

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF MISSOURI  
EASTERN DIVISION**

THE STATES OF MISSOURI,  
ALASKA, ARIZONA, ARKANSAS,  
INDIANA, KANSAS, MONTANA,  
NEBRASKA, OHIO, OKLAHOMA,  
SOUTH CAROLINA, TENNESSEE,  
and UTAH,

*Plaintiffs,*

v.

JOSEPH R. BIDEN, JR. in his official  
capacity as the President of the United  
States of America; et. al.,

*Defendants.*

Case No. 4:21-CV-00287-AGF

Judge Audrey G. Fleissig

---

**UNOPPOSED MOTION FOR LEAVE TO FILE AMICUS CURIAE BRIEF  
OF TEXAS PUBLIC POLICY FOUNDATION, VANCE GINN, Ph.D.,  
BRENTON BENNETT, Ph.D., AND ERWIN ANTONI, Ph.D. IN SUPPORT  
OF PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION**

Pursuant to Local Rule 375, Movants Texas Public Policy Foundation, Vance Ginn, Ph.D., Brenton Bennett, Ph.D., and Erwin Antoni, Ph.D., respectfully seek leave to participate in the above-styled action as amici curiae and to file the accompanying Amicus Brief supporting Plaintiffs' Motion for Preliminary Injunction.

All parties consent to the filing of Movants' Amicus Brief.

Movants' Brief seeks to assist the Court by addressing the flawed premise for using the social cost of carbon as part of regulatory analysis and to explain why

environmental regulations based on the social cost of carbon are fundamentally flawed both in their premise and in their construction.

### **INTEREST OF AMICUS CURIAE**

The Texas Public Policy Foundation (TPPF) is a non-profit, non-partisan research institute dedicated to promoting and defending liberty, personal responsibility, and free enterprise throughout Texas and the nation. For decades, TPPF has worked to advance these goals through research, policy advocacy, and impact litigation.

Since its inception in 1989, the Foundation has emphasized the importance of limited government, free market competition, private property rights, and freedom from regulation. In accordance with its central mission, the Foundation has hosted policy discussions, authored research, presented legislative testimony, and drafted model ordinances to reduce the burden of government on Texans. Historically, the Foundation has worked through its Life:Powered project to advocate for energy policies that promote economic freedom and advance the human condition, which inherently includes the right to judicially challenge unlawful ratemaking.

Vance Ginn, Ph.D., is chief economist at the Texas Public Policy Foundation. He earned his doctorate in economics at Texas Tech University and has an accomplished career as a policy director and university lecturer with experience in public policy, academia, and government. In these capacities, Dr. Ginn works to

unlock poverty through relational, inclusive changes in institutions that expand opportunities to let people prosper. He is a prolific writer and is a leading free market economist who was honored with the “Defender of the American Dream” award by Americans for Prosperity—Texas and with the “Champion of Freedom” award by Grassroots America—We The People. From 2019 to 2020, Dr. Ginn served as the Associate Director for Economic Policy of the Office of Management and Budget (OMB) at the Executive Office of the President during the Trump administration. In this capacity, he advised the OMB’s director on economic and fiscal policy matters; managed a team who sought evidence of good government and modeled the economic assumptions in the President’s FY 2021 federal budget, which proposed a record of \$4.6 trillion in cuts to the national debt over a decade, made most of the Trump tax cuts permanent, and noted the need for fiscal rules; and provided in-depth analyses throughout the COVID-19 pandemic.

Brent Bennett, Ph.D., is the policy director for Life:Powered, an initiative of the Texas Public Policy Foundation to raise America’s energy IQ. Dr. Bennett has an M.S.E. and Ph.D. in materials science and engineering from the University of Texas at Austin and a B.S. in physics from the University of Tulsa. His graduate research focused on advanced chemistries for utility-scale energy storage systems. Prior to joining the Foundation, Dr. Bennett worked for a startup company selling

carbon nanotubes to battery manufacturers, and he continues to provide technology consulting to energy storage companies.

Erwin Antoni, Ph.D., is an economist at the Texas Public Policy Foundation whose research focuses on fiscal and monetary policy. Dr. Antoni earned his master's and doctorate in economics from Northern Illinois University.

It is with this background and experience that the Foundation files the Amicus Curiae Brief in support of Plaintiffs' Motion for Preliminary Injunction.

### CONCLUSION

For this reason, Movant requests that this motion be granted and that this Court accept for filing Movants' Amicus Brief.

Respectfully submitted,

/s/Robert Henneke

ROBERT HENNEKE

*Pro Hac Vice*

Texas Bar No. 24046058

[rhenneke@texaspolicy.com](mailto:rhenneke@texaspolicy.com)

TEXAS PUBLIC POLICY FOUNDATION

901 Congress Avenue

Austin, Texas 78701

Telephone: (512) 472-2700

Facsimile: (512) 472-2728

*Attorney for Amicus Curiae*

*Texas Public Policy Foundation*

## CERTIFICATE OF SERVICE

I hereby certify that on May 14, 2021, a true and correct copy of the foregoing document was filed electronically through the Court's CM/ECF system, to be served on counsel for all parties by operation of the Court's electronic filing system.

/s/Robert Henneke  
ROBERT HENNEKE

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF MISSOURI  
EASTERN DIVISION**

THE STATES OF MISSOURI, ALASKA,  
ARIZONA, ARKANSAS, INDIANA,  
KANSAS, MONTANA, NEBRASKA,  
OHIO, OKLAHOMA, SOUTH  
CAROLINA, TENNESSEE, and UTAH,  
*Plaintiffs,*

v.

JOSEPH R. BIDEN, JR. in his official  
capacity as the President of the United  
States of America; et. al.,  
*Defendants.*

Case No. 4:21-CV-00287-AGF

Judge Audrey G. Fleissig

---

**AMICUS CURIAE BRIEF OF TEXAS PUBLIC POLICY FOUNDATION,  
VANCE GINN, Ph.D., BRENTON BENNETT, Ph.D., AND  
ERWIN ANTONI, Ph.D. IN SUPPORT OF PLAINTIFFS'  
MOTION FOR PRELIMINARY INJUNCTION**

**TABLE OF CONTENTS**

TABLE OF AUTHORITIES..... iii

INTEREST OF *AMICUS CURIAE* ..... vii

EXECUTIVE SUMMARY ..... 1

    I.    CERTAINLY AN UNCERTAIN FUTURE ..... 2

    II.   REDUCING EFFECTS OF EMISSIONS BY MITIGATION AND  
          ADAPTATION..... 4

    III.  THE EXPANDING BULL’S-EYE: WHY REDUCING EMISSIONS  
          WILL NOT SIGNIFICANTLY LOWER FUTURE DAMAGES ..... 9

    IV.  GOING IT ALONE ..... 11

CONCLUSION ..... 12

CERTIFICATE OF SERVICE..... 14

CERTIFICATE OF COMPLIANCE ..... 16

**TABLE OF AUTHORITIES**

<b><u>Other Authorities:</u></b>	<b><u>Page(s):</u></b>
Dayaratna, Kevin D., McKittrick, Ross & Michael, Patrick J., “Climate sensitivity, agricultural productivity and the social cost of carbon in FUND.” <i>SpringerLink</i> , Jan. 18, 2020, <a href="https://link.springer.com/article/10.1007/s10018-020-00263-w">https://link.springer.com/article/10.1007/s10018-020-00263-w</a> .....	1
Lomborg, Bjorn, “Welfare in the 21 <sup>st</sup> century: Increasing development, reducing inequality, the impact of climate change, and the cost of climate policies.” <i>ScienceDirect</i> , vol. 156, 50 <sup>th</sup> Ann. Issue, July, 2020, <a href="https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub</a> .....	1, 7, 8, 10
Ginn, Vance, Ingram, Megan, “Does a Carbon Tax Support Prosperity?” <i>Texas Public Policy Foundation Policy Perspective</i> , April 2018, <a href="https://files.texaspolicy.com/uploads/2018/08/16104452/2018-04-PP-CarbonTaxSupportProsperity-ACEE-CEP-IngramGinn.pdf">https://files.texaspolicy.com/uploads/2018/08/16104452/2018-04-PP-CarbonTaxSupportProsperity-ACEE-CEP-IngramGinn.pdf</a> .....	2
“The History of Solar,” <i>U.S. Dep’t of Energy</i> , <a href="https://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf">https://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf</a> .....	2
“History of Tidal Power,” <i>TidalElectric, Inc.</i> , <a href="http://www.tidalelectric.com/history-of-tidal-power">http://www.tidalelectric.com/history-of-tidal-power</a> .....	3
“9 Notable Facts About the World’s First Nuclear Power Plant – EBR –I,” <i>Office of Nuclear Energy</i> , June 18, 2019, <a href="https://www.energy.gov/ne/articles/9-notable-facts-about-world-s-first-nuclear-power-plant-ebr-i">https://www.energy.gov/ne/articles/9-notable-facts-about-world-s-first-nuclear-power-plant-ebr-i</a> .....	3
Shahan, Zachary, “History of Wind Turbines.” <i>Renewable Energy World</i> , Nov. 21, 2014, <a href="https://www.renewableenergyworld.com/storage/history-of-wind-turbines/#:~:text=1888%3A%20The%20first%20known%20US%20wind%20turbine%20created,to%20provide%20electricity%20for%20his%200mansion%20in%20Ohio">https://www.renewableenergyworld.com/storage/history-of-wind-turbines/#:~:text=1888%3A%20The%20first%20known%20US%20wind%20turbine%20created,to%20provide%20electricity%20for%20his%200mansion%20in%20Ohio</a> .....	3
Speight, James G., “The Chemistry and Technology of Coal,” <i>CRC Press</i> . Third Ed., Sept. 4, 2012, p. 13.....	3

Jump Back in Time, *The Library of Congress*,  
[http://www.americaslibrary.gov/jb/gilded/jb\\_gilded\\_hydro\\_1.html#:~:text=The%20dam%20across%20Fox%20River%20in%20Appleton%2C%20Wisconsin%2C,rivers%2C%20you%20may%20not%20immediately%20think%20of%20electricity.https://www.aoghs.org/petroleum-pioneers/american-oil-history/](http://www.americaslibrary.gov/jb/gilded/jb_gilded_hydro_1.html#:~:text=The%20dam%20across%20Fox%20River%20in%20Appleton%2C%20Wisconsin%2C,rivers%2C%20you%20may%20not%20immediately%20think%20of%20electricity.https://www.aoghs.org/petroleum-pioneers/american-oil-history/) ..... 3

“First American Oil Well,” *Petroleum Pioneers*,  
<https://aoghs.org/petroleum-pioneers/american-oil-history/> ..... 3

History, *NaturalGas.org*, Sept. 30, 2013,  
<http://naturalgas.org/overview/history/> ..... 3

A Brief History of Natural Gas, *American Public Gas Association*,  
<https://www.apga.org/apgamainsite/aboutus/facts/history-of-natural-gas#:~:text=In%201821%2C%20William%20Hart%20dug%20the%20first%20successful,the%20first%20municipally%20owned%20natural%20gas%20distribution%20company> ..... 3

Catalytic Converters, *Chemistry LibreTexts*, Aug. 15, 2020, Chap. 7.1,  
[.https://chem.libretexts.org/Bookshelves/Physical\\_and\\_Theoretical\\_Chemistry\\_Textbook\\_Maps/Supplemental\\_Modules\\_\(Physical\\_and\\_Theoretical\\_Chemistry\)/Kinetics/07:\\_Case\\_Studies\\_-\\_Kinetics/7.01:\\_Catalytic\\_Converters#:~:text=A%20catalytic%20converter%20is%20a%20simple%20device%20that,by%20a%20car%20engine%20into%20less%20harmful%20gases](https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Kinetics/07:_Case_Studies_-_Kinetics/7.01:_Catalytic_Converters#:~:text=A%20catalytic%20converter%20is%20a%20simple%20device%20that,by%20a%20car%20engine%20into%20less%20harmful%20gases) ..... 5

Christensen, P., Gillingham, K., Nordhaus, W., “Uncertainty in forecasts of long-run economic growth.” *Proc. Nat. Acad. Sci.*, vol. 115, no. 21, 2018, p. 5409 ..... 5

Riahi, Keywan, van Vuuren, D P, Kriegler, E., Edmonds, J., O’Neill, B C, Fujimori, S., Bauer, N., et al., “The shared socioeconomic pathways and their energy, land use, and greenhouse gas emissions implications: an overview.” *Global Environ. Change*, vol. 42, 2017, pp. 153-168 ..... 5

Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990, *U.S. Gov’t*, Feb. 2021,  
[https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf) ..... 5

Hinkel, Jochen, Lincke, D., Vafeidis, A.T., Perrette, M., Nicholls, J.N., Tol, R. S. J., Marzeion, B., Fettweis, X., Ionescu, C., Levermann, A., “Coastal flood damage and adaptation costs under 21<sup>st</sup> century sea-level rise.” *Proc. Nat. Acad. Sci.*, vol. 111, no. 9, 2014, pp. 3292-3297..... 6, 8

Lincke, Daniel, Hinkel, Jochen, “Economically robust protection against 21<sup>st</sup> century sea-level rise.” *Global Environ. Change-Human Policy Dimen.*, vol. 51, 2018, pp. 67-73..... 6

Nicholls, Robert J., “Chapter 2 - Adapting to Sea-Level Rise.” *Science Direct*, In: Zommers, Zinta, Alverson, Keith (Eds.), *Resilience*, 2018, pp. 13-29, <https://www.sciencedirect.com/science/article/pii/B9780128118917000025> ..... 6

Wallace-Wells, David, “The Uninhabitable Earth: Life After Warming,” *Tim Duggan Books*, NY, 1st ed., 2019 ..... 6, 7

Vousdoukas, Michalis I., Mentaschi, L., Voukouvalas, E., Verlaan, M., Feyen, L., “Extreme sea levels on the rise along Europe’s coasts,” *Earth’s Future*, vol. 5, no. 3, 2017, pp. 304-323..... 6

Fleischer, A., Mendelsohn, R., Dinar, A., “Bundling agricultural technologies to adapt to climate change,” *Technol. Forecast. Soc. Change*, vol. 78, no. 6, 2011, pp. 982-990..... 6

Jevrejeva, S., Jackson, L.P., Grinsted, A., Lincke, D., Marzeion, B., “Flood Damage Costs Under the Sea Level Rise with Warming of 1.5 Degrees and 2 Degrees C.” *Environ. Res. Lett.*, vol. 13, no. 7, 2018, <https://iopscience.iop.org/article/10.1088/1748-9326/aacc76> ..... 7

Public Utilities Water Supply, *The City of San Diego*, <https://www.sandiego.gov/public-utilities/sustainability/water-supply> ..... 9

Strader, Stephen & Walker, Ashley, “The Expanding Bull’s Eye Effect.” *Weatherwise*, 2015, p. 68 <https://doi.org/10.1080/00431672.2015.1067108> ..... 10

Pielke, Jr., R.A., Landsea, C.W., “Normalized hurricane damages in the United States: 1925-95.” *Weather Forecast*, vol. 13, no. 3, 1998, pp. 621-631 ..... 10

Klotzbach, Philip J., Bowen, Steven G., Pielke, Jr., R.A., Bell, Michael,  
 “Continental U.S. Hurricane Landfall Frequency and Associated  
 Damage: Observations and Future Risks.” *Bull. Am. Meteorol. Soc.*, vol.  
 99, no. 7, 2018, pp. 1359-1376..... 10

Weinkle, Jessica, Landsea, C., Collins, D., Musulin, R., Crompton, R.P.,  
 Klotzbach, P.J., Pielke Jr., R.A., “Normalized Hurricane Damage in the  
 Continental United States 1900-2017.” *Nature Sustain*, vol. 1, no. 12,  
 2018, pp. 808-813..... 10

Pielke, Roger, “Tracking Progress on the Economic Costs of Disasters Under  
 the Indicators of the Sustainable Development Goals.” *Environmental  
 Hazards*, vol. 18, no. 1, 2019, pp. 1-6,  
<https://doi.org/10.1080/17477891.2018.1540343> ..... 11

Pielke, Roger, Jr., “The Rightful Place of Science: Disasters & Climate Change,  
 Consortium for Science, Policy & Outcomes, Tempe, AZ.” 2014 ..... 11

Fossil CO2 emissions of all world countries – 2018 Report, *European  
 Commission*,  
<https://publications.jrc.ec.europa.eu/repository/handle/JRC113738>..... 11

U.S. Energy Related Carbon Dioxide Emissions, *U.S. Energy Information  
 Administration*, Sept. 20, 2020,  
<https://www.eia.gov/environment/emissions/carbon/> ..... 11

The decoupling of economic growth from carbon emissions: UK evidence,  
*Office for National Statistics*, Oct. 21, 2019,  
[https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/comp  
 endium/economicreview/october2019/thedecouplingofeconomicgro  
 wthfromcarbonemissionsukevidence](https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/october2019/thedecouplingofeconomicgrowthfromcarbonemissionsukevidence) ..... 12

### INTEREST OF *AMICUS CURIAE*\*

The Texas Public Policy Foundation (TPPF) is a non-profit, non-partisan research institute dedicated to promoting and defending liberty, personal responsibility, and free enterprise throughout Texas and the nation. For decades, TPPF has worked to advance these goals through research, policy advocacy, and impact litigation.

Since its inception in 1989, the Foundation has emphasized the importance of limited government, free market competition, private property rights, and freedom from regulation. In accordance with its central mission, the Foundation has hosted policy discussions, authored research, presented legislative testimony, and drafted model ordinances to reduce the burden of government on Texans. Historically, the Foundation has worked through its Life:Powered project to advocate for energy policies that promote economic freedom and advance the human condition, which inherently includes the right to judicially challenge unlawful ratemaking.

Vance Ginn, Ph.D., is chief economist at the Texas Public Policy Foundation. He earned his doctorate in economics at Texas Tech University and has an accomplished career as a policy director and university lecturer with experience in public policy, academia, and government. In these capacities, Dr. Ginn works to unlock poverty through relational, inclusive changes in institutions that expand opportunities to let people prosper. He is a prolific writer and is a leading free market economist who was honored with the

---

\* All parties have consented to the filing of this *amicus* brief. This brief was not authored in whole or in part by counsel for any party. No party, party's counsel, or person—other than *amicus curiae* or its counsel—contributed money that was intended to fund preparing or submitting this brief. Fed. R. App. P. 29(a)(4)(E).

“Defender of the American Dream” award by Americans for Prosperity—Texas and with the “Champion of Freedom” award by Grassroots America—We The People. From 2019 to 2020, Dr. Ginn served as the Associate Director for Economic Policy of the Office of Management and Budget (OMB) at the Executive Office of the President during the Trump administration. In this capacity, he advised the OMB’s director on economic and fiscal policy matters; managed a team who sought evidence of good government and modeled the economic assumptions in the President’s FY 2021 federal budget, which proposed a record of \$4.6 trillion in cuts to the national debt over a decade, made most of the Trump tax cuts permanent, and noted the need for fiscal rules; and provided in-depth analyses throughout the COVID-19 pandemic.

Brent Bennett, Ph.D., is the policy director for Life:Powered, an initiative of the Texas Public Policy Foundation to raise America’s energy IQ. Dr. Bennett has an M.S.E. and Ph.D. in materials science and engineering from the University of Texas at Austin and a B.S. in physics from the University of Tulsa. His graduate research focused on advanced chemistries for utility-scale energy storage systems. Prior to joining the Foundation, Dr. Bennett worked for a startup company selling carbon nanotubes to battery manufacturers, and he continues to provide technology consulting to energy storage companies.

Erwin Antoni, Ph.D., is an economist at the Texas Public Policy Foundation whose research focuses on fiscal and monetary policy. Dr. Antoni earned his master’s and doctorate in economics from Northern Illinois University.

## EXECUTIVE SUMMARY

Amici submit their brief in support of Plaintiffs' preliminary injunction motion. Environmental regulations based on the social cost of carbon are fundamentally flawed both in their premise and in their construction. Numerous studies<sup>1</sup> have explained how the models being used to assess such costs are constructed on a foundation of irrational worst-case scenarios and flawed assumptions about the costs and benefits of warmer temperatures and higher greenhouse gas (GHG) levels. This brief focuses on the flawed premise for using the social cost of carbon as a part of regulatory analysis, which is that reducing GHG emissions is the only way to reduce their harm to the public welfare.

In reality, humans have another option for dealing with the future and still uncertain climate effects of GHG emissions: adaptation. Adaptation is how we have dealt with climate change in the past, and adaptation will be a far less expensive option than emissions mitigation in the future.<sup>2</sup> The models that are used to quantify the social cost of carbon fail to properly account for human adaptation, which renders them so inaccurate as to make them useless for evaluating public policy. The cost of adaptation is rarely offered as an alternative in regulatory impact analyses; only the social cost of carbon is used to compare to the cost of reducing emissions. The reasoning for GHG regulations also incorrectly

---

<sup>1</sup> Dayaratna, Kevin D., McKittrick, Ross & Michael, Patrick J., "Climate sensitivity, agricultural productivity and the social cost of carbon in FUND." *SpringerLink*, Jan. 18, 2020, See, e.g., <https://link.springer.com/article/10.1007/s10018-020-00263-w> and references.

<sup>2</sup> Lomborg, Bjorn, "Welfare in the 21<sup>st</sup> century: Increasing development, reducing inequality, the impact of climate change, and the cost of climate policies." *ScienceDirect*, vol. 156, 50<sup>th</sup> Ann. Issue, July, 2020, <https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub>

assumes GHG emissions have been, and will continue to be, the primary force behind the increasing cost of natural disasters, such as hurricanes. Furthermore, the idea that the U.S. alone can solve the problem of growing carbon emissions is also flawed since reductions at home are simply superseded by augmentations abroad.

## I. CERTAINLY AN UNCERTAIN FUTURE

The idea of forecasting the cost of carbon and environmental realities 150 or 300 years into the future is an impossible exercise. Economic models commonly project only a decade into the future because the number of known unknowns, and especially the number of unknown unknowns, increases too quickly thereafter for the models to provide any reliable estimates, and even projections over a decade are imprecise.<sup>3</sup> For example, the Federal Reserve and the Congressional Budget Office routinely revise their respective forecasts, which are almost always less than a decade, as new data becomes available from unforeseen changes. A timeline extending to the year 2100, not to mention 2300, for estimates of carbon production, its subsequent effect on the environment, and technological change is simply arbitrary.

To put the 300-year timetable into perspective, consider the following events and their respective dates. The first megawatt solar power plant was built in 1982.<sup>4</sup> The first

---

<sup>3</sup> Ginn, Vance, Ingram, Megan, “Does a Carbon Tax Support Prosperity?” *Texas Public Policy Foundation Policy Perspective*, April 2018, <https://files.texaspolicy.com/uploads/2018/08/16104452/2018-04-PP-CarbonTaxSupportProsperity-ACEE-CEP-IngramGinn.pdf>

<sup>4</sup> “The History of Solar,” *U.S. Dep’t of Energy*, [https://www1.eere.energy.gov/solar/pdfs/solar\\_timeline.pdf](https://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf)

tidal power plant produced electricity in 1965.<sup>5</sup> The first nuclear power plant began operating in 1951.<sup>6</sup> In 1887, the first wind turbine produced electricity.<sup>7</sup> The first coal-fired<sup>8</sup> and hydroelectric<sup>9</sup> power plants both opened in 1882, 100 years before their aforementioned solar counterpart. In 1859, the first oil well was drilled in America<sup>10</sup> and, in 1821, the first natural gas well was drilled.<sup>11</sup> The first commercial use of coal-derived natural gas occurred in 1785.<sup>12</sup>

The key observation from this brief historical recap is that the energy landscape has evolved dramatically in a very short period relative to the span of human history. The

---

5 “History of Tidal Power,” *TidalElectric, Inc.*,  
<http://www.tidalelectric.com/history-of-tidal-power>

6 “9 Notable Facts About the World’s First Nuclear Power Plant – EBR –I, *Office of Nuclear Energy*, June 18, 2019,  
<https://www.energy.gov/ne/articles/9-notable-facts-about-world-s-first-nuclear-power-plant-ebr-i>

7 Shahan, Zachary, “History of Wind Turbines.” *Renewable Energy World*, Nov. 21, 2014,  
<https://www.renewableenergyworld.com/storage/history-of-wind-turbines/#:~:text=1888%3A%20The%20first%20known%20US%20wind%20turbine%20created,to%20provide%20electricity%20for%20his%20mansion%20in%20Ohio>

8 Speight, James G., “The Chemistry and Technology of Coal.” *CRC Press*. Third Ed., Sept. 4, 2012, p. 13

9 Jump Back in Time, *The Library of Congress*,  
[http://www.americaslibrary.gov/jb/gilded/jb\\_gilded\\_hydro\\_1.html#:~:text=The%20dam%20across%20Fox%20River%20in%20Appleton%2C%20Wisconsin%2C,rivers%2C%20you%20may%20not%20immediately%20think%20of%20electricity](http://www.americaslibrary.gov/jb/gilded/jb_gilded_hydro_1.html#:~:text=The%20dam%20across%20Fox%20River%20in%20Appleton%2C%20Wisconsin%2C,rivers%2C%20you%20may%20not%20immediately%20think%20of%20electricity)

10 “First American Oil Well,” *Petroleum Pioneers*,  
<https://www.aoghs.org/petroleum-pioneers/american-oil-history/>

11 History, *NaturalGas.org*, Sept. 30, 2013, <http://naturalgas.org/overview/history/>

12 A Brief History of Natural Gas, *American Public Gas Association*,  
<https://www.apga.org/apgamainsite/aboutus/facts/history-of-natural-gas#:~:text=In%201821%2C%20William%20Hart%20dug%20the%20first%20successful,the%20first%20municipally%20owned%20natural%20gas%20distribution%20company>

revolutionary changes that have led to the extensive use of fossil fuels and other sources of energy have all occurred in just the last 236 years, whereas for thousands of years, mankind derived nearly 100% of its energy from biomass. Given the ever-increasing pace of technological advancement, it is puerile to think that energy-related technologies will suddenly stagnate for the next 300 years, which is a necessary assumption to believe that one could accurately predict future carbon output. The hubris required to presume anticipating the technological advancements of the coming 300 years is also outrageous.

## **II. REDUCING EFFECTS OF EMISSIONS BY MITIGATION AND ADAPTATION**

Recent environmental economics models have applied the principle of negative externalities to markets which emit various pollutants. In such a model, these external costs incurred by third parties are assigned a price, which is then demanded from the direct market participants to internalize the externality. Those market participants respond to the higher price by reducing their activity, and thus the amount of pollutants produced, until the marginal social cost that includes both the marginal cost of production and the marginal external cost of pollution to third parties equals the marginal benefit to consumers. The pollution has, therefore, been *mitigated*. Mitigation here is the reduction of an underlying cause of the pollution. The reduction in the effect of the pollution is due directly to the reduction in its cause.

One example of mitigation is the catalytic converter in an automobile, which reduces about 98%<sup>13</sup> of nitrous oxides, hydrocarbon, and carbon monoxide to mitigate the effects of those emissions. The cost of the effects of those pollutants has been mitigated by removing the pollutants themselves, at the cost of the catalytic converter, which has been imposed on the buyer and seller of the automobile. This is an example of a relatively effective mitigation strategy with lower costs than the alternative adaptation methods.

In the context of carbon dioxide emissions, a mitigation strategy means directly reducing carbon output, thereby reducing the effects of carbon on climate change. Such strategies usually come with extreme economic costs that are very difficult to calculate in a regulatory analysis context. Some studies suggest the cost of eliminating CO<sub>2</sub> emissions could be very high,<sup>14 15</sup> far higher than the \$51/ton currently being considered by the EPA.<sup>16</sup>

---

<sup>13</sup> Catalytic Converters, *Chemistry LibreTexts*, Aug. 15, 2020, Chap. 7.1, [https://chem.libretexts.org/Bookshelves/Physical\\_and\\_Theoretical\\_Chemistry\\_Textbook\\_Maps/Supplemental\\_Modules\\_\(Physical\\_and\\_Theoretical\\_Chemistry\)/Kinetics/07:\\_Case\\_Studies-\\_Kinetics/7.01:\\_Catalytic\\_Converters#:~:text=A%20catalytic%20converter%20is%20a%20simple%20device%20that,by%20a%20car%20engine%20into%20less%20harmful%20gases](https://chem.libretexts.org/Bookshelves/Physical_and_Theoretical_Chemistry_Textbook_Maps/Supplemental_Modules_(Physical_and_Theoretical_Chemistry)/Kinetics/07:_Case_Studies-_Kinetics/7.01:_Catalytic_Converters#:~:text=A%20catalytic%20converter%20is%20a%20simple%20device%20that,by%20a%20car%20engine%20into%20less%20harmful%20gases)

<sup>14</sup> Christensen, P., Gillingham, K., Norhaus, W., “Uncertainty in forecasts of long-run economic growth.” *Proc. Nat. Acad. Sci.*, vol. 115, no. 21, 2018, p. 5409

<sup>15</sup> Riahi, Keywan, van Vuuren, D P, Kriegler, E., Edmonds, J., O’Neill, B C, Fujimori, S., Bauer, N., et al., “The shared socioeconomic pathways and their energy, land use, and greenhouse gas emissions implications: an overview.” *Global Environ. Change*, vol. 42, 2017, pp. 153-168

<sup>16</sup> Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990, *U.S. Gov’t*, Feb. 2021, [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf)

Given the high cost of mitigation, it is likely that adapting to those climate changes, instead of preventing them, is a far more cost efficient policy.<sup>17,18,19</sup> However, the social cost of carbon fails to adequately consider the benefits derived from adaptation.

Lomborg (2020)<sup>20</sup> provides a thorough review of the current empirical literature on the effect of climate change on increasing coastal flooding. He explains that the estimates of increased coastal flooding from climate change are usually wildly overstated because adaptation, the most efficient method of dealing with climate change, is neglected.<sup>21,22,23</sup> One study that ignores adaptation admits that its central assumption of no adaptation is unrealistic, but still estimates the annual coastal flood damages from climate change at \$14

---

<sup>17</sup> Hinkel, Jochen, Lincke, D, Vafeidis, A T, Perrette, M, Nicholls, J N, Tol, R S J, Marzeion, B, Fettweis, X, Ionescu, C, Levermann, A, “Coastal flood damage and adaptation costs under 21st century sea-level rise.” *Proc. Nat. Acad. Sci.*, vol. 111, no. 9, 2014, pp. 3292–3297.

<sup>18</sup> Lincke, Daniel, Hinkel, Jochen, “Economically robust protection against 21st century sea-level rise.” *Global Environ. Change-Human Policy Dimen.*, vol. 51, 2018, pp. 67–73.

<sup>19</sup> Nicholls, Robert J., 2018. “Chapter 2—Adapting to Sea-Level Rise.” *ScienceDirect*, In: Zommers, Zinta, Alverson, Keith (Eds.), *Resilience*, 2018, pp. 13–29. <http://www.sciencedirect.com/science/article/pii/B9780128118917000025>

<sup>20</sup> Lomborg, 2020, <https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub>

<sup>21</sup> Wallace-Wells, David, “The Uninhabitable Earth: Life After Warming.” *Tim Duggan Books*, NY, 1st ed., 2019

<sup>22</sup> Vousdoukas, Michalis I., Mentaschi, L, Voukouvalas, E, Verlaan, M, Feyen, L, “Extreme sea levels on the rise along Europe’s coasts.” *Earth’s Future*, vol. 5, no. 3, 2017, pp. 304–323.

<sup>23</sup> Fleischer, A., Mendelsohn, R., Dinar, A., “Bundling agricultural technologies to adapt to climate change.” *Technol. Forecast. Soc. Change*, vol. 78, no. 6, 2011, pp. 982–990.

trillion annually by 2100.<sup>24</sup> Other estimates of as much as \$100 trillion in damages per year by 2100 have been made, a staggering figure that is more than current annual global economic output.<sup>25</sup> “Yet, because it ignores adaptation, this description exaggerates the problem by up to two thousand times.”<sup>26</sup>

Adaptation is a much more efficient method of cost reduction and exposes the binary choice of either experiencing these losses or avoiding them through mitigation as a false dichotomy.

One model described by Lomborg predicts that, with no adaptation, 187 million people will experience catastrophic flooding events annually by 2100, with damages totaling \$55 trillion, or 5.3% of global GDP. However, improving dikes reduces flood costs by more than 99.9%, down to \$38 billion per year. Even when the additional \$24 billion in annual dike costs are considered, the total cost in the adaptation scenario is still 99.8% less than with no adaptation. With proper adaptation, the cost of climate change still grows nominally, but it shrinks in relative terms as we spend a smaller and smaller percentage of our faster-growing GDP to finance it.

---

<sup>24</sup> Jevrejeva, S., Jackson, L.P., Grinsted, A., Lincke, D., Marzeion, B., “Flood Damage Costs Under the Sea Level Rise with Warming of 1.5 Degrees C and 2 Degrees C.” *Environ. Res. Lett.*, vol. 13, no. 7, 2018, <https://doi.org/10.1088/1748-9326/aacc76>

<sup>25</sup> Wallace-Wells, 2019

<sup>26</sup> Lomborg, 2020, <https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub>

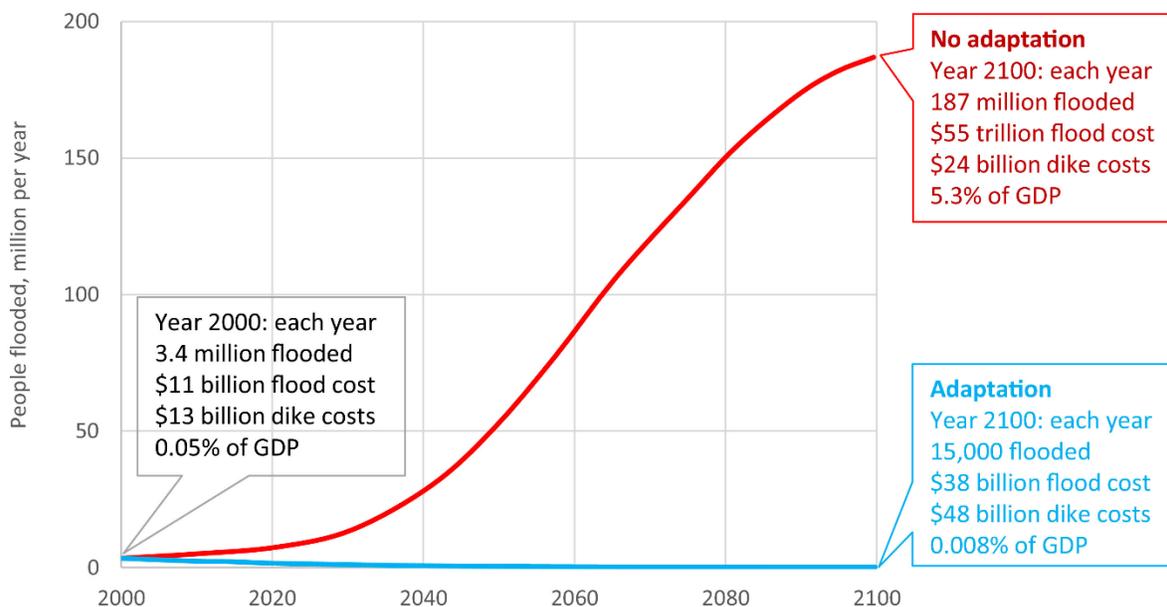


Figure 1: People subject to flooding risk and estimated cost under an extreme emissions pathway, SSP5 with the RCP8.5 climate scenario.<sup>27</sup> Even the sea level rise under the highest conceivable emissions scenario can still be adapted to with relatively little cost. All costs in 2005 US\$, from [Hinkel et al., 2014](#), S4, S5 and S6.<sup>28</sup>

Adaptation applies not just to coastal flooding, but inland flooding too. If annual rainfall increases, either through storm intensity or frequency, people can adapt to this change with enhanced infrastructure. Retention basins, levees, naturalized lowland areas, and the introduction of wetland vegetation are all examples of components of existing flood mitigation programs. These and other methods are already widespread and can be expanded relatively inexpensively. Similarly, methods to combat localized drought have also already been implemented and can be expanded at a lower cost than mitigation. Just as artificial irrigation has been used in agriculture for centuries, water can be transported from areas of

<sup>27</sup> Lomborg, 2020, <https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub>

<sup>28</sup> Hinkel, *Proc. Nat. Acad. Sci.*, vol. 111, no. 9, 2014, pp. 3292–3297

excess supply to areas of greater scarcity. The city of San Diego, for example, already imports 85-90% of its water from Northern California and the Colorado River.<sup>29</sup>

### **III. THE EXPANDING BULL’S-EYE: WHY REDUCING EMISSIONS WILL NOT SIGNIFICANTLY LOWER FUTURE DAMAGES**

The cost of natural disasters like hurricanes and wildfires is increasing over time. However, the rising costs of these disasters are not solely attributable to their increasing severity or frequency. Similar storms happen year after year but the number of people and the value of property in the path of these disasters is increasing dramatically, thereby raising the cost of the damages.

The U.S. population is 4.4 times what it was 120 years ago, but the Gulf and Atlantic coastal populations have increased 1,540% in the same amount of time. The Florida coastal population is 67.7 times what it was in 1900, a growth rate that is more than 15 times faster than the nation at large, and property values are rising even faster. If the same hurricanes of 1900 hit Florida today, they would cause much more damage because they would be hitting many more homes, which are also substantially more expensive than the homes built in the past. There is an “Expanding Bull’s-Eye Effect” wherein the growth of human population, and the building of costlier dwellings or infrastructure, yield a larger target for isolated natural disasters. Strader and Ashley put it this way:

“The expanding bull’s-eye can be thought of as an archery target, where inner rings are made up of people and their possessions, and arrows symbolize hazard events. Unlike real archery, the expanding bull’s-eye target rings enlarge over time. This amplification results in a greater likelihood of arrows

---

<sup>29</sup> Public Utilities Water Supply, *The City of San Diego*, <https://www.sandiego.gov/public-utilities/sustainability/water-supply>

hitting an inner ring on the target. Accordingly, as population continues to grow and expand, the chance that a hazard impacts developed land, resulting in a disaster, increases.”<sup>30</sup>

A hurricane that previously made landfall on an undeveloped section of the Atlantic seaboard would have to metaphorically thread the proverbial needle to accomplish that feat today, since the coast is now built up and thoroughly developed. Using the metric of past hurricanes hitting today’s infrastructure, three of the four costliest storms would all have occurred before 1930, long before the dramatic increases in carbon emissions in the latter half of the twentieth century.<sup>31,32,33</sup> Evaluating previous storms based on damage they would cause today also eliminates any positive correlation between the passage of time and the extent of those storms’ damages.<sup>34</sup> In other words, we should expect disasters to become costlier over time, certainly as measured in dollars and perhaps even lives. It is not indicative of worsening storms but, rather, a growing population and denser, costlier infrastructure in harm’s way.

---

<sup>30</sup> Strader, Stephen & Ashley, Walker, “The Expanding Bull’s Eye Effect.” *Weatherwise*, 2015, p. 68, <https://doi.org/10.1080/00431672.2015.1067108>

<sup>31</sup> Pielke Jr., R.A., Landsea, C.W., “Normalized hurricane damages in the United States: 1925-95.” *Weather Forecast*, vol. 13, no. 3, 1998, pp. 621–631

<sup>32</sup> Klotzbach, Philip J., Bowen, Steven G., Pielke Jr., R A, Bell, Michael, “Continental U.S. Hurricane Landfall Frequency and Associated Damage: Observations and Future Risks.” *Bull. Am. Meteorol. Soc.*, vol. 99, no. 7, 2018, pp. 1359–1376

<sup>33</sup> Weinkle, Jessica, Landsea, C, Collins, D, Musulin, R, Crompton, R P, Klotzbach, P J, Pielke Jr., R A, “Normalized hurricane damage in the continental United States 1900–2017.” *Nature Sustain*, vol. 1, no. 12, 2018, pp. 808–813.

<sup>34</sup> Lomborg, 2020, <https://www.sciencedirect.com/science/article/pii/S0040162520304157?via%3Dihub>

It is worth noting that ever-improving materials and methods of construction are continuously being created to hurricane-proof homes in areas like the Florida coast, which has mitigated tremendous amounts of damages in more recent years. In fact, the cost of natural disasters as a percentage of GDP is falling over time.<sup>35,36</sup> Without these advancements, damages from recent storms would certainly have been worse. This is yet another illustration of the principle of adaptation at work. It was not necessary to eliminate or even reduce the social cost of carbon to save that infrastructure. Rather, additional investment and technological advancement can prevent its destruction.

#### IV. GOING IT ALONE

Carbon emissions are considered to be a global problem and, as such, require a global solution. Because the U.S. is emitting a decreasing portion of global carbon emissions (less than half that of China),<sup>37</sup> it is impossible for the U.S., alone to solve the problem. Despite many agreements between nations to reduce emissions, global emissions increased substantially yet again in 2019, with the U.S. decreasing its own emissions by 2.8%.<sup>38</sup> The economic slowdown due to the coronavirus pandemic and government actions

---

<sup>35</sup> Pielke, Roger, “Tracking Progress on the Economic Costs of Disasters Under the Indicators of the Sustainable Development Goals.” *Environmental Hazards*, vol. 18 no. 1, 2019, pp. 1-6, <https://doi.org/10.1080/17477891.2018.1540343>

<sup>36</sup> Pielke, Roger, Jr., “The Rightful Place of Science: Disasters & Climate Change, Consortium for Science, Policy, & Outcomes, Tempe, AZ.” 2014

<sup>37</sup> Fossil CO2 emissions of all world countries – 2018 Report, *European Commission*, <https://ec.europa.eu/jrc/en/publication/fossil-co2-emissions-all-world-countries-2018-report>

<sup>38</sup> U.S. Energy Related Carbon Dioxide Emissions, *U.S. Energy Information Administration*, Sept. 20, 2020, <https://www.eia.gov/environment/emissions/carbon/>

is contributing to less global emissions in the near term, but it will not reverse the long-term trend of rising emissions in the developing world without substantially less economic growth from more mitigation efforts in the future.

The social cost of carbon cannot be reduced if a decrease in emissions by one country is offset by an increase from another. When one nation engages in mitigation policies, it results in higher production costs that will drive industry overseas to less scrupulous nations that do not monitor their carbon emissions so closely. This has been the case in Europe, and to a lesser extent the U.S. The U.K. has had the largest percentage decrease in carbon dioxide emissions of any developed nation, falling by more than a third since 1990. However, their consumption of emissions, which account for the emissions embodied in the products the country consumes, has been flat since then.<sup>39</sup>

The failure to properly address emissions leakage, as this phenomenon is commonly called, is a fundamental problem with regulatory attempts to reduce GHG emissions. The application of the social cost of carbon is part of the larger failure of regulatory agencies to consider the full slate of the very complex costs and benefits of reducing emissions.

## CONCLUSION

Regulations of carbon emissions should be implemented only after careful consideration of their costs and benefits. The difficulty in predicting these values makes it

---

<sup>39</sup> The decoupling of economic growth from carbon emissions: UK evidence, *Office for National Statistics*, Oct. 21, 2019, <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/october2019/thedecouplingofeconomicgrowthfromcarbonemissionsukevidence>

nearly impossible to provide reliable estimations for the long-term effects of these regulations. As such, government bureaucracies that utilize the social cost of carbon are gambling with the future economic prosperity of the country based on estimates that are, by their very nature, highly uncertain and arbitrary.

This is especially true because the social cost of carbon is developed and used in a way that ignores adaptation to climate change, which will reduce the effects of carbon emissions more efficiently than government mandating (through taxes, regulation, or other measures) a reduction in emissions. Lastly, if the issue truly is collective in nature, the solution must present a realistic way of addressing the problem collectively, as opposed to economically shackling some participants while others progress unfettered. Technological advancement, made possible through the production of inexpensive and efficient energy from fossil fuels, will facilitate wealth and adaptive methods that make the social cost of carbon emissions so small that it will be difficult to measure.

Regulatory policy based on social cost of carbon emissions is arbitrary to its core and should have no place in federal policy. It is a form of social engineering based on a subjective determination of government bureaucrats rather than the profit-loss system in the productive private sector with a legal system that penalizes bad actors. Therefore, *Amici* support the Court granting Plaintiffs' preliminary injunction motion.

Respectfully submitted,

/s/Robert Henneke

ROBERT HENNEKE

*Pro Hac Vice*

Texas Bar No. 24046058

[rhenneke@texaspolicy.com](mailto:rhenneke@texaspolicy.com)

TEXAS PUBLIC POLICY FOUNDATION

901 Congress Avenue

Austin, Texas 78701

Telephone: (512) 472-2700

Facsimile: (512) 472-2728

*Attorney for Amicus Curiae*

*Texas Public Policy Foundation*

### CERTIFICATE OF SERVICE

I hereby certify that on May 14, 2021, a true and correct copy of the foregoing document was filed electronically through the Court's CM/ECF system, and served to:

Jeff P. Johnson

D. John Sauer

Justin D. Smith

Michael E. Talent

[john.sauer@ago.mo.gov](mailto:john.sauer@ago.mo.gov)

Office of the Attorney General of MO

*Counsel for State of Missouri*

Treg R. Taylor

Ronald W. Opsahl

[ron.opsahl@alaska.gov](mailto:ron.opsahl@alaska.gov)

Office of the Attorney General

of AK

*Counsel for the State of Alaska*

Mark Brnovich

Robert J. Makar

[robert.makar@azag.gov](mailto:robert.makar@azag.gov)

Office of the Attorney General of AZ

*Counsel for the State of Arizona*

Leslie Rutledge

Nicholas J. Bronni

[nicholas.bronni@arkansasag.gov](mailto:nicholas.bronni@arkansasag.gov)

Office of the Attorney General of AR

*Counsel for the State of Arkansas*

Theodore E. Rokita

Kian Hudson

[kian.hudson@atg.in.gov](mailto:kian.hudson@atg.in.gov)

Office of the Attorney General of IN

*Counsel for the State of Indiana*

Derek Schmidt

Jerry Edwards

[jerry.edwards@ag.ks.gov](mailto:jerry.edwards@ag.ks.gov)

Office of the Attorney General of KS

*Counsel for the State of Kansas*

Austin Knudsen

David M.S. Dewhirst

[david.dewhirst@mt.gov](mailto:david.dewhirst@mt.gov)

Office of the Attorney General of MT

*Counsel for the State of Montana*

Douglas J. Peterson

James A. Campbell, *pro hac vice*

[jim.campbell@nebraska.gov](mailto:jim.campbell@nebraska.gov)

Office of the Attorney General of NE

*Counsel for the State of Nebraska*

Dave Yost  
Benjamin Flowers  
[bflowers@ohioattorneygeneral.gov](mailto:bflowers@ohioattorneygeneral.gov)  
Office of the Attorney General of OH  
*Counsel for the State of Ohio*

Alan Wilson  
J. Emory Smith, Jr., *pro hac vice*  
[esmith@scag.gov](mailto:esmith@scag.gov)  
Office of the Attorney General of SC  
*Counsel for the State of South Carolina*

Sean D. Reyes  
Melissa A. Holyoak  
[melissaholyoak@agutah.gov](mailto:melissaholyoak@agutah.gov)  
Office of the Attorney General of UT  
*Counsel for the State of Utah*

Mike Hunter  
Mithun Mansinghani  
[mithun.mansinghani@oag.ok.gov](mailto:mithun.mansinghani@oag.ok.gov)  
Office of the Attorney General of OK  
*Counsel for the State of Oklahoma*

Herbert Slatery III  
Attorney General of Tennessee  
P.O. Box 20207  
Nashville, TN 37202  
*Counsel for the State of Tennessee*

Brian M. Boynton  
Eric Womack  
Stephen M. Pezzi  
[stephen.pezzi@usdoj.gov](mailto:stephen.pezzi@usdoj.gov)  
Cody T. Knapp  
[cody.t.knapp@usdoj.gov](mailto:cody.t.knapp@usdoj.gov)  
U.S. Dept. of Justice  
*Counsel for Defendants*

*/s/Robert Henneke*  
ROBERT HENNEKE

### CERTIFICATE OF COMPLIANCE

I certify that the foregoing Amicus Curiae Brief complies with the limitations contained in Rule 84.06 and Local Rule 41. Relying on the word count of the Microsoft Word program, the undersigned certifies that the total number of words contained in this brief is 3,735, excluding the cover, table of contents, table of authorities, signature block and the certificates. The font is Times New Roman 13-point type. The electronic copies of this brief were scanned for viruses and found to be virus free. Pursuant to Rule 55.03, the undersigned further certifies the original of this brief has been signed by the undersigned.

*/s/Robert Henneke*  
ROBERT HENNEKE