

Caiazza Personal Comment on the Benefits Greater than Costs Claim

Summary

The [Climate Leadership and Community Protection Act](#) (Climate Act) has a legal mandate for New York State greenhouse gas emissions to meet the ambitious net-zero goal by 2050. The scoping plan claims that “The cost of inaction exceeds the cost of action by more than \$90 billion”. In my [verbal comments](#) at the Syracuse Climate Act public hearing I said that statement is inaccurate and misleading. This comment explains why that the Draft Scoping Plan must address this issue and makes recommendations for changes to language to clarify the caveats associated with the claim.

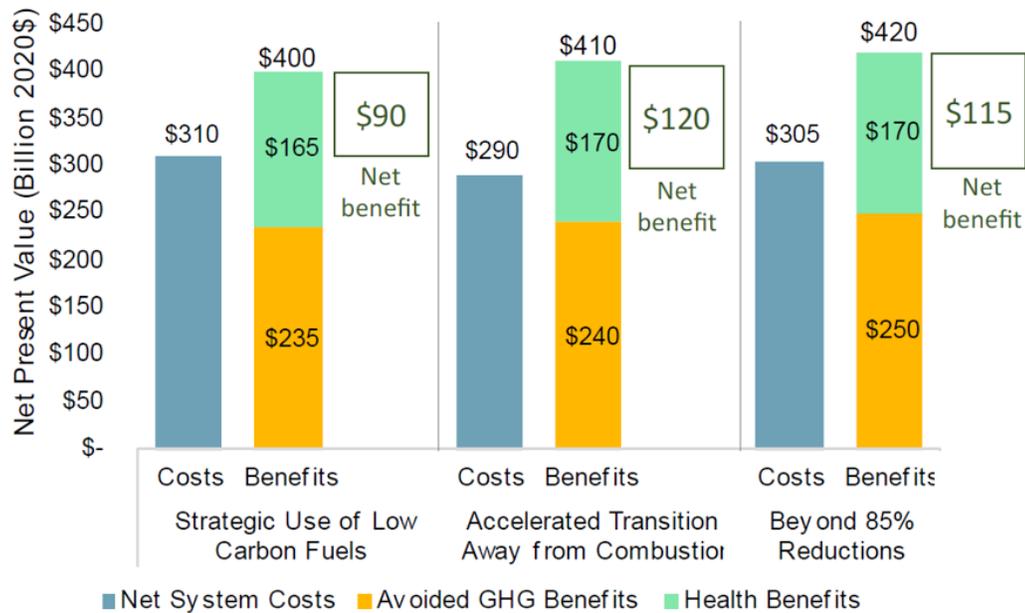
These comments show that the trick used to deceive the public into hearing that benefits out-weigh costs excludes legitimate Climate Act costs by mis-categorizing initiatives such as the 2035 zero-emission vehicle mandate as part of the business-as-usual Reference case. In addition, the Plan uses incorrect guidance to inflate the societal benefits of avoided emissions. The final Scoping Plan should describe all the control measures, provide the assumptions used for the strategies, and list the expected costs and expected emission reduction for each measure for the Reference Case, the Advisory Panel scenario and the three mitigation scenarios so the public can decide for themselves which costs associated with “already implemented” program are appropriate.

Misleading Benefits Exceed the Costs Claim

The Draft Scoping Plan claim that “The cost of inaction exceeds the cost of action by more than \$90 billion” is presented in Figure 51 in [Appendix G Integration Analysis Technical Supplement](#). The Climate Act overview presentation for the public hearings included a similar figure and made the same claim. However, there is a caveat or in this case, a trick. In the following figure I have highlighted the description that notes that the benefits are “relative to Reference Case”. Failure to clearly mention that caveat when these results are presented is misleading and the Draft Scoping Plan should be revised to clearly explain the implications.

Note that quantitative documentation for this figure was recently added to the existing Excel document, ‘Appendix G Annex 2: Key Drivers and Outputs,’ found on the Climate Action Council Draft Scoping Plan [website](#). Because the values are exactly the same in the figure and the table, I believe the updated spreadsheet numbers were simply pulled from the figure and not from the analyses themselves.

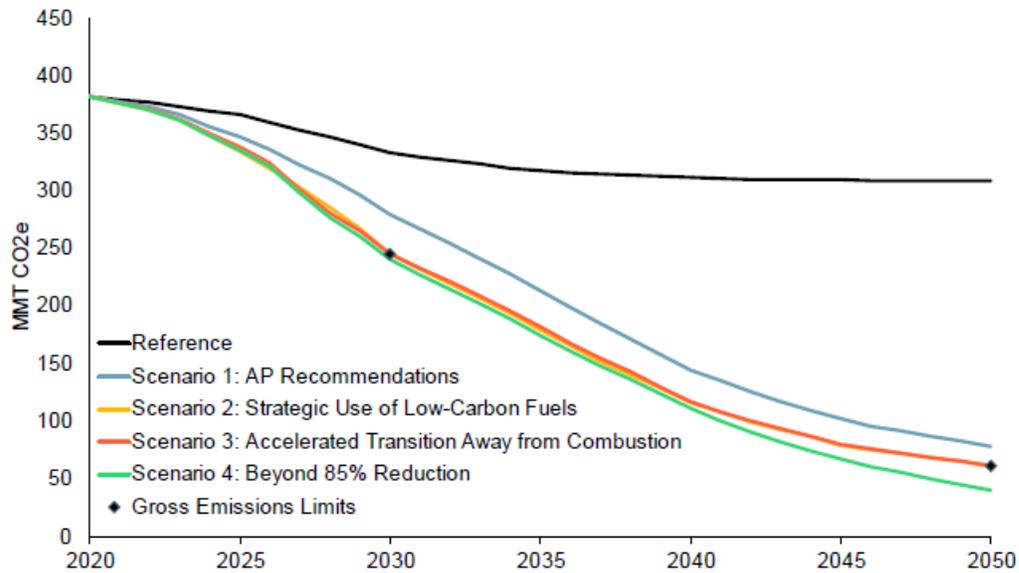
Figure 51. Net Present Value of Benefits and Costs relative to Reference Case, Including GHG benefits, Health Benefits, and Net Direct Costs (2020 – 2050)



Reference Case Costs

The important point is that the costs used to claim benefits are greater than costs subtract the Reference Case costs from the costs attributed to the Climate Act. As a result, the control measures included in the Reference Case make all the difference in the claim. I have [written over 200 articles](#) about the Climate Act at the [Pragmatic Environmentalist of New York](#) blog but did not pick up on this nuance for several months. When I did notice the qualifying statement, I started looking for Reference Case documentation in the Draft Scoping Plan. Ultimately, I ended up searching the document for the phrase “reference case. The following figure reproduces the page with the documentation on page 12 in [Appendix G Integration Analysis Technical Supplement](#) Section I. The documentation is buried in the footnote for the circled reference for the blank caption to Figure 4. Given its importance to this critical claim this caveat should be clearly described in the text rather than in a footnote. In addition, the caption to Figure 4 should be added.

Figure 4. Gross Greenhouse Gas Emissions by Mitigation Scenario



6

- **Scenario 1: Advisory Panel Recommendations:** Representation of the Advisory Panel recommendations,⁷ which provide a foundation for all scenarios through rapid electrification of buildings and transportation, decarbonization of the power sector, and ambitious reductions in non-

⁶ The Reference Case is used for evaluating incremental societal costs and benefits of GHG emissions mitigation. The Reference Case includes a business as usual forecast plus implemented policies, including but not limited to federal appliance standards, energy efficiency achieved by funded programs (Housing and Community Renewal, New York Power Authority, Department of Public Service, Long Island Power Authority, NYSERDA Clean Energy Fund), funded building electrification, national Corporate Average Fuel Economy standards, a statewide Zero-emission vehicle mandate, and a statewide Clean Energy Standard including technology carveouts. For more details see Chapter 5.3.

⁷ More information on the relationship between the Advisory Panel recommendations and the Integration Analysis assumptions can be found in Annex 2.

The footnote text describes what is in the Reference Case. It includes a “business as usual” forecast *plus implemented policies*. The implemented policies include but are not limited to:

- Federal appliance standards
- Energy efficiency achieved by funded programs (Housing and Community Renewal, New York Power Authority, Department of Public Service, Long Island Power Authority, NYSERDA Clean Energy Fund)
- Funded building electrification
- National Corporate Average Fuel Economy standards
- Statewide Zero-emission vehicle mandate
- Statewide Clean Energy Standard including technology carveouts

The Climate Act requires the [Climate Action Council](#) to “[e]valuate, using the best available economic models, emission estimation techniques and other scientific methods, the total potential costs and potential economic and non-economic benefits of the plan for reducing greenhouse gases, and make such evaluation publicly available” in the Scoping Plan. In order to fulfill this obligation, the Draft Scoping Plan should describe all control measures, the assumptions used and references for those control measures, the expected costs for each measure with the expected emission reductions for the Reference Case, the Advisory Panel scenario and the three mitigation scenarios.

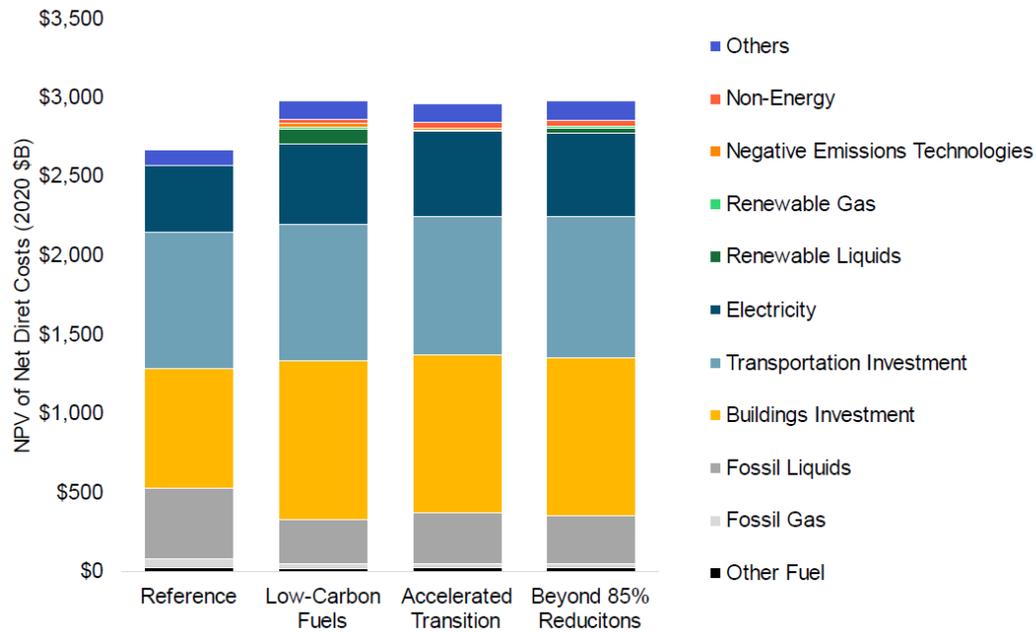
Clearly this information is important for New Yorkers to understand the costs associated with the Climate Act. In order to understand what is included in the Reference Case versus the mitigation scenarios this information is crucial for the already implemented policies. The onus of explaining what costs and emission reductions are included in the Federal appliance standards, energy efficiency achieved by funded programs, funded building electrification, national Corporate Average Fuel Economy standards, and the statewide Clean Energy Standard including technology carveouts is on the Climate Action Council. It is inappropriate to expect that the public will evaluate all these programs and guess the effects of the programs on the net-zero transition. In subsequent sections of this comment, I will specifically address the statewide zero-emission vehicle mandate.

The total system expenditures are shown in Figure 48 in Appendix G Integration Analysis Technical Supplement Section I. The Reference Case total in the following table from the additional information to the IA-Tech-Supplement-Annex-2-Key-Drivers-Outputs spreadsheet lists the net present value of system expenditures as \$2,665 billion; Scenario 2, low-carbon fuels expenditures are \$2,974 billion; Scenario 3, accelerated transition expenditures are \$2,953 billion; and Scenario 4, beyond 85% reductions expenditures are \$2,972 billion. Importantly the category costs are also available. Note that these numbers are not rounded in any way so I believe that they were copied from a different spreadsheet or model. They should be clearly linked to the source of the information in the final Scoping Plan.

Figure 48: Net Present Value of System Expenditures in Reference Case and Scenarios 2-4 (2020-2050)

Category	Reference	Low-Carbon Fuels	Accelerated Transition	Beyond 85% Reducitons
Other Fuel	\$ 23.58	\$ 19.41	\$ 20.22	\$ 20.22
Fossil Gas	\$ 58.76	\$ 31.07	\$ 32.29	\$ 30.69
Fossil Liquids	\$ 442.33	\$ 285.34	\$ 322.58	\$ 299.74
Buildings Investment	\$ 564.98	\$ 800.14	\$ 804.56	\$ 804.56
Transportation Investment	\$ 1,056.07	\$ 1,058.98	\$ 1,071.22	\$ 1,095.77
Electricity	\$ 424.39	\$ 513.85	\$ 535.64	\$ 527.45
Renewable Liquids	\$ 3.96	\$ 90.95	\$ 5.21	\$ 28.12
Renewable Gas	\$ -	\$ 17.80	\$ 5.61	\$ 13.99
Negative Emissions Technologies	\$ -	\$ 13.07	\$ 11.41	\$ -
Non-Energy	\$ -	\$ 21.39	\$ 22.08	\$ 29.71
Others	\$ 90.89	\$ 121.60	\$ 122.61	\$ 121.59
Total	\$ 2,664.96	\$ 2,973.59	\$ 2,953.42	\$ 2,971.85

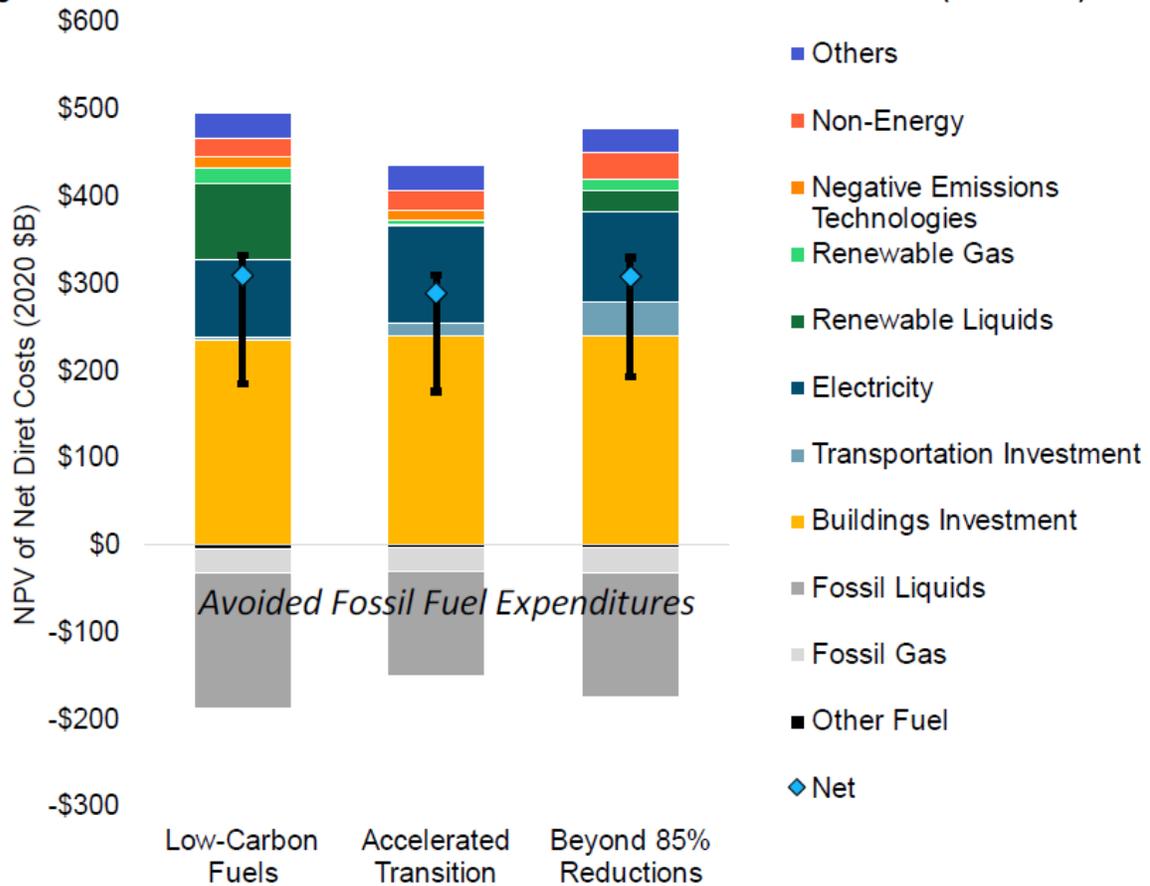
Figure 48. Net Present Value of System Expenditures in Reference Case and Scenarios 2-4 (2020-2050)



I have frequently heard Climate Action Council member refer to the net cost totals in Figure 47 as the costs of Climate Act implementation. Those costs are on the order of \$300 billion: Scenario 2, low-carbon fuels expenditures are \$309 billion; Scenario 3, accelerated transition expenditures are \$288 billion; and Scenario 4, beyond 85% reductions expenditures are \$307 billion. However, these costs are relative to Reference Case for the three mitigation scenarios. In other words, the numbers presented subtract out the Reference Case costs. As explained earlier, the rationale to increase the Reference Case numbers is those estimates include not only the business-as-usual programs but also programs that are already implemented.

Figure 47: Net Present Value of Net Direct Costs Relative to Reference Case (2020-2050)				
Category	Low-Carbon Fuels	Accelerated Transition	Beyond 85% Reductions	
Other Fuel	\$ (4.17)	\$ (3.36)	\$ (3.36)	
Fossil Gas	\$ (27.70)	\$ (26.48)	\$ (28.08)	
Fossil Liquids	\$ (156.99)	\$ (119.76)	\$ (142.60)	
Buildings Investment	\$ 235.16	\$ 239.58	\$ 239.58	
Transportation Investment	\$ 2.97	\$ 15.14	\$ 39.69	
Electricity	\$ 89.45	\$ 111.25	\$ 103.06	
Renewable Liquids	\$ 86.99	\$ 1.25	\$ 24.17	
Renewable Gas	\$ 17.80	\$ 5.61	\$ 13.99	
Negative Emissions Technologies	\$ 13.07	\$ 11.41	\$ -	
Non-Energy	\$ 21.39	\$ 22.08	\$ 29.71	
Others	\$ 27.57	\$ 28.58	\$ 27.57	
Net	\$ 308.68	\$ 288.44	\$ 306.87	

Figure 47. Net Present Value of Net Direct Costs Relative to Reference Case (2020-2050)



Category Cost Implications

The clarifying information update provides numbers associated with each category in Figures 47 and 48. In this section I will address these categories relative to their inclusion as business-as-usual.

The “Buildings Investment” category “Includes capital and operating expenses for building equipment and appliances (e.g., space heaters, air conditioners, water heaters) and investments for building shell upgrades”. The net present value of system expenditures from 2020 – 2050 is \$565 billion for the Reference Case. The building sector costs for the mitigation scenarios only range from \$235 billion to \$240 billion (42% increase) but the emission decreases relative to the Reference Case are 95% greater. In my opinion, that seems inconsistent with the Reference Case costs. It appears that Reference Case cost reductions per ton are double the mitigation scenarios. This anomaly could be caused by excluding the costs but including the emission reductions from the presented numbers. The final Scoping Plan should explain what is happening here.

The “Transportation Investment” category “Includes capital and operating expenses for light-duty vehicles, medium- and heavy-duty vehicles, and buses, in addition to charging infrastructure costs”. The net present value of system expenditures from 2020 – 2050 is \$1,056 billion for the Reference Case. Just based on the bar chart components the difference to add charging infrastructure and the additional costs of electric vehicles relative to current alternatives seemed unacceptably low. According to the

Integration Analysis, Scenario 2 transportation initiatives will reduce emissions 79% relative to the Reference Case at a cost of only \$2.97 billion. The Integration Analysis projects that just the cost of battery electric vehicle chargers will be over \$15 billion for Scenario 2 relative to the Reference Case. Obviously, this needs to be explained in the final Scoping Plan. Something is overlooked or deliberately manipulated to make this claim.

The Figure 47 category label is “Electricity” but the description in the cost methods overview table is “Electricity Incremental”. I assume they are the same. The description of this category states that it “Includes capital and operating costs for electricity generation, transmission, costs to upgrade existing distribution system, and in-state hydrogen production costs.” The net present value of system expenditures from 2020 – 2050 is \$424 billion for the Reference Case. The Integration Analysis described in the Draft Scoping Plan projects that the additional costs necessary to transition the electric grid to zero-emissions ranges between \$89 and \$111 billion for the mitigation scenarios. According to the Integration Analysis that covers the cost of between 5,659 and 7,265 MW on additional land-based wind, 7,393 and 9,310 MW of additional off-shore wind, 40,648 and 45,254 MW of additional solar, and 10,987 and 14,731 MW of additional energy storage beyond the capacity expected in the Reference Case. The Draft Scoping Plan claims the additional costs necessary to the transition the electric grid to zero-emissions range between \$89 and \$111. Many things are must be overlooked or deliberately manipulated to make this claim. A US Energy Information Agency (EIA) [report](#) “Capital Cost and Performance Characteristic Estimates for Utility Scale Electric Power Generating Technologies” published in 2020 estimates that a 200 MWh battery energy storage system has a capital cost of US \$65.9 million. Assuming that the average of the additional energy storage capacity provides four hours of energy for every MW and using the EIA cost number, energy storage costs alone are \$213 billion. The final Scoping Plan must provide the estimated costs for all the renewable resource categories and reconcile these numbers.

The “Other Fuel” category “Includes fuel costs for other fuels such as wood, coal, and petroleum coke consumed for final energy demand (excludes fuel used for electricity generation).” The net present value of system expenditures from 2020 – 2050 for the Reference Case is \$23.58 billion and all three mitigation scenarios project relative minor cost decreases (14 to 18%) relative to the Reference Case

The “Fossil Gas” category “Includes fuel costs for fossil natural gas consumed for final energy demand (excludes fuel used for electricity generation).” The net present value of system expenditures from 2020 – 2050 is \$58.76 billion for the Reference Case. Over the time period 2020 – 2050 the total emissions for the three mitigation cases are about half of the Reference Case emissions for the mitigation cases so the decrease in fuel costs of about half is consistent.

The “Fossil Liquids” category “Includes fuel costs for liquid petroleum products like gasoline, diesel, jet kerosene, LPG, and residual fuel oil consumed for final energy demand (excludes fuel used for electricity generation).” The net present value of system expenditures from 2020 – 2050 is \$442 billion for the Reference Case. All three mitigation scenarios project cost decreases of about a third.

There are two renewable fuels considered. The “Renewable Liquids” category “Includes fuel costs for renewable diesel and renewable jet kerosene consumed for final energy demand”. The net present

value of system expenditures from 2020 – 2050 is \$3.96 billion for the Reference Case. The “Renewable Gas” category “Includes fuel costs for renewable natural gas and imported green hydrogen consumed for final energy demand (excludes fuel used for electricity generation).” The net present value of system expenditures from 2020 – 2050 is zero for the Reference Case. The low-carbon fuels scenario costs are \$90.95 billion. One of the questions that can only be answered with detailed cost measure information is why the sum of the other fuel, fossil gas, and fossil liquids expenditures in the Reference Case (\$525 billion) but for Scenario 2, low-carbon fuels. the sum of those categories plus the renewable liquids and renewable gas categories is only \$445 billion. How can all the additional processing necessary for renewable liquids and gas produce fuel that is cheaper than existing sources? The Scoping Plan should explain how this is possible.

The “Negative Emissions Technologies” category “Includes costs for direct air capture of CO₂ as a proxy for NETs.” The net present value of system expenditures from 2020 – 2050 is zero for the Reference Case. Detailed cost information and references for the assumptions for the cost measures that make up these costs is unavailable but necessary to provide meaningful comments. The Scoping Plan needs to provide this documentation.

The “Non-Energy” category “Includes mitigation costs for all non-energy categories, including agriculture, waste, and forestry”. The net present value of system expenditures from 2020 – 2050 is zero for the Reference Case. Detailed cost information and references for the assumptions for the cost measures that make up these costs is unavailable but necessary to provide meaningful comments. The Scoping Plan needs to provide this documentation.

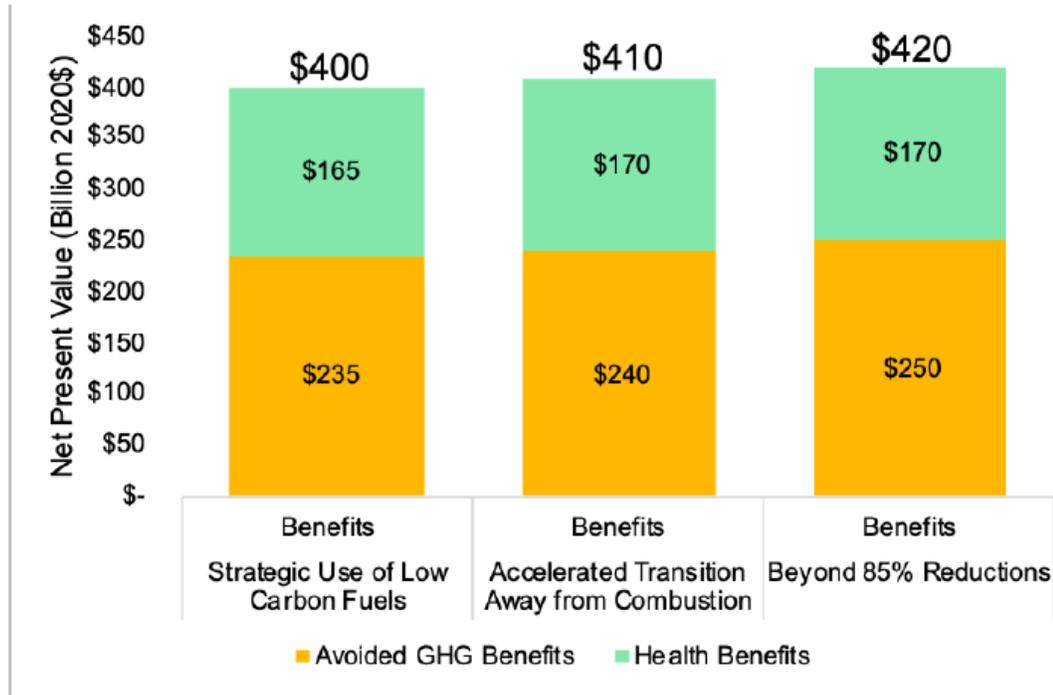
The “Others” category “Includes other direct costs including non-stock sector costs, oil & gas system costs, and HFC alternatives”. The net present value of system expenditures from 2020 – 2050 is \$90.9 billion for the Reference Case. Detailed cost information and references for the assumptions for the cost measures that make up these costs is unavailable but necessary to provide meaningful comments. The Scoping Plan needs to provide this documentation.

Avoided Cost of Carbon Benefits

In Figure 51 the costs are compared to benefits. As shown in Figure 46, the largest benefit comes from avoided GHG benefits. In order to claim that the Climate Act emission reductions provide societal benefits the Social Cost of Carbon (SCC) or Value of Carbon is used. The metric is a measure of the avoided costs from global warming impacts out to 2300 caused by reducing a ton of GHG emissions. I believe there is an error in that calculation. Scoping Plan relies on flawed [DEC Value of Avoided Carbon Guidance](#). The Guidance includes a recommendation to [estimate emission reduction benefits](#) for a plan or goal. I believe that the guidance approach is wrong because it applies the social cost multiple times for each ton reduced. I maintain that it is inappropriate to claim social cost of carbon benefits of an annual reduction of a ton of greenhouse gas over any lifetime or to compare it with avoided emissions. The social cost calculation that is the basis of the Scoping Plan carbon valuation sums projects benefits for every year for some unspecified lifetime subsequent to the year the reductions. In [previously submitted comments](#) I explained that it is inappropriate to use cumulative values for this parameter because it counts the same benefit multiple times. I contacted social cost of carbon expert

Dr. Richard Tol about my interpretation of the use of lifetime savings and he [confirmed that](#) “The SCC should not be compared to life-time savings or life-time costs (unless the project life is one year)”. The final Scoping Plan must reconcile this issue.

Figure 46. Net Present Value of Benefits Relative to Reference Case (2020-2050)



Corrections to Figure 51 Net Present Value of Benefits and Costs

In order to calculate the societal benefit of avoided greenhouse gas emissions appropriately, the New York [values of carbon](#) should be multiplied by the number of tons of carbon reduced. I believe that the societal benefit for Climate Act reductions should use one and only one of the three values in the following table. Using the maximum observed rather than the 1990 baseline makes sense if you want to get credit for New York’s biggest impacts and using the most recent value could be argued as appropriate because it represents the actual value of the Climate Act itself. Note that these numbers are inconsistent with the Draft Scoping Plan values and that I [submitted comments earlier](#) documenting my calculations and asking that the differences be reconciled.

The following table lists the societal benefits for the three different discount rates listed in New York’s [Value of Carbon guidance](#). Note that New York’s emissions estimates using upstream emissions and unconventional assumptions increase emission estimates to 1.9 times higher in 1990 and 2.3 times higher in 2019 than emissions accounting used by other jurisdictions. The state recommends using the 2% discount rate which gives societal benefits ranging between \$46.7 billion and \$57.0 billion using the [2021 values](#) depending on whether the 1990 baseline, maximum observed, or most recent emissions are used. However, consider that most other jurisdictions, including the Federal government are using

conventional, or UNFCCC, format for governmental accounting and the 3% discount rate. That drops the social benefits to \$8.6 for 2019 emissions to \$10.9 billion for 1990 emissions.

Societal Benefits of New York GHG Emission Reductions and Scoping Plan Scenarios

	Year	NYS GHG Emissions mmT CO2e	Recommended Range of Discount Rates			Societal Benefit of Climate Act (\$millions)		
			3%	2%	1%	3%	2%	1%
Climate Act	1990	402.54	\$ 52	\$ 123	\$ 409	\$20,932	\$ 49,512	\$164,639
	2000	463.42	\$ 52	\$ 123	\$ 409	\$24,098	\$ 57,001	\$189,541
	2019	379.43	\$ 52	\$ 123	\$ 409	\$19,730	\$ 46,670	\$155,187
Everybody Else	1990	210.43	\$ 52			\$10,942		
	2019	165.46	\$ 52			\$ 8,604		

	Scenario	Scenario Description	Societal Benefit of Climate Act	
Scoping Plan	2	Strategic Use of Low Carbon Fuels	\$235,000	
	3	Accelerated Transition Away from Combustion	\$240,000	
	4	Beyond 85% Reductions	\$250,000	

The following table incorporates two corrections noted in the Category Cost Implications section and the largest appropriate societal benefit of Climate Act emission reductions (\$57 billion). The first correction included is to add the cost of vehicle chargers for each Scenario that adds between \$15 and \$18.5 billion to the direct costs. The second correction is to add \$213 billion to account for the costs of energy storage that are not included in the Draft Scoping Plan estimate. As a result of just these two corrections the costs of the net-zero transition are between \$295 billion and \$316 greater than the benefits. The final Scoping Plan must reconcile these cost estimates and should provide all the documentation so that New Yorkers can judge the cost-benefit comparison themselves.

Revisions to Figure 51 Data After Correcting Benefit Error and Cost Trick

Draft Scoping Plan Figure 51 Data	Net System Costs	Avoided GHG Benefits	Health Benefits	Net Benefit Benefit
Strategic Use of Low Carbon Fuels	\$310	\$235	\$165	\$90
Accelerated Transition Away from Combustion	\$290	\$240	\$170	\$120
Beyond 85% Reduction	\$305	\$250	\$170	\$115

Revised Figure 51 Data	Net System Costs	Avoided GHG Benefits	Health Benefits	Net Benefit Benefit
Strategic Use of Low Carbon Fuels	\$538	\$57	\$165	-\$316
Accelerated Transition Away from Combustion	\$522	\$57	\$170	-\$295
Beyond 85% Reduction	\$537	\$57	\$170	-\$310

Conclusion

The Draft Scoping Plan claim that the benefits out-weigh the costs is incorrect. I have shown that the trick to deceive the public excludes Climate Act costs by mis-categorizing initiatives such as the 2035 zero-emission vehicle mandate as part of the business-as-usual Reference case. In addition, the Plan uses incorrect guidance to inflate the societal benefits of avoided emissions. If the Draft Scoping Plan described all the control measures, provided the assumptions used for the strategies, the expected costs and expected emission reduction for each measure for the Reference Case, the Advisory Panel scenario and the three mitigation scenarios, then the public would be able to decide for themselves which costs associated with “already implemented” program are appropriate. The lack of documentation prevents that and should be provided in the final Scoping Plan.

I prepared this comment because I believe that the net-zero transition must not endanger affordability and that the claim that the benefits will out-weigh the cost is wrong. I have [written extensively](#) on implementation of the Climate Act because I believe the ambitions for a zero-emissions economy outstrip available renewable technology such that it will adversely affect [reliability](#) and [affordability, risk safety, affect lifestyles](#), will have [worse impacts on the environment](#) than the purported effects of climate change in New York, and [cannot measurably affect global warming](#) when implemented. The opinions expressed in this document do not reflect the position of any of my previous employers or any other company I have been associated with, these comments are mine alone.

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