

Statement for Maryland Climate Change Commission Mitigation Working Group May 31, 2018 Concerning Carbon Pollution Pricing

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Maryland Commission on Climate Change
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Dear Commission Members:

This is our written statement as background for your May 31 meeting. As requested, I will summarize it briefly at the meeting. I am also sending copies of two studies that we have performed to forecast the impacts of carbon pollution pricing in Maryland:

- 1) Impacts on reducing GHG emissions through 2030 and beyond
- 2) Impacts of carbon fees and rebates on households at different income levels

This statement will cover:

Policy design – the major aspects of a possible carbon pricing law

Forecasted emissions cut – our estimate of the reduction in GHG emissions by 2030 due to instituting carbon pollution pricing in 2020

Impacts on households – estimated net gains or losses of households at different income levels from the combination of fees and rebates

Impacts on particular industries – the size of potential fees in relation to overall operating costs for Maryland's major industries, and how these can be mitigated via targeted rebates

Impacts on the overall economy – what changes can be expected in overall employment and economic growth due to the policy

Proposed legislation in other states – other states that are also considering similar policies

Personal qualifications

I am the Policy and Research Director for Climate XChange, based in Boston, Massachusetts, where I focus on carbon pricing policies. I formerly held two positions in Massachusetts state government: Director of Transportation & Buildings Policy with the Executive Office of Energy & Environmental Affairs, and Director of the Electric Power Division of the Department of Public Utilities.

During 2005 through 2007 I was deeply involved in the design of the Regional Greenhouse Gas Initiative. In 2010, I was lead author of Massachusetts' *Clean Energy and Climate Plan for 2020*. In 2014, I co-authored *Analysis of a Carbon Fee or Tax as a Mechanism to Reduce GHG Emis-*

sions in Massachusetts, as part of a consulting team for the state's Department of Energy Resources. Since then I have conducted several studies on carbon pricing and participated in the design of carbon pricing legislation in Massachusetts and several other states.

Policy design

Key aspects of the policy design whose impacts we forecast include:

Carbon price – begins at \$15/metric ton, rises \$5/year until it reaches \$45/ton in year 7.

Sectors and emissions covered – covers all the major fossil fuels and end-use sectors, along with methane leakage from the natural gas distribution system. Fees are charged on electricity imported from other states according to its carbon content.

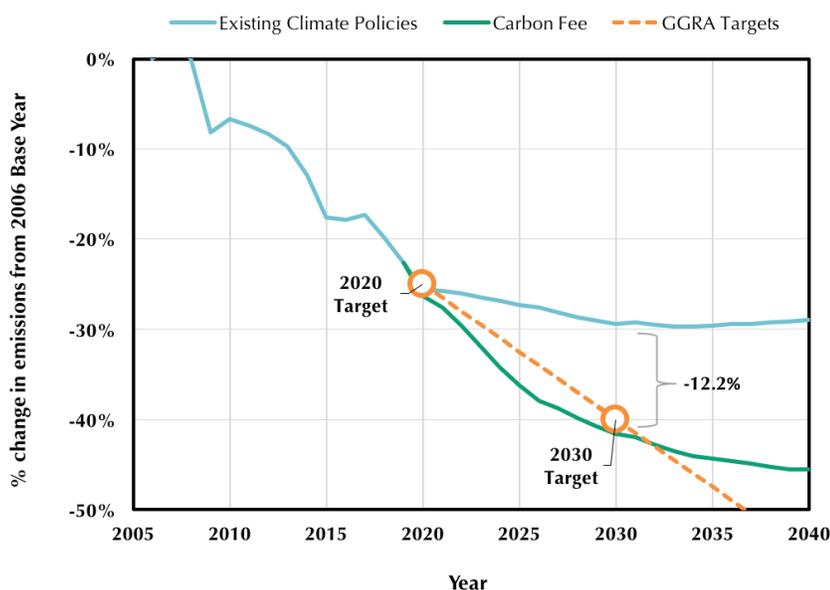
Use of revenues – we simulated a dozen scenarios with varying use of the revenues. Scenario One, the primary scenario, returns 67.5% of the funds to households, targeted toward those with low and moderate incomes; 22.5% to employers, targeted to those we consider “vulnerable” (manufacturing, agriculture, small non-profits, and state and local government), and 10% to investment in clean energy and transition benefits to workers and communities.

Greenhouse gas emissions reduction

Based on a carbon fee beginning in 2020 and with the ramp-up schedule stated above, we forecast that by 2030 the fee would yield a reduction in Maryland's emissions of approximately 12%, or 13 million metric tons, compared to the base year of 2006. This reduction assumes that existing state and federal policies continue throughout the forecast period, and the 12% is beyond the impacts of those policies. This is sufficient for Maryland to reach its target of a 40% reduction in 2030. Should federal policies be scaled back, including the Clean Power Plan and vehicle fuel efficiency standards, a carbon price in Maryland will partially replace the impacts of those policies, resulting in emissions reductions of more than 12%.

If manufacturing is exempted from the carbon fees, we estimate that this would cut the impact of the policy to a reduction of 11.3 million tons, or 10.5% of the 2006 baseline. This is still approximately enough to meet the state's 40% reduction target for 2030.

Estimated GHG Emissions Reductions in MD (2006-2040)



2006-2014 data from the Maryland Department of the Environment GHG Emission Inventory. 2015-2040 data from the US Energy Information Administration Annual Energy Outlook 2017 and Climate XChange Analysis.

Impacts on Households

The policy design we have modeled is intended to protect low and moderate income households from increases in their living costs, even before they make any reductions in their fossil fuel consumption. They will see increases in fossil fuel prices, giving both energy suppliers and consumers an incentive to move to clean sources of energy. But then they will receive rebates that will cover the cost differential. These rebates will be unconnected to the amount of fossil fuel they consume, in order to preserve the incentive.

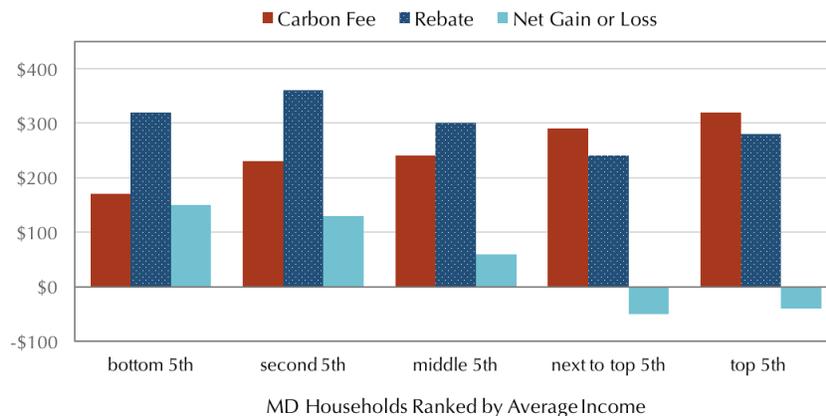
The policy design gives each adult a rebate, with parents getting a half rebate for each dependent. For equity purposes, the rebate per adult is greatest for low-income households, somewhat lower for moderate-income households, and lowest for high-income households. A portion of the funds are also reserved for low-income consumers of high-cost heating fuels including heating oil.

The result of this design is that the lowest two-fifths of Maryland households come out ahead from the combination of fees and rebates, the middle fifth come out about even, and the top two fifths come out behind. The figures below show the impacts on the bottom fifth and then on all fifths of households.

Average Impact on Lowest-Income 5th of Households in Scenario 1



Average Impact on each 5th of Households in Scenario 1



Impacts on Particular Industries

Most of Maryland's largest industries, whether ranked by output (share of gross state product) or employment, are not energy-intensive. As a result, while carbon fees would give them an incentive to reduce their use of fossil fuels, the fees would have little impact on their overall costs.

These industries include (using federal category definitions) "professional, scientific, and technical services," state and local government, "administrative and support services," real estate, health care, food services, retail trade, educational services, and all manufacturing industries, and account for over 60% of all employment in the state. For most of these, energy costs are below 1% of their total operating costs, with a few being between 1% and 2%. As a result, in the first year of the system's operation, with carbon fees at \$15 per metric ton of CO₂ emissions, **the fees would be a very small fraction of each industry's overall costs, in almost all cases less than 0.1%.**

It is our understanding that manufacturing has been exempted from the state's GHG reduction requirements for current planning purposes. Nevertheless, we find that the fees would have a small impact on overall costs, a few tenths of a percent at most. This is because Maryland has little in the way of "heavy" industry that is energy-intensive. Rather its manufacturing is substantially high-tech, such as pharmaceuticals, for which energy inputs are a smaller portion of costs.

Under the policy design modeled here, Scenario 1 reserves 22.5% of the revenues for rebates to "vulnerable" employers. This is sufficient to fully cover increased operating costs for manufacturing (if it was included in the system), small non-profit organizations, and state and local government agencies. Manufacturing we consider vulnerable because it sells most of its output to other states and countries, and therefore is in competition with areas that might not have carbon pricing. Non-profits and state/local government agencies are vulnerable because their revenue sources are highly constrained, making it difficult for them to cover increased expenses.

Impacts on the overall economy

A study on the prospective impacts of carbon pricing on the Maryland economy as a whole has not yet been done. However, several such studies have been done for other states, smaller geographic areas, and the U.S. as a whole. Most have been done by the consulting firm REMI, Inc., whose econometric model is widely used by government agencies and companies throughout the United States. The studies consistently show that carbon pricing yields increases in gross state product (GSP) and employment. The table below summarizes several of the studies.

REMI modeling: changes due to carbon pollution fees		
State or County	Gross State Product (GSP)	Employment
Arkansas	Approaches \$2 billion more in annual GSP	up to 70,000 additional jobs over baseline within 4 years of implementation
California	if implemented in 2014, an extra \$18 billion in GSP by 2035	If implemented in 2014, 300,000 more jobs by 2035
King County, WA (includes Seattle)	adds \$2 billion to \$14 billion from 2015 to 2035, with carbon varying from \$10/mton to \$100/mton	1,000 to 8,000 jobs by 2035 if implemented in 2013
Massachusetts	if implemented in 2016, \$300 million additional growth by 2020, \$450 million 2030, and \$600 million 2040	5,000 additional jobs by 2020, 7,000 to 11,000 by 2030, and 9,000 to 18,000 by 2040
Rhode Island	\$250 million by 2040 if implemented in 2015	5,000 jobs by 2040 if implemented in 2015
Washington State	between \$250 million and \$2.7 billion higher than baseline by 2035, if implemented in 2013	If implemented by 2013, gain of between 5,000 and 40,000 jobs by 2035
Note: If no range is given for impacts, they are for highest fee schedule where several were modeled.		

Proposed legislation in other states

It is unlikely that Maryland would be alone within the region or the nation in implementing this policy. Besides Maryland, carbon pricing bills have been proposed during the 2017-2018 legislative sessions in at least: Vermont, Massachusetts, Rhode Island, Connecticut, New York, Washington, DC, Minnesota, Washington State, and Oregon. We expect that later this year and in 2019 these will be joined by other states, such as New Jersey. Further, legislators in nine states have formed the *Carbon Costs Coalition*, with the intent of passing carbon pollution pricing in a number of states. See: <https://ncel.net/carbon-costs-coalition#principles>

Thank you for the opportunity to provide these comments and to speak at the Commission meeting on May 31st. I am happy to answer further questions that you may have.

Yours truly,

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Policy and Research Director