July 1, 2022

Draft Scoping Plan Comments
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

Re: Comments in Response to New York's Draft Scoping Plan

To whom it may concern:

I have prepared these comments in response to the draft Scoping Plan that was approved for release by the New York Climate Action Council in December 2021. By way of background, I am the director of the Bioeconomy Development Institute and Associate Professor of Energy Resource Economics in the Department of Sustainable Resources Management at the SUNY College of Environmental Science & Forestry. I have a Ph.D. in Biorenewable Resources & Technology from Iowa State University and a J.D. from the University of Missouri. I have published more than 34 refereed publications in the scientific literature on bioeconomy topics and served as principal investigator on research grants totaling more than $2.3 million, including $1.9 million from federal agencies. Finally, I am a member of the Climate Action Council's Energy-Intensive and Trade-Exposed Industries advisory board.

The Climate Action Council, NYSDEC, and NYSERDA are to be commended for the tireless work that went into the preparation of the draft Scoping Plan. The document contains many science-based policy recommendations that would do much to make New York a global leader in the effort to prevent catastrophic climate change. The draft Scoping Plan can be further improved, however, particularly in light of recent findings from global climate change authorities such as the UN's Intergovernmental Panel on Climate Change on the critical role of the bioeconomy in humanity's efforts to mitigate greenhouse gas (GHG) emissions. My comments will focus primarily on those provisions in the draft Scoping Plan that most closely relate to the bioeconomy.

1. The Climate-Focused Bioeconomy

A major strength of the draft Scoping Plan is its inclusion of policy recommendations that directly relate to what the Plan calls the "climate-focused bioeconomy." These recommendations focus on developing two areas of the bioeconomy in New York that have largely been underutilized by climate policy in the U.S. to date: low-carbon products and net-negative carbon dioxide removal (CDR) practices. The fact that these decarbonization practices have been largely underutilized does not diminish their importance, however, for two reasons.

First, renewable electricity is unlikely to yield either low-carbon products or net-negative CDR practices during the time period covered by the CLCPA. Low-carbon versions of fossil products essential to modern life such as plastics, chemicals, asphalt, various building materials, etc.

require a carbonaceous feedstock (biomass)[1] for their production. These fossil products, especially those such as plastics and certain types of chemicals that are derived from natural gas, have substantial carbon footprints despite not being used as fuels, and switching to low-carbon products therefore represents an important decarbonization tool.

Second, a lack of adequate decarbonization to date by the global community has resulted in a situation in which global warming will only stay below the 2 degrees C threshold associated by climate scientists with the onset of catastrophic and potentially irreversible climate change if global GHG emissions decline to the point of being net-negative by mid-century.[i] In other words, it is now the global scientific consensus that catastrophic climate change will only be avoided through the widespread adoption of net-negative CDR practices. The draft Scoping Plan's proposed use of these practices as envisioned by the Climate-Focused Bioeconomy section and demonstrated in the three illustrative scenarios is in keeping with the CLCPA's "climate leadership" claim in this regard. Furthermore, some low-carbon products (e.g., non-biodegradable biobased plastics) are able to meet net-negative CDR needs, and the Climate-Focused Bioeconomy section wisely proposes to pursue both objectives.

2. Renewable Natural Gas

A second strength of the draft Scoping Plan is the inclusion of renewable natural gas (RNG) in all its illustrative scenarios. The CLCPA is correct to prioritize the abatement of methane emissions through its use of a 20-year rather than 100-year global warming potential (GWP) for carbon intensity calculation purposes. Simply put, the capture and destruction of existing methane emissions through the use of RNG is one of the single most cost-effective means of reducing GHG emissions that policymakers have at their disposal. This is because the conversion of methane from existing sources such as wastewater treatment plants, dairy and other animal manure-producing farm operations, and landfills enables the simultaneous displacement of fossil energy (primarily natural gas and/or petroleum) and avoidance of methane emissions. A recent review of the scientific literature conducted by my team at SUNY College of Environmental Science & Forestry found that certain widespread RNG pathways reduce GHG emissions by 300% or more under a 100-year GWP,[ii] and the size of the reduction is correspondingly greater under the CLCPA's 20-year GWP. Notably, no amount of methane leakage from the RNG supply chain is able to completely offset this advantage.[2] Unpublished research that my team conducted in June 2022 has further determined that RNG frequently has a negative carbon abatement cost under a 20-year GWP due to the very large amount of carbon dioxide-equivalent that is avoided through the pathway's use. The same cannot be said for many of the decarbonization pathways (e.g., solar PV paired with energy storage) that are under consideration by the draft Scoping Plan.[3]

An additional advantage of RNG is that it is compatible with New York's existing natural gas infrastructure. While this compatibility has been a point of contention for some of the Climate

[1] While some low-carbon products can in theory be produced from electricity via so-called "electrofuel" pathways, these pathways are at an extremely early stage of development and, in any case, do not provide low-carbon solutions for all of the fossil products mentioned above (e.g., asphalt).

[2] Assuming that the RNG supply chain utilizes an existing source of byproduct/waste methane rather than methane that was intentionally created.

[3] https://www.mckinsey.com/about-us/new-at-mckinsey-blog/a-revolutionary-tool-for-cutting-emissions-ten-years-on

Action Council's members, the ultimate success of the CLCPA will depend in large part on the extent to which New York is able to utilize low-carbon pathways within its existing energy infrastructure. Decarbonization is expensive in strictly financial terms. As a result, global investment in low-carbon energy continues to fall far short of what is needed to avoid catastrophic climate change, record spending on green energy pathways notwithstanding.[iii] This continued investment gap makes it essential that New York prioritize those decarbonization investments that have the lowest carbon abatement costs in order to stretch each dollar of investment as far as possible. This means in part the adoption of so-called "drop-in" decarbonization options that require less investment on supporting infrastructure as do those options that are not drop-in. While RNG does require investment in RNG production infrastructure, the fuel's ability to then be injected into existing natural gas pipelines enables it to utilize existing assets across the rest of its supply chain.

3. Annual GHG emissions versus cumulative GHG emissions

One shortcoming of the draft Scoping Plan is its emphasis on annual GHG emissions, and specifically those in 2050, rather than on cumulative GHG emissions. This emphasis does not reflect climate science and has a distortive effect on climate policymaking.[iv] The severity of climate change will be determined by atmospheric concentration of carbon dioxide-equivalent, and this in turn is a function of the amount of carbon dioxide-equivalent that has been released to the atmosphere over time rather than in a single year. The draft Scoping Plan's focus on emissions in a handful of years between now and 2050 rather than the full time period therefore prioritizes those decarbonization pathways that have the lowest carbon intensities in 2050 rather than those that will abate the largest amount of GHG emissions between now and 2050. Two recent refereed studies[v,vi] that were conducted by my team at SUNY College of Environmental Science & Forestry demonstrate mathematically why policymakers should focus on the latter rather than the former for the purpose minimizing the state's climate impacts. For the purposes of the CLCPA, then, New York should prioritize those low-carbon pathways that are commercially available now over those that have yet to achieve market penetration. That is not to say that it should ignore the latter, of course, but the draft Scoping Plan does not currently distinguish between the two types of decarbonization options.

4. Decarbonizing heavy-duty transportation

A second shortcoming of the draft Scoping Plan is that it treats the decarbonization of heavy-duty transportation as an option rather than an imperative. The International Energy Agency forecasts that more than 40% of global petroleum demand growth through 2030 will be caused by heavy-duty transportation (aviation and road freight).[vii] The continued low energy density of commercially-available battery technologies means that the widespread electrification of road freight, especially long-haul, remains decades away, and I do not expect the widespread electrification of the aviation sector to occur during the CLCPA's timeline. Fortunately for New York, low-carbon fuels capable of decarbonizing these sectors are widely available today for road freight (biodiesel, renewable diesel, and RNG) and increasingly available for aviation (sustainable aviation fuel). However, the draft Scoping Plan largely ignores the widespread use of these fuels outside of its "Strategic Use of Low-Carbon Fuels" illustrative scenario.

The renewable distillate fuels mentioned here achieve large reductions to both lifecycle GHG emissions and criteria pollutant emissions compared to petroleum fuels.[ii] They are also

commercially available today: nearly 50% of California's petroleum diesel demand has been displaced by biodiesel and renewable diesel, for example.[viii] Given the continued lack of high-density vehicle batteries, a failure by New York to utilize these low-carbon fuels would very likely lead to higher emissions of GHGs and criteria pollutants than would otherwise be the case. Such an outcome is easily prevented, and it is more accurate to refer to the use of low-carbon fuels in heavy-duty transportation applications as "essential" rather than "strategic."

5. Increased adoption of net-negative CDR pathways

Finally, while one of the draft Scoping Plan's strengths is its net-negative CDR recommendation, the final Scoping Plan should go further still. The UN IPCC 6th Assessment Report's conclusion that global GHG emissions will need to be net-negative by mid-century if warming is to remain below 2 degrees C is substantially more ambitious than the CLCPA's minimum decarbonization target of an 85% reduction to GHGs. As a wealthy and fully developed economy, New York has contributed far more to GHG emissions on a per capita basis than the global average. If avoiding catastrophic climate change requires global emissions to become net-negative during the CLCPA's timeline, then it follows that New York's emissions should be at least net-negative as well by 2050. Such an enhanced target would enable New York to lay claim to the "climate leadership" referenced by the CLCPA's name. I strongly encourage the Climate Action Council to make full use of the decarbonization pathways, particularly those underutilized bioeconomy pathways referenced above, at its disposal by aligning the final Scoping Plan's decarbonization target with that of the UN IPCC rather than the minimum threshold required by the CLCPA.

Thank you for the opportunity to provide comments to the draft Scoping Plan.

Regards,

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[i] https://www.ipcc.ch/assessment-report/ar6/
[ii] https://www.esf.edu/communications/news/documents/BBD_RNGwhitepaper.pdf
[iii] https://iea.blob.core.windows.net/assets/88dec0c7-3a11-4d3b-99dc-8323ebfb388b/WorldEnergyOutlook2021.pdf
[iv] https://royalsocietypublishing.org/doi/full/10.1098/rsta.2012.0064
[v] https://www.sciencedirect.com/science/article/pii/S2666052021000108
[vi] https://www.sciencedirect.com/science/article/pii/S0016236122010985
[vii] https://www.iea.org/data-and-statistics/charts/oil-demand-growth-by-sector-2017-2030
[viii] https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard