

Memorandum

To: Andrew Cuomo, New York State Governor
From: Emily Thiel
Date: May 6, 2016
Re: Proposed Carbon Tax in New York State

Abstract:

Carbon taxes are a market mechanism aimed at internalizing energy consumption externalities and reducing emission levels. First, I introduce carbon taxes and move on to discuss the basic considerations of instituting a carbon tax. Next, I will explore the successes and failures of carbon taxes around the world. Lastly, I will confer my recommendations for developing a carbon tax inasmuch as I outline what is necessary for a carbon tax to be successful in the State of New York.

Introduction:

Nearly all scientists and governments agree that anthropogenic (human-caused) climate change is occurring and that something must be done to mitigate its effects by reducing carbon and other greenhouse gas (GHG) emissions. The European Commission has also identified many social externalities such as a reduction in life expectancy from sulfur dioxide, a potent greenhouse gas.ⁱ However, political gridlock and low agenda status has hindered any movement towards mitigating climate change and controlling for these externalities on a national level. As a result, individual states have begun to implement environmental standards. Many strategies exist for reducing carbon emissions. One prominently proposed suggestion is the institution of a carbon tax.¹

Carbon Tax vs. Other Control Mechanisms:

The most widely proposed methods of reducing carbon emissions include direct regulatory policies, cap-and-trade systems, and a tax on carbon emissions. According to the International Monetary Fund (IMF), regulatory mechanisms have minimal effects and rate poorly in terms of cost-effectiveness making these the least desirable option.ⁱⁱ

Carbon taxes allow the government to affect price while allowing firms to set emission levels. Conversely, cap-and-trade allows the governing body to set the desired emission level by the number of permits they release and firms set the price by trading between themselves (See Figure 1). This design allows cap-and-trade policies to control emission levels directly lowering them to a specified point. Though a carbon tax cannot directly set emission levels, using a flexible tax capable of changing over time, it can be adjusted to reach a desired emission target. Carbon taxes have the added benefit of causing firms to internalize the social and environmental externalities resulting from their fuel use. According to the IMF and the Congressional Research Service (CRS), carbon taxes also provide for more stable emissions pricing leading to reduced overhead costs, business conditions more favorable to clean technology investment,ⁱⁱⁱ and greater transparency.^{iv} These reasons make a carbon tax a more politically feasible option while having

¹ Though referred to as a carbon tax, such taxes generally include other greenhouse gases such as methane which is converted to units of carbon equivalent in terms of warming potential. Throughout this memo, I will refer to these interchangeably.

the ability to accomplish similar levels of emissions reductions, therefore earning my recommendation over a cap-and-trade model.

Carbon Tax Use: Broad Considerations

Administration

The point of taxation, where to impose the tax and what to tax, is of vital importance. A carbon tax will always tax GHG emissions, but the question of who to tax requires balancing comprehensiveness with administrative complexity and costs.^v The CRS specifies that taxes can be implemented at two points within the energy-to-consumption chain: upstream where the fossil fuels first enter the market, or downstream when emissions are released.^{vi}

The CRS estimates that the top emitters in the United States account for 95% of GHG, but include over three million farms, 36,300 of which are found in New York State.^{vii} These sources are difficult to quantify and therefore highly administratively difficult to implement especially considering they comprise only 15% of GHG emissions.^{viii} However, GHG emissions from large, stationary sources such as power plants and industrial sources are easily calculated. A downstream design, using data from the Environmental Protection Agency's (EPA) Greenhouse Gas Reporting Program, 80-90% of emissions could be captured^{ix} by taxing 221 facilities while taking advantage of publically available EPA data.^x

Setting a Tax Rate

The second most important aspect of designing a carbon tax is where to set the tax rate. Quebec, Canada's tax rate is as low as \$3.20 while Sweden's standard rate rests at \$104.83 per metric ton, but research by the Center for Climate and Energy Solutions (C2ES)² suggests that the social cost of a metric ton of carbon is between \$4.50 and \$18.^{xi} The estimates vary drastically because of the vast amount of inherent uncertainty. As a result, it is important to have a tax rate which is able to change over time upon the revision of these estimates. Ideally, a carbon tax would be set at a relatively low rate, close to the lowest estimated social cost to disrupt the market as little as possible. Subsequent years will increase the tax rate more in line with the estimated \$18 social cost, a measure in line with the precautionary principle.

Environmental Certainty

The U.S. Energy Information Administration rates New York State as the ninth highest emitting state in the United States, having produced 160.3 million metric tons of carbon dioxide in 2013.^{xii} The ultimate goal of a carbon tax is to force firms to internalize their social and environmental externalities. As mentioned, there is significant error and uncertainty in social cost estimates and these must therefore be reevaluated with some frequency to achieve the internalization of these costs.

Equity

The CRS describes a carbon tax as regressive in nature because low-income households spend a larger portion of their income on energy-related goods and is therefore vertically inequitable.^{xiii}

² Formerly the Pew Center on Global Climate Change, C2ES is an independent nonprofit organization known for working closely with policy makers at all levels of government.

This is especially salient as the National Commission on Energy Policy estimates that households and businesses would incur the vast majority of the costs (89%) while fossil fuel producers and electricity generators incur the remaining 11% (See Figure 2).^{xiv} This provides the impetus to distribute 75% of the carbon tax revenues to individuals and small businesses by distributing tax deductions to each of these parties as suggested by the C2ES^{xv}

Additionally, although all parties will benefit from emissions reductions because climate change is a global issue, parties suffering from environmental justice issues are most likely to benefit as emission levels begin to fall. In particular, lower levels of emissions will most highly impact residents of poor communities and people of color as these are the two groups most greatly affected by environmental justice issues.^{xvi} As a result, the remaining 25% of carbon tax revenues will provide targeted energy assistance to lower income households as suggested by the C2ES.^{xvii} This will allow those suffering most greatly from the combustion of fossil fuels to benefit directly through lower energy costs, helping to correct for negative externalities.

Political Feasibility

Tax revenues being redistributed to lower income households and individuals in general greatly increases the political feasibility of a carbon tax while still encouraging abatement. However, this is not often enough to pass such legislation. Bills related to environmental protection, especially regarding climate change face a difficult political battle. However, a carbon tax has never been more politically feasible for the state of New York. The National Oceanic and Atmospheric Administration recently released data indicating that February 2016 just replaced January 2016 as the warmest month ever measured globally, a replacement trend that is growing in frequency.^{xviii} This phenomenon did not go unnoticed with a recent Gallup poll reporting that 78% of Americans in the eastern United States perceived their winter as warmer than usual, most of whom attributed this to anthropogenic climate change.^{xix} With such high rates of climate belief, interventions are likely to be opposed by significantly fewer members of the public. This confluence of factors greatly reduces the political barriers to instituting a carbon tax.

Successes and Failures:

The World Bank identifies that carbon taxes are most popular throughout Western Europe which includes countries such as the United Kingdom, Switzerland, Sweden, and Finland.^{xx} Despite their concentrated prevalence in this area, carbon taxes have recently begun to spread to the Americas (Mexico, Costa Rica, and parts of Canada).^{xxi}

British Columbia, Canada

C2ES describes British Columbia's carbon tax as enacted in 2008 with an initial tax rate of \$9.55 per metric ton which grew by \$4.77 annually to \$28.64 in 2012.^{xxii} A New York Times article reports that this carbon tax has reduced emissions between 5 and 15 percent while having negligible effects on the economy.^{xxiii} Continuing, the tax made gasoline and heating more expensive, but has grown in citizen appeal where 47% opposed the tax in 2009; this figure has since fallen to only 32% opposing which is likely connected to the 1.7 billion dollars in carbon tax revenue being dispersed to businesses and families through lower tax rates.^{xxiv} Despite receiving the approval of the economy and the citizenry, the reductions thus far are not in line with British Columbia's current climate goals, suggesting the need to raise the tax rate further. However, with oil and gasoline prices plummeting, firms are now finding it less expensive to pay

the carbon tax instead of investing in emission reducing technologies.^{xxv} British Columbia's carbon tax is in a precarious position, trying to balance business interests with climate goals.

Montgomery County, Maryland

Widely celebrated as the nation's first county level carbon tax, due to poor policy development, it was repealed a mere two years later. The U.S. Court of appeals describes Montgomery County's carbon tax as including only industrial sources producing above a certain level of carbon emissions which pertained to only one organization in the county, GenOn, an electricity-generating facility.^{xxvi} This ultimately resulted in a lawsuit demanding the repeal of the carbon tax on the basis that the limited tax base constituted a fee rather than a tax as described by the County Council for Montgomery County.^{xxvii} This case highlights the importance a broad-based approach to a carbon tax.

Conclusion:

The overall goal of this memo thus far has been to discuss the benefits and potential pitfalls of a carbon tax, but in order for such a policy to be truly effective, I would only recommend instituting this policy given that the following requirements are met.

Recommendation #1: Setting the Tax Rate and Point of Taxation

As previously mentioned C2ES recommends setting the tax rate low to begin with and increasing it over time as done in nearly every current carbon tax.^{xxviii} Because abatement levels are not set by policy makers, adjustment is necessary to achieve a meaningful level of GHG reduction while not sending shocks into the economy with large fluctuations in tax rates. Additionally, applying this tax to too small a population will not result in any changes and may generate additional problems. Such pitfalls can be seen in Montgomery County, Maryland where each of these considerations were poorly made resulting in the legislation being repealed without having made large impacts on GHG emissions.

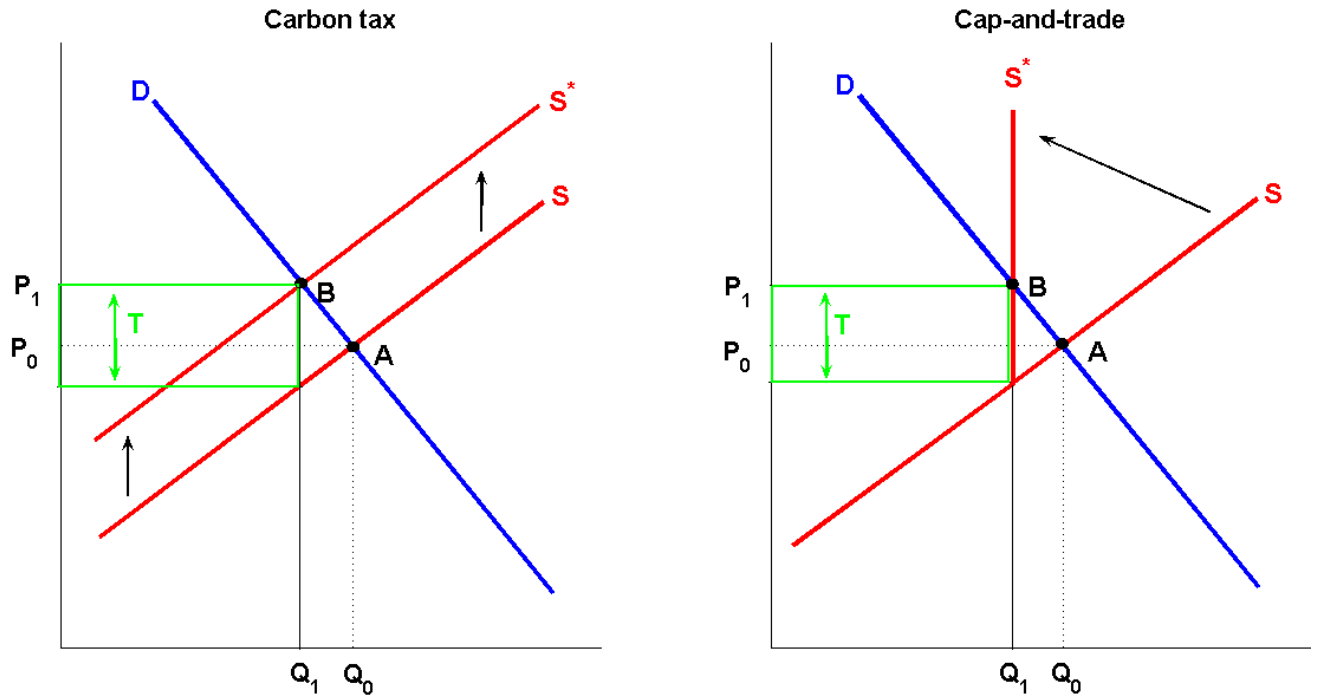
Recommendation #2: Prolonged Political and Public Support

Because the carbon tax requires such fine tuning in the short run and the long term, it is important that the political impetus for such legislation is maintained. Currently British Columbia's carbon tax is at risk from low fossil fuel energy prices. Strong public and political support is necessary to maintain the carbon tax and to adapt it to fit this new situation.

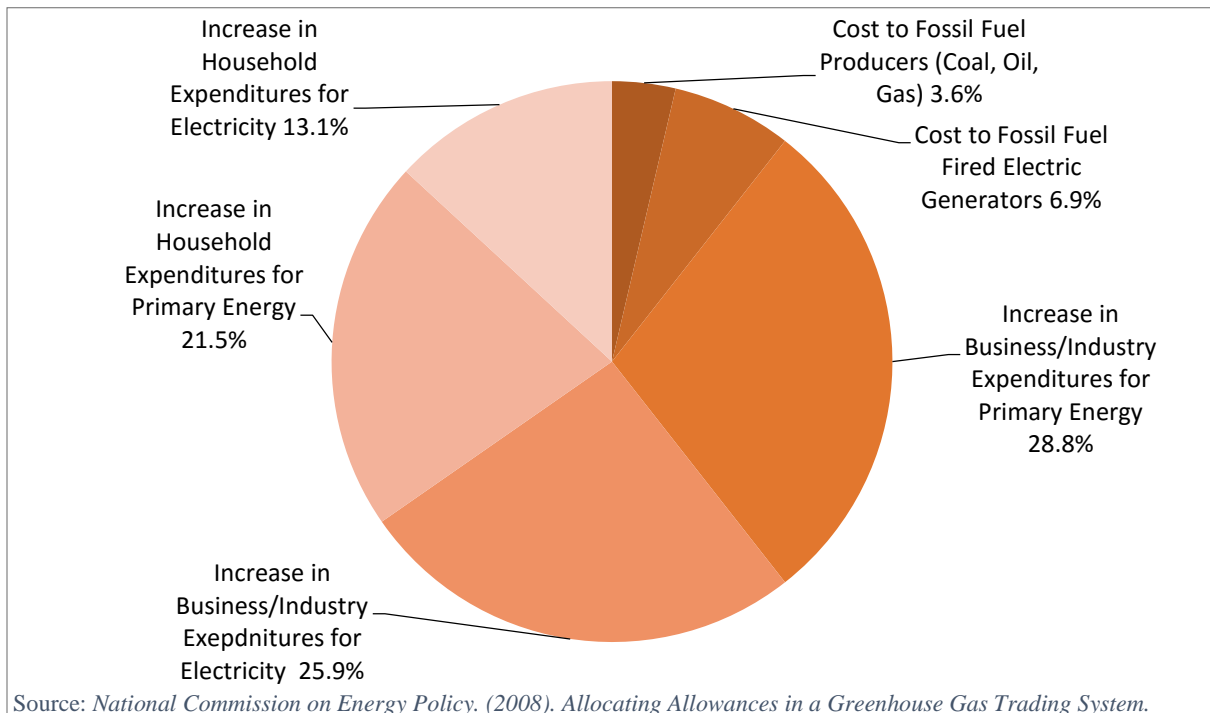
Recommendation #3: Institute Other Measures

Lastly, and perhaps most importantly, a carbon tax will greatly help GHG abatement, but will not solve the problems presented by climate change. As David Roberts, dedicated energy and climate explains, "Slowing climate change will require a suite of policies, regulatory reforms, and investments," making it vital to continue to institute reforms at the state, national, and global levels.^{xxix}

Appendix:



Source: Gordon, Stephen (2012). *Econ 101: What you need to know about carbon taxes and cap-and-trade*
 Figure 1: Supply and Demand Representation of a Carbon Tax and a Cap-and-Trade System



Source: National Commission on Energy Policy. (2008). *Allocating Allowances in a Greenhouse Gas Trading System*.
 Figure 2: Distribution of Private Costs Estimated at the National Level

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- ⁱ European Commission. (October 5, 2010). ExternE: Externalities of Energy. A Research Project of the European Commission. Retrieved April 25, 2016 from http://www.externe.info/externe_2006/
- ⁱⁱ International Monetary Fund. (2012). Fiscal Policy to Mitigate Climate Change: A Guide for Policymakers.
- ⁱⁱⁱ Ibid.
- ^{iv} Congressional Research Service (2012, Sept. 17). Carbon Tax: Deficit Reduction and Other Considerations.
- ^v Ibid.
- ^{vi} Ibid.
- ^{vii} Ibid.
- ^{viii} Ibid.
- ^{ix} Ibid.
- ^x Environmental Protection Agency. (2014). GHG Reporting Program Data Sets: 2014 Data Summary Spreadsheet. Retrieved March 20, 2016 from <https://www.epa.gov/ghgreporting/ghg-reporting-program-data-sets>
- ^{xi} Center for Climate and Energy Solutions. (2013). Options and Considerations for a Federal Carbon Tax.
- ^{xii} U.S. Energy Information Administration. (2016, October). Energy-Related Carbon Dioxide Emissions at the State Level. Table 1: State energy-related carbon dioxide emissions by year (2000-2013). Retrieved March 20, 2016 from <http://www.eia.gov/environment/emissions/state/analysis/>
- ^{xiii} Congressional Research Service (2012, Sept. 17). Carbon Tax: Deficit Reduction and Other Considerations.
- ^{xiv} National Commission on Energy Policy. (2008). Allocating Allowances in a Greenhouse Gas Trading System.
- ^{xv} Center for Climate and Energy Solutions. (2013). Options and Considerations for a Federal Carbon Tax.
- ^{xvi} <http://www.ejnet.org/ej/rwc.html>
- ^{xvii} Center for Climate and Energy Solutions. (2013). Options and Considerations for a Federal Carbon Tax.
- ^{xviii} National Oceanic and Atmospheric Administration (2016). State of the Climate. Retrieved April 25, 2016 from <https://www.ncdc.noaa.gov/sotc/global/201601>
- ^{xix} Gallup. (2016, March 14). Americans Attribute Warm Winter Weather to Climate Change. Retrieved March 20, 2016 from <http://www.gallup.com/poll/189920/americans-attribute-warm-winter-weather-climate-change.aspx>
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- ^{xxi} Ibid.
- ^{xxii} Center for Climate and Energy Solutions. (2013). Options and Considerations for a Federal Carbon Tax.
- ^{xxiii} Does a Carbon Tax Work? Ask British Columbia. (2016, March 1). Retrieved March 20, 2016 from http://www.nytimes.com/2016/03/02/business/does-a-carbon-tax-work-ask-british-columbia.html?partner=rss&emc=rss&_r=1
- ^{xxiv} Ibid.
- ^{xxv} Ibid.
- ^{xxvi} United States Court of Appeals. (2011, June 20). Genon Mid-Atlantic v. Montgomery County, Maryland.
- ^{xxvii} County Council for Montgomery County, Maryland. (2012, July 10). Repeal of Department of Finance Regulation 12-10, Excise-Tax: Major Emitters of Carbon Dioxide.
- ^{xxviii} Center for Climate and Energy Solutions. (2013). Options and Considerations for a Federal Carbon Tax.
- ^{xxix} Roberts, David. (2016). Putting a price on carbon is a fine idea. It's not the end-all be-all. <http://www.vox.com/2016/4/22/11446232/price-on-carbon-fine>