

**Public Hearing – Climate Change and RGGI  
House Environmental Resources & Energy Committee  
22 June 2021**

**Testimony of David R. Legates, PhD, CCM  
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I am David R. Legates, a professor and climatologist at the University of Delaware. I also hold a joint appointment in the Department of Applied Economics and Statistics. I served as the Delaware State Climatologist from 2005 to 2011 and was a founder of the Delaware Environmental Observing System, a statewide network for environmental monitoring and analysis that includes Chester County (PA). Recently, I was on leave at NOAA where I served as the Assistant Deputy Secretary of Commerce for Environmental Observation and Prediction and was detailed to the White House as the Executive Director of the United States Global Change Research Program.

I am recognized as a Certified Consulting Meteorologist by the American Meteorological Society and I was part of the US delegation that negotiated a protocol for the first climate data exchange program with the Soviet Union in 1990. I was the recipient of the *2002 Boeing Autometric Award* in Image Analysis and Interpretation by the American Society of Photogrammetry and Remote Sensing and I was awarded First Place in the International Statistical Institute (ISI) and ESRI Paper Competition in Kuala Lumpur, Malaysia. I would like to thank both the Chairman and the Committee for the opportunity to provide my perspective of forty years of experience in climate change.

It is a privilege for me to offer my views on the science involving carbon dioxide and climate change. I might best be described as a statistical hydroclimatologist—someone who researches the interactions between water and climate from an observational setting. I have investigated biases in our evaluation of precipitation

owing to errors in precipitation gage measurement and how they influence satellite and radar estimates. For more than forty years, I have been involved with the analysis of hydrological data to assess the impact of climate variability and change.

Efforts to manipulate the future climate usually focus on trends in the current climate and model projections of what the future climate is likely to be. Other speakers have eloquently described the problems associated with interpretation of the data and the issues associated with climate models. Let me focus then on the molecule that is supposedly responsible for the destruction of our climate—carbon dioxide.

Please note that carbon dioxide is *not* the most important greenhouse gas—that honor goes to water vapor, which is responsible for nearly 90% of the net warming of the planet due to the radiative impact of the Earth's atmosphere. Moreover, our scientific understanding is a doubling of carbon dioxide will yield a warming of only about 2 degrees Fahrenheit on mean global air temperature. In 2005, I participated in a US Senate hearing on climate change. When Professor Michael Mann, now of the Pennsylvania State University, was asked why scientists are more concerned about carbon dioxide than water vapor, his response was that the evaporation of water into the atmosphere is impossible to regulate. Thus, carbon dioxide is the focus of climate change.

Climate is both dynamic and variable. It is ever-changing because it always has changed, and it always will. However, recent arguments have been posited that carbon dioxide is a “magical climate control knob” such that climate responds almost exclusively to the amount of carbon dioxide in the atmosphere. We are told that carbon dioxide is rendering our climate more dangerous—that nearly all weather disasters are increasing in frequency and/or intensity. This increase, the alarmists assert, is directly attributable to increasing concentrations of atmospheric carbon dioxide. Climate models, they warn, forecast that conditions will only get

worse and that our only hope—for both our planet and our children’s future—is to limit the production of fossil fuels with an ultimate goal of becoming “carbon free”.

The fact is that warmer conditions, such as what we currently are experiencing, exhibit less climate variability than colder conditions. The Equator-to-Pole temperature gradient drives the poleward transport of energy in the climate system. Under a warmer world, the Tropics warm but the Poles warm even more. Consequently, the Equator-to-Pole temperature gradient lessens and the outbreak of much severe weather—driven by the interaction of cold polar air with warm tropical air—diminishes. Thus, we would *expect* that in a warmer world, the occurrences of extreme weather events would diminish, rather than intensify.

Historically, civilization has thrived under warmer conditions and struggled when global temperatures plummeted. More vegetation and longer growing seasons are partly responsible but, simply put, colder temperatures kill more people than warmer temperatures. We have currently entered a warmer period in human history. But I do not believe humans are responsible for most of this warming as many other factors exist to cause climate to change. So, to create a plan to ‘stabilize’ the Earth’s climate is like trying to keep the Sun from shining. We cannot halt something that for all history has been variable and so all such attempts at “climate stabilization” are doomed to failure.

While many scientists have observed our changing climate, the hypothesized *dangerous* consequences of rising atmospheric carbon dioxide are too speculative for responsible regulatory policy. In analyzing climate policy, legislators such as yourselves must be cognizant of three key considerations regarding the impact of projected rises in atmospheric carbon dioxide. They are (1) policy choices likely will have no measurable effect on the occurrence of severe weather; (2) positive effects on ecosystems and biodiversity must be considered; and (3) carbon mitigation may not lead to a reduction in atmospheric carbon dioxide.

Given these considerations, you must carefully consider the potential impacts of carbon emission control. If climate change regulation proceeds unchecked, it will produce policy that is out of touch with both the real world and objective science and will likely impose large costs on society that benefit only a small cadre of “climate entrepreneurs,” will provide no meaningful effect on Pennsylvania’s climate, and will adversely affect Pennsylvania’s economy.

***Consideration #1: Efforts at “Climate Stabilization” will have no impact on the Earth’s climate.***

Legislators, such as yourselves, have a responsibility to carefully consider the limitations of the science and the impacts of factors other than manmade carbon dioxide. It would be wrong to attribute all observed impacts to climate change—even more so to greenhouse gases—and even further to efforts that could be controlled by humans. Herein lies our first consideration: that rising atmospheric carbon dioxide concentrations will *not* produce adverse weather and changes to climate beyond what will occur due to natural variation. You must consider that the assumptions regarding future harm from rising atmospheric carbon dioxide are contradicted by the evidence, as has been identified by other presenters in this forum.

You also must reconcile scientists’ failure to find a carbon dioxide greenhouse-warming signal despite extensive and objective scouring of climate records. I have reached a very simple conclusion: atmospheric carbon dioxide is but a minor driver of weather and climate. This lies in sharp contrast to the speculations from computer climate models, which are predicated on a pre-determined relationship between atmospheric carbon dioxide and climate change. Such findings indicate that computer modeling may be inherently limited in its ability to make accurate predictions regarding a system as complex as the global climate. This is not to suggest that computer research is a trivial pursuit; but rather, that it is not

developed enough to generate reliable prognoses for policy making. Thus, informed decisions must weigh all observed climate data rather than relying on outputs from the artificial worlds generated by computer climate models.

***Consideration #2: Legislators must weigh the potential benefits of a changing climate.***

Climate activists often negatively characterize climate change as an unnatural process that is bound only to bring disaster. Unfortunately, some of these characterizations have become embodied in law through judicial decisions and legislative actions. To avoid these shortcomings, you must reject the notion that a changing climate is always detrimental. Instead, the best scientific data available must include the positive effects of climate change. In evaluating the chemical and biological influences of rising atmospheric carbon dioxide, special attention must be paid to our second consideration: that the negative effects on ecosystems and biodiversity of increases in atmospheric carbon dioxide must be properly weighed against the benefits.

You must be careful to avoid the mistake of turning scientifically inaccurate definitions into laws and regulations. In 2007, for example, the United States Supreme Court held that greenhouse gases fit within the Clean Air Act's capacious definition of "air pollutant," creating a non-scientific legal definition. Rather than being an "air pollutant," atmospheric carbon dioxide is the basic building block for all plant life. Legal definitions at odds with science make it impossible to enact sensible policy.

Imprecise language can also lead to exaggerations about the potential dangers of carbon dioxide that may cause legislators to misjudge the urgency of the situation. For example, commercial greenhouses often increase the carbon dioxide levels to enhance plant growth. Most of our planet has greened over the past thirty years and part of the side effect is that plants use water more efficiently under elevated

carbon dioxide concentrations. Yet few politicians or “climate entrepreneurs” consider these positive benefits.

Some scientists have cautioned about the dangers of *carbon myopia*—of seeing and examining only the alleged dangers of rising carbon dioxide levels in the atmosphere while ignoring its potential benefits. Moreover, carbon dioxide-limiting conservation can be bad for biodiversity and harmful to both plants and animals. Such conservation may adversely affect non-arboreal plants, result in shorter tree species, and put non-forested ecosystems at risk and that “tree planting among carbon investors could create perverse incentives leading to major biodiversity losses.”

Not all biological, chemical, and ecological responses to rising atmospheric carbon dioxide portend doom and gloom. Balanced discussions are essential, rather than pursuing a one-sided and misguided strategy of carbon dioxide reduction.

***Consideration #3: Legislators must recognize the possibility that legislation may not lead to a reduction of atmospheric carbon dioxide.***

Professor Roger Pielke Jr. has critically remarked that “very complex policies full of accounting tricks, political pork and policy misdirection” create the false promise of an international climate-solution. Even *Science* magazine reluctantly agreed with this premise. This leads to my third consideration for legislators—that climate “stabilization” may not lead directly to a reduction in atmospheric carbon dioxide.

I have watched legislation toward climate stabilization be enacted in Delaware. I implore the Commonwealth of Pennsylvania to *not* make the same mistake. Let me provide you with our example. To facilitate a green economy and cut carbon dioxide emissions, the State of Delaware has given more than \$18 million of taxpayer money in cash and incentives to Bloom Energy to create green energy jobs. We are on the hook for another nearly two decades of subsidies. This

boondoggle is funded predominantly by Delmarva Power ratepayers through a feed-in tariff which has made electricity in Delaware more expensive as, to date, Delmarva ratepayers have paid nearly \$300 million to Bloom Energy. Amazingly, Delaware declared natural gas as a renewable energy resource—but only if consumed in a Bloom Energy fuel cell. This allowed Bloom Energy to qualify for subsidies under the Renewable Portfolio Standards Act (RPSA). Just over 300 jobs were ultimately created, and the removal of hazardous waste that Bloom claimed its fuel cells do not create has been an ongoing problem. Presently, a consortium of both conservative and environmental groups is fighting to get the Bloom Energy deal repealed. Unfortunately, the Delaware State Legislature refuses to remedy the problem. And all of this has occurred as a direct result of our intent to lower greenhouse gas emissions according to our climate action plan and to make Delaware a “green energy” state.

### ***Conclusion***

As prudent legislators, please do not fall for the shortsightedness of the alarmist presentation of human-induced global warming. Rather, given the potential costs and impacts, be suspicious that advocates have subverted science to further their own causes. Understandably, the extent of uncertainty regarding the role and impact of rising atmospheric carbon dioxide may come as a shock to those swept up by the fanaticism. Given the uncertainty involved, you must consider the scientific data carefully.

Please consider the following questions: Do we really want a future based on the grievous misunderstanding engendered by carbon myopia? Can the Commonwealth afford to ignore the real harm that would be caused by adhering to these fallacies about carbon dioxide? You must have the courage to stand against climate alarmism and stand for rational stewardship and for reliable, affordable energy. I urge Pennsylvania to do the right thing and to reject any deal

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that would restrict carbon emissions to accomplish “climate stability”. Only in that way can the jobs, health, welfare, economic opportunities, environmental quality, living standards, and civil rights of Pennsylvania’s citizens that depend so critically on hydrocarbon energy be protected.

Thank you again for the opportunity to present my views to you today.

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