# ARE CARBON TAXES A GOOD IDEA?

## Happer and Everett versus Hartley

**The Global Warming Policy Foundation**
Open debate 2

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## Editor's note

This debate was prompted by Professor Hartley's paper, *It Pollutes, So Tax It: Need We Say More About Carbon Dioxide,* hereafter 'Hartley 2022', which appeared as GWPF Technical Paper 7.

## About the debaters

***William Happer***

William Happer is the Cyrus Fogg Brackett Professor of Physics, Emeritus, at Princeton University, and a long-term member of the JASON advisory group. He is a member of the Academic Advisory Council of GWPF.

***Bruce Everett***

Bruce M. Everett, PhD, is a specialist in international energy and environmental policy. After starting his career in the US Department of Energy, he worked as an Executive for ExxonMobil and has taught courses in the international petroleum market at the Fletcher School and the Georgetown School of Foreign Service.

***Peter Hartley***

Peter R. Hartley is George A. Peterkin Professor of Economics, Economics Department, and Rice Faculty Scholar, Center for Energy Studies, Baker Institute for Public Policy, Rice University and Visiting Adjunct Professor of Economics at the University of Western Australia.

# Why carbon taxes are a bad idea

## William Happer and Bruce Everett

By training, economists gravitate to tax policy to solve problems. Even economists who are skeptical of the extreme claims of climate advocates often support carbon taxes as a 'sensible' compromise. A carbon tax, however, would be a terrible idea. Here's why.

Corrective taxes are based on the concept of the *externality*, defined as a consequence of a transaction that affects someone not party to the transaction and is therefore not priced into the transaction. The textbook response to externalities is the imposition of a 'Pigouvian tax' (named after British economist Arthur Pigou) equal to the amount of the externality. Such a tax adjusts the price of the transaction so that it equals its total social cost. Pigouvian taxes sound great, but only work if the externality (a) is negative and (b) can be quantified. Carbon dioxide meets neither test.

The textbook case of an externality correctable through a Pigouvian tax is pollution. The Oxford Reference Library defines pollution as 'Contamination or undesirable modification of soil, food, water, clothing, or the atmosphere by a noxious or toxic substance.[1]' If the production of a certain good causes pollution, policymakers can estimate the health impacts and set a tax rate that captures this externality in the price of the good. Alternatively, they can limit or otherwise regulate the pollutant.

A proper public understanding of carbon dioxide has been derailed by the deceptive and misleading term 'carbon pollution'. The use of the word 'pollution' suggests that carbon dioxide is harmful to human health, in the same way as sulfur oxides, nitrogen oxides, carbon monoxide or soot. Carbon dioxide is in fact a benign gas, essential to all life on Earth, and is nothing like these other substances. In no sense can it be regarded as noxious or toxic.

Consider, for example, carbon monoxide (CO). When inhaled, carbon monoxide displaces oxygen in the blood, with serious health consequences. The US Occupational Safety and Health Administration sets a maximum limit of 50 parts per million (ppm) in the surrounding air. Concentrations as low as 9 ppm are believed to cause some adverse health effects. At 400 ppm, carbon monoxide is usually fatal.[2] Limiting carbon monoxide concentrations in the atmosphere is clearly an appropriate subject for environmental policy.

Human beings, however, require a minimum amount of $CO_2$ in their bloodstream – a by-product of normal respiration. Exhaled air contains about 40,000 ppm of $CO_2$ – a hundred times the current atmospheric level. More $CO_2$ in the blood decreases the pH from its slightly alkaline equilibrium value of 7.4. Less $CO_2$ in the blood increases the pH and makes the blood more alkaline. People breathe mainly to expel $CO_2$ and maintain blood pH close to its optimum value. If there is too little $CO_2$ in the blood, for example from hyperventilation, alkalosis sets in. If not corrected, this can be fatal.

To ensure the safety of crews of submarines or spacecraft, many studies have been performed to see what levels of $CO_2$ in inhaled air

might be a problem. The US Navy sets the limit at 5,000 ppm of $CO_2$, more than 10 times the current atmospheric concentration. No conceivable scenario of $CO_2$ emissions from fossil fuel use will have any harmful physiological impacts on humans or animals.

Although atmospheric $CO_2$ has no impact on people, its impact on plants is positive. Controlled experiments show that almost all plants grow much better at $CO_2$ levels that are double or quadruple current atmospheric concentrations. In fact, in historical terms, plants are currently malnourished, because $CO_2$ concentrations are so much lower than those that have prevailed over geological history.

Two main factors make higher concentrations of $CO_2$ beneficial to plants. The first is efficient respiration. Plants live by using a special enzyme, known as rubisco, to convert $CO_2$ and water into sugar. If plants cannot find sufficient $CO_2$, they will use oxygen instead, which produces chemicals the plant cannot use without expending significant energy, a process known as photorespiration. Photorespiration is estimated to waste 25% of plant productivity. Doubling $CO_2$ concentrations would cut photorespiration losses in half.

The second benefit of $CO_2$ is water-use efficiency. When there is more $CO_2$ in the air, plants grow leaves with fewer pores (known as stomata) and therefore lose less water by transpiration. The plants can then better cope with arid conditions and are less affected by droughts. Satellite observations show pronounced greening of the Earth as a result of the modest increase in atmospheric $CO_2$ experienced so far.[3] This greening is evidence of higher crop yields in places such as Africa, where growing populations are desperate for additional food supplies.

Given this situation, the argument over carbon dioxide has nothing to do with 'pollution' as that term is generally understood. The real argument is about the influence of $CO_2$ on the Earth's climate.

Over recent decades, a politically powerful but scientifically dubious movement has developed, claiming that expected levels of $CO_2$ emissions from fossil fuels will cause the Earth's atmosphere to warm dramatically, with disastrous consequences, including more frequent and intense storms, droughts, disease, abnormal rainfall, ice cap melting, sea-level rise, 'ocean acidification', wildfires and other problems. Adherents of this view demand the rapid phase-out of fossil fuels and see renewables as a viable, low-cost substitute.

The Earth's climate is one of the most complex systems known. Conditions in the atmosphere and the ocean vary dramatically from region to region and hour to hour. Long-term changes can be influenced by many factors, including solar activity, slight changes in the Earth's orbit, ocean currents and volcanic activity, as well as greenhouse gases. None of these, nor their interaction, is well enough understood to reliably predict changes in the overall climate over time.

While it is generally agreed that $CO_2$ is a greenhouse gas, with some warming properties, there is no agreement on the magnitude of the warming that is likely to result or its consequences. Climate activists base their dire warnings on computer models that assume a strong positive feedback effect from increased humidity and changes in cloud cover as the atmosphere warms. If $CO_2$ concentrations in the atmos-

phere were to double, these feedback effects, it is argued, will generate a temperature increase of several degrees Celsius, compared to the calculated 'feedback-free' increase of about 1°C. The results would supposedly be damaging.

The essence of science, however, is neither consensus by experts nor the output of computer models, but rather the testing of hypotheses against actual data. Climate models have been generating apocalyptic scenarios for 40 or so years, but what has actually happened?

Since the year 1900, the average global temperature has increased about 1°C, mostly at far northern latitudes, in the winter, and at night. It is generally agreed that this warming was due partly to natural effects, such as recovery from the Little Ice Age, and partly to increases of greenhouse gases, mostly $CO_2$, but with minor contributions from methane and nitrous oxide. Overall, however, observed warming appears close to the feedback-free value of around 1°C for a doubling of $CO_2$.

The computer models cited by climate activists have all 'run hot' – predicting much more warming than has occurred. Actual data support neither the hypothesis of a large positive feedback nor scenarios of catastrophic climate change.

Climate activists see the Earth's climate as fragile, subject to 'tipping points' that can bring disastrous consequences. Over geological time, however, the climate has undergone massive changes in temperature and composition, yet always seems able to restore equilibrium. The climate, like other natural systems, conforms to 'Le Chatelier's principle', which states that natural systems are generally subject to equilibrium-restoring negative feedbacks. The climate appears to be far more robust than climate activists assume.

The failure of the dire predictions of climate models to materialize has created a serious problem for those advocating fossil fuel reduction. One of their responses has been to categorize all severe weather events as proof of the adverse effects of atmospheric $CO_2$. There are two problems with this line of argument.

First, it isn't true. The events so often hyped by the media are within the normal range of experience. Specifically:

- Hurricanes show some cyclicality, apparently associated with southern oscillation events such as El Niño and La Niña, but there is no known correlation between hurricane frequency or intensity and $CO_2$ levels.

- California is indeed experiencing a severe drought, but that state has a long history of such droughts unrelated to $CO_2$ emissions. For the US as a whole, the most severe periods of drought have been the 1930s and 1950s.[4]

- California's wildfires, often cited as evidence of 'climate change', are more closely related to population shifts and poor forest management than to $CO_2$.

- Sea levels continue to rise worldwide, but at the same rate as that experienced over the last hundred or more years.

- 'Ocean acidification' is a clever way of saying that the oceans will

become slightly less alkaline than in the past. Alkalinity, however, will remain within the range for healthy growth of coral reefs and other sea creatures.

Media hype is no substitute for a real understanding of these events and familiarity with historical data.

The second problem is simply logic. In our universe, cause must precede effect. It makes no sense to argue that the consequences of warming are occurring, even though the predicted warming itself has not happened.

Evidence of the substantial uncertainty surrounding the influence of $CO_2$ on climate is the inability of even the most ardent climate activists to quantify the damages associated with their predicted warming. The US Government calculates a number called the 'social cost of carbon' (SCC) for use in making cost-benefit analysis for regulatory decisions. The current administration estimates the SCC at about $50 per metric tonne of $CO_2$ emitted to the air. A look behind this number, however, uncovers a truly questionable methodology. The combined climate-damage models used in the analysis show almost no economic losses in the next hundred years and very little loss between 100 and 200 years out. The $50 number assumes that global economic growth continues apace, making the average human quite rich two hundred or more years from now. Assuming a modest loss of GDP at that time, discounted to the present using an artificially low discount rate, generates the $50. In other words, the implication is that today's poor should make major sacrifices to prevent minor inconvenience to tomorrow's rich. A strong case can be made that $CO_2$ additions at current rates will be beneficial for centuries. So the SCC is in fact negative.[5]

In conclusion, analysis suggests the following externalities of atmospheric $CO_2$ :

- no impact on human and animal health,
- a substantial positive impact on plant growth and crop yields,
- positive impacts from the modest warming observed so far, and
- no empirical support for net damages, which remain a prediction, not an observation.

It's difficult to extract from this analysis any basis for supporting a Pigouvian tax on $CO_2$. The United States currently emits roughly 5 billion metric tonnes of $CO_2$ per year, mainly from fossil-fuel use. A carbon tax at $50/mt (the US Government's SCC) would impose an annual burden of $250 billion on the US economy or approximately $2,000 per household. This burden would be in addition to the substantial increases in gasoline, heating oil, natural gas and electricity prices experienced over the last year. Despite the best hopes of climate activists, renewable energy is too costly and performance-limited to replace the fossil fuel economy.[6]

Pigouvian taxes are appropriate when an identified externality (a) is negative and (b) can be quantified. Carbon dioxide meets neither test, and a carbon tax would create a substantial dead-weight loss to the

***Notes***

economy for no benefit at all.

1. https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100335169.

2. https://www.abe.iastate.edu/extension-and-outreach/carbon-monoxide-poisoning-health-effects-aen-166/.

3. Source: NASA at https://www.nasa.gov/feature/goddard/2016/carbon-dioxide-fertilization-greening-earth.

4. For data, see US Environmental Protection Agency at https://www.epa.gov/climate-indicators/climate-change-indicators-drought.

5. For a more complete analysis of this problem, see *The Social Cost of Carbon and Carbon Taxes – Pick a Number, Any Number* by Bruce Everett at https://CO2 coalition.org/publications/the-social-cost-of-carbon-and-carbon-taxes-pick-a-number-any-number/.

6. For a more complete discussion of the problems of renewable energy, see *Dumb Energy – A Critique of Wind and Solar Energy*, by Norman Rogers.

# Comment on 'Why carbon taxes are a bad idea'

**Peter Hartley**

The first point that Everett and Happer make is that carbon dioxide is not a pollutant in the sense of a noxious or toxic substance. To the contrary, it is essential to human existence not least because of its extremely beneficial effects on plants via what I termed, in Hartley (2022),[1] the 'aerial fertilizer effect.' I also presented evidence that additional atmospheric $CO_2$ not only has greened the Earth, but also increased agricultural productivity. I also noted that these beneficial effects increase the cost of reducing $CO_2$ emissions. It is indeed possible, as Everett and Happer imply, that these beneficial effects could be large enough, when added to the forgone benefits of fossil fuels as an energy source, to more than offset the potential negative effects on climate of $CO_2$ accumulation in the atmosphere. That would indeed imply that taxing $CO_2$ emissions would be 'a bad idea.'

Everett and Happer next discuss whether the potential harm from the influence of $CO_2$ on the Earth's climate is likely to be large enough to offset the aforementioned benefits. They make five key points:

- Many poorly understood natural factors affect the Earth's climate (I would say the Earth's climates, plural, a distinction that I argue is important for policy).
- There is great uncertainty about the warming effects of $CO_2$, especially because of uncertainty about the strength of any feedbacks to an initial warming.
- The 'apocalyptic scenarios' found in the output of computer models have been contradicted by many lines of evidence. 'Actual data support neither the hypothesis of a large positive feedback nor scenarios of catastrophic climate change.'
- 'Geological time' data seems to support the notion that climates, like other natural systems, conform to 'Le-Chatelier's principle' whereby negative feedbacks always restore equilibrium following sometimes even massive shocks.
- Severe weather events touted as 'proof of the adverse effects of atmospheric $CO_2$ ' are in fact 'within the normal range of experience' and in any case cannot be attributed to $CO_2$ accumulation if temperature increases cannot be.

In Hartley (2022), I made most of these and several related points. A lower mean effect of $CO_2$ on warming because of lower mean feedbacks will also reduce the variability of the warming and thus the 'insurance value' of reducing $CO_2$ accumulation. Uncertainty about the effects of $CO_2$ emissions on $CO_2$ accumulation in the atmosphere adds to uncertainty about the effect of that accumulation on temperature, and the effects of temperature changes on severe weather events. As a result, the link from the policy instrument – reduced $CO_2$ emissions – to the policy target – extreme weather events – is extremely uncertain. A general result in the theory of economic policy is that such uncertainty about the

effect of an instrument on a target implies that the instrument should be used less aggressively. The likelihood that uncertainties could be reduced with more research strengthens the case for moderation in the short run.

Most importantly, I argued that 'climate change' should be understood as 'a change in the distributions of the various climate variables at one or more locations.' The harm from extreme weather events, whether within the range of natural variability or pushed beyond it by $CO_2$-induced temperature change, and the events likely to be of most concern, will vary considerably across locations. Disparate effects will make market insurance more effective at ameliorating the welfare impacts of extreme weather events. They also greatly strengthen the case for taking defensive actions that reduce the expected cost of damage from adverse weather events. Each locale can tailor defensive measures to counter the types of extreme events it finds most threatening, while retaining benefits from continued fossil-fuel use and any beneficial effects from $CO_2$ accumulation. Unlike $CO_2$ emissions control, defensive measures can be implemented without requiring agreement in contentious and inherently adversarial international deliberations. Implementation of defensive measures would also further reduce the possible benefits of reduced $CO_2$ accumulation and thus of $CO_2$ emissions control.

Reducing $CO_2$ emissions in just some countries, and especially exempting large-population developing countries, where most increases in energy use will occur over the next few decades, could yield at best trivial benefits. Yet, as has been proven by events in 2022, reducing fossil-fuel production in developed western economies alone, and increasing reliance upon China for wind turbines, solar panels and critical 'energy minerals', is dangerous to energy and national security.

If a government insists on reducing $CO_2$ emissions, economists support Pigouvian taxes as the most efficient policy, but only if costly and ineffective command and control regulations are simultaneously eliminated. Moreover, if the case for a tax on $CO_2$ emissions is weak, the case for mandating costly, poorly-performing alternative energy technologies that also compromise energy and national security is even weaker.

In summary, economic analysis implies a clear hierarchy in policies aimed at moderating the harmful effects of extreme weather events. First, eliminate harmful command and control regulations of the energy industry, imposed in the name of 'climate policy,' which inflict substantial costs without any proven benefits. Second, each jurisdiction should implement cost-effective defensive measures that protect against, and reduce the costs of, harmful weather events, no matter the cause. Third, and only if the then greatly reduced expected costs still warrant it, and only if effective international agreement can be obtained, Pigouvian taxes on $CO_2$ emissions could be imposed. So, yes, simply proposing a tax on $CO_2$ emissions without these preconditions would indeed be 'a bad idea.'

### *Note*

1. P Hartley, *It Pollutes, So Tax It: Need We Say More About Carbon Dioxide,* Technical Paper 7, The Global Warming Policy Foundation, 2022.

## About the Global Warming Policy Foundation

People are naturally concerned about the environment, and want to see policies that protect it, while enhancing human wellbeing; policies that don't hurt, but help.

The Global Warming Policy Foundation (GWPF) is committed to the search for practical policies. Our aim is to raise standards in learning and understanding through rigorous research and analysis, to help inform a balanced debate amongst the interested public and decision-makers. We aim to create an educational platform on which common ground can be established, helping to overcome polarisation and partisanship. We aim to promote a culture of debate, respect, and a hunger for knowledge.

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