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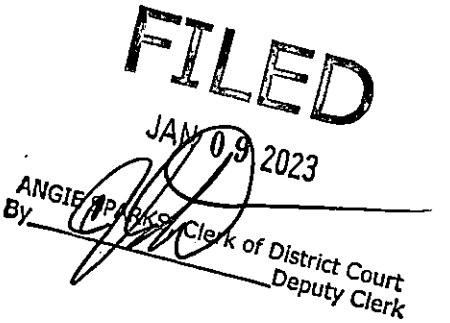

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MONTANA FIRST JUDICIAL DISTRICT COURT, LEWIS & CLARK COUNTY

RIKKI HELD, et al., Plaintiffs, v. STATE OF MONTANA, et al., Defendants.	Cause CDV 2020–307 Hon. Kathy Seeley **DEFENDANTS' SECOND SUPPLEMENTAL EXPERT WITNESS DISCLOSURE**

Pursuant to Mont. R. Civ. P. 26 (e)(2), Defendants State of Montana, et al. provide this second supplemental expert witness disclosure. Following the disclosure of Dr. Anderson on October 31, 2022, Dr. Anderson discovered errors in his report. His Amended Report correcting these errors is attached as **Exhibit B**. Dr. Anderson's disclosure is unchanged in all other respects.

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DATED this 3rd day of January, 2023.

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Date: January 3, 2022

Dia C. Lang

Exhibit B

CORRECTED EXPERT REPORT

OF

TERRY L. ANDERSON

RIKKI HELD, ET AL.

V.

STATE OF MONTANA, ET AL.

MONTANA FIRST JUDICIAL DISTRICT COURT

LEWIS AND CLARK COUNTY

Cause CDV-2020-307

Prepared for Defendants, State of Montana

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Expert Report
of
Terry L. Anderson
Senior Fellow, Hoover Institution, Stanford University
Professor Emeritus, Montana State University

INTRODUCTION AND QUALIFICATIONS

This report was written at the request of the State of Montana Attorney General's Office and is based on my professional expertise as an economist.[1] My qualifications include a Bachelor of Science Degree in Business Administration from the University of Montana (1968), a MS Degree in Economics (1991) and a Ph. D. Degree in Economics (1992), both from the University of Washington. Since 1997, I have been a Senior Fellow and am currently the John and Jean DeNault Senior Fellow at the Hoover Institution, Stanford University. I began teaching in the Department of Agricultural Economics and Economics at Montana State University in 1992 and retired from there in 1999 as a Professor Emeritus. I was a Senior Fellow with the Property and Environment Research Center (PERC), Bozeman, MT, from 1980 to 2014 and president of PERC from 2012 to 2014. I have also been a visiting scholar at Oxford University, England, the University of Basel, Switzerland, and the University of Canterbury, New Zealand, and a Fulbright Fellow at the University of Canterbury, New Zealand. Most of my teaching and research has been focused on natural resource and environment policy, and I have received numerous teaching and research awards for that work. That research includes publishing hundreds of professional journal articles and 42 books. The most recent of those books is *Adapt and be Adept: Market Responses to Climate Change* (Hoover Institution Press, 2020).

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[1] The author thanks his research assistant, Dylan Granum, Mathematics and Economics student at Montana State University, for his excellent work in gathering and analyzing data.

I currently reside in Bozeman, Montana, where I enjoy the benefits of Montana's clean and healthful environment. I have attached a copy of my CV as Exhibit 1 to my expert report.

I. Overview

This report was written in response to Plaintiffs' Expert Disclosures, in particular those of Richard Barrett on behalf of the Youth Plaintiffs in the case dated 30 September 2022 (hereafter referred to as *Report*; the first page number refers to the number at the bottom of the page of his report and the second to the page within the "Plaintiffs Disclosures and Exhibits). That *Report* attempts to support the claims of the Youth Plaintiffs that two Montana statutes, the Montana Environmental Protection Act and the State Energy Policy, adversely affect the plaintiffs' Montana constitutional right to a "clean and healthful environment." It argues that these statutes:

1. promote greenhouse gas (GHG) emissions, especially CO2, from Montana sources, which then cause global climate change;

2. do not correctly account for the benefits and costs of those policies;

; and

3. discourage other states and nations from reducing their emissions and thus lead to a race to the bottom in climate change policy.

My expert report critically examines the economics and data regarding each of these claims.

II. Montana's Contribution to Climate Change

Because the plaintiffs' claim of harm is due to global climate change, it is important to put Montana's contribution to global greenhouse gas emissions, regardless of whether they are due to Montana statutes, into a global perspective.

In 2020, total global emissions were 34.8 GtCO2.[2] Of that amount, Montana emitted approximately 0.0262 GtCO2[3] Therefore, Montana contributed 0.07529 percent (i.e. 7 one-hundredths of one percent) to global GHG emissions in 2020. 0.07529 percent (i.e. 7 one-hundredths of one percent) to global GHG emissions in 2020. Given that Montana's emissions account for only 0.07529 percent of global GHG emissions, the state's policies have virtually no effect on global climate change and no effect on the welfare of Montana's citizens, other than the contribution that fossil fuel production makes to the state's economy, and that effect is a benefit to Montana's citizens.

A. Montana's Fossil Fuel Emissions Declining

Moreover, between 2005 and 2020, CO2 emissions from fossil fuel combustion in Montana decreased by 21 percent.[4] This reduction was driven mainly by a 35 percent reduction in electrical power production from fossil fuels. It is difficult to determine how the state's energy policies have contributed to this decline, but certainly some amount of the decline is due to state regulations that have reduced GHG emissions. Hence, whatever plaintiffs' claims are that Montana's energy policies are causing or contributing to global

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[2] Viewed on 10 October 2022 at https://www.co2.earth/global-co2-emissions.
[3] Viewed on 10 October 2022 at https://www.eia.gov/environment/emissions/state/.
[4] Viewed on 15 September 2022 at https://deq.mt.gov/files/deqadmin/climate/2020-09-09_montanaclimatesolutions_final.pdf.

warming, those claims must be offset by policies that have reduced Montana's emissions and reduced global climate change.

To further put Montana's GHG emissions into perspectives, Appendix Table 1 projects emissions by sector and source for the Mountain Region (Montana, Idaho, Nevada, Utah, Colorado, Arizona, and New Mexico) beyond 2019. Assuming the U.S. Energy Information Administration projections for the Intermountain Region apply to Montana, we can expect carbon emissions for every sector—residential, commercial, industrial, transportation, and electric power— to decline and expect total Montana CO2 emissions for all fuels—petroleum, coal, natural gas, and other, to decline by 11.5 percent between 2019 and 2030.

B. Montana's Emissions have a Minimal Effect on Global Climate

The plaintiffs' claims that Montana' energy policies are causing them harm due to climate change is implausible given how little Montana contributes global carbon emissions. Using the middle-of-the-road estimates of global emissions, the Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC) predicts that global temperatures will rise by 7.4°F by 2100. Assuming that Montana joined all the rich countries in eliminating fossil fuel use by 2100—a very unlikely target—the increase in global temperature associated with zero global GHG emissions would be reduced by only 0.8°F, meaning global temperature would increase by 6.6°F by 2100.[5]

Now suppose that only the United States, including Montana, but no other nations, reduced GHG emissions to zero by 2100, the increase in global temperature would be

[5] Bjorn Lomborg, *False Alarm* (Basic Books, 2020), 41-42.

reduced by a mere 0.33°F by the century's end, meaning global temperature would increase by 7.07°F by 2100.

Further assume that the other 49 states reduced their use of fossil fuel to zero by 2100, while Montana kept its emissions at 2020 levels. Thus Montana would be contributing nothing to potential global temperature reductions, making it a "free rider," to use Richard Barrett's words (*Report*, p. 9 (302)). How much difference would Montana's "free ride" make to global warming by 2100?

To estimate the difference, I divided Montana's total in 2020 (26.2 million metric tons)[6] by the US total in 2020 (4,592 million metric tons)[7] to estimate Montana's share of US emission—0.57 percent—and assumed that Montana did nothing between 2020 and 2100 to reduce its GHG emissions. (Note that the assumption that Montana will do nothing is not consistent with the State's significant recent emissions reductions.) In other words, the globe would lose Montana's contribution associated with US reductions by 2100.

Montana's Lost Contribution by 2100 = 0.33°F x 0.57 = 0.019°F

Hence, the increase in global temperatures by 2100 would be approximately 0.349°F rather than 0.33°F. In other words, if Montana undertook all of the cost to the state in the form of lost benefits from fossil fuel production, Montana's efforts would reduce the predicted 2100 increase of 7.4°F to 7.38°F.

In short, Montana's energy or environmental policies have virtually no effect on global or local climate change because Montana's GHG contribution to the global total is trivial.

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[6] Viewed on 10 October 2022 at https://www.eia.gov/environment/emissions/state/.
[7] Viewed on 25 October 2022 at https://www.eia.gov/environment/emissions/state/excel/table1.xlsx.

III. Life Expectancy as a Measure of "Clean and Healthful Environment"

The *Report's* claims that Montana's environmental and energy policies are depriving the youth plaintiffs of their "right to a clean and healthful environment" are based mainly on estimates of the effect of climate change on snowpack, water flows, wildlife populations, etc., but they provide no measure of harm to the state's citizens.

According to the OECD,[8] "Live Expectancy at birth is one of the most frequently used health status indicators. Gains in life expectancy at birth can be attributed to a number of factor, including rising living standards, improved lifestyles, and better education, as well as greater access to quality health services. Using an Overlapping Generations Model, researchers from the Institute for the Study of Labor (IZA) in Bonn, Germany,[9] found "a positive correlation between longevity and environmental quality, both in the long run and along the transition path." Based on these conclusions, life expectancy at birth of Montana's citizens provides a causal link between the environment and health. As seen in Appendix Figure 1, life expectancy at birth in Montana has been climbing since 1950. Moreover, the trend in Montanan's life expectancy is not different from that of the United States as a whole and no different from other states that have constitutional or statutory requirements that states must provide citizens with healthy environments. It should be noted that the general upward trend in life expectancy is

[8] Viewed on 25 October 2022 at https://data.oecd.org/healthstat/life-expectancy-at-birth.htm#:~:text=Life%20expectancy%20at%20birth%20is%20one%20of%20the%20most%20frequently,access%20to%20quality%20health%20services.

[9] Viewed on 25 October 2022 at https://data.oecd.org/healthstat/life-expectancy-at-birth.htm#:~:text=Life%20expectancy%20at%20birth%20is%20one%20of%20the%20most%20frequently,access%20to%20quality%20health%20services.

directly related to rising incomes, and incomes in Montana likely will rise less if the state pursues policies that limit fossil fuel use.

IV. Accounting for the Social Benefits and Costs of Climate Change

The expert *Report* filed on behalf of the Youth Plaintiffs attempts to apply the economic methodology based on the idea that the private benefits and private costs from the use of coal, oil, and gas do not take full account of the social costs that are external to market transactions. Putting aside the question of whether there is a connection between Montana policies regarding GHG emissions and the citizens' constitutional right to a clean and healthful environment, the expert's application of "benefit-cost analysis" is faulty for two reasons. First, it does not use standard economic reasoning based on *additional or marginal* benefits and *additional or marginal* costs. Second. It does not account for the potential additional social benefits of climate change; in other words, GHG emissions have marginal social benefits as well as marginal social costs.

Consider Mr. Barrett's statements about how benefits and costs are calculated. The *Report* asks, "does the economic (market) value of an additional unit of fossil fuel produced (i.e., the price, P_{FF}, of an additional ton of coal, barrel of oil, etc.) exceed, or fall short of, the private (PC_{FF}) plus the social cost (SC_{FF}) incurred in producing it?" (*Report*, p. 6 (299)). Note that the adjective, "additional," is applied to private benefits and costs, but not to the social benefits. In economic parlance, the proper comparison for a benefit-cost calculation is to compare the *marginal benefits* with the *marginal costs*. Under the assumption that the coal market is perfectly competitive, meaning that Montana fossil fuel producers take the price as given from the global market, it is reasonable to infer that P_{FF} is an accurate measure of the marginal private benefit of an additional unit of fossil fuel production, and

PC_{FF} is an accurate estimate of the *marginal* private costs on an additional unit of fossil fuel production.

A. Social Benefits of Carbon

To give a full benefit-cost evaluation of carbon, however, it is necessary to include potential social benefits that are not included in P_{FF}. The *Report* asserts that "Increasing temperatures have and will cause significant, measurable economic damages, including, but not limited to, reduced human health and labor productivity, rising sea levels with associated damage to coastal communities and infrastructure, and impaired agricultural productivity and food availability" (*Report,* p. 4 (297)). Obviously rising sea levels are not a relevant cost to Montana, and food availability is dependent on global production, not just Montana's production. The *Report* continues saying that "climate change will reduce Montana's crop yields by as much as 25% . . . . [and] will reduce the productivity of the rangeland cattle industry by 20%" (*Report,* p. 5 (298)).

The *Report* does not even attempt to estimate the positive effects that climate change may have on agricultural productivity and on human health, locally and globally. This is another glaring problem with Barrett's analysis. Warmer temperatures are causing cropping patterns to change around the world, and Montana farmers and ranchers are likely to follow and gain from this adaptation. A study by Conservational International,[10] published in the, forecasts that wine production in California may drop by 70 percent and regions along the Mediterranean by as much as 85 percent over the next fifty years. The silver lining is that vintners will adapt by moving their grape production north, some predicting it will even move to places such as Montana, Wyoming, and

[10] Viewed 7 June 2022 at https://www.pnas.org/doi/10.1073/pnas.1210127110.

Michigan, noted for their severe winters.[11] Canadian biologist John Pedlar[12] sees more people in southern Ontario "trying their hand at things like peaches a little farther north from where they have been trying." This is consistent with the US Department of Agriculture's Plant Hardiness Zone Map,[13] which shows tolerant zones moving north. These predictions suggest that Montana agriculture could benefit from global warming by producing crops more valuable than current crops. Such potential benefits are not mentioned in the *Report.*

Other benefits from climate change are benefits resulting from lower ocean transportation costs due to less ice, greater agricultural output in northern climes due to higher temperatures, more species in areas where the climate is warmer, and, most importantly, fewer temperature related human deaths because cold kills more than heat. As Matt Ridley, scientist and journalist, points out,[14] "climate change has done more good than harm so far and is likely to continue doing so for most of this century. This is not some barmy, right-wing fantasy; it is the consensus of expert opinion."

A study by Professor Richard Tol, Sussex University in England, published in the *Journal of Economic Perspectives* (2009)[15] concludes that climate change in the past century has improved human welfare by 1.4 per cent of global economic output. Depending

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[11] Viewed 7 June 2022 at https://qz.com/1108814/the-improbable-new-wine-countries-that-climate-change-is-creating.
[12] Viewed 7 June 2022, quoted in https://academic.oup.com/bioscience/article/64/4/341/247944.
[13] Viewed 7 June 2022 at https://www.npr.org/sections/thesalt/2012/01/25/145855948/gardening-map-of-warming-u-s-has-plant-zones-moving-north.
[14] Viewed 7 June 2022 at https://www.spectator.co.uk/article/why-climate-change-is-good-for-the-world.
[15] Viewed 18 June 2022 at https://www.aeaweb.org/articles?id=10.1257/jep.23.2.29.

on how long the benefits will exceed the costs, he finds that the percentage increase will be 1.5 per cent by 2025, will be 1.2 percent by 2050, and will not turn negative until around 2080. In his benefit-cost calculations, Mr. Barrett **assumes** that the price captures the full social value, but this assumption misses the potential for social benefits to exceed private benefits when fossil fuels are put into production processes along with labor, capital, and other resources. It is entirely conceivable that the value of the total product exceeds the sum of the input costs (prices), i.e. economic rents are generated. To understand this in another way, suppose that fossil fuels were immediately banned so that alternative energy had to make up the loss. As the people of Texas discovered in the winter of 2022, it was nearly impossible to make up for the loss of fossil fuel used to generate electricity. The far higher costs in the absence of fossil fuel are rents that are lost. By focusing only on the social cost side and ignoring the social benefit, it is not possible to conclude that "the additional unit of fossil fuel produced is wasteful."

In his chapter titled "Hydrocarbons are Here to Stay" (in Anderson 2021, 43-44), Mark Mills concludes that

> Over the past two centuries—the rise of the hydrocarbon era—society has seen a radical collapse in the share of an economy's GDP devoted to acquiring fuel and food. . . . More wealth is always required to build resilience and adaption into society infrastructures and thus protect civilization from any and all of nature's attacks—including, but far from limited to future climate changes regardless of the proximate cause.

The value of the resilience and adaptation that results from fossil fuels is not totally captured in P_{FF}. Adding that value into the benefit cost calculations can easily tip the efficiency scales in the direction of fossil fuels.

The important take-away from this discussion is that the Mr. Barrett's expert *Report,* which totally ignores the social benefits of climate change, is not an accurate depiction of the social costs and benefits of GHG emissions **even if Montana's laws allowed policy makers to take account of costs and benefits outside the state.** If the plaintiffs' claims that Montana policies contribute to climate change and global warming were correct, it is conceivable that Montana's GHG policies make Montana citizens better off. The youth plaintiffs aren't worried about starvation, but pursuing drastic global policies to reduce GHG emissions will leave them poorer. In short, curtailing fossil fuel production in Montana will add few environmental benefits to the state's citizens, but will reduce the potential for increasing incomes for the youth who must leave that state in search of better paying jobs.

B. Social Cost of Carbon

Just as there are social benefits not captured in P_{FF}, there are social costs not captured in PC_{FF}. For that reason, Mr. Barrett focuses on the social cost of carbon (SCC). To be sure, calculating the SCC is complicated and politically contentious. Nonetheless, economists agree that estimates of SCC must be based on an integrated assessment model (IAM) in order to simulate time paths for the atmospheric CO2 concentration, its impact on temperature, and resulting reductions in GDP. Even if scientific debates over what is the best IAM could be settled, the economic effects of the time paths and the GDP reductions have and will continue to fill economic journals.

Mr. Barrett identifies four modules that go into SCC: the socioeconomic and emissions trajectory module; the climate module; the damages module; and the discounting module. The latter two are of utmost importance to economists, and it is no

surprise that economists do not agree on how climate change translates into economic damage or on how to discount future damages (or benefits) into present value.

The most recent and best summary of where economics stand on these two modules is provided by MIT economist, Robert Pindyck, "The Social Cost of Carbon Revisited."[16] After surveying experts and trimming outliers and focusing on experts who expressed a high degree of confidence in their answers, he finds the SCC to be between $80 to $100/mt, a range that is well below Mr. Barrett's $125 SCC. Using Barrett's emission coefficient (e) and his P_{FF} and applying Pindyck's recent survey of economists' and scientists' estimates of the SCC, changes the conclusion regarding the economic efficacy of fossil fuels. Recall that these calculations take no account of possible social benefits of using fossil fuels beyond the price.

- Coal—At a SCC of $100 and $80, respectively, the social costs of coal are $201.40 or $162.12, respectively, compared to Barrett's estimate of $252. Taking the P_{FF} of coal to be $21 (Barret), coal does not pass benefit-cost muster, mainly because coal is so cheap.
- Oil—Similarly, the social cost of oil is $47 and $37.60, respectively, compared to Barrett's estimate of $59. Taking the P_{FF} of oil to be $45 (Barrett), oil nearly passes at the upper end of SCC and clearly passes at the lower end.
- Natural Gas—Similarly, the social cost of natural gas is $6.05 and $4.84, respectively, compared to Barrett's estimate of $7.56. Taking the P_{FF} to be $5.50

[16] Viewed on 5 October 2022 at https://www.sciencedirect.com/science/article/abs/pii/S0095069617307131?via%3Dihub.

(Barrett), natural gas passes benefit-cost muster at both the upper and lower ends of SCC.

V. Adverse Effects of Climate Change to Montana's Environment

The *Report* asserts that Montana statutes in question here contribute to such things as wildfires, air quality, water flows, and recreational opportunities, to mention a few. It is implausible that Montana environmental and fossil fuel regulations are contributing to these claims via climate change because Montana's contributions to global GHG emissions are so small. Furthermore, GHG emissions are not the only cause of environmental problems. For example, claiming that smoke from wildfires is the result of Montana statutes ignores the smoke that comes from states to our West, especially California. And claiming that all the costs of Montana wildfires are the result of the statutes in question ignores other factors—for example forest management (or mismanagement)—that contribute to those costs. Air quality is much more related to local emissions rather than CO2. In the Missoula valley, for example, it was emissions from the pulp mill that cause poor air quality and that problem was fixed with stricter air quality standard. Finally, recreational opportunities go far beyond snow in the mountains and water in fishing streams, both of which have been sufficient to attract increasing numbers of skiers, snowmobilers, and fishers. Public hunting and fishing access has been a priority for the DFWP and most wildlife populations, especially elk, are at all-time highs.

The expert scientists claim that it is "critical that GHG emissions are reduced immediately, particularly in light of the young ages of the Plaintiffs in this case" (*Report*, p. 8 (25)). Referring back to Montana's contribution of GHG to the global atmosphere, this

claim is hard to justify. Nonetheless, it is obvious that some of the costs claimed by the plaintiffs are the result of factors other than MEPA and the State Energy Policy.

VI. Is there a Race to the Bottom or to the Top?

One of the benefits of federalism is that it allows states to determine the best fit of policies to the citizens of each state. Some have argued that this will result in a race to the bottom with environmental policy as states try to compete for business based on more lenient and less costly regulations. One of the main reasons that we would **not** expect a race to the bottom with climate policy is that virtually all environmental policies follow what is called the "environmental Kuznets Curve," named after Nobel Laureate Simon Kuznets.[17] were the first to note the relationship between economic growth and environmental quality. What they found and what was further elaborated on by economist Bruce Yandle[18]is that the relationship between growth and environmental quality may be negative in early stages of growth—i.e. more growth leads to less environmental quality—but it becomes positive as wealthier citizens demand and get more environmental quality. Hence, rather than there being a "race to the bottom" with environmental policy, there is a "race to the top," and this is evident in a number of environmental regulations from dissolved oxygen in water to deforestation. This also explains why richer countries are taking more action than poorer countries to curb carbon emissions.

Part of the economic rationale for the "race to the bottom" theory is that environmental emissions are not confined to the home jurisdiction where emissions may occur, and this is especially the case with carbon emissions which instantly become part of

[17] Viewed 13 June 2022 at https://www.jstor.org/stable/2118443?seq=1.
[18] Viewed 13 June 2022 at https://www.independent.org/pdf/tir/tir_09_2_3_yandle.pdf.

the global commons. The claim is that there will be a "tragedy of the commons," thus explaining why the marginal social cost of GHG emissions are greater than the marginal private costs. As noted above, however, Montana's carbon emissions have a negligible effect on its own citizens as well as on neighboring jurisdiction—local, state, national, or international. This provides a rationale for why the 2011 Montana legislature specifically amended MEPA to provide that policy makers should **not** take account of costs outside the state's borders. Simply put, there are no significant spillover costs to take into account regarding Montana's contributions to GHG, but there are private costs to the state that would certainly result from Montana's inability to capture the value of *in situ* fossil fuels. Hence, Montana's GHG policies will have benefits that outweigh the costs because the costs are negligible. This is contrary to the *Report's* claim that there are reciprocal costs that justify accounting for putting the social cost of carbon into the policy equation.

The expert *Report* contends that Montana needs to take the lead by implementing policies that reduce GHG emission because "it is neither realistic nor reasonable to expect other states to behave in that way if Montana does not." (*Report*, p. 9 (302)). This is a value judgment, not a statement grounded in any economic theory, the authors expertise. Economics has no way of calculating what is or is not "realistic" or "reasonable" for others to do. Indeed, to the contrary, undertaking policies to reduce CO2 emissions in order to slow climate change would not be a rational move for the state because it has costs without benefits.

As further evidence of "realistic and responsible," behavior the *Report* cites a study that calculates an international "climate reciprocity ratio" of 6.1 to 6.8 (*Report*, 9 (302)). The ratio implies that for every ton the United States pledged to reduce its emissions under

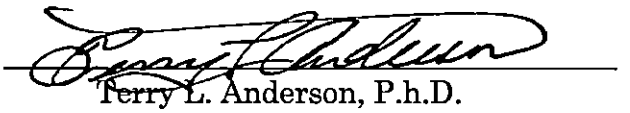
the Paris Agreement other countries will *pledge* to reduce their aggregate emissions by six times more. These correlation estimates do not suggest a causation resulting from reciprocity. As the expert *Report* admits, "Thus, **if** [emphasis added] reciprocity has an important influence on the formulation of climate policies, **and in my opinion it does** [emphasis added], Montana should adopt policies that will serve its economic interest for other states and nations to reciprocate – in this case, the use of a global SCC" (*Report,* p. 9 (302)). There is **no** basis in economic reasoning to support this opinion. The *Report* makes **no** attempt to defend its claim that Montana's state policies will be influential on other states and countries. It is a naked assumption, unsupported by any empirical evidence. especially in light of the fact that Montana's share of national or global emissions and that its population is small compared to the nation or the world. What reason is there to think the state's actions will influence other political jurisdictions?

CONCLUSION

Montana's statutes under question in this case—2011 amendments to MEPA and the State Energy Policy—may or may not result in net increases in GHG emissions. It is clear, however, that these two statutes cannot possibly be contributing significantly to climate change because Montana's aggregate emissions were only 0.07529 percent to global GHG emissions in 2020. Additionally, the economic estimates of the SCC are trending downward because adaptation to climate change is reducing the likelihood that those costs will be significant.[19] It is implausible that the two state laws in question here are adversely affecting the welfare of its citizens, youth or older. Combining Montana's

[19] See Pindyck, viewed on 5 October 2022 at https://www.sciencedirect.com/science/article/abs/pii/S0095069617307131?via%3Dihub.

trivial effect on climate change with upper-bound estimates of SCC is not the path to a clean and healthy environment or to a vibrant economy.



Terry L. Anderson, P.h.D.

Appendix Table 1

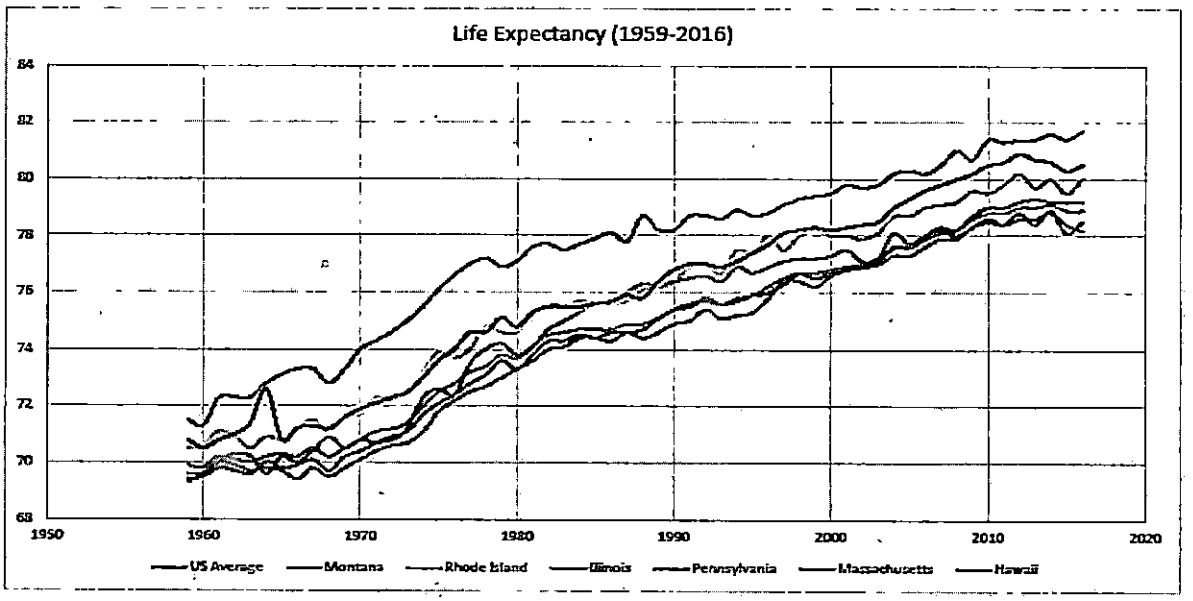
Mountain Region CO_2 emissions projections by sector (MMmt CO_2)	2019	2030	% Change
Total residential	86.809	65.345	-24.72%
Total commercial	79.21	61.084	-22.96%
Total industrial	107.37	104.62	-2.55%
Total transportation	135.99	131.33	-3.43%
Total electric power	169.66	121.22	-28.55%

Mountain Region CO_2 emissions projections by fuel source (MMmt CO_2)	2019	2030	% Change
Petroleum	161.26	158.53	-1.69%
Natural Gas	126.46	128.172	1.35%
Coal	121.63	75.510	-37.92%
Other	0.1111	0.1771	59.41%
Total	409.46	362.386	-11.50%

Source:https://www.eia.gov/outlooks/aeo/data/browser/#/?id=17-AEO2020&region=1-8&cases=ref2020&start=2019&end=2030&f=A&linechart=ref2020-d112119a.3-17-AEO2020.1-8~ref2020-d112119a.4-17-AEO2020.1-8~ref2020-d112119a.5-17-AEO2020.1-8~ref2020-d112119a.6-17-AEO2020.1-8~ref2020-d112119a.9-17-AEO2020.1-8~ref2020-d112119a.10-17-AEO2020.1-8~ref2020-d112119a.11-17-AEO2020.1-8~ref2020-d112119a.12-17-AEO2020.1-8~ref2020-d112119a.13-17-AEO2020.1-8~ref2020-d112119a.16-17-AEO2020.1-8~ref2020-d112119a.17-17-AEO2020.1-8~ref2020-d112119a.18-17-AEO2020.1-8~ref2020-d112119a.19-17-AEO2020.1-8~ref2020-d112119a.20-17-AEO2020.1-8~ref2020-d112119a.23-17-AEO2020.1-8~ref2020-d112119a.24-17-AEO2020.1-8~ref2020-d112119a.25-17-AEO2020.1-8~ref2020-d112119a.26-17-AEO2020.1-8~ref2020-d112119a.29-17-AEO2020.1-8~ref2020-d112119a.30-17-AEO2020.1-8~ref2020-d112119a.31-17-AEO2020.1-8~ref2020-d112119a.32-17-AEO2020.1-8~ref2020-d112119a.33-17-AEO2020.1-8~ref2020-d112119a.36-17-AEO2020.1-8~ref2020-d112119a.37-17-AEO2020.1-8~ref2020-d112119a.38-17-AEO2020.1-8~ref2020-d112119a.39-17-AEO2020.1-8~ref2020-d112119a.40-17-AEO2020.1-8~ref2020-d112119a.43-17-AEO2020.1-8&map=ref2020-d112119a.4-17-AEO2020.1-8&ctype=linechart&sid=~~&sourcekey=0

Appendix Figure 1

Life Expectance for Various States



When the green amendment was ratified
MT: 1972
MA: 1972
PA: 1971
RI: 1987 (very limited green amendment)
HI: 1978
IL: 1970 (conflicting answers, many sources say PA and MT were first states to ratify a green amendment)

Source:https://cdn.jamanetwork.com/ama/content_public/journal/jama/938283/jsc190006supp1_prod.pdf?Expires=2147483647&Signature=Jf3AfNo~8yhdMy2mBSCzAe5qqt8tpe0tfMxhf~jAuJpM5fKlieW3BNnQp-GHMpA8aRPAttLr38l5FShvdvjj5MAC42GtZUGTpH9wSE372PRvL7UXecBPEh21owmfe3GkFCBblkFaYYRSghRlMdll-96UUKW3PuELFfecxTidHOuOiLhta2ns3hiQfD5oFqPy6a6gF00Wk61qCzsP0E3JsDEQ1m5bdi6GpiBL5uaRJm892dq-OpqRMnr9exwHysnUxujENdtrkN4PkOghnwWjBhKmgRrT3dd-W-MQFryjXx-uMbRlje8WsSMS~SDJY8Dp-gqDFbIDCZM6uICDcabuFg__&Key-Pair-Id=APKAIE5G5CRDK6RD3PGA

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