Senator Bill Frist, M.D., Chair of The Nature Conservancy's Global Board of Directors
Senate Committee on the Budget
Lessons Learned: Leadership Perspectives and Experience
on the National Cost of Climate Change
May 10, 2023

INTRODUCTION

I am appearing before you today drawing on three distinct experiences. First, as a heart and lung transplant surgeon who has treated thousands of patients with acute and chronic disease. I have seen firsthand the detrimental effects climate change is having, and will have, on people, their communities, and nations. Yes, climate change is an environmental crisis, but it's also a public health crisis, a food crisis, and a threat to our economic security.

Second, as a former Senate Leader, and indeed a former member of this committee from 1995-2002, I am intimately aware of how a stable federal budget is critical to the fiscal health of our economy and national security. Climate change is an economic issue. It affects individuals, families, and businesses of all sizes. The fallout from climate change – from increased droughts and flooding to hotter temperatures and rising sea levels – costs the United States billions of dollars every year. I appreciate the Budget Committee for recognizing this and for scheduling this important hearing.

Finally, as the Chair of the Global Board of Directors for The Nature Conservancy (TNC)—one of the most wide-reaching conservation organizations in the world with over 900 scientists and science staff across 79 countries and territories: 37 by direct conservation impact and 42 through partnerships—I understand that the long-term physical and mental health and well-being of people absolutely require a sustainably healthy planet and climate. They are inextricably linked. The dedicated people at TNC are working hard to build a future in which nature flourishes and people from all walks of life can enjoy happier, healthier, and more fulfilling lives. Their ambitious agenda is grounded in scaling solutions based on science to match the severity of the interconnected biodiversity and climate crises, which almost by definition require sound, durable policy solutions.

According to recent data from National Oceanic and Atmospheric Administration (NOAA) and NASA,[1] 2022 tied as the fifth warmest year on record. Why does this matter? Well, a warming climate directly affects the health of individuals, communities, businesses, and economies. We are seeing these effects now and scientists anticipate that they are expected to grow.

Consider these facts:

1. More extreme and dangerous heat waves

Rising greenhouse gas concentrations increase average temperatures and are making extreme heat waves more frequent and more intense. Cases of heatstroke, hypothermia, and related conditions brought on by extreme temperature conditions are climbing, and in turn exacerbating existing cases of cardiovascular, pulmonary, and renal disease. According to the Centers for Disease Control, an average of 702 heat-related deaths occur each year.[2] Highly susceptible populations such as children, the elderly and adults who work primarily outdoors are at the highest risk to be impacted by heatwaves.

Many of you will remember the 2021 unprecedented heat wave that hit the Pacific Northwest. Scientists found that the heat wave, which was made worse by climate change and killed hundreds in the United States and Canada, and combined with drought conditions at the time in the West, cost an estimated $8.9 billion to the economy.[3]

In 2021, The Nature Conservancy and AECOM conducted an economic assessment of heat-related health costs in the Phoenix Metro area, and found that heat-related emergency room visits and hospitalizations cost the city $7.3 million per year.[4] They found that the out-of-pocket expenses for patients with insurance were on average $1,066 for an emergency room visit, and $11,343 for hospitalization.[5]

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[1] NOAA National Centers for Environmental Information. (2023, April). *Climate at a Glance National Time Series.* https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/national/time-series

[2] Centers for Disease Control and Prevention, (May 2023) *Heat and Health Tracker*, https://ephtracking.cdc.gov/Applications/heatTracker/

[3] NOAA. (2022, January 24). *2021 U.S. billion-dollar weather and climate disasters in historical context.* Climate.gov. https://www.climate.gov/news-features/blogs/beyond-data/2021-us-billion-dollar-weather-and-climate-disasters-historical

[4] deBoer, A., Schwimmer, E., McGregor, A., Adibi, S., Kapoor, A., Duong, S., Love, J., Bonham-Carter, C., & Lindquist, J. (2021). *Economic Assessment of Heat in the Phoenix Metro Area.* The Nature Conservancy. https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_EcoHeatAssement_AZ_Report.pdf

[5] Rosenthal, S. (2023, January 24). *The Health Care Consequences of Extreme Heat Are Just the Tip of the Iceberg.* Center for American Progress. https://www.americanprogress.org/article/the-health-care-consequences-of-extreme-heat-are-just-the-tip-of-the-iceberg/

2. Reduced and contaminated water supplies

More frequent and intense precipitation increases runoff into our water systems, increasing the risk of water- and food-related illness. When it comes to acute gastrointestinal sickness, eight pathogens are responsible for 97 percent of waterborne illnesses[6] and all eight are affected to some extent by climate.

Coastal communities are already seeing an impact, namely in those experiencing greater algal blooms or "red tide." Contaminated ocean and lake water can close beaches and further contaminates seafood supplies. Moreover, heavy, extreme weather-runoff into inland water reservoirs can introduce harmful chemicals and pathogens into drinking water, which leads to a rise in diarrheal diseases, dehydration as well as death — and disproportionately impacts developing nations.

At the other extreme, droughts can limit access to household water supplies for drinking, cooking, and cleaning, as well as for agriculture, transportation, and power generation. Droughts may lead to higher water costs, rationing, or the decimation of important water sources like wells. Entire communities in rural, low-income, predominantly Latino areas of California's Central Valley lost drinking water as the towns' wells dried up during the last major drought between 2012 and 2015. [7] Reduced flows in rivers and streams can concentrate pollutants, threatening the quality of water used for drinking and recreation.[8] The drought that spanned the western and central U.S. in 2022 cost $22.2 billion and was the second most expensive extreme event for that year.[9]

3. Threatens our food supply

Higher temperatures directly impact our food supply, making agricultural products susceptible to toxins brought on by pests and extreme weather events. Food shortages are forecasted to lead to a rise in world hunger, and diets will be unhealthier because of the diminished nutritional value of foods due to poorer quality soil and other factors.

Pollination patterns, which are dependent on insects like bees and butterflies, are being radically altered, affecting both the feeding habits of insects and leading to weaker, less resilient crops.

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[6] Trtanj, J., Jantarasami, L., Brunkard, J., Collier, T., Jacobs, J., Lipp, E., McLellan, S., Moore, S., Paerl, H., Ravenscroft, J., Sengco, M., & Thurston, J. (2016). Ch. 6: Climate Impacts on Water-Related Illness. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 157–188. http://dx.doi.org/10.7930/J03F4MH

[7] Legislative Analyst's Office. (2021, May 13) *What Can We Learn From How the State Responded to the Last Major Drought?* https://lao.ca.gov/Publications/Report/4429

[8] Centers for Disease Control and Prevention. (n.d.). *Health Implications of Drought.* https://www.cdc.gov/nceh/drought/implications.htm

[9] NOAA National Centers for Environmental Information. (2023, January 10*). Assessing the U.S. Climate in 2022*. https://www.ncei.noaa.gov/news/national-climate-202212

4. Certain deadly diseases are becoming more common

Warmer temperatures are allowing some vector-borne diseases — illnesses carried and transmitted by insects or other animals — to move further north, exposing places like the U.S. to zoonotic diseases we have not previously encountered.[10]

Deforestation at scales we have previously not experienced across the Congo and Amazon basins and the forests of South East Asia is causing a precipitous decline in biodiversity. This loss and the encroachment of human civilization into new ecosystems accelerates disease transmission. While the exact interaction between these diseases and hosts is challenging to predict, several vector-borne diseases such as West Nile virus and Chikungunya virus have appeared for the first time in recent years in the United States. Ticks, fleas, and mosquitos carrying debilitating diseases like Lyme disease and malaria have seen their range expanded and their periods of activity lengthened over the past decade. Data indicate that other pathogens, such as the Zika virus,[11] respond similarly to a temperature increase.

5. Poor air quality

How many of you experienced terrible allergies this season? That's a sign of things to come. Rising temperatures, precipitation, and extreme weather events are increasing the prevalence of harmful air pollutants which is worsening air quality. Ozone, commonly known as smog, is particularly harmful to those individuals who suffer from chronic respiratory illnesses, such as asthma and emphysema. Annual U.S. health costs for ozone smog pollution are estimated to be $7.9 billion.[12] A 2019 study estimated the annual health cost of ozone pollution in Nevada. They found that ozone exposure was responsible for 97 deaths, 114 hospitalizations, and 194 trips to the emergency room—and that it cost nearly $900 million.[13]

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[10] Beard, C. B., Eisen, R. J., Barker, J. F., Garofalo, M., Hahn, M., Hayden, M., Monaghan, A. J., Ogden, N. H., & Schramm, P. J. (2016). Ch. 5: Vectorborne Diseases. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 129–156. http://dx.doi.org/10.7930/J0765C7V

[11] Tesla, B., Demakovsky, L. R., Mordecai, E. A., Ryan, S. J., Bonds, M. H., Ngonghala, C. N., Brindley, M. A., & Murdock, C. C. (2018). Temperature drives Zika virus transmission: evidence from empirical and mathematical models. *Proceedings of the Royal Society B: Biological Sciences*, *285*(1884), 20180795. https://doi.org/10.1098/rspb.2018.0795

[12] De Alwis, D. & Limaye, V. S. (n.d.). *The Costs of Inaction: The Economic Burden of Fossil Fuels and Climate Change on Health in the United States.* Natural Resources Defense Council. https://www.nrdc.org/sites/default/files/costs-inaction-burden-health-report.pdf

[13] Limaye, V. S., Max, W., Constible, J., & Knowlton, K. (2019). Estimating the Health-Related Costs of 10 Climate-Sensitive U.S. Events During 2012. *Geohealth*, *3*(9), 245–265. https://doi.org/10.1029/2019gh000202

6. Increasing Wildfire Risks

More people, communities and assets are being exposed to fire risk and are more vulnerable to harm. At the same time, fires are increasing in frequency and intensity,[14] and the risks are extending beyond the communities in the immediate vicinity. We are now experiencing landscape scale fires, where fires can range across 10 or more miles. Megafires burn hundreds of thousands of acres: In 2020, California's August Complex Fire reached giga-fire size, covering more than 1 million acres. Smoke plumes from fire incidents routinely impact air quality and health across multiple states, with even the East Coast seeing haze from the 2020 western fires.

In addition to the physical destruction and health effects, disasters such as wildfires can have lasting impacts to mental and emotional health. A study demonstrated that after a major response event, firefighters suffered rates of PTSD (post-traumatic stress disorder) from 13 to 18 percent for nearly four years.[15] Traumatic events and frequent hostile weather can inflict lasting harms that run deeper than physical wounds as people are forced to move from their homes and communities.

FEDERAL BUDGET IMPLICATIONS

All of these impacts have human and financial costs. In 2022, NOAA calculated 18 separate weather and climate disasters that cost the United States at least $1 billion. And, over the last seven years, 122 separate billion-dollar disasters have killed at least 5,000 people and cost more than $1 trillion in damage.[16]

The direct and after-effects of a changing climate here and around the world have direct implications across the entire U.S. federal budget, which today stands at $6.4 trillion.[17] Whether infrastructure, healthcare, defense, foreign assistance, or social spending, the effects of climate change are increasing the risks to these investments, increasing costs, and expanding needs. In the last 10 years, federal fire suppression costs alone have grown by nearly 400%, while wildfire resilience investments have remained essentially flat.[18] The Office of

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[14] NOAA National Centers for Environmental Information. (2023). U.S. Billion-Dollar Weather and Climate Disasters. https://www.ncdc.noaa.gov/billions/ , DOI: 10.25921/stkw-7w73

[15] Benedek, D. M., Fullerton, C. S., & Ursano, R. J. (2007). First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers. *Annual Review of Public Health*, *28*(1), 55–68. https://doi.org/10.1146/annurev.publhealth.28.021406.144037

[16] NOAA National Centers for Environmental Information. (2023, January 10). *Assessing the U.S. Climate in 2022*. https://www.ncei.noaa.gov/news/national-climate-202212

[17] Cubanski, J., Fuglesten Biniek, J., & Neuman, T. (2023, March 20). *FAQs on Health Spending, the Federal Budget, and Budget Enforcement Tools*. KFF. https://www.kff.org/medicare/issue-brief/faqs-on-health-spending-the-federal-budget-and-budget-enforcement-tools/#:~:text=Federal%20spending%20on%20domestic%20and,%246.4%20trillion%20(Figure%201)

[18] Clavet, C., Topik, C., Harrell. M., Holmes, P., Healy, R., & Wear, D. (2021, June). *Wildfire Resilience Funding: Building Blocks for a Paradigm Shift*. The Nature Conservancy. https://www.nature.org/content/dam/tnc/nature/en/documents/WildfireResilienceFunding_TNC_6-30-21.pdf

Management and Budget estimated that annual federal expenditures on crop insurance premium subsidies could increase between $330 million and $2.1 billion annually by later this century (in 2021 dollars). Spending on coastal disaster response could be up $22 billion and $94 billion annually.[19]

Furthermore, the federal government covers more than a third (34%) of the nation's $4.3 trillion in annual healthcare costs,[20] which includes $829.9 billion (13% of the federal budget) for Medicare, $625.4 billion (10%) for Medicaid and CHIP, and $127.0 billion (2%) for veterans' hospital and medical care.[21] The escalating impact of climate change could increase federal healthcare spending between $824 million to $23 billion annually. [22]

In total, the risk from just four program areas – crop insurance, coastal disasters, healthcare, and wildfires, could reach $134 billion annually later this century.

The Congressional Budget Office states it quite plainly: "Climate change increases federal budget deficits, on net." A reduction in economic output related to lower worker productivity and damage to physical capital and the corresponding drop in income and payroll taxes will create a drag on federal revenues, while mandatory and discretionary spending demands will increase.[23]

In this regard, I appreciate the inclusion of special chapters in the President's Budget, *Analytical Perspectives* for the past two years that focus on the federal budget's exposure to climate change. Drawing from this year's report and recognizing the issue you are having to deal with today – raising the statutory debt limit – I note that three potential scenarios for greenhouse gas (GHS) emission reductions have a direct impact on real economic growth and the level of debt accumulation.

While there is uncertainty that underlies these estimates, and they are compared to the President's policy assumptions, I still found it interesting that even under a lower emissions

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[19] Office of Management and Budget. (2022, April). 21. Federal Budget Exposure to Climate Risk. *Climate Risk Exposure: An Assessment of the Federal Government's Financial Risks to Climate Change*. https://www.whitehouse.gov/wp-content/uploads/2022/04/ap_21_climate_risk_fy2023.pdf

[20] U.S. Centers for Medicare & Medicaid Services. (n.d.). *NHE Fact Sheet.* https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet

[21] Cubanski, J., Fuglesten Biniek, J., & Neuman, T. *FAQs on Health Spending, the Federal Budget, and Budget Enforcement Tools*. KFF. https://www.kff.org/medicare/issue-brief/faqs-on-health-spending-the-federal-budget-and-budget-enforcement-tools/#:~:text=Federal%20spending%20on%20domestic%20and,%246.4%20trillion%20(Figure%201)

[22] Office of Management and Budget. (2022, April). 21. Federal Budget Exposure to Climate Risk. *Climate Risk Exposure: An Assessment of the Federal Government's Financial Risks to Climate Change*. https://www.whitehouse.gov/wp-content/uploads/2022/04/ap_21_climate_risk_fy2023.pdf

[23] Congressional Budget Office. (2021, April 27). *Budgetary Effects of Climate Change and of Potential Legislative Responses to it*. https://www.cbo.gov/publication/57019

scenario, climate damages' consequences to the macroeconomy weaken the fiscal outlook. Debt to GDP under a lower emissions scenario is projected to reach 111.2 percent by 2048, compared to 110.0 percent in the President's policy baseline. Debt to GDP is projected to be even higher under the intermediate and higher emissions scenarios, reaching 111.9 percent and 112.6 percent, respectively, by 2048. Beyond the 25-year window considered here, the macroeconomic outlooks under these emissions scenarios diverge further over time. Therefore, the higher emissions scenario, in particular, would lead to even further deteriorations in the longer-term fiscal outlook. This underscores both the macroeconomic and the fiscal risks posed by climate change and the benefits of reducing future emissions.

These are obviously all long-term estimates. And as all in this room know our federal budget preparation has a much shorter near term, 10-year focus. How to make the consequences of our decisions (or lack of decisions) today and these estimates more real to today's decision makers is a challenge. But I would suggest our budget processes and procedures may need a serious update as we move into the 50th Anniversary of the Congressional Budget and Impoundment Control Act of 1974.

For as daunting as these challenges may seem, the solutions are accessible and available today. In the last Congress, significant investments for nature, clean energy, and climate resilience; as well as bills related to water infrastructure, natural climate solutions, coastal and ocean resilience were passed. These steps to reduce carbon emissions, invest in cleaner, more reliable energy systems, and leverage the power of nature will pay dividends for our economy and communities. In the face of crises affecting people and nature globally, doubling down on American leadership and investment through targeted foreign policy and assistance to include biodiversity and climate change could not be more paramount. Working with other governments and international organizations to safeguard natural resources and co-develop and deploy nature-based solutions to improve the resilience of people and critical ecosystems is not only prudent for America to do, it is strategic for our economic prosperity and security interests around the world.

Recently enacted policies could drive nearly $3.5 trillion in cumulative capital investment in new American energy supply infrastructure over the next decade (2023-2032).[24] Those investments will be made across a range of energy supplies, including wind and solar, nuclear, and natural gas with carbon capture, that together will create a more resilient, reliable energy system. By diversifying clean energy supplies, fostering innovation, and creating new jobs, these investments will increase the nation's energy security and boost American competitiveness. Recent policies to boost the carbon-storing potential of farmland, forests, and natural lands can reduce emissions and help us adapt to climate impacts, while also creating new jobs and

[24] Jenkins, J.D., Mayfield, E.N., Farbes, J., Jones, R., Patankar, N., Xu, Q., & Schivley, G. (2022, August). *Preliminary Report: The Climate and Energy Impacts of the Inflation Reduction Act of 2022.* REPEAT Project, Princeton, NJ. https://repeatproject.org/docs/REPEAT_IRA_Prelminary_Report_2022-08-04.pdf

revenue streams for farmers, ranchers, foresters, and Indigenous communities. If the United States stays the course, independent research commissioned by The Nature Conservancy shows the full suite of recent climate and clean energy investments will:

- Support nearly 537,000 jobs annually for 10 years, and
- Add $50.9 billion in value to the economy every year for 10 years – a return of $1.42 for every federal dollar invested.[25]

The investments in nature-based solutions provide effective means for hazard mitigation for all types of natural disasters and have shown their ability to bolster environmental, economic and social co-benefits at considerable cost savings for U.S. taxpayers over the long run. For example, people are safer during floods when rivers have more room for floodwaters to disperse and slow down rather than rise, rage and threaten communities. Along coasts, natural features like sand dunes, marshes and reefs reduce wave heights and absorb storm surges. In a 2017 study, The Nature Conservancy, in partnership with Risk Management Solutions (a global, leading risk modeler for the insurance industry), Guy Carpenter & Co. and others showed that coastal wetlands saved more than $625 million in property damages during Hurricane Sandy and reduced annual property losses by nearly 20 percent in Ocean County, N.J.

CONCLUSION

The perspectives that I have offered here are drawn from the three roles I mentioned at the outset – a doctor, Senate Leader, and Chair of The Nature Conservancy's Global Board. Policy is the connective tissue between these roles. Smart policy is a force multiplier that can amplify and extend the actions of individuals, industries, and nations. And smart policy is good politics. Most budget matters and any tough policy decisions rely on bipartisan support. Bipartisanship, I believe, will be critical in pushing forward science-based, durable policies that are sufficiently ambitious to meet this moment.

This is the time for American leadership and action to address the interconnected challenges we face—biodiversity and nature loss, climate change, a global health and economic crisis. Left underinvested, these risks can severely undermine America's place in the world, our prosperity and security interests.

The topic of climate change should unite us. Protecting nature and our natural resources should be an issue that brings us together as we find solutions to our emerging climate challenges. Conservation and climate action are central and urgent policy issues for the United States and the world. Preserving and building on the wins for nature that Congress recently passed will ensure a world where nature and people can thrive.

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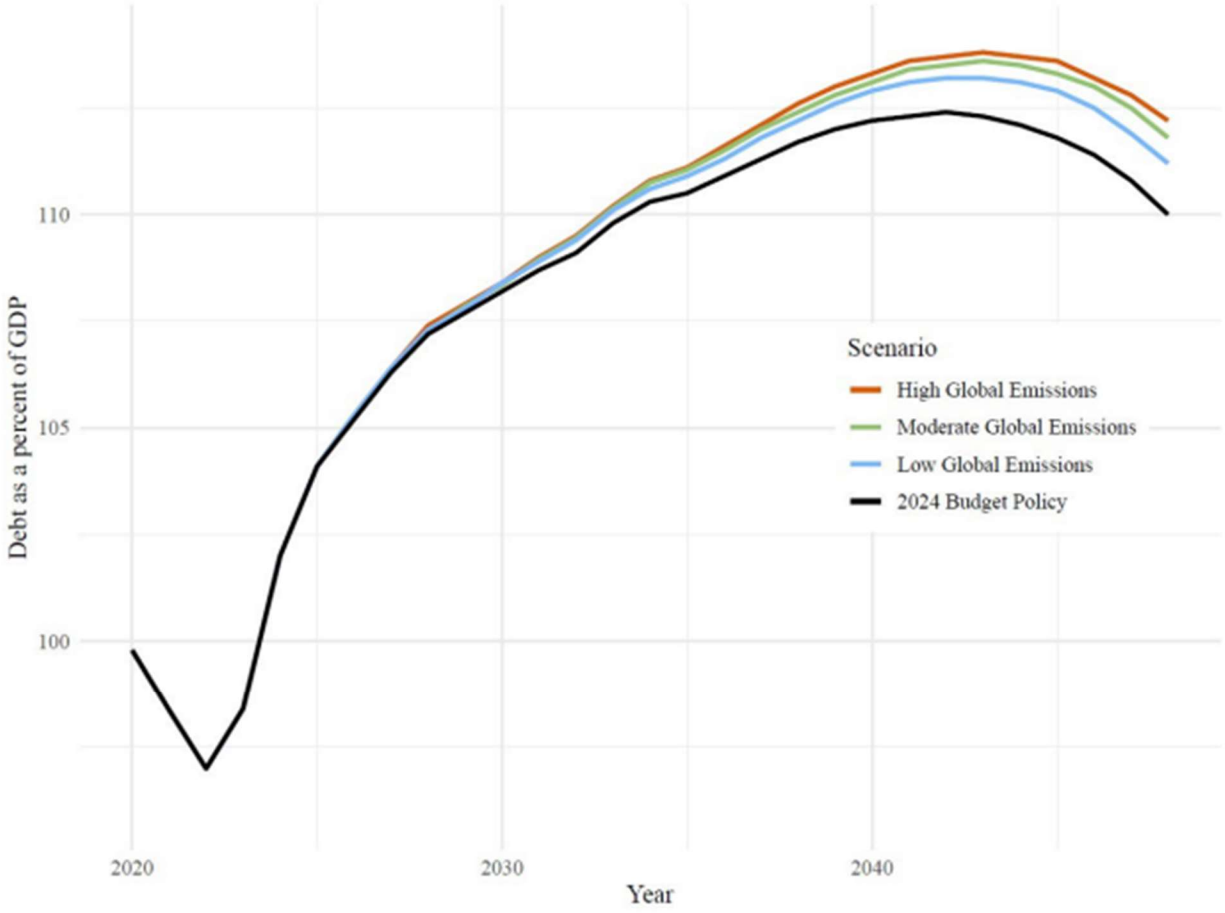
[25] The Nature Conservancy. (2022, August 12). *Clean Energy and Climate Policies Benefit America's Economy and Communities*. https://www.nature.org/en-us/about-us/who-we-are/how-we-work/policy/clean-energy-climate-policy-economic-benefits/

Appendix:

Figure 2: Debt-to-GDP Ratio Projections under Scenarios including Physical Climate Risks in the FY 2024 Long-Term Budget Outlook



Compares the President's FY2024 Budget to three different global scenarios: 1.) Low Global Emissions – other countries eliminate net greenhouse gas (GHC) emissions by 2050; 2.) other countries make no changes to current policies to address GHC; 3.) other countries weaken their current policies to address GHC.

Source: White Paper, Council of Economic Advisers and OMB. Methodologies and Considerations for Integrating the Physical and Transition Risks of Climate Change into Macroeconomic Forecasting for the President's Budget. March 2023.