# Response to Request for Information

# Development of a Climate Superfund Cost Recovery Program

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On July 22, 2024, the Vermont Agency of Natural Resources ("Agency") requested information relevant to its implementation of the state's Climate Superfund Cost Recovery Program ("Program").[1] The ostensive purpose of the Program is "to secure compensatory payments from responsible parties … to provide a source of revenue for climate change adaptation projects" in Vermont.[2] The term "responsible parties" in the statute refers to any entity, with sufficient connections to the state to satisfy the requirements of the U.S. Constitution, that "engaged in the trade or business of extracting fossil fuel or refining crude oil" between January 1, 1995, and December 31, 2024, and which the Agency determines is responsible for more than 1 billion metric tons of covered greenhouse-gas emissions during that period.[3] Such responsible parties must pay their proportional "share of the costs of climate change adaptation projects and all qualifying expenditures supported by" the Program.[4]

This response provides input for the Agency to consider in developing processes to identify responsible parties, determine their applicable shares of greenhouse-gas emissions, and calculate the associated cost to Vermont.

## I. Climate Change and the Program Are Too Important to Get Wrong.

Any estimates related to the extent and costs of anthropogenic climate change ("climate change") must be robust and reliable to maintain Program integrity. This is especially true because of the significant financial liability that the Agency may assess based on those determinations.

The Agency must therefore account for the wide range of scientific opinions on the impact of climate change on meteorological phenomena. The U.N.'s International Panel on Climate Change ("IPCC"), for example, has reported low confidence that climate change has affected past droughts, floods, and storms.[5] And while damages from extreme weather have increased, such losses have *decreased* as a percentage of gross domestic product

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[1] Vermont Agency of Natural Resources, *Request for Information: Development of a Climate Superfund Recovery Program* (July 22, 2024), https://www.vermontbusinessregistry.com/bidAttachments/61438/Climate_Superfund_Request_For_Information.pdf.

[2] 10 V.S.A. § 597.

[3] *Id.* § 596(22).

[4] *Id.* § 598(a)(1).

[5] IPCC, *Climate Change 2021: The Physical Science Basis* 1856 (2021) (Table 12.12: Emergence of CIDs in Different Time Periods, As Assessed in This Section), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport_small.pdf.

("GDP").[6] This strongly suggests that economic growth, rather than any climate change related effect, is the cause of such increases.[7] The Agency must account for the possibility that Vermont has not suffered harm from climate change and may have even experienced positive impacts.

As discussed below, recent studies estimating the extent and costs of past and future climate change have demonstrated that attempts to quantify such a number are susceptible to manipulation and distortion. Noah Kaufman, who served as a Senior Economist at the White House Council of Economic Advisers in the Biden Administration, and as Deputy Associate Director of Energy & Climate Change at the White House Council on Environmental Quality in the Obama Administration, noted that "[t]he value of climate damages is not a thing we can estimate. There is no consensus. Never will be."[8] Disaggregating the effects of a global phenomenon like climate change on Vermont specifically is an even more fraught endeavor.

## II. The Agency Must Avoid Obvious Pitfalls When Estimating Harms Attributable to Climate Change.

When developing its processes, the Agency must be careful to avoid certain obvious pitfalls. Its processes cannot rely on unsubstantiated or incorrect assumptions.

Accurate emissions scenarios are fundamental to reliable climate change projections because they are one of the primary drivers of the extraordinarily complex modeling. Many of the sensational climate harms projected by media and certain academic research, such as rapidly melting ice caps leading to rising sea levels and raging wildfires leading to deforestation, are based on RCP8.5, an outdated emissions scenario that projects a temperature rise of around 5°C by 2100.[9] RCP8.5 lacks scientific credibility and becomes demonstrably more implausible with each passing year. The latest projections of the

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[6] Roger Pielke Jr., *Tracking Progress on the Economic Costs of Disasters Under the Indicators of the Sustainable Development Goals*, 18 Envt'l Hazards 1, 1–6 (Mar. 2019), https://doi.org/10.1080/17477891.2018.1540343.

[7] *Id.*

[8] Noah Kaufman (@noahqk), X (June 3, 2024, 10:26 PM), https://x.com/noahqk/status/1797817256493412800.

[9] *Id.*; 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://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario.

International Energy Agency, expect a median warming of around only 2.4°C by 2100.[10] As Zeke Hausfather and Glen Peters explain, 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."[11]

But despite the now well-known shortcomings of RCP8.5, it continues to appear as a central input in climate modeling and research, undermining the role this work could otherwise play in informing the policymaking process.[12] The use of models or research that rely on RCP8.5—or any equivalent—as a baseline scenario of the impacts of climate change would be a fatal error. As described below, this applies equally to climate damage functions based on RCP8.5

Professor Justin Mankin testified before the Vermont legislature that "scientists can quantify the economic losses a region like Vermont has endured from the impacts of global warming to date."[13] His methods are equally flawed. He relies heavily on a GDP correlation method from a 2015 *Nature* article by Marshall Burke et al.[14] Recent analysis by David Barker, however, explains how Burke and his co-authors "cherrypick" and "use data with characteristics that are known to create spurious regression results without making proper adjustments or even acknowledging these characteristics."[15] Others have made similar methodological criticisms.[16]

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[10] *World Energy Outlook 2023*, Int'l Energy Agency, at 22 (2023), https://www.iea.org/reports/world-energy-outlook-2023/executive-summary; *see also* Hausfather & Peters, Comment, *supra* note 9.

[11] Hausfather & Peters, Comment, *supra* note 9, at 619.

[12] Roger Pielke & Justin Ritchi, *Systemic Misuse of Scenarios in Climate Research & Assessment* (Apr. 21, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3581777.

[13] Written Testimony from Dr. Justin S. Mankin Before the Vt. S. Judiciary Comm., at 1 (Feb. 22, 2024), https://legislature.vermont.gov/Documents/2024/WorkGroups/Senate%20Judiciary/Bills/S.259/Witness%20Documents/S.259~Justin%20Mankin~Written%20Testimony~2-22-2024.pdf.

[14] Marshall Burke et al., *Global Non-linear Effect of Temperature on Economic Production*, 527 Nature 235 (2015), https://doi.org/10.1038/nature15725.

[15] David Barker, *Global Non-linear Effect of Temperature on Economic Production: Comment on Burke, Hsiang, and Miguel*, 21 Econ. J. Watch, Mar. 2024, at 35–36, https://econjwatch.org/File%20download/1297/BarkerMar2024.pdf.

[16] *Id.* at 36–37 (discussing Richard G. Newell et al., *The GDP-Temperature Relationship: Implications for Climate Change Damages*, 108 J. Env't Econ. & Mgmt., July 2021, art. no. 102445, https://doi.org/10.1016/j.jeem.2021.102445; Richard A. Rosen, Letter, *Temperature Impact on GDP Growth Is Overestimated*, 116 PNAS 16170 (2019), https://doi.org/10.1073/pnas.1908081116; Richard S.J. Tol, *A Social Cost of Carbon for (Almost) Every Country*, 83 Energy Econ. 555 (2019), https://doi.org/10.1016/j.eneco.2019.07.006).

Mankin further relies on the controversial social cost of carbon ("SCC") to estimate damages.[17] That tool is highly suspect and easy to manipulate,[18] continues to rely upon the implausible RCP8.5 scenario, and uses arbitrary discount rates to inflate the cost of predicted harms.[19] One recent paper, relying on RCP8.5, claims that the SCC should properly be set at $1,056 per metric ton of $CO_2$ emitted.[20] The Breakthrough Institute immediately criticized the paper's reliance on "conceptually bizarre, poorly justified economic methods."[21] By contrast, the U.S. Environmental Protection Agency ("EPA") estimated the SCC at $130 per ton of $CO_2$,[22] and Nobel laureate William D. Nordhaus estimated the SCC at $31 per ton of $CO_2$.[23]

Kaufman has observed that "[t]he use of SCCs to make whatever point one would make without SCCs remains undefeated."[24] Hausfather similarly noted that "the SCC is, generally speaking, just a thin veneer of objectivity covering what is ultimately a naked value judgement."[25] And Arvind Ravikumar, co-director of the Energy Emissions Modeling

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[17] Written Testimony from Dr. Justin S. Mankin, *supra* note 13, at 2.

[18] Kevin Dayaratna et al., *Empirically Constrained Climate Sensitivity and the Social Cost of Carbon*, 8 Climate Change Econ., art. no. 1750006 (2017), https://doi.org/10.1142/S2010007817500063; Kevin Dayaratna & David Kreutzer, *Environment: Social Cost of Carbon Statistical Modeling Is Smoke and Mirrors*, 30 Nat. Gas & Elec., Issue 12, at 7 (2014), https://doi.org/10.1002/gas.21771.

[19] *See, e.g.*, Roger Pielke Jr., *Secret Sauce: You'll Never Guess What Drives the Biden Administration's Social Cost of Carbon*, The Honest Broker (Dec. 4, 2023), https://rogerpielkejr.substack.com/p/secret-sauce (addressing the role of RCP8.5 in the damage functions of EPA's SCC).

[20] 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), https://www.nber.org/papers/w32450.

[21] Alex Trembath & Patrick Brown, *When Activist Research Contradicts the Consensus*, Breakthrough Inst. (Jun. 3, 2024), https://thebreakthroughjournal.substack.com/p/when-activist-research-contradicts.

[22] EPA, *Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* 101 (Nov. 2023) (Table 4.1.1), www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf.

[23] William D. Nordhaus, *Revisiting the Social Cost of Carbon*, 114 PNAS 1518, 1518 (2017), https://doi.org/10.1073/pnas.1609244114,

[24] Noah Kaufman (@noahqk), X (Jun. 4, 2024, 8:52 AM), https://x.com/noahqk/status/1797974627832205575.

[25] Zeke Hausfather (@hausfath), X (Jun. 4, 2024, 2:25 PM), https://x.com/hausfath/status/1798058427274658291.

and Data Lab at the University of Texas, called the SCC "a ~useless metric."[26] He continued that calculating a "consensus" figure for the SCC "is a fool's errand" that is "90% value judgment."[27]

In addition, the SCC calculated by EPA and others often purports to estimate *global* harms. Without methodologically credible modification, such SCC figures would wildly overstate the harms to Vermont.

In an effort to assess the harms climate change might have in specific geographic regions, on specific economic sectors, and on specific population demographics, the EPA has also developed a tool called FrEDI, the "Framework for Evaluating Damages and Impacts."[28] 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."[29] But, like the SCC, the tool is fundamentally flawed.

The Center for Environmental Accountability ("CEA") prepared comprehensive critique of FrEDI that it filed as a comment on the EPA's most recent revision of the tool.[30] As with many SCC calculations, FrEDI uses RCP8.5 to predict future harms, undermining its scientific validity from the outset and calling into question its use in the policymaking context. Given this and other flaws, use of FrEDI would be CEA strongly urges the Agency not to use it in an attempt to calculate climate damages specific to Vermont.

Finally, any modeling must be careful to account for *all* potential causes of climate change, including natural causes. It must also account for changing demographic patterns. To the extent property damage from storms may have increased, this likely reflects increased growth and exposure from the independent acts of third parties, i.e., more homes and more expensive homes being built on coastlines and in vulnerable areas.[31] Any

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[26] Arvind Ravikumar (@arvindpawan1), X (Jun. 4, 2024, 2:48 PM), https://x.com/arvindpawan1/status/1798064300130779553.

[27] *Id.*

[28] 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.

[29] *Id*. at 2.

[30] 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.

[31] Philip J. Klotzbach et al., *Trends in Global Tropical Cyclone Activity: 1990–2021*, 49 Geophysical Rsch. Letters, Issue 6, Mar. 14, 2022, https://doi.org/10.1029/2021GL095774; *see also* Adam B. Smith & Richard W. Katz, *US Billion-Dollar Weather and Climate Disasters: Data Sources, Trends, Accuracy and Biases*, 67 Nat. Hazards 387, 408 (2013), https://doi.org/

modeling must account for and exclude voluntary, knowing exposure to alleged climate harms.

## III. The Agency Must Considering Constitutional and Federal Limits on the Program.

The Agency should be mindful of constitutional limitations on the Program when developing its processes. American law incorporates an "antiretroactivity principle" that "finds expression in several provisions of [the U.S.] Constitution," including the Due Process Clause, Ex Post Facto Clause, Takings Clause, and prohibition on bills of attainder.[32] The U.S. Constitution also "implicitly forbids" state power when the "interstate … nature of the controversy makes it inappropriate for state law to control."[33] Disputes that "deal with air and water in their ambient or interstate aspects" are thus the domain of federal law.[34] Such considerations are even stronger for international emissions.

Congress likewise passed the Clean Air Act to balance "the environmental benefit potentially achievable" against "our Nation's energy needs and the possibility of economic disruption."[35] The Clean Air Act leaves no room for states to impose their laws on out-of-state emissions.

In addition, not all entities that have engaged in extracting fossil fuel or refining crude oil have a sufficient connection with Vermont to satisfy the nexus requirements of the U.S. Constitution.[36] This is an especially important consideration when considering liability for out-of-state emissions that cannot be traced to within Vermont's borders. These limitations are important to resolve before expending taxpayer resources to implement the Program further.

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The myriad challenges associated with developing accurate models to implement the Program make it crucial for the Agency to engage experienced and knowledgeable consultants to help with implementation of the Program. Experts such as Roger Pielke Jr.

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10.1007/s11069-013-0566-5 ("[I]t is difficult to attribute any part of the trends in losses to climate variations or change, especially in the case of billion-dollar disasters."); Roger Pielke Jr., *"Billion Dollar Disasters" Are a National Embarrassment*, The Honest Broker (Jan. 8, 2023), https://rogerpielkejr.substack.com/p/billion-dollar-disasters-are-a-national.

[32] *Landgraf v. USI Film Prod.*, 511 U.S. 244, 266 (1994).

[33] *Franchise Tax Bd. of Cal. v. Hyatt*, 587 U.S. 230, 246 (2019) (cleaned up).

[34] *Illinois v. City of Milwaukee*, 406 U.S. 91, 99–100, 103 (1972).

[35] *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 427 (2011).

[36] *Cf.* 10 V.S.A. § 596.

and David Barker have already proven their ability to identify obvious errors in existing climate models, and therefore would be prudent experts to engage in this endeavor.

CEA is also well equipped to assist the Agency as it develops processes to administer the Program. CEA is a 501(c)(3) organization devoted to educating the public and government on the importance of transparency and accountability in the areas of environmental and energy policy, and has consistently participated in government rulemakings related to emissions and climate modeling.[37]

[37] *See, e.g.*, CEA, *supra* note 30.