

## The Case for a Low Carbon Tax

Roger Pielke Jr.\*

Conventional wisdom in the climate debate is that a high price on carbon is necessary as a central feature of climate policy. The underlying logic is that people need to feel a price signal in order to change their behaviors and to motivate political decision making leading to deep decarbonization. Of course, people do respond to energy price signals, in some cases in the form of political action against those who increased energy prices, such was the case among the *gilets jaunes* (yellow vests) protesters in France. Despite ample research and real-world evidence against the prospects of establishing high carbon prices, conventional climate policy discussions have stubbornly refused to consider alternative approaches to high carbon prices. In this essay I outline the case for a low-and-rising carbon price, one that is consistent with political realities and that seeks to avoid unintended policy consequences.

Economists have long recognized that a price on carbon is necessary if deep decarbonization of the global economy is to succeed. The economic case for pricing carbon arises directly from economic theory that was initially developed more than a century ago by economists such as Alfred Marshall and Arthur Pigou. The idea is straightforward: the burning of fossil fuels results in harms to society that are not reflected in the market prices of coal, oil and natural gas. A carbon price would address this mismatch between harm and price. Pricing mechanisms have been successfully applied in policies related to pollution, drinking, smoking and other activities that cause societal harms unreflected in market prices.

The fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC) explains the logic of carbon pricing as follows: “Policies that provide a real or implicit price of carbon could create incentives for producers and consumers to significantly invest in low-GHG products, technologies and processes” (IPCC 2007). The IPCC uses integrated assessment models to project the consequences of carbon pricing on emissions, under highly idealized assumptions. The IPCC fifth assessment report assessed scenarios for 2020 under which a uniform, global carbon price ranging from >\$10 ton (of carbon dioxide-equivalent) to more than \$100 per ton. For 2100 the range spanned >\$30 per ton to >\$800 per ton (Edenhofer et al. 2014). In the models, such prices on carbon dioxide successfully mitigate climate change to a range of target levels.

However, models are not the real world. According to the World Bank, in 2019 only 5.5% of global greenhouse gas emissions are covered by a carbon tax, and another 9.8% are covered by

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\* Professor, Environmental Studies Program, University of Colorado Boulder, US

emissions trading mechanisms that establish a price on carbon.<sup>1</sup> What accounts for the difference between what we see in idealized models and what we observe in the real world?

In *The Climate Fix* (Pielke 2010), I explained that there is an “iron law” of climate policy which holds that when economic growth and emissions reductions collide, economic growth will win out every time. Economists argue that over the long-term, taxes are economically efficient and may in fact contribute to economic growth (not to mention the health of the planet). While this may or may not be true, elections occur in the short-term and many people often vote based on their wallets, and very few vote based on century-long estimates of discounted costs and benefits that are calculated via esoteric models.

Jenkins (2014) conducted an assessment of the “iron law” and concluded that indeed, “addressing climate change externalities by pursuing an “economically optimal” or “first-best” Pigouvian carbon price is likely to yield suboptimal outcomes in practice when such policy efforts collide with real-world political economy constraints.” In plain English: the “iron law” is real and it matters. Evidence indicates that although carbon pricing is politically possible, it is virtually certain that carbon prices at the levels used in idealized models, such as those assessed by the IPCC, cannot be approached in the real world.

Some have looked at the gap between what theory says is needed for carbon pricing and that which might be possible and concluded that carbon pricing cannot serve as an effective tool of climate mitigation (e.g., Patt and Lillestam 2018). Yet, effective carbon pricing remains a necessary element of any successful suite of mitigation policies. One reason for the necessity of carbon pricing can be found in the following argument: if alternatives to fossil fuels are deployed in such amounts that they significantly depress demand for oil, gas and coal, this will have the market effect of reducing prices of these commodities. That will make fossil fuels more competitive against alternatives. There is thus a paradox here: the more successful that decarbonization is, the harder it becomes because of the simple economics of supply and demand. Thus, to evade this paradox, a floor price is needed on fossil fuels, maintained by a rising carbon price.

German economist Hans Werner-Sinn (2008) has argued that there is another “green paradox” lurking in carbon pricing. A commitment to a rising carbon price could create incentives for greater production and consumption of fossil fuels in the short term as the expected value of these commodities will be greater today than in the future. Werner-Sinn writes: “good intentions do not always bring good deeds.” To succeed, carbon pricing policy design therefore must recognize the real-world political constraints of the “iron law” and the potential unexpected consequences of “green paradoxes.”

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<sup>1</sup> [https://carbonpricingdashboard.worldbank.org/map\\_data](https://carbonpricingdashboard.worldbank.org/map_data)

To meet these constraints, I recommend three criteria of policy design for carbon pricing:

- Clearly distinguish the existence of a carbon tax from the level at which it is set. These issues can and should be considered to be separate political questions.
- Any carbon price designed to rise over time must consider, in addition to political economy constraints, the resulting incentives in commodity markets to minimize “green paradox” effects.
- Revenue raised via a carbon tax should be recycled, ideally with some large fraction invested into clean energy innovation (Galiana and Green 2010), thus creating a virtuous cycle in which technological advances and deployments provide evidence of tangible benefits of carbon pricing, thus reinforcing political support (Beiser-McGrath and Bernauer 2019).

Taken together, these three criteria suggest that climate policy advocates should focus on the establishment of a low carbon price, implemented upstream in fossil fuel extraction markets for simplicity sake and harmonized worldwide.

How low is low? I have argued for a price of \$5 per ton of carbon dioxide or lower, but the fact that ExxonMobil and other fossil fuel companies have endorsed a price of \$40 per ton,<sup>2</sup> it would seem that there is ample political space to establish a carbon price at some low level. A \$1 per ton carbon dioxide tax, would (at market prices at the time of this writing) increase the cost of petrol by <1%, natural gas by about 2% and coal by about 7%.<sup>3</sup> Those wanting a substantially higher price should engage that debate once a globally-harmonized price is established.

Policies would also need to be put into place for the pace of increase in carbon pricing, perhaps tied to the rate of deployment of carbon-free energy technologies. Similarly, policies would need to be established for revenue recycling. Globally, in 2020 a \$1 carbon dioxide tax would raise about \$40 billion, and in the U.S. about \$5 billion. The bulk of these proceeds should be used to invest in energy innovation, to develop and deploy the technologies that will be necessary to achieve deep decarbonization this century (Galiana and Green 2010). One model for how such innovation might be supported is the Consultative Group for International Agricultural Research,<sup>4</sup> an international consortium of groups focused on innovation in agriculture needed to address poverty, hunger and environmental degradation.

An additional benefit of proposals to establish a low-and-rising carbon tax is it offers a test of seriousness of commitment to mitigating climate change. It would be safe to conclude that any government that cannot support such a tax is decidedly unserious about climate change. A low carbon price is thus not only necessary, but it may be the only feasible approach to carbon pricing.

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<sup>2</sup> <https://www.clcouncil.org/our-plan/>

<sup>3</sup> <https://www.resourcsmag.org/common-resources/calculating-various-fuel-prices-under-a-carbon-tax/>

<sup>4</sup> <https://www.cgiar.org/>

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### Writer's Profile

Roger Pielke Jr.

He founded and served as Director of the Center for Science and Technology Policy Research at the University of Colorado Boulder from 2001 to 2007 and from 2013 to 2016. He was a visiting scholar at Oxford University's Saïd Business School in the 2007-2008 academic year. His interests include understanding the politicization of science; decision making under uncertainty; policy education for scientists in areas such as climate change, disaster mitigation, energy policy; and sports governance.