, more recently and improbably, depopulation. Inequality has hit record levels, and housing segregation has returned to a degree not seen since the early 1960s.[44]

Though California's environmentalist groups—often led by the same NGO's responsible for the Petition—claim to want a "just [energy] transition," the inevitable consequence of their policies is "the creation of a new Green Jim Crow era in California," in which a regulatory morass subordinates racial minorities' aspirations of material progress to the managerial class's virtue signaling.[45] Their efforts have transformed California from the ultimate expression of the American dream into a playground for only the rich and the famous. The PSC should not assist Petitioners' efforts to do the same in Montana.

9. As written, the proposed rule requires the Commission to "apply" the SC-GHG when making determinations of prudency. Petition 25. In economic terms, is it the intention of the proposed rule to require the

[42] Petition at 25.
[43] Jennifer Hernandez, *Green Jim Crow: How California's Climate Policies Undermine Civil Rights and Racial Equity* (Aug. 16, 2021), https://thebreakthrough.org/journal/no-14-summer-2021/green-jim-crow.
[44] Hernandez, *supra* n. 43.
[45] *Id*.

Commission to internalize the SC-GHG, either in whole or in part, when setting utility rates?

While the language of the Petition is far from clear, its proposed requirement that the PSC "consider the quantitative and qualitative impacts of its decisions . . . on climate change"[46] certainly appears to require the PSC "internalize the SC-GHG . . . when setting utility rates." According to the Petition, the PSC's "relevant duties" into which it might incorporate the SCC includes "rate making."[47] Further, in the Petitioners' discussion of Montana's implementation of the Public Utility Regulatory Policies Act (PURPA),[48] the Petitioners argue that "avoided environmental and societal costs of climate change from fossil fuel resources" are "real and actual cost[s]" that the Commission could include in avoided cost rates for "qualifying facilities."[49] The SCC would presumably be the means the Petitioners would have the PSC use to calculate such costs to include in rates. It would follow from this that the Petitioners would have the PSC do the same in ratemaking beyond PURPA.

To the extent to which rates are set in such a manner, the results would be confiscatory rates that would provide windfall profits to the utility or the qualifying facility ("QF"). This would violate the PSC's duty to ensure just and reasonable rates and would constitute a taking of private property without just compensation under the Fourteenth Amendment. Under the just and reasonable standard, a utility is entitled to recovery of the costs associated with fulfilling its duties to serve its customers, as required by Montana law, plus a rate of return on its investment sufficient to attract equity capital.[50] Rates must be sufficient to "insure to the consumer reasonable service, and to the utility a reasonable return."[51] But, they must be no more than this.[52] The utility or the QF is not entitled to receive compensation in its rates for costs that *it* did not incur. That the world—the SCC is a measure of *global* climate harms—can be said to have avoided harms because a utility or QF uses one rather than another generating source does not entitle it to include those costs in its rates. Otherwise, utilities should have been allowed to include in their rates the social

[46] Petition at 25.
[47] *Id.* at 19–20.
[48] Pub. L. No. 95-617, 92 Stat. 3117.
[49] Petition at 20.
[50] *Mountain States Tel. & Tel. Co. v. Dep't of Pub. Serv. Regul.,* 624 P.2d 481, 482–83 (Mont. 1981) ("In determining a fair and reasonable rate of return, it is necessary to determine what it costs the utility to secure the required capital to finance its operations … The 'cost of capital' involves not only the interest the utility must pay on its borrowed capital (debt), but also the cost of attracting purchasers of its common stock (equity). A regulatory commission such as the PSC must authorize utility rates sufficient to cover the utility's cost of debt and cost of equity, but no more, or the utility's customers will be paying excessive rates for the services the utility provides.").
[51] *Great N. Utilities Co. v. Pub. Serv. Comm'n*, 293 P. 294, 305 (Mont. 1930).
[52] *Mountain States* at 483.

benefits of such things as air conditioning or refrigeration that their electrical services made possible. But these factors have never factored into what constitutes just and reasonable rates. Rather, utility commissions look to the costs associated with providing the public service and determine a reasonable return for the utility on those costs that it has invested in the enterprise.[53]

For QFs, the avoided costs are the costs that the utility avoids when it is compelled to accept the QF's power. Montana law limits such costs to "real and actual costs."[54] The Federal Energy Regulatory Commission, the federal agency tasked with enforcing PURPA, defines "[a]voided costs as the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source."[55] In other words, the avoided cost is the cost that the utility would otherwise incur but for the power that the QF supplies.

Using some measure of externalities associated with the provision of the utility service may be appropriate for state policymakers or for system planners who shape the nature of the service the utility must provide, but they are not appropriate factors to incorporate into rates themselves.

> **10. The last sentence of the proposed rule creates a cost-benefit standard for the Commission to apply in decisions regarding electric utilities:**
>
> **In making determinations regarding electric utilities . . . the Commission must determine that short-term costs or direct costs of renewable energy generation that are higher than the short-term costs or direct costs of alternatives relying more heavily on fossil fuels are reasonable, just, prudent, in the public interest, or otherwise approvable, if the adverse impacts resulting from the use of fossil fuels are larger than those from renewable energy generation.**
>
> **a. Does the standard require the Commission to conduct cost-benefit analyses of utility actions that maintain and operate currently rate-based electric generating plants when setting rates? If so, would the cost of replacement energy and capacity be among the "adverse impacts" that the Commission must consider in the cost-benefit analysis of existing operations?**

Regardless of the Petition's intent, it would not be just and reasonable, and, therefore, it would not be lawful, to impose on ratepayers the costs associated with replacing currently rate-based

[53] Mont. Code Ann. § 69-3-1206.
[54] § 69-3-1206.
[55] 18 C.F.R. 292.101(b)(6).

used-and-useful utility assets. The costs to replace them would be extraordinary and, as discussed in the response to Question 9, could not be just and reasonable because they would provide a windfall to the utilities, who would be given license to incur these extraordinary costs.

b. By its terms, the standard applies only to determinations regarding electric utilities. When the Commission makes decisions regarding natural gas service, is it the intent of the proposed rule to require a cost-benefit test similar to the standard used in electric cases? If so, how would the Commission and parties in contested cases quantify the benefits of the natural gas delivery infrastructure and supply?

To the extent the natural gas system is included in the Petition, the PSC would have to consider the benefits of the existing natural gas system and the value it provides to ratepayers. Natural gas is significantly less costly than other alternatives, including electric utilities. The Energy Information Administration estimated that the average US homeowner who uses electricity to heat their home will pay 77% more than heating with natural gas in the 2023–2024 winter.[56] Similarly, the Department of Energy found that electricity costs 3.3 times more than an equivalent amount of natural gas in 2023.[57] The discrepancy in prices means that the push to "electrify everything" is effectively a "regressive tax" pushed by wealthy NGOs with combined budgets totaling more than $800 million per year.[58] Additionally, natural gas is "at least twice as efficient and emits about half as much CO_2 as processes that use electricity produced from fossil fuels."[59] These numbers are improving as natural gas distribution systems have themselves improved over the last few decades, with emissions declining 70% since 1990.[60]

c. The standard would require a comparison of the adverse impacts of two categories of resources: renewable energy generation and "alternatives relying more heavily on fossil fuels." Petition 25–26. If the proposed rule requires the Commission to apply a similar test in natural gas cases, what alternative(s) to natural gas infrastructure and supply would the test consider? Would the alternative analysis need to assume and account for a conversion of appliances and infrastructure from natural gas to another resource, like electricity or propane?

A full cost-benefit analysis would require the PSC to consider all of the costs associated with switching away from the natural gas system towards other forms of energy, including the costs of

[56] Energy Information Administration, *Short-Term Energy Outlook* (Jun. 11, 2024), https://www.eia.gov/outlooks/steo/report/perspectives/2023/10-winterfuels/article.php#casetab1.
[57] Robert Bryce, *Federal Data Shows, Again, That The Electrify Everything Push Means Higher Energy Costs* (Nov. 10, 2023), https://robertbryce.substack.com/p/federal-data-shows-again-that-the.
[58] *Id.*
[59] *Id*.
[60] American Gas Association, https://playbook.aga.org/environment (last visited Jul. 1, 2024).

replacing appliances and building whatever infrastructure would be necessary to support such a switch in energy systems. But, if Montana is going to abandon its natural gas system in favor of total electrification, this is a decision that should be made by the state legislature, not the PSC. A decision of such magnitude should be made by the most politically accountable branch: the legislature.

d. The standard uses the terms "short-term" and "direct" to describe the costs considered in the analysis. Petition 25–26. Should the proposed rule define those terms and, if so, how should the terms be defined?

If the PSC were to adopt the Petition it would need to define those terms. But under Montana law, neither definition could incorporate the SCC or any externalities, except to the extent that a utility actually had to bear such costs to provide its service.[61]

Montana law forbids the use of "a bonus or adder in the cost of a new resource" as "compensation for costs such as environmental externalities" except "to compensate for a real and actual cost required by existing regulation or existing law."[62] Though not part of their proposed rule, the Petitioners argue that the PSC could consider "avoided environmental and societal costs of climate change from fossil fuel resources . . . 'real and actual cost[s].'"[63] As explained in response to Question 9, such costs are limited to the costs the utility bears to provide utility service under its service obligations.

e. If, after applying the standard, the Commission was required to find a renewable energy generating resource prudent, would the Commission also be required to find a competing fossil-fuel resource imprudent? … g. If, after applying the standard, the Commission found that costs associated with a renewable energy generating resource were prudent, would a utility be entitled to recover the full cost of the resource, even if the resource was not the least-cost resource?

The plain language of the Petition appears to require both things. But this would have enormous costs for Montana ratepayers. As detailed above, such a forced abandonment of existing resources would entitle the incumbent utility to recover stranded asset costs. This in turn would put the PSC at odds with Montana law, which requires the state's utilities to plan their systems to meet their service obligations "in the most cost-effective manner."[64]

[61] *See* Mont. Code Ann. § 69-3-1206(3).
[62] § 69-3-1206(3).
[63] Petition at 20.
[64] Mont. Code Ann. § 69-3-1206(1)(a).

11. In cases concerning natural gas service, does the proposed rule require the Commission to disallow rate recovery of actual test-year costs of service if those costs plus the SC-GHG exceed the benefits of natural gas service? If so, would the Commission need to adopt or establish a method of valuing the benefits of natural gas service at times when heat is required to prevent loss of life?

As described above, the SCC is deeply flawed and is not suitable for this sort of analysis. However, if the Commission were to use the SCC in this way, it must also quantify the value of benefits of natural gas service in addition to whatever costs the PSC would quantify.[65]

12. The Petitioners' comments state that:

[t]he Rule would only require the Commission to consider long-term societal costs it is constitutionally required to consider and constitutionally prohibited from ignoring. Such Consideration is not even outcome determinative—i.e. use of the SC-GHG does not require the Commission to take action based on that consideration, to pick one alternative over another, or to decide whether or not to allocate costs to Montana ratepayers based on such considerations. It would simply prevent the Commission from proceeding in ignorance of the true costs of a utility's planning and resource acquisition activities and would prohibit the uninformed allocation of those costs to Montana ratepayers.

a. If the proposed rule as written requires the Commission to make a finding of prudency or imprudency based on the SC-GHG, would that also require the Commission to take certain action "to pick one alternative over another, or to decide whether or not to allocate costs to Montana ratepayers based on such considerations"? See Petitioners' Comments 4.

Petitioners' comments are misleading. Either the Petition requires "action" from the PSC, or incorporating the SCC into the PSC's proceeding serves no purpose at all, except to increase costs for the ratepayer and the taxpayer.

The Petition would require the Commission to take certain action "to pick one alternative over another, or to decide whether or not to allocate costs to Montana ratepayers based on such considerations." The Commission would make this decision based on its finding of prudency or imprudency. The Petitioners are advocating for the PSC to consider the SCC when making "decisions regarding ratemaking."[66] As Peter Drucker famously observed, "what gets measured gets

[65] *See* Response to Question 10(b), *supra*.
[66] Petition at 25.

managed."[67] It is impossible to apply the final sentence of the Petitioners' proposed rule without making decisions about the prudency of expenditure, whether rates are just and reasonable, or other actions that are core functions of the PSC. This in turn would lead to the Commission's decision to choose one energy source over another or make a decision on ratemaking.

c. If the purpose of the proposed rule is to avoid "uninformed" ratemaking decisions and the proposed rule is not "outcome determinative" as asserted on page 4 of Petitioners' comments, why is the standard set in the last sentence of the proposed rule reasonably necessary?

Under Montana law, "agency decision-making" must be "scientifically-driven and well-reasoned."[68] As CEA has explained above and in its initial comment, the SCC does not represent a scientifically derived measure of the harms of climate change but rather a "veneer of objectivity covering what is ultimately a naked value judgement."[69] As a result, using the SCC cannot result in more informed decision making, but only the opposite. To avoid "uninformed" ratemaking decisions, the Petition should be rejected.

d. Intervenors in contested cases before the Commission routinely raise additional issues, including the impacts of greenhouse gas emissions. *See, e.g.*, *In re NorthWestern Energy's Application for Authority to Increase Rates*, Dkt. 2022.07.078, 350 Montana Motion for Intervention (Aug. 31, 2022). Given that intervenors can already present arguments and information about greenhouse gas emissions in Commission proceedings, how is the proposed rule reasonably necessary to avoid uninformed ratemaking decisions?

As CEA explained in its initial comment, the PSC is already in a position to consider the effects of its decisions on climate change and should continue to consider such issues on a case-by-case basis. The Montana legislature has codified that it is the state's policy "to encourage utilities to acquire resources … that will help ensure a clean, healthful, safe, and economically productive environment."[70] The PSC has, in turn, implemented this policy in its own regulations and requires that a "utility's resource procurement processes shall be guided by" these considerations.[71] Within this framework, the PSC has ample discretion to consider the environmental effects of greenhouse gas emissions.

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[67] Larry Prusak, *What Can't Be Measured*, Harbard Business Review (Oct. 7, 2010), https://hbr.org/2010/10/what-cant-be-measured.
[68] *Flathead Lakers Inc. v. Montana Dep't of Nat. Res. & Conservation*, 530 P.3d 769, 781 (Mont. 2023).
[69] Zeke Hausfather (@hausfath), X (Jun. 4, 2024, 2:25 PM), https://x.com/hausfath/status/1798058427274658291.
[70] Mont. Code Ann. § 69-3-1202.
[71] Mont. Admin. R. 38.5.2024.

Additionally, Montana law governing utilities' development of integrated resource plans allows utilities to consider "externalities associated with the acquisition of a resource" in developing their plans.[72] The PSC's regulations require that the utilities' plans include "annual emissions of carbon dioxide" for "existing resources."[73] And when assessing future needs, the PSC requires utilities to consider "a wide range of plausibly cost-effective resources" and include in their descriptions of these possibilities their "environmental impacts including … emissions," "a broad range of … risks related to uncertainty about future loads, resource costs and performance, and changes in public policy," and "at least two scenarios that rely on increased renewable energy resources."[74]

These provisions already give the PSC the ability to conduct a measured consideration of environmental risks, including those associated with GHG emissions. That the PSC already considers these factors in its proceedings undermines the Petitioners' argument that their rule is necessary for the PSC to execute its constitutional duty to "maintain and improve a clean and healthful environment in Montana for present and future generations."[75]

> **13. Administrative rules are "out of harmony" with legislative guidelines if they "(1) engraft additional and contradictory requirements on the statute; or (2) if they engraft additional, noncontradictory requirements on the statute which were not envisioned by the legislature." *Clark Fork Coal. v. Tubbs*, 2016 MT 229, ¶ 25, 384 Mont. 503, 380 P.3d 771. Is there any legislative history that supports the Petition's assertion that the requirements of the proposed rule were envisioned by the Legislature when it granted the Commission the rulemaking authority cited in the Petition?**

The legislative history directly contradicts the Petitioners' assertion that their proposed rule is of the type "envisioned by the Legislature when it granted the Commission rulemaking authority." Under the Montana Administrative Procedure Act, the agency must point to a statute granting it authority to adopt a rule that "clearly and specifically lists the subject matter of the rule as a subject upon which the agency shall or may adopt rules" or "the rule implements or relates to a subject matter or an agency function that is clearly and specifically included in a statute to which the grant of rulemaking authority extends."[76]

[72] Mont. Code Ann. § 69-3-1204(3)(b).
[73] Mont. Admin. R. 38.5.2022(1)(d).
[74] Admin. R. 38.5.2022(1)(d).
[75] Mont. Const. art. IX, § 1.
[76] Mont. Code Ann. § 2-4-305(3).

The Montana Legislature has conferred explicit authority upon the Commission to regulate the rates and services provided by public utilities. But it has explicitly exempted the Commission from environmental requirements and obligations required of other state agencies in the Montana Environmental Protection Act (§75-1-201(3)). In doing so, the state legislature made clear that the PSC is an economic regulator, not an environmental regulator. Its main responsibility is to regulate the rates for utility service in the State of Montana, not to impose environmental regulations upon the state's utilities.

In 2021, the Legislature amended Mont. Code Ann. § 69-3-1206, the provision governing what expenses can be included in rates, to include a provision that the Commission cannot add a bonus or adder for externalities in the costs of a new resource, unless there are real and actual costs associated with such externalities that the utility itself bears and must, therefore, be compensated for incurring. As explained in response to Question 9, to count as an avoided cost, the cost must be of the kind incurred by a utility to fulfill its state law service obligations, not some figure that might be associated with activities that have macroeconomic benefits. To include such externalities, would be to re-write the basic requirements of ratemaking. For example, the electric system has underpinned the growth and development of nearly every aspect of the economy of the United States. CEA is unaware of efforts to incorporate the positive externalities of electric service in rates.

The Montana Constitution does not grant the Commission the authority to adopt rules beyond the scope of its statutory authorization. A fundamental right in the Constitution to a clean and healthful environment is not sufficient to provide the PSC with rulemaking authority of the type required to grant the Petition.

14. Mont. Code Ann. § 69-8-421(7) limits the Commission's ability to disallow costs related to certain approved electricity supply resources. The Petition asserts that "[c]ompensating utilities for capital expenses to maintain aging power plants for increasingly expensive coal or gas that is burned at such plants may create incentives—effectively subsidies—to continue operating climate-polluting facilities that would otherwise retire." Petition 21. If the last sentence of the proposed rule requires the Commission to conduct a cost-benefit analysis of operating and maintenance costs for assets approved under Mont. Code Ann. § 69-8-421, and to potentially disallow costs, does the rule conflict with Mont. Code Ann. § 69-8-421(7)?

The Petition conflicts with Mont. Code Ann. § 69-8-421(7). The statute limits the Commission's ability to "disallow the recovery of costs related to the approved electricity supply resource," though the PSC "has express latitude to determine if the electricity supply costs were 'prudent,'

meaning careful, sensible, practical, discreet, wise, or farsighted or, more apt in the regulatory environment, avoiding unnecessary risks."[77] The Petition would expand the definition of "prudent" to incorporate a cost-benefit analysis that would seemingly make the SCC the overriding consideration in any evaluation of the prudence of such costs. The Petition advocates for the prudency finding to consider "climate impact,"[78] even though the climate impact is not found in the statutory or case law definition of "prudent." Expansion of the definition of "prudent" in this manner would effectively remove the statute's limitation on the Commission's ability to disallow costs related to "electricity supply resources" that the PSC had already approved.

16. The Petitioners intend for the Commission to apply the proposed rule in integrated resource planning, which is governed by Integrated Least-Cost Resource Planning and Acquisition Act, Title 69, Chapter 3, Part 12 of Montana Code Annotated, and Mont. Admin. Rs. 38.5.2020–2025 (2024). Current rules on resource planning provide that "[t]he cost-effectiveness of all resource acquisitions will be evaluated with respect to long-term total costs, including scenarios based on societal costs." Mont. Admin. R. 38.5.2020(2). "Societal costs" are defined as "all costs to a utility plus externalities." Mont. Admin. R. 38.5.2021(14). Given the requirements of current rules, why is the proposed rule reasonably necessary to effectuate the purpose of the Integrated Least-Cost Resource Planning and Acquisition Act?

The Petitioners' proposed rule is not necessary to effectuate the purpose of the Integrated Least-Cost Resource Planning and Acquisition Act. As explained in CEA's initial comment and in response to Question 12(d), the PSC is already effectuating the purposes of this statute.

Montana law governing utilities' development of integrated resource plans allows utilities to consider "externalities associated with the acquisition of a resource" in developing their plans.[79] The PSC's regulations require that the utilities' plans include "annual emissions of carbon dioxide" for "existing resources."[80] When assessing future needs, the PSC requires utilities to consider "a wide range of plausibly cost-effective resources" and include in their descriptions of these possibilities their "environmental impacts including . . . emissions." When considering the system-wide costs of new resources and retirements, the utilities' assessments of options must include "a broad range of . . . risks related to uncertainty about future loads, resource costs and performance, and changes in public policy." This assessment must also include "at least two scenarios that rely on increased renewable energy resources." These provisions allow for the PSC's

[77] *NorthWestern Corp. v. Montana Dep't of Pub. Serv. Regul.*, 385 Mont. 33, 45 (Mont. 2016).
[78] Petition at 21.
[79] Mont. Code Ann. § 69-3-1204(3)(b).
[80] Mont. Admin. R. 38.5.2022(1)(d).

measured consideration of environmental risks and effects.[81] Given that the PSC is already engaging in these consideration, the PSC need not adopt the Petition to effectuate its statutory purposes.

17. Footnote 44 of the Petition refers to a website with a list of states that use the SC-GHG.

a. Of the states that use the SC-GHG, what discount rate does each state apply to the SC-GHG?

As shown in the Table below, the states that use a SCC use discount rates ranging from 1% to 7%. Some states use a specific discount rate, while others use a range.

State	Use Case	Year	Discount Rate
California	Scoping Plan	2022	2.5–5%
Colorado	Utility Planning	2021	2.5%
Delaware	Offshore Wind Procurement Options	2022	3.92%
Illinois	Zero Emission Credits Program	2018	3%
Maryland	Proceeding on Transforming MD's Electric Grid	2018	5–7%
Minnesota	Public Utilities	2023	1.5–2.5%
New Jersey	Energy Efficiency and Demand Reduction	2020	3%
New York	Scoping Plan	2022	2%
Vermont	Low- and Zero-Emission Vehicles	2022	1–3%
Washington	Utility Resource Planning	2020	2.5%

As Section II of this comment explains, the discount rate is a value judgment, but one that significantly affects the ultimate SCC figure. It should come as no surprise then that a survey of these states shows a wide range of discount rates, showing that there is no consensus on the correct rate. For example, Vermont's SCC values vary from $56/metric ton for year 2025 emissions, using a 3% discount rate, to $418/metric ton, using a 1% discount rate.[82] This irresolvable variability undermines the usefulness of the figure to the Montana PSC.

b. Of the states that use the SC-GHG, which states have rules similar to the proposed rule?

[81] CEA Comment at 26.
[82] *Vermont Applies Social Cost of Carbon in Regulations for Low-Emission and Zero-Emission Vehicles*, The Cost of Climate Pollution (Dec. 2022), https://costofcarbon.org/states/entry/vermont-applies-social-cost-of-carbon-in-regulations-for-low-emission-and-zero-emission-vehicles.

While several states have incorporated the SCC into cost-benefit analyses for system planning purposes,[83] none require the use of the higher of the EPA or IWG SCC value. The inclusion of these requirements in the Petition shows is transparent political motivation.

c. Of the states that use the SC-GHG in utility proceedings, is the use of SC-GHG required by a legislative act?

Of the states that use the SCC in utility proceedings, most require it by legislative act. For example, Colorado passed a law in 2021 requiring the state's Public Utilities Commission to use the SCC in utility planning.[84] Minnesota passed a law requiring the use of the SCC with a 1.5–2.5 percent discount rate range by its Public Utilities Commission.[85] Virginia passed the Clean Economy Act in 2020 requiring the State Corporation Commission, Virginia's electric utility regulator, to use the SCC when assessing the building of fossil fuel-fired generators.[86] Washington passed the Clean Energy Transformation Act in 2019, which required the use of the SCC in utility resource planning.[87]

Fewer states have adopted the SCC through administrative actions. Nevada's Public Utilities Commission passed an order in 2018 requiring the use of the SCC in resource planning.[88] California passed a law to set a carbon-neutrality goal for its electricity sector, and its Public Utilities Commission issued a report in 2021 on the law's implementation using the SCC.[89] The New Jersey Board of Regulatory Commissioners issued an order adopting a cost test using the SCC to implement its Clean Energy Act.[90]

Given the economic and political significance of using the SCC, as well as its irreducibly value-laden nature, the PSC should only adopt its use if the legislature requires that it do so.

d. Of the states that use the SC-GHG in utility proceedings, is it used in all regulatory decisions, or just in select categories of cases, like resource planning and procurement proceedings?

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[83] For example, Colorado requires its utility commission to use the SCC developed by the federal government using a discount rate of 2.5 percent or less. Colo. Rev. Stat. Ann. § 40-3.2-106.
[84] Colo. Rev. Stat. Ann. § 40-3.2-106.
[85] Minn. Stat. Ann. § 216B.2422 § 3 (demanding use of "the full range of discount rates from 2.5 to 1.5 percent, with two percent as the central estimate.").
[86] Va. Code Ann. § 56-585.1(A) 6.
[87] Wash. Rev. Code Ann. § 19.280.030 (3).
[88] Nev. Admin. Code 704.937.
[89] California Pub. Utilities Comm'n, California Energy Comm'n, *2021 SB 100 Joint Agency Report*, Pub. No. CEC-200-2021-001(2021) https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity.
[90] *In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency & Peak Demand Reduction Programs*, No. QO19010040, 2020 WL 5078017 (N.J. Bd. Reg. Comm. Aug. 24, 2020).

Of the states that use the SCC in utility proceedings, most only use it in select categories of cases, like resource planning proceedings. For example, Colorado passed a law that requires it in utility planning, including electric resource plans, renewable energy standards, electrification, and demand-side management programs.[91] Nevada,[92] Minnesota,[93] and Washington[94] require it for resource planning. Virginia passed the Clean Economy Act in 2020, which requires its electric utility regulator to determine if a fossil fuel-fired generator should be built.[95] Virginia's provision allows the Virginia Corporation Commission to consider the SCC as a "benefit or cost" and gives that commission wide discretion on how to develop and use the figure.[96]

IV. Conclusion

The Petition urges the PSC to incorporate a methodologically flawed and politically-inflected social cost of carbon into its ratemaking and planning procedures. As CEA has explained, the social cost of carbon that Petitioners advance is methodologically flawed and, therefore, invalid as a measure of the damage done by emitting a ton of a greenhouse gas. Further, the discount rate, is an inherently subjective and value laden figure that cannot be derived from neutral scientific expertise.

Further, the PSC is already following Montana constitutional and statutory protections for the environment and should spare Montanans the significant costs to affordability and reliability that the implementing the Petition would entail.

For these reasons, the Center for Environmental Accountability again urges the PSC to reject the Petition for Rulemaking.

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[91] Colo. Rev. Stat. Ann. § 40-3.2-106.
[92] Nev. Admin. Code 704.937.
[93] Minn. Stat. Ann. § 216B.2422.
[94] Wash. Rev. Code Ann. § 19.280.030.
[95] Va. Code Ann. § 56-585.1.
[96] § 56-585.1.

EXHIBIT A

CENTER FOR ENVIRONMENTAL ACCOUNTABILITY

COMMENTS OF THE
CENTER FOR ENVIRONMENTAL ACCOUNTABILITY

Comments on Technical Documentation for the
Framework for Evaluating Damages and Impacts (FrEDI).

Notice of Document Availability
and Request for Comments.
Docket No. EPA–HQ–OAR–2023–0614
(February 23, 2024)

SUBMITTED APRIL 24, 2024

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I. Introduction

This letter serves as a comment on the Environmental Protection Agency ("EPA")'s "Technical Documentation for the Framework for Evaluating Damages and Impacts (FrEDI)." 89 Fed. Reg. 13717 (Feb. 23, 2024). EPA explains that "[t]he main objective of the framework, implemented through the associated FrEDI R package, is to provide projections of annual physical and economic impacts of climate change in the U.S. through the 21st century under any custom temperature scenario, for a broad range of economically important impact category sectors (e.g., impacts across human health, infrastructure, labor, electricity, agriculture, and ecosystems and recreation)." EPA, 430-R-24-001, *Draft Technical Documentation for the Framework for Evaluating Damages and Impacts (FrEDI)* 1 (Feb. 2024) ("FrEDI Draft Technical Documentation"), https://perma.cc/93L5-NWMA.

We write to explain that FrEDI's projections are fatally flawed because they systematically overestimate damage in two ways.

First, and most importantly, all but one of the studies FrEDI relies on project damages using the RCP8.5. RCP8.5 is an emissions pathway generated to inform the Intergovernmental Panel on Climate Change ("IPCC") in 2005 and was intended to show the impact of very high emissions consistent with a fivefold increase in the use of coal and effectively no policies to limit greenhouse gas emissions. This reference scenario was always exceedingly unlikely and is now only of use as a counterfactual. FrEDI's reliance on this outdated and extreme scenario results in much larger damages at lower temperatures and introduces a significant bias in its results, predicting elevated damages even when there is virtually no increase in the underlying projections.

Second, many of the damage projections in FrEDI effectively exclude the possibility of adaptation to the effects of rising atmospheric greenhouse gas concentrations, adaptations which in many cases could reduce projected damages with minimal expense. It beggars belief to suggest that communities across the United States will do *nothing* to modify their infrastructure to protect themselves from, for example, increased inland flooding. But this is what EPA assumes.

This comment explains how an adaptation-free RCP8.5 trajectory is wholly unrealistic, and how its lingering presence in the scientific literature, EPA's social cost of carbon, and FrEDI is a black mark on scientific integrity. The attached expert report of Prof. Roger Pielke details how these assumptions infect nearly every part of FrEDI's damage projections, how this causes FrEDI to systematically overproject damage, and why this means FrEDI cannot be used to usefully project temperature related mortality, air quality, flooding, or anything else.

This comment further explains why the framework if adopted would violate the Information Quality Act and EPA's Scientific Integrity Policy. These flaws would fatally undermine any future action that relies on FrEDI. Finally, the comment explains that giving official government endorsement to these wildly inaccurate projections of damages misleads the public and propagates the misinformation that the Biden Administration purports to hate.

Climate science and climate policy are difficult and complex, but at their root, they both depend on the credibility of scientific and governmental authority. As proposed, FrEDI undermines that credibility. EPA should not adopt or use FrEDI in any fashion without first correcting the fundamental errors in its methodology.

II. RCP8.5 is Unsuitable for Use in FrEDI.

As detailed in Prof. Pielke's attached expert report, all of the studies in FrEDI incorporate an emissions scenario called RCP 8.5 or its equivalent into their damage calculations. Pielke Rep. ¶ 10. Though it is often labeled the "business-as-usual scenario," RCP8.5 is now widely regarded by the climate science community as implausibly extreme. Malte Meinshausen, et al., *A Perspective on the Next Generation of Earth System Model Scenarios: Towards Representative Emission Pathways (REPs)*, Geoscientific Model Development (preprint) (Sep. 6, 2023), https://doi.org/10.5194/gmd-2023-176. While the latest projections of the International Energy Agency expect a median warming of around 2.4°C by 2100, RCP8.5 projects a temperature rise of around 5°C. Int'l Energy Agency, *World Energy Outlook 2023*, at 22 (2023), https://perma.cc/8S7J-8R88; Zeke Hausfather & Glen P. Peters, Comment, *Emissions—The "Business As Usual" Story Is Misleading*, 577 Nature 618, 618 (2020), https://doi.org/10.1038/d41586-020-00177-3; Zeke Hausfather, *Explainer: The High-Emissions 'RCP8.5' Global Warming Scenario*, CarbonBrief (Aug. 21, 2019), https://perma.cc/9LD9-EGDU.

Despite this, RCP8.5 is now firmly lodged in the scientific literature as the expected trajectory of radiative forcing. Thousands of scientific papers refer to RCP8.5 as the "business-as-usual" scenario. *See* Google Scholar Search, https://scholar.google.com/scholar?hl=en&as_sdt=0%2C6&q=rcp8.5+%22business+as+usual%22&btnG= (searching "rcp8.5 'business as usual'").[1] Among these are many of the studies on which EPA's FrEDI relies.

[1] Admittedly, some of these papers are critiquing the use of the term "business-as-usual" to describe RCP8.5, but many if not most take the scenario at face value.

A. The origins of RCP8.5 as the "business-as-usual" scenario.

Accurate emissions scenarios are fundamental for reliable climate damage projections because they serve as the primary driver in complex climate models. Climate models incorporate atmospheric physics, biogeochemical cycles, and feedbacks to simulate how future greenhouse gas concentrations will translate into global and regional changes in temperature, precipitation patterns, and extreme weather events. Essentially, emissions scenarios provide the input signal that determines the magnitude and character of the climate response we project.

Scientists create emissions scenarios by first defining socioeconomic assumptions about factors like economic and population growth, energy use, land-use changes, and pollution levels. These assumptions about future human behavior on a global scale are then fed into integrated assessment models which produce different possible pathways for future emissions. The resulting emissions scenarios include time-resolved predictions of carbon dioxide, methane, and nitrous oxide emissions over the coming decades. These scenarios are fed into more complex climate models, which are themselves used to calculate radiative forcing (a measure of atmospheric energy imbalance), which in turn feeds climate models that project future climate conditions like global temperature or sea-level rise.

Early climate research relied on scenarios that were highly idealized and focused on exploring what would happen if, for example, carbon dioxide concentrations doubled from their preindustrial levels or increased at a steady rate of 1 percent per year. When it was formed in 1988, the IPCC introduced several more sophisticated scenarios intended both to predict the current trajectory and to try to understand how changes in emissions patterns could result in alternate futures. The 1990 IPCC report created four scenarios to model "four hypothetical future patterns of greenhouse gas emissions and their effect on the atmosphere." IPCC, *Policymaker Summary of Working Group III (Formulation of Response Strategies* 121 (1990), https://perma.cc/XE7U-DXNF. Climate policies could then be evaluated based on the benefits that might come from changing emissions patterns to conform with one of the reduced scenarios, or the consequences associated with sticking with the baseline.

The first scenario of these four scenarios was called the "business as usual," scenario, and was meant to capture what the future would look like in the absence of unforeseen events or changes to emission rates either through a shift in energy sources, a reduction in energy use, or changes in population trajectories. That scenario projected that cumulative greenhouse gas emissions would result in an atmospheric concentration in the year 2100 of more than 1,200 parts per million of carbon dioxide equivalent, a consequent radiative forcing of 10 watts per square meter, and a

global temperature rise of between 2.9 and 6.2 degrees Celsius above preindustrial values. *Id.* at 121–123 (*see* Figure 3). The second scenario assumed that various energy efficiency measures and emissions controls would be adopted globally, and that the share of the world's primary energy provided by natural gas would increase and the share of coal would decrease. *Id.* "Under this scenario, the cumulative effect of such measures is a CO_2 equivalent doubling around 2060" as opposed to 2025 in the business-as-usual scenario. The remaining two scenarios were intended to reflect futures where emission reduction efforts in addition to those in the second scenario were taken. These efforts included: "utilization of renewable energy sources, strengthening of the Montreal Protocol, and adoption of agricultural policies to reduce emissions from livestock systems, rice paddies, and fertilizers." *Id.* at 121.

The IPCC has since updated its scenarios several times. In 2005, the IPCC was beginning to produce a new generation of emissions scenarios but was worried that an extended development would delay the advance of climate modeling research. As a stopgap, the IPCC selected a set of four radiative forcing pathways to the year 2100 to be used immediately by researchers while scenario developers worked in parallel to develop socioeconomically plausible emissions scenarios to match. These pathways, called Representative Concentration Pathways, or RCPs, were drawn from the hundreds of existing emissions scenarios to represent a low, medium, high, and very high radiative forcing pathways. These scenarios were called RCP2.6, RCP4.5, RCP6.0, and RCP8.5, respectively, indicating the radiative forcing expected by 2100 (e.g., RCP8.5 assumed a pathway that reached a radiative forcing of 8.5 watts per square meter in 2100).

These scenarios were not intended—like IPCC's 1990 scenarios—to be *predictions* of different policy pathways. Indeed, in 2008 the IPCC stressed that "[i]t is an open research question as to how wide a range of socioeconomic conditions could be consistent with a given [RCP] pathway of forcing, including its ultimate level, its pathway over time, and its spatial pattern." IPCC, *IPCC Expert Meeting Report: Towards New Scenarios for Analysis of Emissions, Climate Change, Impacts, and Response Strategies*, at ix, 43 (Sept. 2007), https://perma.cc/NKC2-GULA. The IPCC warned researchers and policymakers against reading too much into the different scenarios: "The differences between the RCPs can therefore not directly be interpreted as a result of climate policy or particular socioeconomic developments." RCP Database (version 2.0, 2009), https://perma.cc/UJR3-MTYT.

But somewhere along the way some wires got crossed. When the RCP scenarios were published, the IPCC labeled RCP8.5 as the "business-as-usual" scenario, seemingly inadvertently branding that scenario as the baseline against which all future policy intervention would be set. This labeling was quickly set upon by climate activists, like Tom Steyer, who had been looking for ways to

"make climate change feel real and immediate." Burt Helm, *Climate Change's Bottom Line*, N.Y. Times (Jan. 31, 2015), https://tinyurl.com/4ehefamv. Steyer, joined by Michael Bloomberg and Hank Paulson, eventually funded a project which would result in the 2014 report, *Risky Business: The Economic Risks of Climate Change in the United States.* Risky Bus. Project (2014), https://perma.cc/KDN4-BNSD. That report focused on characterizing RCP8.5 not as one of several possible radiative forcing scenarios, but instead "as the pathway closest to a future without concerted action to reduce future warming." Roger Pielke Jr., *Climate Cooking*, The Honest Broker (Apr. 13, 2024), https://perma.cc/D3BA-E4PS.

The Risky Business Project spawned a host of papers that uncritically adopted this assumption. One 2016 paper, published in *Science*, compared the social and economic impacts from the "business as usual (RCP 8.5)" and "stringent emissions mitigation (RCP 2.6)." Tamma A. Carleton & Solomon M. Hsiang, *Social and Economic Impacts of Climate*, 353 Sci., no. 6304, Sept. 9, 2016, https://www.science.org/doi/10.1126/science.aad9837. Another used the same assumptions to project a 10 percent loss in U.S. GDP "under business-as-usual emissions (Representative Concentration Pathway 8.5)." Solomon Hsiang et al., *Estimating Economic Damage from Climate Change in the United States*, 356 Sci., no. 6345, at 1362 (June 2017), https://www.science.org/doi/10.1126/science.aal4369 (*see* Figure 5A). Both papers have been cited over 1,000 times and the 10 percent GDP loss projection was featured prominently in the Fourth National Climate Assessment and became a favorite headline of media outlets. *See* Amir Jina, *Will Global Warming Shrink U.S. GDP 10%? It's Complicated Says the Person Who Made the Estimate*, Forbes (Dec. 5, 2018), https://tinyurl.com/3625yjrf.

B. RCP8.5 is an incredibly implausible future.

Whatever its likelihood when it was first published, RCP8.5 has become increasingly implausible with every passing year. Hausfather & Peters, *supra*, at 619. EPA itself has recognized this repeatedly, though that hasn't stopped RCP8.5 from continuing to run the show in zombie form, as explained in more detail below.

This is wrong. There is strong evidence that both near-term and long-term greenhouse gas emissions are already well below those needed to create emissions scenarios associated with RCP8.5. There are several factors that have combined to achieve this.

First, as Zeke Hausfather and Glen Peters explained, the "[e]mission pathways to get to RCP8.5 generally require an unprecedented fivefold increase in coal use by the end of the century, an amount larger than some estimates of recoverable coal reserves." Hausfather & Peters, *supra*, at 619. But at this point this is unlikely to occur. "It is thought that global coal use peaked in 2013,

and although increases are still possible, many energy forecasts expect it to flatline over the next few decades." *Id.* With coal-derived energy gradually being replaced with natural gas or other low carbon sources, emissions per unit of energy will tend to decline, and absent a proportional rise in energy use, total emissions will fall.

Second, the high emissions scenarios associated with RCP8.5 also generally rely on a continued growth in global population, which would raise total emissions even if emissions per capita declined. But this isn't likely to happen either. There were 129 million births globally in 2021. GBD 2021 Fertility and Forecasting Collaborators, *Global Fertility in 204 Countries and Territories, 1950–2021, with Forecasts to 2100*, Lancet (Mar. 20, 2024), https://doi.org/10.1016/S0140-6736(24)00550-6. This is an increase from around 93 million in 1950, but a decline from the peak of 142 million in 2016. *Id.* Overall, fertility has declined steadily at a global level and across almost all countries and territories since 1950 and is likely to continue to do so until 2100, from a global total fertility rate of more than 4.8 births per woman in 1950 to approximately 2.2 in 2021. *Id* (*see* Figure 1). For nearly all countries sustained low fertility will produce a contracting population before the end of the 21st century. *Id.* With a declining population—particularly in wealthier countries which are responsible for higher per capita greenhouse gas emissions—emissions will also tend to decline.

These and other factors have led EPA to acknowledge that RCP8.5 is not a plausible emissions pathway. When it began to update its Social Cost of Greenhouse Gases methodology in 2022, EPA noted the weakness of models that depended on RCP8.5, and excised it from its own emissions projections, "based on a review of available sources of long-run projections for socioeconomic variables and GHG emissions necessary for damage calculations." EPA, *External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* 19 (Sept. 2022), https://perma.cc/QB6W-LBH7. Instead, EPA decided to use "the socioeconomic and emissions projections recently developed under the Resources for the Future Social Cost of Carbon Initiative." *Id.*

As shown in Figure 1 below, the Resources for the Future emissions projections that EPA used (the black line) are far, far less than those of RCP8.5, most closely approximated by the orange line, representing the somewhat different SSP5-8.5. That emissions scenario is so unlike all other projections of emissions that EPA felt the need to explain that SSP5-8.5 is the "only SSP-RCP pairing with CO_2 emissions projections outside the 1st to 99th percentile range of RFF-SPs." *Id.* at 24. In other words, RCP8.5 is the only scenario ever discussed in the Social Cost of Greenhouse Gases modeling that EPA considers to be essentially impossible.

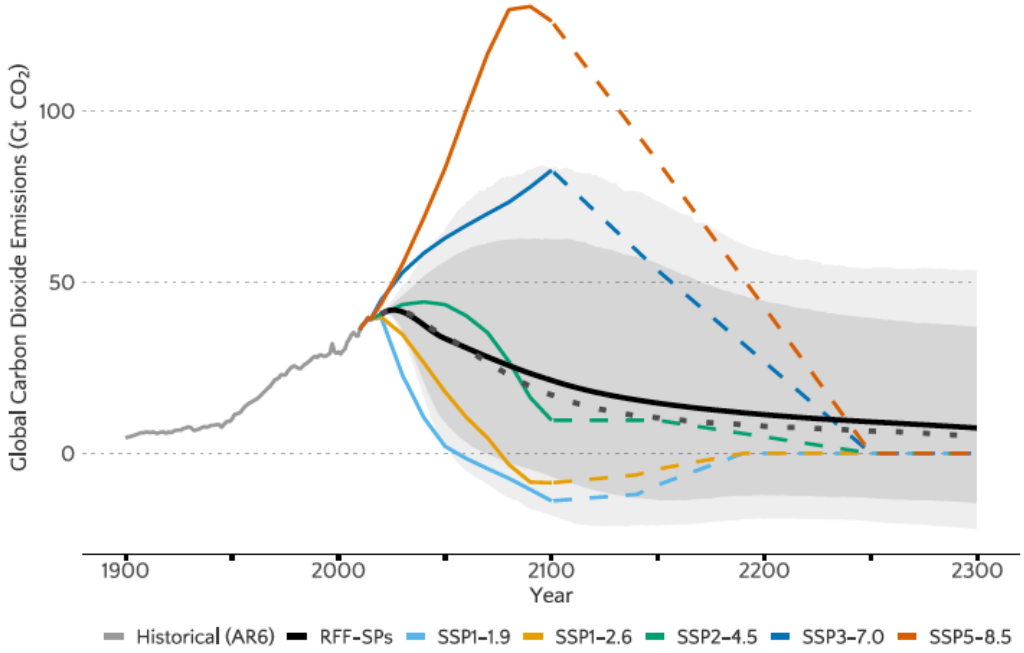

Figure 1: Net Annual Global Emissions of Carbon Dioxide (CO_2) under RFF-SPs and SSPs, 1900-2300. *Id.* at 25 (Figure 2.1.3).

C. The use of RCP8.5 in EPA's modelling undermines the damage predictions of FrEDI.

The draft framework purports to be capable of providing "projections of annual physical and economic impacts of climate change in the U.S. through the 21st century under any custom temperature scenario." FrEDI Draft Technical Documentation, *supra*, at 1. In other words, FrEDI provides damage as a function of temperature, and its users are free to supply their own temperature as a function of time. To estimate these damages, FrEDI uses "pre-processing," where damages are individually related to increasing temperatures via the development a mathematical function—typically a simple linear regression of damages on changes in temperature—across the 25 different "impact categories," most of which were the subject of an individual study under the EPA CIRA project. Pielke Rep.¶¶ 9–13.

But each of these impact functions uses RCP8.5 (or even more extreme scenarios) to project damages for temperature rises of 5°C or higher values above a 2010 baseline. *Id.* at ¶ 10, 19. Due to the nature of nonlinear impact at extreme temperatures, the more extreme the values that are included in creating a damage function, the higher the damage function will be at all temperatures. *Id.* at ¶ 30, 32, 48, 49. Thus, the use of the extreme RCP8.5 scenario results in much larger damages at lower temperatures than would result if extreme scenarios were not included, simply due to the linear fitting used to create the impact function. *Id.*

For example, projections of temperature related mortality—which appears to make up about 75 percent of the total damage, *see* FrEDI Draft Technical Documentation, *supra*, at 46 (Figure 5)—rely on the same Hsiang et al. study mentioned above that projected a 10 percent GDP reduction based solely on RCP8.5. *Id.* at 8–9 (Table 1). Virtually all of the damages associated with mortality in that study are dependent upon RCP8.5. Pielke Rep.¶ 43–45. At lower temperatures, up to around 3°C, there is virtually no correlation between temperature and mortality. *Id.*

This is unsurprising, as the broader scientific literature suggests that there is small but noticeable mortality decrease at low temperatures, due to a reduction in cold-related deaths. *See, e.g.*, Jangho Lee & Andrew E. Dessler, *Future Temperature-Related Deaths in the US: The Impact of Climate Change, Demographics, and Adaptation*, 7 GeoHealth art. no. e2023GH000799 (2023).. A 2015 meta-study found that 17 times more deaths are attributable to low temperatures than to high. *See* Antonio Gasparini et al., *Mortality Risk Attributable to High and Low Ambient Temperature: A Multicountry Observational Study*, 386 Lancet 369, Table 2 (2015), https://doi.org/10.1016/S0140-6736(14)62114-0 (showing a attributable mortality of 7.29 percent for cold and 0.42 percent for heat). Similarly, a 2021 study found that, while heat-related deaths have increased somewhat over the last two decades, they were more than offset by reductions in cold-related deaths, with the net effect that climate-related mortality has decreased by about 166,000 deaths per year. Qi Zhao et al., *Global, Regional, and National Burden of Mortality Associated with Non-optimal Ambient Temperatures from 2000 to 2019: A Three-stage Modelling Study*, 5 Lancet Planetary Health E415 (2021) https://doi.org/10.1016/S2542-5196(21)00081-4 (finding "global excess death ratio changed by −0.51 percentage points for cold temperatures and increased by 0.21 percentage points for hot temperatures, resulting in a net decline of −0.30 percentage points" with global excess deaths of approximately 5.5 million).

Similarly, FrEDI's assessment of air quality—which makes up about 7 percent of the total damage, *see* FrEDI Draft Technical Documentation, *supra*, at 46 (Figure 5)—relies on a study that uses only RCP8.5 to generate temperature changes across two climate models and four time steps. FrEDI then uses a linear regression to fit impact functions from 0°C mean warming up to 7°C mean warming. Pielke Rep.¶ 46. But when a linear regression is performed with warming levels above 4.5°C (only possible with RCP8.5) excluded, any significant relationship between mean warming and air-quality deaths disappear. *Id.* at ¶ 48–49. In other words, the use of RCP8.5 in the original study creates extreme values that, when fitted with a linear trend, results in increasing losses from 0°C to 4.5°C despite no evidence of these losses in the underlying data.

Prof. Pielke's declaration goes to highlight how similar results occur for the wind damage module, the sea level rise module, and could be expected from almost every other module within the

draft framework. Correcting the erroneous use of RCP8.5 in just those modules would likely reduce the damage projections of FrEDI by a factor of 10.

D. FrEDI's accuracy is further undermined by the assumption of no or limited adaptation.

Humanity has an impressive track record of reducing vulnerability to extreme weather. There has been an over 90 percent decline in annual global deaths from extreme weather over the last century even while the world population has more than tripled. Hannah Ritchie & Pablo Rosado, *Natural Disasters*, Our World in Data (rev. Jan. 2024), https://perma.cc/W9CH-QRWU. One recent study documented a "a clear decreasing trend in both human and economic vulnerability, with global average mortality and economic loss rates that have dropped by 6.5 and nearly 5 times." Giuseppe Formetta & Luc Feyen, *Empirical Evidence of Declining Global Vulnerability to Climate-related Hazards*, 57 Glob. Env't Change, art. 101920, at *1 (2019), https://doi.org/10.1016/j.gloenvcha.2019.05.004.

This is because wealthier societies with abundant access to energy and technology are far better at adapting to extreme weather than our predecessors. When hot weather threatens heat stroke, we install air conditioners. When areas become prone to flooding, we build on higher ground. Indeed, the World Health Organization has explained in its own *Quantitative Risk Assessment of the Effects of Climate Change*, that "the attributable mortality is zero when 100% adaptation is assumed." WHO, at 23 (2014), https://tinyurl.com/24wc8ddv.

But FrEDI largely ignores this reality. Instead, the framework only considers adaptation in a few select sectors and even there does so incompletely. Eleven sectors—including the temperature-related mortality sector, which dominates damages—assume *no additional adaptation*. Most of the others assume only a limited form of adaptation. The only unqualified use of adaptation occurs in the "winter recreation" sector, where adaptation is expected to mitigate revenue lost from suppliers of alpine, cross-country skiing, and snowmobiling.

This effect is exacerbated by a restrictive definition of adaptation that has been broadly adopted by the climate impacts literature. *See* Patrick Brown, *The IPCC Report on the Impacts of Climate Change is Depressing*, Breakthrough Inst. (Mar. 30, 2023), https://perma.cc/NKF4-WC9H. In this literature, adaptation is often narrowly defined as only those actions explicitly taken to reduce the impact of climate change. Thus, if some technological or socioeconomic trend would have occurred in the absence of climate change, then it cannot be counted as adaptation. "For example, the adoption of tractors instead of manual labor can cause a large increase in [crop]

yields, but this would not be an explicit adaptation to climate change, and thus it would typically not be considered in a projection of future [crop] yields that 'accounts for adaptation.'" *Id.*

As Brown explains

> Herein lies the obscurantism. Although most readers will understand the word "decrease" to mean a *decrease relative to today*, the IPCC uses the word to mean a decrease *relative to a hypothetical world without climate change*. So crop yields can be projected to continue to increase overall, but still be said to decrease compared to a hypothetical world with no climate change but in which everything else is the same.

Id. While it is appropriate for damages framework is right to use the right reference, this highlights another important point. Money spent to avoid climate change could also potentially be used to "adapt" (using the limited definition adopted above) or advance other sectors. Thus, even if FrEDI was accurately capturing the damages from future climate change, it cannot capture the damages from investing the money spent to reduce climate change instead of in more useful quarters.

While precise quantification of future reduced vulnerability is difficult, there is no doubt that at least some adaptation will occur. Even with no technological changes—a highly improbable future—there are already meaningful ways that populations can reduce their exposure to the most damaging aspects of climate change. Consequently, an accurate projection of the future impacts and damages of climate change must include some discounting of damages as a result of cost-effective adaptation. Failure to consider this important aspect of the problem further undermines the validity of FrEDI's damage projections, and the reliability of the model.

III. FrEDI Violates the Information Quality Act.

The Information Quality Act ("IQA") places strict requirements on federal agencies to ensure the accuracy of information they disseminate to the public. Pub. L. No. 106-554, app. C, § 515, 114 Stat. 2763A-153 (2000) (H.R. 5658). To that end, the IQA mandates that agencies implement measures to guarantee the quality, objectivity, utility, and integrity of released information. Both the Office of Management and Budget ("OMB") and individual agencies have developed guidelines to uphold these standards.

EPA's own IQA guidance explains that "[w]hen evaluating environmental problems or establishing standards," EPA must use "a 'weight-of-evidence' approach that considers all relevant information and its quality." EPA, 260R-02-008, *Guidelines for Ensuring and Maximizing the Qual-*

ity, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency § 6.4 (Oct. 2002) ("EPA IQA Guidance"), https://perma.cc/8QV4-K9BH. EPA explains that doing this requires ensuring two related things about the information it uses:

> (A) The substance of the information is accurate, reliable and unbiased. This involves the use of:
>
> > (i) the best available science and supporting studies conducted in accordance with sound and objective scientific practices, including, when available, peer reviewed science and supporting studies; and
> >
> > (ii) data collected by accepted methods or best available methods (if the reliability of the method and the nature of the decision justifies the use of the data).
>
> (B) The presentation of information on human health, safety, or environmental risks, consistent with the purpose of the information, is comprehensive, informative, and understandable. In a document made available to the public, EPA specifies:
>
> > (i) each population addressed by any estimate of applicable human health risk or each risk assessment endpoint, including populations if applicable, addressed by any estimate of applicable ecological risk;
> >
> > (ii) the expected risk or central estimate of human health risk for the specific populations affected or the ecological assessment endpoints, including populations if applicable;
> >
> > (iii) each appropriate upper-bound or lower-bound estimate of risk;
> >
> > (iv) each significant uncertainty identified in the process of the assessment of risk and studies that would assist in resolving the uncertainty; and
> >
> > (v) peer-reviewed studies known to the Administrator that support, are directly relevant to, or fail to support any estimate of risk and the methodology used to reconcile inconsistencies in the scientific data.

Id. FrEDI fails both tests.

First, the "substance of the information" presented in FrEDI is not "accurate, reliable[, or] unbiased." A predictive model that produces inflated damage estimates through the use of the flawed RCP8.5 scenario is not using the "best available" data, as it is widely recognized as out-of-date

and as having been empirically falsified. Sound scientific practice requires collecting data on future damage projections from studies that consider reasonably likely future outcomes and not results tainted by a scenario that EPA itself has conceded is incredibly improbable. FrEDI's systematic reliance on RCP8.5 indicates a failure by EPA to consider all relevant factors or reflects an inaccurate understanding of the causal relationships within the system being modeled. The biased data implies the model was built on information that is deliberately unrepresentative, leading to deliberately unreliable and misleading predictions.

Further, FrEDI's use of a linear fit on non-linear data violates the requirement for the "science and supporting studies [to be] conducted in accordance with sound and objective scientific practices." Linear models assume a constant rate of change, and are unsuitable for complex systems like climate change where relationships are rarely so simple. Here, the mismatch between model and reality undermines accuracy. As demonstrated in the attached expert report of Roger Pielke, the reliance on linear fits to non-linear data leads to consistent overprediction and introduces an inherent bias into the output.

Second, the information is not presented in a way that either "expected risk" or the "significant uncertaint[ies]" in FrEDI are "comprehensive, informative, and understandable." The draft framework, by consistently overestimating damages, paints an inaccurate and misleading picture of true "human health, safety, or environmental risks." This undermines the IQA's requirement to present information in a way that is "comprehensive, informative, and understandable." Systematically inflating risk makes it impossible for the public to gain a true understanding of potential impacts, rendering the FrEDI misleading rather than informative. Additionally, neglecting to provide even the option for alternative calculations using less extreme scenarios directly violates (B)(iii), which mandates presentation of "appropriate upper-bound or lower-bound estimate[s] of risk."

Further, FrEDI's exclusive reliance on studies anchored in RCP8.5 casts doubt on the objectivity of the results. The EPA's IQA guidance demands that EPA specify studies that "support, are directly relevant to, or fail to support any estimate of risk." Including only biased sources gives the illusion of scientific rigor while actively undermining the objectivity and comprehensiveness the legal standard is designed to ensure. This casts doubt on the draft framework's ability to provide the unbiased, scientifically sound risk assessment that the IQA expects. Indeed, the only thing certain about the FrEDI model is that it will mislead and confuse.

IV. FrEDI Violates EPA's Scientific Integrity Policy.

EPA's Scientific Integrity Policy explains that "[s]cience is the backbone of the EPA's decision-making" and that the agency's mission "depends upon the integrity of the science on which it relies." EPA, *Scientific Integrity Policy* 2 (2012), https://perma.cc/36T6-248U. To that end, the policy requires that every scientist adheres to "information quality" and "quality assurance" policies and to "act honestly and refrain from all of scientific misconduct." *Id.* at 6. As particularly relevant here, this includes the requirement that "when communicating scientific findings, Agency employees include a clear explication of underlying assumptions, accurate contextualization of uncertainties, and a description of the probabilities associated with both optimistic and pessimistic projections." *Id.* at 7.

The draft framework directly violates the Scientific Integrity Policy's core principles of "information quality" and "quality assurance." First, the model's systematic overestimation of risk by cherry-picking studies based on the now-highly-improbable RCP8.5 scenario demonstrates a complete disregard for data accuracy and completeness. Additionally, by using a linear fit on non-linear data to project damages even when underlying studies do not support it fundamentally undermines the quality of the projections presented. As demonstrated above, FrEDI's use of linear fitting overstates projected damages at low temperatures by at least an order of magnitude. This is not honest.

Furthermore, framing the model as scenario neutral and claiming that FrEDI can provide "projections of annual physical and economic impacts of climate change in the U.S. through the 21st century under *any custom temperature scenario*," FrEDI Draft Technical Documentation, *supra*, at 1 (emphasis added), while simultaneously relying solely on an outdated and unrealistic scenario associated with extreme increases in temperature is demonstrably misleading. True scenario neutrality would necessitate incorporating a range of possibilities, including damage function fit to less severe scenarios. Omitting this possibility creates an incomplete and biased picture, hindering a comprehensive understanding of potential risks. The Scientific Integrity Policy explicitly requires a "clear explication of underlying assumptions" and an "accurate contextualization of uncertainties." But the draft framework fails to meet these standards.

Finally, the draft framework completely neglects to describe the "probabilities associated with both optimistic and pessimistic projections." This omission directly contradicts the Scientific Integrity Policy's guidelines for communicating scientific findings. By failing to provide a balanced perspective on potential outcomes, the model prioritizes worst-case scenarios without ac-

knowledging their likelihood (or lack thereof). This approach undermines transparency and prevents informed decision-making. As the policy explains, EPA's mission "depends upon the integrity of the science on which it relies." The current draft fails that mission.

The Scientific Integrity Policy is not an aspirational statement. The public relies on EPA to candidly present accurate information with all of the necessary caveats and explanations. As a result, violations of the Scientific Integrity Policy can result in formal disciplinary action against EPA employees, including reprimands, suspensions, or even termination of employment. Serious misconduct—like deliberately misrepresenting the "probabilities associated with both optimistic and pessimistic projections"—can trigger investigation by the EPA's Office of Inspector General or other oversight bodies.

V. Using FrEDI in Other Contexts Would Undermine Those Actions.

EPA's draft framework does not exist in a vacuum. As the agency explained, FrEDI was developed as a tool "to provide projections of annual physical and economic impacts of climate change in the U.S. through the 21st century … for a broad range of economically important impact category sectors (e.g., impacts across human health, infrastructure, labor, electricity, agriculture, and ecosystems and recreation)." 89 Fed. Reg. at 13717.

Previous versions of FreDI have been used in a variety of contexts and could be used in others in the future. *FrEDI Publications and Applications*, EPA (updated Feb. 22, 2024), https://perma.cc/DSC3-ZYZ3. These include:

- In the regulatory impact analysis for major rules. *See, e.g.*, EPA, EPA-452/R-23-013, *Regulatory Impact Analysis of the Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review* (Dec. 2023), https://perma.cc/CL6B-GBL8; EPA, Doc. ID No. EPA-HQ-OAR-2021-0317-1549, *Supplementary Material for the RIA for the Supplemental Proposed Rulemaking, NSPS and EG for Existing Sources: Oil and Natural Gas Sector Climate Review – EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* (Sept. 2022), https://tinyurl.com/ypdeby7c.

- In the environmental reviews conducted to satisfy the requirements of the National Environmental Policy Act ("NEPA"). *See* 42 U.S.C. § 7609 ("The Administrator shall review and comment in writing on the environmental impact of any matter … in any (1) legislation proposed by any Federal department or agency, (2) newly authorized Federal projects for construction and any major Federal agency action …, and (3) proposed regulations published by any department or agency of the Federal Government.").

- In determining the allocation of grant funding. *See, e.g.*, Pub. L. No. 117-169, § 60103, 136 Stat. 1818, 2065 (2022) (establishing the "Greenhouse Gas Reduction Fund"); *id.* § 60114, 136 Stat. at 2076 (establishing the "Climate Pollution Reduction Grants"); *id.* § 60201, 136 Stat. at 2078 (establishing "Environmental and Climate Justice Block Grants").

- In projecting exposure to costs and lost revenue by the White House or other federal agencies. *See* OMB, White Paper, *Budget Exposure to Increased Costs and Lost Revenue Due to Climate Change: A Preliminary Assessment and Proposed Framework for Future Assessments* (Mar. 2023), https://perma.cc/5U9K-AW57.

In essence, a flawed framework acts like a faulty map. It leads to a distorted view of the true risks, hindering effective decision-making and leading the federal government down dead-end roads, delaying effective climate action while wasting trillions. Given the methodological flaws identified in EPA's Framework, any use in these or other contexts would create legal vulnerabilities for any agency actions that might rely upon FrEDI as part of the justification for the agency action.

For regulatory impact analyses, analysis based on FrEDI could make the rule arbitrary and capricious. "The APA's arbitrary-and-capricious standard requires that agency action be reasonable and reasonably explained." *FCC v. Prometheus Radio Project*, 592 U.S. 414, 423 (2021). Agencies "must … articulate a satisfactory explanation for [their] action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). Because FrEDI does not represent a "reasonable" accounting of damages, costs calculated with FrEDI cannot provide a "satisfactory explanation" for agency action.

For example, in EPA's recently finalized *Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review*, EPA uses FrEDI as an alternative domestic justification for the benefits of its rule. EPA, *supra*, at 3-24. The rule primarily relies on EPA's recent update of the Social Cost of Greenhouse gas emissions, by which EPA purports to realize billions of dollars in benefits to offset the costs of the rule.[2] *Id.* But in response to "commenters who suggest that the EPA can or

[2] EPA's Social Cost of Greenhouse gases estimates are also gross overstatements of damage because RCP8.5 is used in the damage functions of those calculations. EPA maintains RCP8.5 in each of the three damage functions in that model: the Data-driven Spatial Climate Impact Model developed by the Climate Impact Lab; the Greenhouse Gas Impact Value Estimator model developed under Resources for the Future's Social Cost of Carbon Initiative; and the

should use a metric focused on benefits resulting solely from changes in climate impacts occurring within U.S. borders" EPA also ran an alternative analysis using FrEDI to show that the rule would still be justified because impacts within the contiguous United States "are estimated to be $27 billion." *Id.* at 3-25. As explained in detail above, this estimate of benefits fails because FrEDI systematically overstates damages.

FrEDI would similarly undermine a NEPA environmental impact analysis or environmental assessment. Such analyses require the agency to make quantitative assessments of the impacts of a project. When faced with uncertainty as to impacts, NEPA regulations require that "[t]he agency's evaluation of such impacts [be] based upon theoretical approaches or research methods generally accepted in the scientific community." 40 C.F.R. § 1502.21(c)(4). But RCP8.5, and thus the damages assessed by the draft Framework, are not "generally accepted in the scientific community." Instead, they have been widely rebuffed, including by EPA.

Nor can FrEDI be used to effectively allocate grant funds. Many grants, including EPA's Greenhouse Gas Reduction Fund, are to be distributed on a "competitive basis." 42 U.S.C. § 7434(a). *Cf. Competitive*, Britannica Dictionary, https://tinyurl.com/yzzbke5h (last accessed Apr. 24, 2024) ("a situation in which people or groups are trying to win a contest or be more successful than others"). It is impossible to determine what projects would be more successful if the projections of their benefits are based on a flawed accounting of climate damage.

FrEDI is also unsuitable for performing budget risk exposure analysis or other economic policy projections. Budgets are based on priorities and risks. If the true costs of climate change are overstated, federal resources might be directed away from more pressing issues. Even within the climate context, inaccurate representations of damages direct critical investments away from the most effective forms of climate adaptation and mitigation.

The likelihood that EPA—or other actors within the executive branch—will encourage agencies across the federal government to use FrEDI in their own policymaking processes magnifies the possibility that the methodological flaws in FrEDI will undermine the integrity of future federal policymaking. This makes it all the more urgent for EPA to withdraw FrEDI until these systematic methodological issues are addressed.

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global damage function estimation based on Howard and Sterner. Approximately 50 percent of EPA's damages are based on projected temperature changes of between 3–8°C by 2300. *See* Roger Pielke Jr., *Secret Sauce*, The Honest Broker (Dec. 4, 2023), https://perma.cc/RCK2-MCNR.

VI. FrEDI Propagates Misinformation.

The Biden Administration has consistently expressed its desire to combat "misinformation" across a variety of spheres, even going so far as to establish Disinformation Governance Board in April 2022 before rapidly "pausing" the board less than a month later after predictable constitutional issues were raised. *See* Benjamin Hart, *Poorly Conceived Biden Disinformation Board Put on Pause*, N.Y. Mag. (May 18, 2022), https://tinyurl.com/4rmd3xah. The "misinformation" at issues spans a wide range of topics, but the most frequently recurring are election misinformation, health misinformation, and climate misinformation.

In June 2022, at an Axios event entitled "A Conversation on Battling Misinformation," White House National Climate Advisor Gina McCarthy took aim at "climate misinformation" saying: "We have to get together; we have to get better at communicating, and frankly, the tech companies have to stop allowing specific individuals over and over to spread disinformation." *Missouri v. Biden*, 680 F. Supp. 3d 630, 722 (W.D. La. 2023). McCarthy explained that climate "misinformation" went beyond just "denying the problem," and extended to anything that mislead its readers "about the costs associated with" climate change, green technologies, and the effectiveness of government policies. Editorial, *Climate Change Censorship: Phase Two*, Wall St. J. (June 13, 2022), https://tinyurl.com/53w55eba. As an example of this new "disinformation," McCarthy cited the response to the week-long power outage in Texas in February 2021 following Winter Storm Uri. "'The first thing we read in the paper was' that the black-outs occurred 'because of those wind turbines,' she said. 'That became the mantra.'" *Id.*

McCarthy was wrong about the specifics—wind turbines failing *was* a but-for cause of the black-outs, *see* Michael Buschbacher & Taylor Myers, *FERC Gaslights America*, Am. Conservative (Sept. 6, 2022), https://perma.cc/BUZ6-8VEM—but her point is valid, nonetheless. Accurate information about the trajectory of global temperatures, damage from current and future weather events, and the effectiveness of various technologies *is* critical to policymaking in highly complex and technical fields like environmental and energy law. The special deference often given to the federal government when it speaks only heightens the importance of making sure that speech is accurate.

FrEDI is not accurate. As detailed above and in the attached expert report of Roger Pielke, EPA's Framework makes several errors which cause it to systematically overstate the damage that can be expected from climate change. Because these overstatements are made by government tool intended to be used across a variety of contexts, this misinformation can be expected to

spread, and metastasize, negatively shaping policy and public opinion in ways that could be incredibly damaging.

VII. Conclusion

FrEDI is methodologically flawed and politically inflected. Its finalization would violate the Information Quality Act, would violate EPA's own scientific integrity policy, and would infect every action that subsequently relied on it. For these reasons, the Center for Environmental Accountability urges the EPA to withdraw the draft.

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