

Can a Carbon Tax Solve Man-Made Global Warming?

By: Ronald Bailey – January 16, 2013

Last week, the U.S. National Climate Data Center declared that 2012 was the warmest year on record for the lower 48 states by a healthy margin. In fact, 2012 was more than 3 degrees Fahrenheit warmer than the 20th century average and 1 degree warmer than the previous record year of 1998. In addition, the National Oceanic and Atmospheric Administration flatly declared, in the draft version of its National Climate Assessment report, “Climate change is already affecting the American people” and it is “primarily driven by human activity.”

The balance of the scientific evidence currently bears this out. So if it's true that man-made global warming will cause significant problems for humanity, what should be done about it?

Back in 1992, the Rio Earth Summit launched an international negotiation process under the United Nations Framework Convention on Climate Change (UNFCCC) with the aim of preventing “dangerous anthropogenic interference with the climate system.” In 1998, that process produced the Kyoto Protocol under which developed nations committed to cutting their greenhouse gas emissions (chiefly carbon dioxide) by an average of 5 percent below the levels they emitted in 1990. The goal was to ration carbon dioxide emissions through an international cap-and-trade carbon market.

The United States subsequently refused to join the Kyoto Protocol and only the European Union set up a carbon-trading market. As the recent U.N. climate change conference in Doha made clear, the Kyoto Protocol has failed. The nations of the world are now supposed to reach some kind of binding agreement on limiting greenhouse gas emissions by 2015 that would go into effect by 2020. Since Kyoto Protocol-style cap-and-trade schemes have failed, what other policies might gain international acceptance? One of the chief contenders is a system of carbon taxes.

Before weighing the merits of the carbon tax idea, it's worth considering whether limits on greenhouse gases (chiefly carbon dioxide) may be justified in the first place. In a persuasive 2009 article, “Taking Property Rights Seriously: The Case of Climate Change,” Case Western Reserve University law professor Jonathan Adler argues that carbon dioxide emissions may be likened to common law nuisances. Under common law, property owners are not permitted to use their property in ways that damage their neighbors' property, e.g., you may not build a pond that floods your neighbor's field. In Adler's view, the people who benefit from producing, selling, and buying products and services that emit carbon dioxide should similarly be held liable for the damages caused to their neighbors as a consequence of emissions-induced temperature increases. Such damages might include flooding from rising sea levels and more intense rain events or crop losses due to changes in rain and temperature regimes.

In other words, carbon dioxide emissions generated in the production of certain goods and services likely impose costs on people, but those costs are not borne by the producers and consumers of those goods and services and are thus not reflected in their prices. Such costs are often called externalities because they are outside the market processes that would otherwise

oblige producers and consumers to pay for them. Ideally, people could seek restitution in court for damages caused by emissions and the damages paid would be reflected in the price consumers are charged.

The trick is identifying those who are actually causing climate damage and those who are being harmed by it. As the Nobel Prize-winning economist Ronald Coase argued in his seminal 1960 article, “The Problem of Social Cost,”[\[PDF\]](#) assigning property rights solves this sort of puzzle by enabling people to settle the issue of liability and payment for damages. Notionally, in the case of global warming, people would be assigned property rights to the atmosphere, leaving would-be polluters to negotiate payments with these owners for the right to emit carbon dioxide. But as Coase acknowledged, sometimes the transactions costs—meaning the costs of identifying who’s harmed, the amount of the damages, and the costs of adjudication—would simply be too great to be practical.

In the eyes of many people, it appears quite impractical to assign property rights to the global atmosphere, even though externalities are clearly being imposed upon third parties. In such cases, the conventional argument holds that government intervention is necessary to force market participants to take account of the damages—the externalities—that they impose on third parties. After the failure of the Kyoto Protocol, one such intervention getting the attention of both the public and policymakers is a tax on carbon dioxide emissions.

In his 1988 introduction to *The Firm, the Market, and the Law*, however, Coase countered this line of thinking. “The ubiquitous nature of ‘externalities’ suggests to me that there is a *prima facie* case against intervention,” he wrote, “and the studies on the effects of regulation which have been made in recent years in the United States, ranging from agriculture to zoning, which indicate that regulation has commonly made matters worse, lend support to this view.” So the question is: Would a carbon tax make matters worse?

Let’s take a look. Most economists prefer a revenue-neutral carbon tax that would be imposed at the mine-head for coal, the wellhead for natural gas, and at the refinery-gate for petroleum products. Revenue neutral means the tax would not increase government revenues, but would replace other taxes. One often-heard proposal is a dollar-for-dollar reduction in taxes on labor (the payroll tax) and on capital (the corporate income tax). One significant upside is that reducing taxes on labor and capital boosts economic growth by encouraging people to work harder and invest more. Another plus is that carbon taxes would ideally displace top-down command-and-control regulations such as the Environmental Protection Agency’s new rules on electric power plant emissions and subsidies to wind, solar, and bioethanol energy production.

One big distributional concern, however, is that a carbon tax falls more heavily on the poor since they spend a higher proportion of their incomes on energy-intensive goods and services than do the better off. One way to address the regressive distributional consequences is a tax-and-dividend proposal in which every American receives an equal share of the carbon taxes collected that is deposited each month in their bank accounts. While this idea addresses the concern about the regressive nature of carbon taxes, it lessens the incentives that offset taxes would provide for increased work and investment.

In terms of mitigating future climate change, a revenue neutral carbon tax would encourage producers and consumers to economize on energy produced by burning coal, natural gas, and oil that produce climate-damaging carbon dioxide emissions. Boosting the price of fossil fuels aims to enable actors in markets, not politicians and bureaucrats, to pick the least costly ways to cut

emissions. Taxing carbon is also supposed to call forth innovation that would eventually create low-cost no-carbon sources of energy.

This is precisely what the European cap-and-trade carbon market was supposed to achieve. However, a 2011 report by the Swiss bank UBS found that the European Trading Scheme had cost European consumers \$277 billion for “almost zero impact.” This waste of money occurred because European countries issued far too many carbon dioxide emissions permits so that their prices were too low to encourage investment in energy innovation. In order to avoid the European mess, the folks over at Carbon Tax Center argue that a much higher carbon tax is needed. As an example, they point to a 2009 bill sponsored by Rep. John Larson (D-Conn.) which would impose an initial carbon tax of \$15 per ton and then increase it every year by \$10 to \$15 per ton for the next 10 years. A carbon price of \$120 per ton would add about \$1 to the price of a gallon of gasoline and 5 cents per kilowatt-hour to the retail price of electricity.

It is likely that such a high tax would result in significant carbon dioxide emissions reductions. But what might a U.S. carbon tax by itself achieve with regard to altering the course of future man-made climate change? Not all that much, argues Chip Knappenberger, the assistant director of the Center for the Study of Science at the libertarian think tank, the Cato Institute. Knappenberger points out that the U.N. Intergovernmental Panel on Climate Change (IPCC) projects an increase in global average temperature of about 3 degrees Celsius by the end of this century. Assuming the projected trajectory of overall global emissions by all countries, if the U.S. were somehow to completely eliminate all of its greenhouse gas emissions now that would reduce future warming by only 0.2 degree Celsius by 2100. In other words, the globe would warm by 2.8 degrees Celsius instead of by 3.0 degrees Celsius.

So clearly if the projected damages caused by future man-made warming are to be mitigated, most countries in the world would have to adopt a carbon tax. A globally harmonized carbon tax would be collected and spent by each country—there would be no international tax financing any international agency. An advantage of carbon taxes is that they function much like tariffs, which are much more transparent than cap-and-trade schemes. In addition, countries that do tax carbon could impose tariffs on goods imported from countries that don't so that their home producers are not disadvantaged by high energy prices. But is it really feasible that most countries in the world would adopt a carbon tax?

To get at this question, University of Sussex economist Richard Tol has calculated what he evocatively calls the Leviathan carbon tax. Tol defines his Leviathan tax as the maximum carbon tax that is budget-neutral—that is, all other taxes are reduced to zero and replaced by a carbon tax. The Leviathan tax takes into account the carbon intensity of each country, meaning the amount of carbon dioxide generated by every dollar of growth in the economy. He finds that Nigeria and Liberia could finance their entire government budgets with a \$1 per ton carbon tax. Any more than that would funnel more revenues into government coffers and grow the size of their governments relative to their private sectors.

Tol uses World Bank tax data that excludes taxes that directly finance social security programs to determine the percent of GDP paid in tax revenues to the U.S. government. Tol calculates that a tax of \$223 per ton of carbon dioxide could replace all revenues derived from U.S. income and corporate taxes. To replace all tax revenues, China would have to levy a carbon dioxide tax of \$29 per ton; India \$45; Germany \$267; Japan \$450; and the United Kingdom \$855 per ton. In each case, collecting more violates revenue neutrality and increases government tax revenues.

Tol then calculated what level a globally harmonized carbon tax would have to reach to limit greenhouse gas atmospheric concentrations (now 390 parts per million) to 650 ppm carbon dioxide equivalent (CO_{2e}), 550 ppm CO_{2e}, and 450 ppm CO_{2e}. The IPCC argues that it will be necessary to keep greenhouse atmospheric concentrations below 450 ppm in order to have at least a 50-50 chance of keeping the increase in global average temperature below 2.0 degrees Celsius. According to Tol's calculations, that implies a global \$149 per ton carbon tax imposed beginning in 2015.

Imposing such a steep carbon tax in countries like China, India, Russia, and Indonesia would dramatically increase the percentage of their GDP that flows into government coffers, which, in turn, would greatly enlarge their governments. On the other hand, if those nations did not collect a \$149 per ton tax, it would mean that other countries would have to raise their taxes in order to keep greenhouse gas concentrations below the 450 ppm threshold. By the way, Tol calculates that a \$149 per ton tax could replace two-thirds of current federal income tax revenues in the United States.

Assuming that man-made climate change is imposing damage and costs on third parties, there is a strong libertarian case they should be compensated. However, the preferred Coasean policy of establishing and allocating property rights and then allowing negotiations over proper compensation is impractical. If a carbon tax is to be the next best alternative to a property rights regime for mitigating harms caused to third parties by future climate change, it should be revenue neutral and globally harmonized.

History reveals that the prospect of government fiscal restraint in the presence of new revenue streams is not promising. For example, Thomas Pyle, the president of the Institute of Energy Research, has pointed out that the top rate of the new U.S. income tax in 1913 started out at 7 percent, but under pressure of World War I reached 77 percent by 1918. In addition, Tol's Leviathan Tax analysis suggests that it is unlikely that a globally harmonized carbon tax is achievable. One counter-argument is that if the U.S. and other developed nations were to adopt a high carbon tax this could spur more rapid technological development of cheaper no-carbon and low-carbon energy technologies that poorer countries could then adopt to leapfrog over further burning of coal, natural gas, and oil.

In 1988, Coase argued, "The fact that governmental intervention also has its costs makes it very likely that most 'externalities' should be allowed to continue if the value of production is to be maximized." Considering how well governments afflicted by political conflicts of interest, chronic corruption, and inherent incompetence can be expected to execute a carbon tax, global warming is likely just such an externality.