Environmental Updates

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Accounting for Carbon Emission Externalities in U.S. Environmental Policy

As discussed in the text, carbon emissions represent a negative externality due to their contribution to global climate change. Unregulated market outcomes will be economically inefficient in the presence of a negative externality. An efficient outcome can be achieved by instituting a Pigovian tax which fully internalizes the externality. But in order to design efficient policies, it is necessary first to determine the cost of the externality damages associated with carbon emissions.

Since 2010 the United States Environmental Protection Agency (EPA) has incorporated a "social cost of carbon" (SCC) into its cost-benefit analyses of environmental policies. The social cost of carbon is

> meant to be a comprehensive estimate of climate change damages and includes, but is not limited to, changes in net agricultural productivity, human health, and property damages from increased flood risk. However, given current modeling and data limitations, it does not include … all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. Nonetheless, the SCC is a useful measure to assess the benefits of CO2 reductions. (EPA, 2013, p. 1)

The EPA's estimates of the social cost of carbon, which were updated in 2013, reflect the importance of the discount rate. Based on a 5% discount rate the SCC in 2015 is estimated to be $12 per ton of carbon dioxide. But with a 2.5% discount rate the SCC rises to $61 per ton of CO2.

The EPA has included the benefits of reduced carbon emissions in analyses of several recent regulations, including standards regulating power plants, mercury emissions, and fuel economy. U.S. fuel economy standards for cars and light-duty trucks are scheduled to gradually increase from 35.5 miles per gallon in 2016 to 54.4 mpg in 2025. The EPA estimates that the cost of complying with these more stringent standards will be $150 billion. However, the fuel savings and environmental benefits of the policy more than outweigh the cost. The fuel savings alone amount to $475 billion. The environmental benefits, including reduced CO2 emissions evaluated with an SCC based on a 3% discount rate, are estimated to be $126 billion. Thus the total benefits are about four times greater than the costs. The EPA notes that the new fuel

economy standards

> will result in model year 2025 vehicles emitting one-half of the greenhouse gas emissions of a model year 2010 vehicle, representing the most significant federal action ever taken to reduce GHG emissions and improve fuel economy. … [The policy is] projected to save families more than $1.7 trillion in fuel costs and reduce America's dependence on oil by more than 2 million barrels per day in 2025, which is equivalent to one-half of the oil that we currently import from OPEC countries each day. In addition, [the policy] will cut 6 billion metric tons of greenhouse gases over the lifetimes of the vehicles sold in model years 2012-2025 – more than the total amount of carbon dioxide emitted by the United States in 2010.

Such economic analyses demonstrate that there are environmental policies that can provide society with significant economic benefits. Recognizing the social cost of carbon can help policymakers design future environmental policies that reduce the future damages from climate change in an economically efficient manner.

Sources:
U.S. EPA. 2013. "Fact Sheet: Social Cost of Carbon," November 2013.
U.S. EPA. 2012. "EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks," Regulatory Announcement EPA-420-F-12-051, August 2012.