Agriculture and Forestry

I. Introduction

The contributions of the Agriculture and Forestry sectors to greenhouse gas ("GHG") emissions are often overlooked in the discussion on climate change. Agricultural activities and forest management for commercial products are both major sources of greenhouse gases, and state governments have numerous tools at their disposal to transform these sectors to help mitigate catastrophic climate change.

The Agriculture and Forestry sectors provide unique opportunities for climate change mitigation because they impact GHG sources *and* sinks. New York's 18.6 million acres of forest play a critical role in sequestering carbon, supporting biodiversity, and providing numerous other ecosystem services.[1] The conservation and restoration of the state's existing forests, as well as reforestation of previously forested areas, are critical to achieving New York's climate targets. However, many of the strategies in the Draft Scoping Plan ("DSP") related to forestry seek to protect the profitability of the forestry industry rather than maximizing climate benefits. The

[1] N.Y. Climate Action Council, *Draft Scoping Plan* ("DSP"), 194 (2021), https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.pdf.

Final Scoping Plan ("FSP") should ensure that pressures from the forestry industry to harvest and generate forest crops do not threaten the preservation of New York's forests. Additionally, the FSP should not offer New York's forests as an excuse for delaying action on reducing fossil fuel emissions through offset programs, which are scientifically unsound and strongly opposed by many environmental justice groups.

The State Department of Environmental Conservation ("DEC") indicates that agriculture is responsible for 6% of total state GHG emissions, and that 92% of those emissions come from livestock.[2] Unlike other sectors in New York where emissions have already decreased, livestock management emissions have increased 44% since 1990.[3] And unlike the energy sector, whose contributions to climate change are largely in the form of carbon dioxide, agricultural emissions include methane, nitrous oxide, and carbon dioxide. Over 20 years, methane has a global warming potential about 84 times greater than carbon dioxide, and nitrous oxide has a global warming potential about 264 times greater than carbon dioxide.[4] Despite the impact of these emissions, the DSP fails to include any mandatory strategies to regulate methane emissions from livestock. The FSP should include greater accountability and transparency across all strategies related to reducing emissions from livestock and croplands and strategies related to increasing soil carbon storage.[5]

The DSP acknowledges the significance of the Agriculture and Forestry sectors to climate change mitigation and proposes many effective approaches to curbing their greenhouse gas contributions. However, the urgency of achieving the Climate Leadership and Community Protection Act ("CLCPA")'s ambitious goals calls for more transformative and creative approaches. Below, we provide recommendations to maximize the efficacy of the Plan's agriculture and forestry strategy.

II. Sustainable Forest Management

A. The Final Scoping Plan Should Prioritize Reforestation and Forest Preservation Efforts, Which Provide the Maximum Climate Benefit, Rather Than Promoting Strategies Designed to Profit the Forestry Industry

Several strategies under the Sustainable Forest Management section of the DSP are based on a mischaracterization of forest carbon cycling in New York. These strategies are designed to support the forestry industry rather than to maximize climate benefits. The FSP must revisit these assumptions and only make recommendations based on accurate climate impact accounting,

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[2] N.Y. Dep't of Env't Conservation ("DEC"), *Agriculture Forestry, and Other Land Use: 2021 NYS Greenhouse Gas Emissions Report*, at 3, tbl. SR3.3, https://www.dec.ny.gov/docs/administration_pdf/ghgafolu21.pdf.
[3] *Id.*
[4] Intergovernmental Panel on Climate Change Working Groups I, II and III, *Climate Change 2014: Synthesis Report* 87 box 3.2 tbl.1 (2014), https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf; *see also* Eastern Rsch. Grp. Inc., *Technical Documentation: Estimating Energy Sector Greenhouse Gas Emission Under New York State's Climate Leadership and Community Protection Act* 65 app. E (2021), https://www.dec.ny.gov/docs/administration_pdf/energyghgerg.pdf.
[5] *See generally* Peter H. Lehner & Nathan A. Rosenberg, *Advancing Climate-Neutral Agriculture in New York*, *Viewpoint*, 33 Env't Law in N.Y. (2022) [attached as Exhibit A].

rather than relying on biased accounting promoted by industry to suggest that harvesting provides a climate benefit.

The DSP claims that "[t]o maximize New York forests carbon sequestration potential, it is critical that forest management activities *increase* statewide," because the "carbon sequestration rate has slowed" in New York's forests.[6] This flawed framing is used to justify removals from forests, despite clear scientific evidence that allowing New York forests to remain intact will generally provide the maximum climate benefit. There are several reasons why this is so.

First, most forest stands in New York are predicted to have positive growth increments for several decades absent accelerated harvesting intensities. The majority of forest stands in the northeast are relatively young and are dominated by growth following the abandonment of agricultural fields in the region in the mid-1800s.[7] The mean age of forest stands in New York is between 60–70 years old, with most forest stands comprised of younger trees.[8] This transition from agricultural activities has allowed northeastern forests to play a unique, ongoing role in mitigating climate change. While global anthropogenic activities have dramatically increased atmospheric carbon dioxide concentrations, northeastern forests continue to help counteract these emissions by sequestering more than a megaton of carbon per hectare annually through photosynthesis.[9] Forest stands with trees between 70–100 years hold the greatest densities of carbon in the state, and these older stands also continue to sequester significant quantities of carbon.[10] Protected from harvest, New York forests have the potential to continue to sequester carbon at increasing or stable rates for several decades. However, harvesting reduces the capacity of these forests to continue functioning as a carbon sink.

Second, losses in carbon stocks following harvest are not compensated by new growth in timescales relevant to New York state's climate action planning. In northeastern forests, it takes several decades to recover from the debt of carbon removals following harvest to arrive back at pre-harvest carbon stocks.

Third, this period of regrowth represents a lost opportunity for existing forest growth to continue to accrue carbon, as would have occurred in the absence of disturbance. The continued

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[6] DSP at 198–199 (emphasis added).

[7] *See* Jana E. Compton & Richard D. Boone, *Long-term Impacts of Agriculture on Soil Carbon and Nitrogen in New England Forests*, 81 Ecology 8 (2000) [attached as Exhibit B]; *see also* Charles V. Cogbill et al., *The Forests of Presettlement New England, USA: Spatial and Compositional Patterns Based on Town Proprietor Surveys,* 29 J. Biogeography 1279 (2002) [attached as Exhibit C].

[8] *See* Yude Pan et al., *Age Structure and Disturbance Legacy of North American Forests,* 8 Biogeosciences 715 (2011); *see also* Richard H. Widmann et al., U.S. Dep't of Agric., *New York Forests*, at 97, fig.70 (2012), https://www.fs.fed.us/nrs/pubs/rb/rb_nrs98.pdf.

[9] *See* Xiaoliang Lu et al., *Land Carbon Sequestration within the Conterminous United States: Regional- and State-Level Analyses,* 120 J. Geophysical Rsch.; Biogeosciences 379 (2015); *see also* Thomas Buchholz et al., Cary Institute of Ecosystem Studies, *Forest Biomass and Bioenergy: Opportunities and Constraints in the Northeastern United States* (2011), https://www.caryinstitute.org/sites/default/files/public/downloads/report_biomass.pdf.

[10] *See Forest Inventory & One Click Factsheet*, U.S. Dep't of Agric. ("USDA"), https://public.tableau.com/views/FIA_OneClick_V1_2/StateSelection?:showVizHome=no; *see also* Forest Res. Ass'n. Forest Carbon Report: New York (2021), https://live-forest-resources-association.pantheonsite.io/wp-content/uploads/2021/12/New-York.pdf.

harvesting of these forests as they mature not only reduces stored carbon but also eliminates the sequestration that continued growth would otherwise provide. Accounting for this opportunity cost is often left out of assessments on the sustainability of bioenergy harvesting and other evaluations of forest management planning.

Fourth, harvesting these forests, including the removal of biomass for bioenergy, leads to additional emissions from harvesting activities, burning, transportation, and manufacture of wood products.[11]

The forest industry's claims and the strategies in this section of the DSP wholly overlook these critical facts. Harvesting biomass sets the clock back on carbon sequestration and weakens one of our strongest defenses against increasing atmospheric greenhouse gases. The FSP must recognize the fundamental benefits of leaving forests intact and carefully account for this potential for continued carbon sequestration in any forest management proposals that suggest harvesting as a climate mitigation strategy.

Despite their important functions, only 6% of forestland in the northeastern U.S. is legally preserved from harvest.[12] While logging efforts may not consume a large proportion of the landscape, these removals consume over 50% of *net* growth in New York State (i.e., the change in biomass that remains in undisturbed forests following natural causes of tree mortality), already significantly reducing the potential of these systems to sequester carbon.[13]

The Land Use chapter of the DSP provides a more accurate account of the climate benefits of allowing New York's forests to remain as forests than what is contained in the Sustainable Forest Management section:

> New York has 18.6 million acres of forests, which hold an estimated 1,911 MMT of carbon. In addition to carbon sequestration and storage, New York's forests provide wildlife habitat, forest products, flood mitigation, recreational opportunities, and mental health benefits, and protect the State's air and water quality. *Forestlands in many parts of the State are under pressure from development and forest conversion, which is causing a steady decline in the amount of CO2 being absorbed each year. Keeping forests as forests is critical to maintaining and increasing levels of carbon sequestration and storage and preventing emissions, as forests sequester and store much more carbon than any other land use in New York.* State and municipal land acquisition provide the most reliable long-term protection of forested areas from land conversion. There are currently 4.8 million acres of forestland owned by the State, local municipalities, or land trusts in New York. In 2020, 6,005 acres of land were protected through acquisition by DEC and OPRHP and 14 grants were awarded to protect forests

[11] *See* Tara W. Hudiburg et al., *Regional Carbon Dioxide Implications of Forest Bioenergy Production,* 1 Nature Climate Change 419 (2011) [attached as Exhibit D].
[12] Thomas Buchholz et al., Cary Institute of Ecosystem Studies, *Forest Biomass and Bioenergy: Opportunities and Constraints in the Northeastern United States* 14 (2011), https://www.caryinstitute.org/sites/default/files/public/downloads/report_biomass.pdf.

[13] Buchholz et al., *supra* note 12, at 19; *see also* Widmann et al., *supra* note 8.

through the Conservation Partnership Program. *To maintain the State's carbon storage and sequestration levels, additional protection is needed, which can be accomplished through land acquisition and conservation easements.*[14]

Thus, the FSP should ensure recommendations related to forests are internally consistent and it should focus on strategies to incentivize forest conservation, protection, and afforestation and reforestation efforts as laid out in the Land Use chapter rather than conflicting incentives to manage forests for forest products as described in the Agriculture and Forestry chapter.

The FSP must accurately reflect the climate benefits of allowing New York's forests to remain intact and continue to sequester carbon as they age. As described in greater detail below, the Climate Action Council should re-evaluate the strategies currently within AF1-8 and eliminate those that incentivize removals from New York's forests, including, for example, tax breaks for the development of forest management plans to produce and harvest forest crops. The DSP offers potential remedies to level the playing field and encourage private landowners to keep forest land intact. However, the FSP must ensure that these new programs are at least equally attractive as existing harvesting incentives. Additionally, the FSP should eliminate recommendations that offer forest carbon sequestration as an opportunity to purchase offsets—rather than actually reduce—fossil fuel emissions. Finally, the FSP should include mechanisms for close oversight of any funding directed towards forest harvesting equipment.

B. The Final Scoping Plan Should Ensure That Benefits for Private Forest Landowners Who Manage for Carbon Sequestration or Conserve Their Forests in Natural Conditions are *At Least* Equal to Benefits for Private Forest Landowners Who Manage for Wood Products

The DSP includes recommendations for amending Real Property Tax Law 480a and enacting new legislation to include tax incentives for private forest landowners to manage for multiple benefits including wildlife habitat and carbon sequestration or to conserve their forests in natural conditions. These recommendations will help reduce the incentive in Real Property Tax Law 480a to harvest forests. However, the DSP states that "[i]nitial benefits" of these new tax incentives—which will be contained in a new section 480b—"should start at a lower level than 480a and 480c with up to 100% reimbursement to municipalities."[15] While these amendments will help incentivize landowners to keep forested land intact, the FSP should ensure that abatement rates for forest landowners managing their forests for wildlife habitat or carbon sequestration or conserving their forests in natural conditions are offered benefits *at least* equal to those available to forest landowners managing for wood products or other harvesting activities. Absent a level playing field for these outcomes with clear climate benefits, the FSP will not go far enough to protect New York forests from harvest.

[14] DSP at 276. (emphasis added).
[15] DSP at 204.

C. The Final Scoping Plan Should Not Include AF6, Which Relies on Dangerous and Ineffective Offsetting of Fossil Fuel Emissions Through Forest Carbon Sequestration

The FSP should not include AF6, which suggests that carbon sequestration in New York State forests may be used to offset emissions from other sectors. Forest carbon sequestration should not be used to allow fossil fuel emissions from other sectors to persist. Fossil fuel polluters should not be allowed to circumvent their responsibility to curb direct emissions by claiming to offset them by purchasing impermanent carbon gains elsewhere.

Such offset schemes seek to avoid accountability for direct emissions of greenhouse gases with uncertain, imprecise and difficult-to-monitor supposed increases in carbon stocks elsewhere. These offset schemes are premised on a scientific fallacy that equates increases in carbon stocks in soil and vegetation with past and ongoing losses of fossil carbon. However, these are not at all equivalent. It is critical to note that climate change is primarily attributed to the removal of large amounts of *fossil* carbon, which would have remained sequestered in the absence of anthropogenic activities. In contrast to these slow-cycling fossil stocks, carbon in biogenic pools including vegetation and soils in New York forests is inherently impermanent and perpetually vulnerable to decomposition. Thus, offsets should not be allowed to delay irreversible losses of fossil carbon. Carbon sequestration rates in New York state should be restored and accelerated (for example, through strategies to incentivize reforestation described in the Land Use chapter) in parallel with independent reductions in fossil fuel emissions.

The FSP should also take heed of the failures of past market-based approaches to regulating pollution that allow for offsets. As noted in our comments on economy-wide mechanisms and by the Climate Justice Working Group ("CJWG"), environmental justice communities have historically not benefited from—and indeed have often been harmed by—offset market-based policies though they are the most burdened by pollution-generating facilities. For example, one leading study found that California's cap-and-trade policy, which represents a market scheme that permits offsets, has exacerbated environmental injustice. An analysis of the program found that (1) regulated facilities were disproportionately sited in environmental justice neighborhoods, (2) most of the regulated facilities increased emissions of both GHGs and co-pollutants during the time period studied, and (3) neighborhoods that experienced increases in both annual average GHGs and annual average co-pollutants were more likely to be environmental justice neighborhoods.[16] This study also concluded that the use of offsets allowed regulated facilities to keep polluting (and degrading local air quality) by purchasing offsets from projects largely out-of-state that provided no benefit to frontline communities.[17] To avoid replicating these type of harms, the FSP must consider non-GHG co-pollutants and local environmental impacts to environmental justice communities and thus avoid offering New York forests as an opportunity to offset fossil fuel emissions.

There is simply no substitute for directly reducing fossil fuel emissions. Such reductions are critical to achieving climate targets as well as environmental justice goals as pollution

[16] *See* Lara Cushing et al., *Carbon Trading, Co-pollutants, and Environmental Equity: Evidence from California's Cap-and-Trade Program (2011–2015)*, 15 PLOS Med. e1002604 (2018).
[17] *See id*.

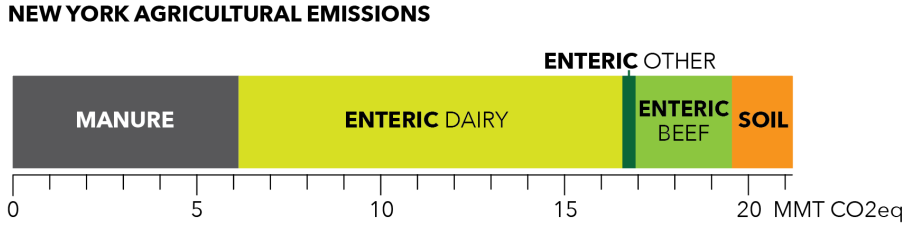
hotspots disproportionately burden low-income communities and communities of color. The FSP should not support accounting that allows avoidable ongoing fossil fuel emissions to persist based on offsets.

D. The Final Scoping Plan Should Require Close Oversight of Any Grants for Logging and Manufacturing Equipment to Ensure These Programs Do Not Inadvertently Support Increased Harvesting at the Expense of Conservation

Under AF3, the DSP recommends investments in logging and manufacturing equipment as a strategy to reduce site impacts associated with harvesting activities. While foresters should be required to adopt strategies to reduce site impacts, the FSP should ensure that funding such equipment does not further incentivize forest harvests over allowing New York forests to remain intact. If DEC provides foresters with funding for adopting such technology, it should include close oversight of grants to ensure forest management planning accurately accounts for the climate benefits of avoiding harvesting (as described above).

III. Livestock Management

New York ranks third for the number of milk cows in farms across the state, and is among the top five largest dairy-producing states in the country.[18] Its scale of production is associated with large, concentrated emissions of methane. Manure management and enteric fermentation from livestock account for 92% of New York's agricultural greenhouse gas emissions.[19] In 2019, manure management released over 6 million metric tons of CO2 equivalents (MMT CO2eq), and enteric fermentation released over 13 MMT CO2eq as methane (*see figure below*).[20]



Livestock emissions in New York are heavily concentrated in the largest concentrated animal feeding operations (CAFOs). In 2017, out of over 4,600 dairy farms in New York, only 142 farms—3% of all dairy farms in New York—had herd sizes over 1,000 milk cows, and only an additional 141 farms had herd sizes between 500 and 999 milk cows.[21] Just 6% of New York

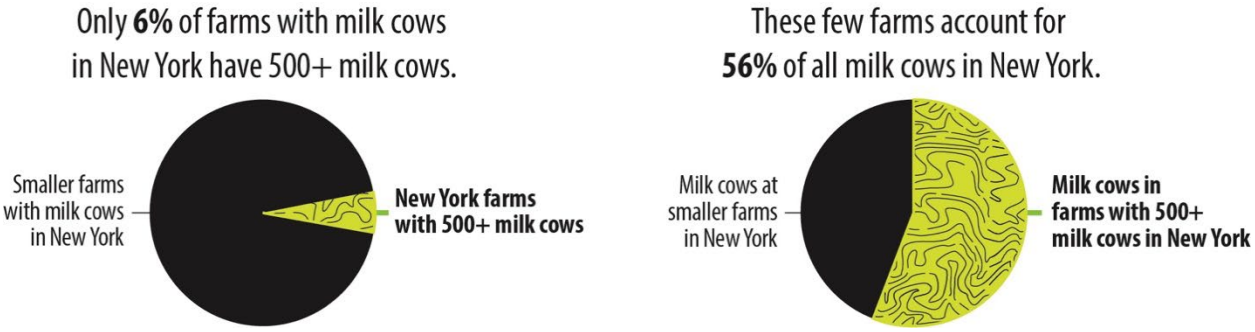
[18] USDA, Statistical Bull. No. 1055, *Milk Cows and Production Final Estimates 2013-2017* 7, 9 (2019), https://downloads.usda.library.cornell.edu/usda-esmis/files/cz30ps66x/jd473517g/bk128k88x/mcprsb19.pdf; *see also Farm Milk Production*, USDA, Econ. Rsch. Serv., https://www.ers.usda.gov/topics/animal-products/dairy/background/ (last updated Apr. 27, 2022).

[19] N.Y. DEC, *supra* note 2 at 3, tbl.SR3.3.

[20] *Id.*

[21] USDA, AC-17-A-32, *Census of Agriculture*, 23 tbl.17 (2019), https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_State_Level/New_York/nyv1.pdf.

dairies account for 56% of New York's dairy cow population (*see figure below*), and are thus responsible for the majority of methane emissions from both enteric fermentation and manure management.[22] This provides an opportunity to tailor policies for reducing livestock methane based on farm size. New York's limited funding should be prioritized to support small-and mid-size farms in controlling their emissions. The largest producers, on the other hand, should be required to control their emissions without financial support (or with much lower financial support) from the state. Focusing climate mitigation efforts on these large operations should be a priority for reducing New York's total greenhouse gas emissions.



A. The Final Scoping Plan Should Include Regulatory Options, as Authorized Under the Environmental Conservation Law ("ECL") and Consistent with the CLCPA, for Reducing Methane Emissions

1. DEC Has a Mandate and Authority to Regulate Methane Emissions from New York's Largest CAFOs

Under New York law, "[i]t *shall* be the responsibility of the department, in accordance with such existing provisions and limitations as may be elsewhere set forth in law, by and through the commissioner to carry out the environmental policy of the state set forth in section 1-0101 of this chapter." ECL § 3-0301(1) (emphasis added). That environmental policy, in turn, is "to conserve, improve and protect [New York's] natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well being." ECL § 1-0101(1). New York's laws specific to air pollution additionally mandate that DEC "require the use of all available practical and reasonable methods to prevent and control air pollution in the state of New York." ECL § 19-0103.

There is no question that methane is considered "air pollution" under the statute, as the term is broadly defined as:

> the presence in the outdoor atmosphere of one or more air contaminants in quantities, of characteristics and of a duration which are injurious to human, plant or animal life or to property or which unreasonably interfere with the comfortable

[22] *Id.*

enjoyment of life and property throughout the state or throughout such areas of the state as shall be affected thereby. . .

ECL § 19-0107(3). Given methane's tremendous global warming potential, and the New York legislature's finding in the CLCPA that "climate change is adversely affecting economic well-being, public health, natural resources, and the environment of New York," 2019 NY Senate-Assembly Bill S6599, A8429 § 1 ("CLCPA"), DEC is required by statute to abate this pollution. And under New York law, it must use "all available practical and reasonable methods to prevent and control" this air pollution—i.e., methane emissions—in the state. ECL § 19-0103.

DEC is also empowered to "[f]ormulate, adopt and promulgate, amend and repeal codes and rules and regulations for preventing, controlling or prohibiting air pollution in such areas of the state as shall or may be affected by air pollution," including requiring permits or certificates. ECL § 19-0301(1)(a). DEC is given explicit authority to "[i]nclude in any such codes and rules and regulations provisions establishing areas of the state and prescribing for such areas (1) the degree of air pollution or air contamination that may be permitted therein, [and] (2) the extent to which air contaminants may be emitted to the air by any air contamination source."[23] "Air contamination source" is defined as "any source at, from or by reason of which there is emitted into the atmosphere any air contaminant" and clearly encompasses livestock. ECL § 19-0107(5). DEC can thus use its authority under this provision to regulate methane emissions from CAFOs.

2. The CLCPA Does Not Limit DEC's Authority to Regulate Livestock Emissions

The CLCPA requires DEC to promulgate regulations "to ensure compliance with" the CLCPA's new greenhouse gas emission targets. CLCPA § 2 (amending ECL § 75-0109(1)). These regulations must "include legally enforceable emissions limits, performance standards, or measures or other requirements to control emissions from greenhouse gas emission sources, with the exception of agricultural emissions from livestock." *Id*. (amending ECL § 75-0109(2)(b)). This does not limit the authority DEC already had under the ECL to regulate methane emissions from livestock, for several reasons.

First, emissions that emanate from manure and grazing lands are not "from" the livestock, but rather are a result of how manure and grazing lands are managed by farmers and ranchers. (Emissions from municipal sewage treatment plants, similarly, are not considered to be "from humans".) Thus, the plain language makes clear the legislature's intent that DEC retain authority to promulgate legally enforceable emissions limits or performance standards relating to manure GHG emissions.

Second, the exception occurs in the paragraph imposing a mandate on DEC that it *must* regulate certain sources: "The regulations promulgated by [DEC] *shall*: . . . Include legally enforceable emissions limits, performance standards, or measures or other requirements to control emissions from greenhouse gas emissions sources, with the exception of agricultural

[23] ECL § 19-0301(1)(b); *see also* ECL §§ 3-0301(1)(a)–(b); §§ 3-0301 (2)(a), (m) (stating DEC's authority to issue rules and regulations to carry out state's general environmental policy).

emissions from livestock." CLCPA § 2 (amending ECL § 75-0109(2)(b)) (emphasis added). A close reading suggests that DEC *may* impose enforceable emission limits; it is only that the CLCPA does not *require* DEC to do so under the aegis of the CLCPA.

3. Regulating Methane Emissions from CAFOs Would Be Feasible and Come at Reasonable Cost to CAFOs

Not only *can* DEC regulate methane from CAFOs, but the costs of such regulation are reasonable and would be easily borne by the industry's largest operations. Several existing practices and mitigation strategies can curb these emissions at reasonable cost. CAFO operators can reduce methane generation by shifting more production to pasture-based systems or implementing dry manure management and greater solid/liquid separation at reasonable cost. As described below, these and other transformative shifts should be a priority in the FSP as they achieve greater emission reductions along with many other environmental and social co-benefits.

However, we recognize that at best it will take significant time to transition New York dairies from the current CAFOs structure. CAFOs with liquid manure management can currently adopt technology to cover existing lagoons and flare methane emissions. While cover and flare systems do not address the large share of enteric methane emissions upstream of manure production or emissions from land application of liquid manure, they are preferable to open liquid manure lagoons. Recent studies show this practice is cost-effective and financially feasible in the context of large New York dairies. For example, researchers at Cornell University found that these systems cost about $13 per megagram of carbon dioxide equivalent, or $0.005 per liter milk.[24] A separate Cornell University study of 128 farms in New York found that net farm income among the top 20% of dairies with an average of 1,515 cows was $1,112,949 (or $735/cow) in 2017.[25] This cost of adoption is similar to costs borne by producers in other sectors to mitigate greenhouse gas pollution.

B. The Final Scoping Plan Should Include More Transformative Strategies for Reducing Manure Outside of Cover and Flare Systems and Digesters, Including Strategies to Reduce Manure Generation and Reducing Wet Storage

The FSP should focus much more on reducing methane generation upstream of emissions, unlike the DSP's focus on methane destruction following production. This approach would be similar to the framework guiding waste management, where there is a primary preference for strategies leading to source reduction and reuse rather than simply treating produced waste.[26] While the DSP includes alternative manure management strategies in AF9, these strategies focus largely on end-of-lifecycle strategies to reduce emissions from manure

[24] Jennifer L. Wightman & Peter B. Woodbury, N*ew York Dairy Manure Management Greenhouse Gas Emissions and Mitigation Costs (1992-2022)*, 45 J. Env't Quality 1 (2016).
[25] John Karszes, Cornell Univ., EB 2018-08, *Six Year Trend Analysis New York State Dairy Farms Selected Financial and Production Factors* (2018), https://dyson.cornell.edu/wp-content/uploads/sites/5/2019/02/Cornell-Dyson-eb1808.pdf.
[26] *See Sustainable Materials Management: Non-Hazardous Materials and Waste Management Hierarchy*, EPA, https://www.epa.gov/smm/sustainable-materials-management-non-hazardous-materials-and-waste-management-hierarchy (last updated Dec. 15, 2021).

storage rather than more transformative strategies focused on reducing manure generation and accumulation in the first place. We are especially concerned that any further public investment in the largest CAFOs in the state (as opposed to enacting regulations limiting methane emissions as discussed above) will only further exacerbate consolidation, concentration, and harm to our rural communities.

While cover and flare systems and other strategies listed in AF9 can reduce methane emissions, the FSP should also recommend more transformative practices upstream of manure storage and incentivize practices that smaller producers can adopt. The first priority in manure management should be generating less methane to begin with. For example, using dry manure management and transitioning to managed-pasture-based and lower-density farming reduces the concentration and quantity of stored manure, and thus the generation of methane, while also improving soil health. Additionally, best practices during the spreading of manure—such as spreading only the amount that plants need and can use and avoiding spreading on frozen or saturated soils—can prevent unnecessary emissions.[27] These practices also have significant air and water quality co-benefits.

Relying on end-of-process systems also is less certain as engineered systems often fail, leak, or are operated sub-optimally. Digesters have been found to have leakage rates of about 3–6%,[28] which largely undercuts their climate benefits, and which can even cause them to be net sources of methane.[29] Furthermore, biodigesters release additional pollutants such as NOx, sulfur oxide, and particulate matter.[30] If the gas is then transported—through pipelines that also tend to have high leakage rates—the climate benefit is further reduced. These leaks not only increase the climate change impact, but they also endanger local communities. In addition, these systems do nothing to address enteric emissions or emissions from the land application of the liquid manure after digestion or flaring.

In allocating resources for these emissions reduction strategies, the FSP should prioritize financial support to small and mid-sized livestock operations, rather than the state's largest CAFOs. We suggest a cap on total funding awarded to large industrial CAFOs. Reducing methane emissions from large operations is essential to meet GHG emission targets, but these emissions can and should be controlled through regulatory safeguards (as described above) rather than through voluntary incentive mechanisms. New York's limited financial resources should support smaller operations, which often have thinner profit margins and face larger obstacles to

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[27] *See* Adam Kotin et al., Cal. Climate & Agric. Network, *Diversified Strategies for Reducing Methane Emissions from Dairy Operations* (2015), https://calclimateag.org/wp-content/uploads/2015/11/Diversified-Strategies-for-Methane-in-Dairies-Oct.-2015.pdf; *see also*, Olga Gavrilova et al., Emissions From Livestock and Manure Management, 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories 67 tbl.10.17 (2019), https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch10_Livestock.pdf.

[28] Lehner & Rosenberg, *supra* note 5 at 99 [attached as Exhibit A].

[29] *See* Felipe Montes et al., *Mitigation of Methane and Nitrous Oxide Emissions from Animal Operations: II. A Review of Manure Management Mitigation Options*, 91 J. Animal Sci. 5070 (2013); *see also* Mathieu Dumont et al., *Methane Emissions in Biogas Production*, Biogas Handbook (2013); *See also* Thomas Flesch, et al., *Fugitive Methane Emissions from an Agricultural Biodigester*, 34 Biomass & Bioenergy 3927 (2011); *see also* Jessica Fu, *Is California Giving Its Methane Digesters Too Much Credit?*, The Counter (May 19, 2022), https://thecounter.org/is-california-giving-its-methane-digesters-too-much-credit/.

[30] *See* Nicole G. Di Camillo, *Methane Digesters and Biogas Recovery - Masking the Environmental Consequences of Industrial Concentrated Livestock Production*, 29 UCLA J. Env't Law & Policy 367 (2011).

implementing sustainability practices.

In addition, the FSP should have explicit recommendations to increase the number and portion of organic operations in the state, aiming to at least double them by 2030 and double them again by 2040. For example, California calls for a doubling of organic agriculture by 2045 as a climate-smart strategy.[31] These operations generally use systems that generate far less methane from manure—and through better manure, compost and soil management, less cropland GHG emissions as well—and thus reliably reduce GHG emissions. Increasing support and incentives for certified (and perhaps non-certified) organic operations through direct and market support (including State procurement and certification) can also increase the profitability and viability of these operations.

C. The Final Scoping Plan Should Include Strategies for Increasing Oversight and Data Transparency Related to Emissions and Practices at Large Industrial CAFOs.

The FSP should recommend strategies for greater oversight of manure management planning and reporting to quantify emissions. Currently, the EPA's Greenhouse Gas Reporting Program requires livestock operations with manure management systems that have animal populations over a set threshold to report emissions of methane. *See* 40 C.F.R. § 98.360. The regulation applies to facilities using manure management systems including uncovered anaerobic lagoons, liquid/slurry systems with and without crust covers, storage pits, digesters, solid manure storage, dry lots (including feedlots), high-rise houses for poultry production, poultry production with litter, deep bedding systems for cattle and swine, manure composting, and aerobic treatment.[32]

However, EPA is currently prevented from implementing or enforcing this regulation due to restrictions placed on it in legislative riders. For example, section 437 of the Consolidated Appropriations Act states: "Notwithstanding any other provision of law, none of the funds made available in this or any other Act may be used to implement any provision in a rule, if that provision requires mandatory reporting of greenhouse gas emissions from manure management systems."[33] Thus, the full extent of emissions from manure management is not quantified well. In order to fully understand the scope of impact from this sector and achieve maximum emissions reduction, New York must gather these data from the largest of the state's livestock operations. The FSP should include strategies to require such data reporting from the largest facilities, particularly those receiving public funding through state programs, and should make these data publicly available.

IV. The Final Scoping Plan Should Include More Transformative Strategies for Reducing Enteric Methane Emissions from Livestock, Such as Feed Additives and Reductions in Livestock Antibiotic Use

[31] *See* Cal. Air Resources Bd., *Draft 2022 Scoping Plan Update* 65 (2022), https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf.
[32] *Id*.
[33] Consolidated Appropriations Act, Public Law No. 116–260, 116th Cong. § 437 (2021).

In addition to manure management, New York's meat and dairy operations release significant emissions directly from livestock as part of animals' digestive processes. The DSP proposes several effective strategies to reduce enteric methane emissions under AF10, including precision feed and forage management. While we support the promotion and expansion of these methods, the FSP should also explore strategies to accelerate the adoption of feed additives and integrate strategies to promote reductions in antibiotic use.

As noted under AF10, numerous feed additives have demonstrated promising results in decreasing methane emissions from livestock, at least in the short-term. One study documented a 30% decrease in enteric methane emissions over 12 weeks with the addition of 3-nitrooxypropanol, a chemical compound that blocks an enzyme critical to methane formation.[34] Another promising study found that supplementing livestock feed with red seaweed resulted in an 80% reduction in enteric emissions from cattle over 5 months.[35] Scientists continue to develop new additives that may have even more promising results. The FSP should include recommendations to accelerate the adoption of feed additives (through nudges, incentives, fees, and possibly mandates) as a potential approach to achieving significant emissions reductions and should explore opportunities to fund accelerated research and outreach on the development of novel strategies to reduce enteric emissions.

Finally, eliminating nontherapeutic uses of antibiotics in livestock could also be an effective approach to reducing emissions. Studies indicate that antibiotics may alter microbial activities and have cascading consequences that lead to increased methane emissions.[36] This research indicates that—in addition to mitigating the public health risks of increasing antibiotic resistance—minimizing antibiotic use could also be an effective method for decreasing emissions. The FSP should examine the prohibition or restriction of unnecessary antibiotic use (to the extent that it's still employed in New York), as well as any other emerging, science-based strategies for reducing enteric methane.

V. The Final Scoping Plan Should Focus on Strategies to Reduce Herd Size Which Could Accelerate Reductions in Both Manure and Enteric Emissions

The additions to AF9 and AF10 that we recommend above will help strengthen strategies to reduce emissions from manure and enteric fermentation from existing livestock. However, the DSP overlooks one key strategy entirely, which would reduce both enteric emissions and emissions from manure: the reduction in the number of livestock animals in New York State. As a long-term strategy, with appropriate support for a just transition for current producers, promoting dietary changes to reduce demand for dairy and beef products and thus ruminant livestock may be one of the strongest tools we have for reducing agricultural emissions. Given

[34] *See* Alexander Hristov et al., *An Inhibitor Persistently Decreased Enteric Methane Emission From Dairy Cows With No Negative Effect on Milk Production*, 112 Proc. Nat'l Acad. Sci. U.S. Am. 10663 (2015) (finding a 30% decrease in enteric methane emissions over 12 weeks with the addition of 3-nitrooxypropanol); *see also* J. Dijkstra et al., *Short Communication: Antimethanogenic Effects of 3-Nitrooxypropanol Depend on Supplementation Dose, Dietary Fiber Content, and Cattle Type*, 101 J. Dairy Sci. 9041 (2018) (A subsequent study to Hristov's).
[35] *See* Breanna M. Roque et al., *Red Seaweed* (Asparagopsis Taxiformis) *Supplementation Reduces Enteric Methane by Over 80 Percent in Beef Steers* 16 PLoS ONE (2021).
[36] *See* Tobin J. Hammer et al., *Treating Cattle with Antibiotics Affects Greenhouse Gas Emissions, and Microbiota in Dung and Dung Beetles*, 283 Proceedings Royal Soc'y Biological Sci. (2016).

that current and chronic over-production of dairy products also creates pressure for prices below production costs, a careful effort to reduce supply could have significant producer benefits (as federal farm policy did before 1980).

In addition, meat and dairy alternatives also present an enormous business opportunity. Indeed, while demand for dairy and beef products is falling,[37] demand for plant-based alternatives is skyrocketing.[38] The plant-based meat and dairy products market was already an over $29.4 billion industry in 2020—and is projected to reach $162 billion by 2030.[39] There is also growing interest in "cultured meat" products, given recent technological innovations and an influx of public and private funding for research and development.[40] These trends have prompted New York-based producers to reassess their operations—and, in some cases, have inspired rapid changes in operations to meet shifts in consumer demand. For example, in 2017, Elmhurst—a former dairy operation that was founded in 1925—responded to the "steady decline in dairy consumption and the changing American diet" by reopening as a plant-based milk operation in Buffalo, New York.[41] Like other efforts by producers to reimagine their operations, Elmhurst's transition indicates that the growing plant-based sector offers New York producers an enormous market—especially if they get ahead of the curve.[42]

Many studies have found lower GHG emissions throughout the full life cycle of both more plant-based diets and plant-based dairy and meat alternatives when compared to animal-based products.[43] In a carbon footprinting analysis of the USDA Foods Program based on one year of purchasing data, Friends of the Earth found that animal products were responsible for 98% of GHG emissions associated with the $1.3 billion of food purchasing for this program.[44] The same analysis found that replacing 25% of USDA's beef, pork, chicken, and cheese purchases with plant-based sources of protein would save 4 million metric tons of carbon dioxide

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[37] *See, e.g.*, Hayden Stewart et al., USDA Econ. Research Serv., *Examining the Decline in U.S. Per Capita Consumption of Fluid Cow's Milk, 2003–18* (2021), https://www.ers.usda.gov/webdocs/publications/102447/err-300.pdf?v=5705.9.

[38] *See* Blake Byrne & Ryan Dowdy, *Demand for Plant-Based Meat is Growing. We Must Ensure Our Supply Chain Can Keep Up*, Good Food Institute (Jan. 21, 2022), https://gfi.org/blog/meeting-plant-based-meat-demand/ (noting that "[i]n 2020, retail sales for plant-based alternatives grew twice as fast as overall food sales in the US" and that "[s]ales for plant-based meat in particular grew 45 percent.").

[39] Bloomberg Intelligence, *Plant-Based Foods Poised for Explosive Growth* (2020), https://assets.bbhub.io/professional/sites/10/1102795_PlantBasedFoods.pdf.

[40] *See* Kate Aronoff, *Lab to Table*, New Republic (Sept. 29, 2021), https://newrepublic.com/article/163554/lab-meat-save-planet; Isaac Nicholas & Mike Silver, *Tufts Receives $10 Million Grant to Help Develop Cultivated Meat*, TuftsNow (Oct. 15, 2021), https://now.tufts.edu/articles/tufts-receives-10-million-grant-help-develop-cultivated-meat (describing USDA funding for interdisciplinary research about cultured meat products).

[41] *The Dairy That Gave Up Dairy*, Elmhurst, https://elmhurst1925.com/pages/our-story (last visited Mar. 29, 2022).

[42] *See* Liz Susman Karp, *Farmers Trial Climate-Friendly Chickpeas in Upstate New York*, Civil Eats (May 3, 2022), https://civileats.com/2022/05/03/farmers-trial-climate-friendly-chickpeas-in-upstate-new-york/ (describing a farm in the Finger Lakes region that transitioned to chickpea farming to meet demand spurred by "the popularity of plant-based products").

[43] *See* Peter Newton & Daniel Blaustein-Rejto, *Social and Economic Opportunities and Challenges of Plant-Based and Cultured Meat for Rural Producers in the US*, Frontiers Sustainable Food Sys., (2021); *see also* Martin C. Heller et al., *Greenhouse Gas Emissions and Energy Use Associated with Production of Individual Self-Selected US Diets*, 13 Env't Rsch. Letters (2018); *see also* World Resources Institute, *Creating a Sustainable Food Future* (2019), https://files.wri.org/d8/s3fs-public/wrr-food-full-report.pdf.

[44] Friends of the Earth, *USDA Foods: How A $1.3 Billion Program Can Be Transformed to Create a More Just and Healthy Food System* (2021), https://foe.org/usda-foods.

equivalent (CO2eq) annually, which is equivalent to taking every registered automobile in Mississippi off the road.[45]

There are also numerous studies showing that plant-based diets are better for public health.[46] New York should dramatically increase efforts to promote these healthier, lower-emission diets—through the state's food procurement policies, public education programs, and increasing access to plant-based foods. The FSP should explore these and other strategies for decreasing meat and dairy consumption, and in turn reducing both manure management-related and enteric methane emissions.

VI. Soil Health, Nutrient Management, and Agroforestry

Improving soil health has the potential to restore soil carbon stocks lost due to poor land use practices. These efforts can help store carbon and reduce losses of nutrients from soil. The FSP should increase the focus of soil health, nutrient management and agroforestry programs to optimize climate-benefits, improve equity, ensure accountability, and reduce pesticide use, while advancing goals to improve water quality and protect biodiversity. As discussed below, the FSP may do so by setting targets for adoption rates of improved practices, setting targets for funding to disadvantaged communities, and recommending strategies to shift funds away from practices that further entrench polluting systems from industrial animal agriculture. The FSP should also include clear plans for measurement of outcomes, integrate strategies to reduce pesticide use, and impose fees on excess fertilizer use to promote improved nutrient management.

A. The Final Scoping Plan Should Set Statewide Goals Based on Targets Proposed at The National Scale for the Adoption of Climate-Friendly Practices to Track Progress and Increase Accountability.

The DSP includes several strategies to incentivize and promote the voluntary adoption of climate-friendly soil health practices. The FSP should go one step further and recommend mechanisms to ensure these strategies effectively drive shifts in practice adoption. The FSP should include targets for the adoption of climate-friendly practices to track progress and increase accountability. It can model such targets after those proposed at the federal level. For example, The Agriculture Resilience Act, introduced by U.S. Representative Chellie Pingree (ME) in 2021, offers several possible targets for 2040 that could be adopted in New York:

- Expand soil health practices to restore at least half of soil organic carbon that has been lost in the last 300 years;

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[45] *Id.* at 4.

[46] *See* Am. College of Lifestyle Med., *The Benefits of Plant-Based Nutrition* (2021), https://lifestylemedicine.org/common/Uploaded%20files/PDFs/News%20Room/ACLM-2021_Plant-based-Nutrition.pdf; *see also More Evidence for Replacing Red Meat with Other Protein Sources*, Harvard T.H. Chan Sch. Pub. Health , https://www.hsph.harvard.edu/news/hsph-in-the-news/replacing-red-meat-with-other-protein/ -:~:text=Reducing red meat consumption while,School of Public Health researchers (last visited June 13, 2022); Press Release, World Health Org., Int'l Agency Rsch. Cancer, *IARC Monographs Evaluate Consumption of Red Meat and Processed Meat* (Oct. 26, 2015), https://www.iarc.who.int/wp-content/uploads/2018/07/pr240_E.pdf.

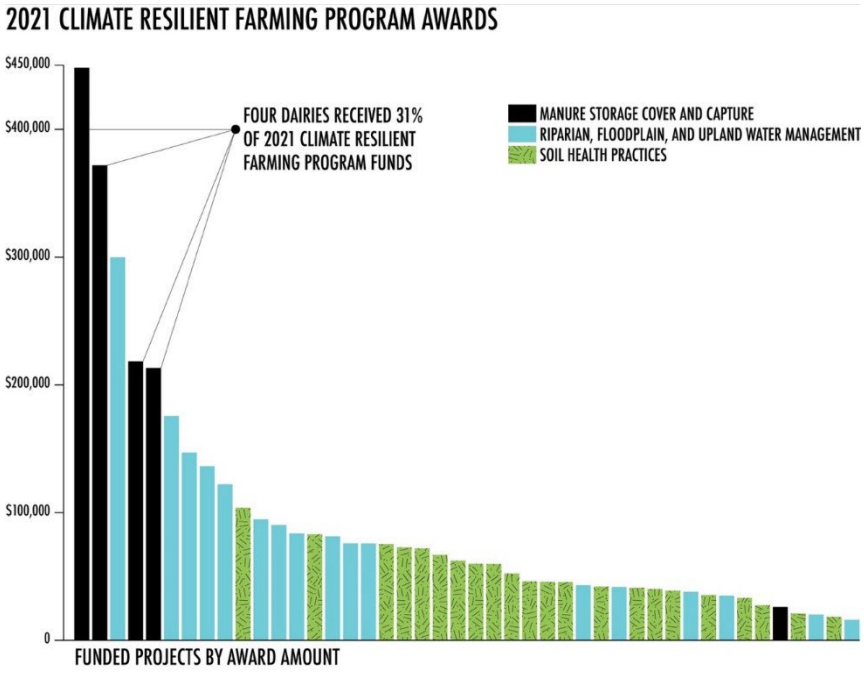
- Maintain year-round cover on at least 75% of cropland acres;
- Establish advanced grazing management on 100% of existing grazing land;
- Reduce GHG emissions related to the feeding of ruminants by at least 50% by reducing non-grazing of ruminants, growing feed grains and forages with soil health and nutrient practices that minimize net GHG emissions from cropland, and utilizing livestock feed mixtures and supplements to mitigate enteric methane emissions;
- Increase crop-livestock integration by at least 100% over 2017 levels; and convert at least two thirds of wet manure handling and storage to alternative management.[47]

Additionally, the FSP could include a target for reductions in the use of fossil-fuel based synthetic inputs, such as a 25% reduction in total fertilizer use by 2040, consistent with data on current excess application, and a 50% reduction of synthetic fertilizer use by 2040 due to its much greater climate impacts. Including specific targets, such as those listed above, will be necessary to drive progress toward climate targets for the voluntary strategies listed in the DSP.

B. The Final Scoping Plan Should Focus Strategies and Soil Health Funding on Climate-Friendly Perennials, Rather Than Practices That Further Entrench Polluting Systems from Animal Agriculture

The DSP includes expanded support for existing programs as a strategy to incentivize adoption of soil health practices (AF12). However, the FSP should ensure that these expanded programs focus funding exclusively on soil health practices with clear climate benefits, rather than practices that entrench polluting systems, as they have in the past. For example, in Climate Resilient Farming ("CRF") Program awards announced for 2021, a few large dairies received significant grants up to $448,000 to install cover and flare systems, while soil health practices accounted for smaller allocations of funds (see figure below).[48] Over 30% of total program funds went to just four large dairies to adopt this practice.[49] Manure management practices at these large operations are already eligible for support through the Department of Agriculture and Markets Agricultural Nonpoint Source Pollution Abatement and Control Program, which in 2021 allocated $8.9 million (or 55% of the total program budget) to projects including manure storage and management practices.[50] Thus, for improved equity and efficacy, the FSP must include guidelines to ensure that expanded programs are tailored towards soil health practices with climate benefits rather than simply channeling funding towards large industrial animal facilities.

[47] Agriculture Resilience Act, H.R. 2803, 117th Cong. (2021).
[48] N.Y. Dep't of Agric. & Markets, *Climate Resilient Farming Round* 5 (2021), https://agriculture.ny.gov/system/files/documents/2021/02/crf_round5_projectdescriptions_0.pdf.
[49] *Id.* Note that this is an improvement from 2018 awards, in which 78% of funds went to just four dairies and one swine farm to implement cover and flares. *See also* N.Y. Dep't of Agric. & Markets, *Climate Resilient Farming* (2018), https://agriculture.ny.gov/soil-and-water/climate-resilient-farming.
[50] *See* N.Y. Dep't of Agric. & Markets, *Agricultural Nonpoint Source Pollution Abatement and Control Program Round* (2021), https://agriculture.ny.gov/soil-and-water/agricultural-non-point-source-abatement-and-control.



C. The Final Scoping Plan Should Ensure 40% of the Benefits from Soil Health Programs Accrue to Disadvantaged Communities

Given the legacy of discrimination that prevented farmers of color from gaining equal resources to support ownership of agricultural operations, it is essential that farmers and ranchers of color benefit from the resources provided through CRF and other programs. As noted by the CJWG, Black, Indigenous, and people of color ("BIPOC") producers represent a small fraction of total producers in New York state and an even smaller proportion of producers on the largest farms. For example, only 0.24% of farmers in New York State are Black, and government subsidies and support per Black farm are 60% less than average payments per farm for all of New York's farms.[51]

The CLCPA directs that disadvantaged communities receive at least 35% of overall benefits of spending on certain key climate, energy, and environmental investments. *See* ECL § 75-0117. The Biden Administration has similarly committed to direct 40% of certain climate and environmental federal investments to disadvantaged communities.[52] The CLCPA is not entirely clear whether this mandate applies to agricultural expenditures. We urge that the FSP include guidelines to extend this guarantee to the benefits of funding from soil health programs. Many soil health programs will benefit both the farmers and/or those downstream or downwind, and the FSP should ensure that disadvantaged communities, including previously underserved farmers, in New York benefit from soil health programs. The FSP must recognize that existing

[51] *Rising and Organizing in New York State*, Black Farmers United NYS, https://www.blackfarmersunited.org/statements/rising-and-organizing-in-new-york-state (last updated Apr. 6, 2022); *see also* USDA, Nat'l Agric. Stat. Serv., *Census of Agriculture* (2017), https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Race,_Ethnicity_and_Gender_Profiles/New_York/cpd36000.pdf.

[52] *See* Tackling the Climate Crisis at Home and Abroad, Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

incentive programs that benefit the largest farms will further entrench these disparities and must therefore ensure that disadvantaged communities have access to relevant forms of support.

D. The Final Scoping Plan Should Include a Plan for Measurement of Outcomes.

The DSP largely relies on voluntary programs to incentivize the adoption of soil health practices. While many soil health practices, including cover crops, improved nutrient management, perennial crops, conservation crop rotations, and agroforestry have demonstrated climate benefits compared to conventional cropping systems,[53] the FSP should include plans for measurement, monitoring and verification of outcomes to ensure accountability and track soil health progress within New York. This accountability is necessary for ensuring that funding results in climate benefits—either through increases in carbon sequestration or reductions in emissions—and for shaping state programs towards practices with maximal climate benefits. Measurement, monitoring and verification can also help guide research efforts and provide valuable information for outreach and education specific to producers in New York.

While many soil health practices have been well documented and proven, they are still not widely adopted in New York and there is always room for additional improvement in their design and implementation with respect to specific crops, regions, and contexts. Moreover, as farmers themselves are in an excellent position to share information with others, both about implementation and impact, there should be a strong push—and funding—for gathering detailed documentation about project implementation and environmental outcomes with each funded project. In addition, if taxpayers can be assured that their money is being put to good use and achieving the goals it is being allocated for, it is more likely the program will be able to continue and grow. Industrial-scale producers receiving these sources of funding should be required to submit detailed documentation of implemented activities and data on outcomes and key environmental indicators to DEC. This will allow the agency, legislature, and the public to measure the progress of the program, help quantify its environmental benefits, provide data to help refine and improve the program, and give farmers the information they need to make sound business and conservation decisions.

E. The Final Scoping Plan Should Include Strategies to Reduce Reliance on Pesticides and Herbicides

[53] *See,* e.g., Amy Swan et al., USDA & Colo. State Univ., *COMET-Planner: Carbon and Greenhouse Gas Evaluation for NRCS Conservation Practice Planning*, http://bfuels.nrel.colostate.edu/health/COMET-Planner_Report_Final.pdf; *see also* Christopher Poeplaua & Axel Don, *Carbon Sequestration in Agricultural Soils via Cultivation of Cover crops – A Meta-analysis*, 200 Agric., Ecosystems & Env't 33 (2015) [attached as Exhibit E]; Jinshi Jian et al., *A Meta-analysis of Global Cropland Soil Carbon Changes Due to Cover Cropping*, 143 Soil Biology & Biochemistry 107,735 (2020) [attached as Exhibit F]; Shibu Jose & Sougata Bardhan, *Agroforestry for Biomass Production and Carbon Sequestration: An Overview*, 86 Agroforestry Systems 105 (2012) [attached as Exhibit G]; Joseph E. Fargione et al., *Natural Climate Solutions for the United States* 4 Sci. Advances (2018); *AgEvidence*, The Nature Conservancy, https://www.agevidence.org/ (last visited June 13, 2022); Xiongxiong Bai et al., *Responses of Soil Carbon Sequestration to Climate-smart Agriculture Practices: A Meta-analysis*, 25 Global Change Biology 2591 (2019) [attached as Exhibit H].

Reducing pesticide and herbicide use is critical to building soil health and preventing harm to non-target organisms and surrounding communities. Healthy soil depends on the presence of billions of soil microorganisms, including bacteria and fungi. Pesticide use by its very nature kills beneficial as well as harmful life in soil and thus often impairs soil health and fertility, with the potential to impact soil carbon and nutrient cycling and climate. Pesticides and herbicides can alter the composition, diversity, and functioning of soil organisms. Ultimately, pesticides and herbicides can harm and alter soil communities that play a major role in carbon sequestration and create a thriving agricultural system.[54] We thus urge the FSP to explicitly include strategies to reduce synthetic pesticide and herbicide use and to promote integrated pest management (including alternative strategies to suppress pests through conservation crop rotations, cover crops and other agroecological practices[55]) as key goals.

F. The Final Scoping Plan Should Include Additional Strategies to Reduce Nitrous Oxide Emissions from Excess Fertilizer Use, Including Outreach and Consideration of a Graduated Fertilizer Fee

The FSP should more directly address excess application of fertilizer, a common practice that has several harmful environmental and climate impacts, including the release of nitrous oxide, which is both a potent greenhouse gas and a major ozone depleting substance. This gas is emitted almost entirely by agricultural soil management and accounts for about 10% of the state's agricultural GHG emissions.[56] Farmers routinely apply fertilizer at higher rates than crops require for a variety of reasons: as a form of insurance or risk avoidance, hope for a great year, over-focus on yield over return, habit, and misinformation.[57] Due to losses to the atmosphere, retention in soil, and runoff to waterways, only a proportion of the nitrogen applied as fertilizer to annual grains is removed at harvest.[58] In addition, in New York, application of manure from CAFOs in the winter or on saturated ground is allowed, even though plants do not take up any nutrients at those times. These practices result in large losses of nutrients, leading to nitrous oxide emissions among other negative consequences.

The DSP recognizes that "[e]fficient use of nitrogen fertilizer can reduce nitrous oxide emissions from cropland, improve water quality, and can save the farmer money."[59] The efficient use of fertilizer includes applying it at the right time and place and can be advanced by practices such as split application and slow-release fertilizers. We support certain strategies in the DSP, including increasing outreach and support for improved nutrient management, especially to and

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[54] *See* Kendra Klein, Friends of the Earth, *Pesticides and Soil Health* (2019), https://foe.org/wp-content/uploads/2019/08/PecticidesSoilHealth_Final-1.pdf.
[55] *See Integrated Pest Management*, USDA Nat'l Res. Conservation Serv., https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/?cid=nrcs144p2_027181 (last visited June 13, 2022).
[56] *See* N.Y. DEC, *supra* note 2.
[57] G. Philip Robertson & Peter M. Vitousek, *Nitrogen in Agriculture: Balancing the Cost of an Essential Resource*, 34 Ann. Rev. Env't & Res. 97, 117 (2009) (Finding that farmers often apply excess fertilizer "in the hopes that 'this year will be the one in ten' when extra N will pay off.").
[58] G. Philip Robertson, *Nitrogen Use Efficiency in Row-Crop Agriculture: Crop Nitrogen Use and Soil Nitrogen Loss*, Ecology in Agriculture 351 (Louise E. Jackson ed., Academic Press 1997).
[59] DSP at 213.

for previously underserved farmers. We support the use of all existing support programs including the Agricultural Nonpoint Source Abatement and Control program and the new CRF program. However, the FSP should incorporate at least two additional measures to improve nutrient management on farms in New York.

First, since one of the most important things a farm can do is apply fertilizer no earlier than the planting season,[60] the FSP should recommend that DEC revise its CAFO general permits—applicable to the several hundred large dairies in New York accounting for nearly 70% of New York's dairy cow population—to prohibit winter manure spreading. Such a provision would reduce both nitrous oxide and methane emissions because fertilizer left unutilized in the soil over winter is vulnerable to environmental loss, including as nitrous oxide.[61]

Second, the FSP should recommend more aggressive efforts to incentivize improved fertilizer management, including phased-in institution of a fertilizer fee. While the DSP includes discussion on imposing some form of price on carbon dioxide emissions in its Economy-Wide Strategies Chapter (which we address elsewhere in these comments), the FSP should also develop a similar approach for nitrous oxide. The FSP should include consideration of imposing a fertilizer fee that could directly encourage and fund assistance for farmers' enhancing fertilizer use efficiency. This should be structured to apply only to excess fertilizer, such as applying over the per acre amounts that represent the plants' nutritional needs. More sophisticated fee schemes could provide a base rate with discounts for enhanced-efficiency fertilizers that emit less nitrous oxide. To assist in the transition, such a fee could be phased in, with significant outreach and technical assistance beforehand to enable farmers to adopt precision and other improved fertilizer management regimes. All revenue from the fee should be directed to farmer support. Improvements in fertilizer management are possible—and profitable—with similar reductions in nitrous oxide emissions.

VII. Climate-Focused Bioeconomy

A. The Final Scoping Plan Should Ensure That Strategies Listed Under the Climate-Focused Bioeconomy are Founded on Accurate Accounting of the Climate Impact of Harvesting and That They Do Not Undermine Strategies Listed in the Land Use Chapter

The DSP includes a number of strategies under the Climate Focused Bioeconomy section which prioritize growth of the forestry industry over climate mitigation. The FSP should include guidance to relevant agencies to ensure that any funding for forestry training as described in

[60] *See* Marc Ribaudo et al., USDA Econ. Rsch. Serv., ERR-127, *Nitrogen in Agricultural Systems: Implications for Conservation Policy* 11 (2011), https://www.ers.usda.gov/publications/pub-details/?pubid=44919; *see also* Terry L. Roberts, Int'l Plant Nutrition Inst., *Right Product, Right Rate, Right Time, and Right Place . . . the Foundation of Best Management Practices for Fertilizer*, Fertilizer Best Management Practices, 29–32, (1st ed. 2007); G. Philip Robertson et al., *Nitrogen-Climate Interactions in U.S. Agriculture*, 114 Biogeochemistry 41, 55–56 (2013).

[61] *See* Xiaojing Hao et al., *Nitrous Oxide Emissions From an Irrigated Soil as Affected by Fertilizer and Straw Management*, 60 Nutrient Cycling Agroecosystems 1, 5 (2001) [attached as Exhibit I]; Claudia Wagner-Riddle & G.W. Thurtell, *Nitrous Oxide Emissions From Agricultural Fields During Winter and Spring Thaw as Affected by Management Practices*, 52 Nutrient Cycling Agroecosystems 151, 162 (1998) [attached as Exhibit J].

AF18, efforts to expand wood product markets as described in AF19, or promotion of wood products as described in AF8, reflect accurate accounting of the impact of harvesting on both (1) existing carbon stocks in New York forests, and (2) the lost potential for sequestration resulting from removals of these carbon stocks. As described above, this is necessary to ensure that these recommendations do not undermine strategies laid out in the Land Use chapter, which rightly prioritize the climate benefits of keeping forests as forests rather than managing for commercial products. The FSP should provide guidance to relevant agencies to ensure that any funded education, outreach and product promotion reflect unbiased accounting of the potential negative impacts of forest harvesting on climate, and the FSP should direct relevant agencies to ensure that all claims and educational materials reflect sound science.

B. The Final Scoping Plan Should Not Include AF20, Which Calls for the Expansion of the Use of Biomass Feedstocks and Bioenergy Products

Biomass harvesting and bioenergy are false climate solutions and should have no place in the FSP. Biomass harvests reduce the capacity for New York's forests to continue functioning as a carbon sink. Not only do these activities reduce the magnitude of the carbon sink, they also lead to additional emissions from the harvest, burning, transportation and manufacture of wood products.[62] Harvesting biomass results in a lost opportunity for forest stands to continue to sequester carbon, as they would if left undisturbed. The FSP must recognize the fundamental benefits of leaving forests intact and carefully account for this potential for continued carbon sequestration in any proposals that suggest harvesting as a climate mitigation strategy.

As noted in the DSP, the CJWG has "expressed concerns about the combustion of biomass and biofuels due to their release of emissions."[63] The DSP fails to address these concerns, and should not include AF20, which calls for an expansion of biomass and bioenergy.

VIII. Conclusion

Reducing emissions from livestock and dairy production in New York, rebuilding soil organic carbon stocks on croplands, and restoring and protecting forests must all be a part of New York's climate action plan. The DSP includes several strategies that have the potential to reduce emissions from agriculture and forestry; however, there are a number of areas in which the DSP may be improved to avoid false solutions and increase accountability and impact. This includes the following:

Forestry

The FSP must revisit the currently proposed forestry strategies to avoid incentivizing removals from forests. The FSP must prioritize forest preservation and restoration efforts, which provide the maximum climate benefit, over managing forests to produce forest crops. The FSP must also not offer forests in New York as an excuse to delay action on reducing fossil fuel emissions through offset markets.

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[62] *See* Tara W. Hudiburg et al., *supra* note 11 at 419 [attached as Exhibit D].
[63] DSP at 227.

1. The FSP should ensure that benefits for private forest landowners who manage for carbon sequestration or conserve their forests in natural conditions are *at least* equal to benefits for private forest landowners who manage for wood products.
2. The FSP should not include AF6, which relies on dangerous and ineffective offsetting of fossil fuel emissions through forest carbon sequestration.

Livestock

Successfully reducing methane emissions from livestock will require strategies that extend beyond the voluntary and limited suggestions in the DSP. The FSP must include regulatory options to mandate reductions in methane emissions from large operations, and the FSP should explore an additional suite of more transformative strategies to reduce methane from enteric fermentation and manure management.

3. The FSP should include regulatory options, as authorized under the ECL and consistent with the CLCPA, for reducing methane emissions.
4. The FSP should focus on more transformative strategies for reducing manure methane outside of cover and flare and digesters, including strategies to reduce manure generation and reducing wet storage, and more transformative strategies for reducing enteric methane emissions from livestock, such as feed additives and reductions in livestock antibiotic use.
5. The FSP should focus on strategies to reduce herd size which could accelerate reductions in both manure and enteric emissions.

Soil Health

While the DSP provides useful suggestions for increasing the adoption of soil health practices on croplands in New York, the FSP should incorporate additional strategies to ensure that soil health programs result in real climate benefits and that these funds support disadvantaged communities.

6. The FSP should set statewide goals based on targets proposed at the national scale for the adoption of climate-friendly practices and climate-smart systems such as organic practices, and should include a plan to track progress and increase accountability.
7. The FSP should focus on strategies to incentivize climate-friendly cropping practices, rather than practices that further entrench polluting systems from animal agriculture.
8. The FSP should ensure 40% of the benefits from soil health programs accrue to disadvantaged communities.
9. The FSP should urge revision of the CAFO general permit and development of a phased-in tiered fertilizer fee to incentivize enhanced fertilizer management.

Climate-focused Bioeconomy

The FSP should focus on preserving the climate benefits of keeping forests as forests. The FSP must revisit forestry strategies in the context of accurate carbon accounting unbiased by the forestry industry to avoid false solutions like bioenergy from forest carbon stocks.

10. The FSP should ensure that strategies listed under the Climate-Focused Bioeconomy are founded on accurate accounting of the climate impact of harvesting.
11. The FSP should not include AF20, which calls for the expansion of the use of biomass feedstocks and bioenergy products.

Respectfully submitted,

Acadia Center
Alliance for a Green Economy
Brookhaven Landfill Action and Remediation Group
Catskill Mountainkeeper
Clean Air Coalition of WNY
Climate Reality Project, Capital Region NY Chapter
Climate Reality Project, Finger Lakes Greater Region NY Chapter
Climate Reality Project, Hudson Valley and Catskills Chapter
Climate Reality Project, Long Island Chapter
Climate Reality Project, NYC
Climate Reality Project, Westchester NY Chapter
Climate Reality Project, Western New York Chapter
Committee to Preserve the Finger Lakes
Community Food Advocates
CUNY Urban Food Policy Institute
Earthjustice
Environmental Advocates NY
Friends of the Earth
Fossil Free Tompkins
Gas Free Seneca
Green Education and Legal Fund
HabitatMap
Hotshot Hotwires
Long Island Progressive Coalition
Nassau Hiking & Outdoor Club
Natural Resources Defense Council (NRDC)
Network for a Sustainable Tomorrow
New Clinicians for Climate Action
North Brooklyn Neighbors
Northeast Organic Farming Association of New York, Inc. (NOFA-NY)
NY Renews
People of Albany United for Safe Energy
Riverkeeper Inc.
Roctricity
Seneca Lake Guardian
Sierra Club
South Shore Audubon Society
Sustainable Finger Lakes
University Network for Human Rights
UPROSE
WE ACT for Environmental Justice