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Sensitivity Analysis of Social Cost of Carbon Assumptions in CBA of a Clean Fuel Standard for New York

Memo

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Background: In December of 2020, the New York Department of Environmental Conservation announced finalization of its value of carbon guidance to measure impacts of Greenhouse Gas emissions.[1] The Department's value of $125 per metric ton of carbon dioxide emitted brings the state much closer to the Intergovernmental Panel on Climate Change's value of $135 per metric ton than the Biden Administration's $51 per metric ton.[2,3]

The draft scoping plan for the New York State Climate Action Council identifies lower carbon renewable fuels as one of its twelve key sector strategies for effectively reducing emissions from the transportation sector and transitioning to zero-emission technologies.[4] The first component of this strategy cited in the report is a "clean fuel standard," a requirement for providers who manufacture and distribute transportation fuels to reduce the carbon intensity of fuels they produce and distribute.[5] This memo is an addendum to the Scioto Analysis report "Economic and Health Impacts of a Clean Fuel Standard for New York," previously prepared to analyze the impacts of a clean fuel standard in the state of New York.[6]

Methods: In this memo, we apply the Department of Environmental Conservation's $125 per metric ton social cost of carbon to the model detailed in our previous report to determine how this valuation would impact cost-benefit results for a clean fuel standard for the state of New York. We do this by substituting the conservative $51 valuation put forth by the Biden administration for the $125 valuation in our Monte Carlo simulation. We also combine partial sensitivity analysis with breakeven analysis within our Monte Carlo simulation to estimate the minimum social cost of carbon valuation for total economic costs of a clean fuel standard for New York to outweigh total economic benefits.

Results: Increasing the social cost of carbon from $51 to $125 leads to an increase in the present value of carbon emission reduction for a clean fuel standard for New York from $6.6-10 million to $16-24 million. It also increases the total net present value of the clean fuel standard

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[1] "DEC Announces Finalization of 'Value of Carbon' Guidance to Help Measure Impacts of Greenhouse Gas Emissions," Press Release, New York Department of Environmental Conservation, December 30, 2020.
[2] de Coninck, H.; Revi, A.; Babiker, M.; Bertoldi, P.; et al. (2018). "Chapter 4: Strengthening and Implementing the Global Response" (PDF). Global Warming of 1.5 ºC. pp. 313–443.
[3] Clark, Lesley, and Niina H. Farah, "Federal agencies can use social cost of carbon — for now," Article, CLIMATEWIRE, E&E News, May 27, 2022.
[4] "Draft Scoping Plan," New York State Climate Action Council, December 30, 2021.
[5] SB S2962B defines "providers" as "includ[ing], but…not…limited to, all refiners, blenders, producers or importers of transportation fuels, or enablers of electricity used as transportation fuel."
[6] Scioto Analysis, "Economic and Health Impacts of a Clean Fuel Standard for New York," June 2020.

from $4-17 billion to $14-31 billion. The benefit/cost ratio of the program increases from $2.06-10.16 in benefits for every dollar in infrastructure costs to $4.59-18.18 in benefits for every dollar in costs. Total benefits also outweigh total costs much more quickly under the $125 social cost of carbon, reducing time for benefits to outweigh costs from 1-10 years to 0-4 years.

Outcome	Biden Administration ($51)	New York Department of Environmental Conservation ($125)
Present value of carbon emission reductions	$6.6-10 million	$16-24 million
Net present value of clean fuel standard	$4-17 billion	$14-31 billion
Benefit/cost ratio of clean fuel standard	$2.06-10.16	$4.59-18.18
Time for benefits to outweigh costs	1-10 years	0-4 years

Table 1: Result summary

Even reducing the social cost of carbon to the Trump Administration value of $1 leads to a benefit of $1.60 for every $1 in benefits under our median scenario (50th percentiles of energy security benefits, local emission benefits, carbon emission benefits, and infrastructure costs). This is because, in this scenario, energy security and local emission benefits are still large enough to make up for the low carbon emission benefits.

In our most pessimistic scenario (5th percentile of energy security, local emission, and carbon emission benefits, 95th percentile of infrastructure costs), **social cost of carbon must be valued at below $19 for economic costs of a clean fuel standard to outweigh economic benefits**.