



Climate Leadership and Community Protection Act, Draft Scoping Plan Commentary: Agriculture, Forestry and Land Use

Matthew Sheffer
Managing Director, Hudson Carbon
matt@hudsoncarbon.com

HC

1. Introduction

New York State's *Climate Leadership and Community Protection Act, NY State Senate Bill S.6599¹*, is one of the most ambitious pieces of state-level climate legislation in the country. As the title of the bill suggests, it not only sets an example for the rest of the country in terms of climate-change mitigation goals and strategies, but also recognizes that we must do so in service of the diverse communities that make up this great state. At the core of any successful and just climate policy is the implicit notion that *our communities are situated within a web of interconnected ecosystems that our lives, our land and our health depend on for vital services* like healthy food, clean water, clean air, and recreation, *in addition to climate change mitigation*.

There are tremendous gains to be made in terms of emissions reductions across New York's diverse sectors of industry, and we are excited to provide the following guidance document, which focuses on how the management of farms, forests and ecosystems, both working and natural, can be leveraged towards achieving *the goals laid out in Chapters 15 and 19 of the CLCPA Draft Scoping Plan*.

These ambitious climate goals not only include *emissions reductions*, but also:

- *durable natural carbon removals,*
- *enhancement of other key ecosystem services* like water purification and biodiversity enhancement,
- *and the revitalization of New York's food system and bioeconomy* to bolster local and regional agricultural economies across the state.

¹ "NY State Senate Bill S6599". *NY State Senate*. 2019-06-18. Retrieved 2020-05-20.

2. The Northeast Carbon Alliance (NECA)

Founded by Scenic Hudson, NECA uses science and collaboration to bring together land managers, scientists and public policy experts to realize the great power of natural climate solutions to combat climate change – from mountaintop to ocean floor – in the Hudson Valley, New York, Northeastern states, and beyond.

NECA directionally supports comments on the Draft Scoping Plan submitted by Scenic Hudson. While NECA has coordinated with Scenic Hudson on its own comments, and advised Scenic Hudson generally on policies that support regenerative agriculture, the opinions and priorities of both organizations are separate. The principal author of this document is Matt Sheffer of Hudson Carbon. Hudson Carbon is affiliated with the NECA and their comments herein are informed by various NECA members and findings. However, not all NECA members have been involved in crafting and reviewing this document.

In addition, Scenic Hudson directionally supports comments on the Draft Scoping Plan submitted by the Northeast Carbon Alliance. While NECA affiliates contributed ideas to Scenic Hudson's comments on the agricultural portions of the Draft scoping plan, Scenic Hudson is the primary author of these comments.

NECA's diverse members are working together to develop a robust, science-based framework for the implementation of regional *payment-for-ecosystem-service (PES)* markets. For the purposes of these comments, **NECA defines payment-for-ecosystem services (PES) as a framework that compensates farmers and other land stewards for implementing soil health practices, promoting watershed health and applying any other land management practices and systems that produce measurable ecosystem services** including, but not limited to:

- reduced nutrient runoff into watersheds for improved water quality,
- flood, erosion and drought mitigation through increased soil water-holding capacity,
- climate resilience through carbon sequestration,
- safe habitat for pollinators and other native wildlife,
- and economic stabilization and revitalization from reduced spending on externalities.

Implicit in this definition is the concept of quantifying and verifying the benefits produced. We recognize the state has made important strides in the arena of quantification and verification; however, we observe that additional development of measurement tools and policy is needed before a Payment for Ecosystem Services program can be implemented. Payment for Ecosystem Services programs have been envisioned in a variety of forms, including but not limited to direct payment programs, grant programs and market-based programs.

We note that is distinctly different from “payment-for-practices” (PFP) programs, also referred to as “voluntary conservation incentive programs.” **We define PFP programs as state**

programs that provide financial payment to land stewards in exchange for implementing or continuing best management practices, including soil health practices, determined to be the most effective, economically feasible and practical means of improving soil health, improving water quality, and reducing pollution generated by runoff.

These practices often have the co-benefits of adapting to and mitigating the effects of climate change, by reducing potent greenhouse gas emissions and capturing carbon in soil. The state's current AEM framework, and Climate Resilient Farming grants and Agricultural Non-point Source Pollution Control grants program within the State's Environmental Protection Fund, are examples of such programs.

As indicated in this commentary, NECA supports rapid scaling up of investment in Payment for Practices programs while the necessary measurement tools and policy infrastructure is developed to implement more targeted Payment for Ecosystem Services Programs. The severity of the climate crisis requires that we use all available strategies to curtail emissions and sequester carbon; while long term policy should privilege the measurable benefits of Payment for Ecosystem Services approaches, we should not wait to generate the obvious benefits available to us through more traditional Payment for Practices approaches.

NECA's unique group of stakeholders representing well-known institutions and organizations across New York State and the Northeast is well positioned to design, develop, and implement strategies to manage natural and working landscapes for the production of food, feed, fuel, fiber, and medicine, while maximizing the flow of critical ecosystem services, including GHG emissions reductions and removals.

Based on the work of our member scientists, research institutions, and the extensive experience of our network of farmers and land managers, NECA believes there is a tremendous opportunity to integrate the strategies for GHG reductions and carbon removals laid out in *Chapters 15 and 19 at the systems level*. Using a regenerative framework, New York can synergistically and efficiently achieve the ambitious goals for climate mitigation and community preparedness that impact key environmental, economic, and social concerns. Furthermore, NECA believes strongly that efforts to research and monitor the success of these strategies, as well as efforts to design and implement state-level PES markets and other programs, *should be managed and organized around watersheds, as water is the medium by which all ecosystems and communities across the state are connected*.

3. Regenerative System Design and Adoption

Within the context of working landscapes (i.e. farms and forests), the most efficient and effective way to achieve the greatest level of durable social, economic, and ecological impact is to leverage the synergistic power of *systems-level implementation* of regenerative best management practices (BMPs) that lead to positive qualitative and quantitative outcomes,

and support those systems with sound public policy and investment in downstream value-chains that make them economically and ecologically viable.

Currently, when an existing farm in New York adopts a single practice within an established system aimed at GHG emissions mitigation, like cover cropping or precision nutrient management, there are indeed positive impacts that result. Unfortunately, these individual practices are often implemented on only a subset of farm acreage, as opposed to incorporating an entire suite of regenerative practices as the foundation of a production system, thus limiting their overall impact in GHG reduction, soil fertility, and climate mitigation.

When practices such as diverse crop rotations, cover cropping, integration of perennial crops, management-intensive rotational grazing, and agroforestry, are *implemented in unison at farm-scale*, powerful synergies can be achieved that maximize GHG emissions reductions & carbon storage, while also improving water quality, restoring biodiversity & wildlife habitat, and increasing the diversification of food production within New York to further good nutrition, community prosperity, and food independence within the state.

Long-Term Synergies Important for Regenerating Ecosystem Health

For the long-term strategy, there is immense synergistic potential in rebuilding ecosystem health by adopting regenerative agriculture and forestry systems at the landscape- or watershed-scale. This large-scale, systems-level approach to how we adapt our farming and forestry systems within New York State is the best way in which to ensure rapid and long-term success of the CLCPA.

Because of the enormity of the goals and timeline of the CLCPA, *strategies must be targeted at maximizing regenerative agriculture & forestry system adoption across NYS farm & forest land on a relevant time scale.* This means looking very deliberately at New York State agriculture & forestry production on a per-acre basis, in order to establish a geospatial understanding of the underlying systems that are in place in terms of enterprises and cultural management practices, such that we can execute more precise planning and implementation of the systems of practices highlighted in the many strategies within this scoping plan.

Whole-system transition of farms to climate resilient, regenerative production systems is complex, requiring multi-phase planning, technical skills, education, peer support, market access for new products, and capital. In addition, transition plans are farm-specific, necessarily stemming from a production system currently in place. However, there are often similarities between farms within regions across the state (i.e. the Hudson Valley, Finger Lakes Region, etc.) such that transition planning can lend itself to a more regional, watershed-scale approach.

Within *the Draft Scoping Plan*, there are multiple strategies that must be integrated into a holistic, synergistic effort to maximize systems-level, landscape-scale adoption of

regenerative agriculture & forestry. These strategies must also be looked at in terms of their potential in the near-term, mid-term, and long-term, such that we ensure long-term, durable carbon removals while also ensuring long-term flows of other critical ecosystem services, bolstering of local and regional food systems, and the health and vitality of our communities across the state.

New York State's Agricultural Landscape

New York State farms produce an array of agricultural products, including dairy, grains & dry beans, orchard fruits and other specialty products. NECA recognizes the diversity of agriculture and farm enterprises in the state, but also the fact that the majority of farm enterprises, particularly in the dairy sector, are conventionally managed and highly specialized.

The goals set for food system viability within the CLCPA are critical. Relatedly, conversion of conventional farmland to non-agricultural use is a risk associated with non-viability of agricultural enterprises, affecting long-term food independence and potential for climate mitigation. Therefore, it remains the mission of NECA to pursue long-term strategies for food system viability and affordability in New York State, strategies that are aimed at promoting the adoption of diverse, regenerative production systems at the farm-scale, and building supporting value-chains and markets to enable new york's family farmers to remain in business, respond to changing demand trends, and participate in state-sponsored PES programs.

4. Short-Term Strategies: Reduce Emissions / Mitigate Climate Impact

New York's dairy farms have become significant sources of powerful GHG emissions, due to the national and global economic pressures and giant corporate monopolies that force family dairy businesses to concentrate feeding systems and consolidate operations to achieve enough scale to maintain thinning margins.

Critical, short-term strategies to mitigate these sources of GHGs have been outlined in the following strategies:

- **AF9. Advance Alternative Manure Management**
- **AF10. Advance Precision Feed, Forage, and Herd Management**
- **AF11. Advance Agricultural Nutrient Management**

While it is critical to rely on strategies like cap-and-flare to mitigate the current level of livestock agriculture emissions, it is imperative that we do not rely on these strategies as long-term solutions. Concentrated animal feeding operations (CAFOs) produce the lion's-share of nitrous oxide (N₂O) and methane (CH₄) emissions from livestock operations

across the US², and New York is no exception. Therefore, just as carbon capture is a strategy to make coal-generated electricity “less bad,” these strategies are merely ways in which to make concentrated livestock operations marginally “less bad.”

Furthermore, certain components of strategies such as **AF9** create incentives that are counter-productive in the long-term; i.e. relying on concentrated stores of manure as a “green” source of renewable fuel for electricity generation. What this strategy overlooks is the continued threat that liquid manure poses as a source of water pollution and N₂O emissions, possible antibiotic resistant bacteria, and issues that other components of these strategies do not adequately address.

Also implicit in the reliance of these strategies as long-term solutions is the fact that *maintaining the dairy industry in NY as it stands is actually counter-productive to other important food system goals within the CLCPA, such as **AF17. Bolstering Local Agricultural Economies**, which implicitly calls for food-system diversification, and better access to land for stakeholders such as BIPOC, women, LGBTQIA+, low income, veteran, and beginning farmers. Relying on climate mitigation approaches that in turn rely on the existence and maintenance of concentrated dairy operations on an upward trend of consolidation only increase monoculture commodity production and make land less available to marginalized food-system stakeholders and those who want to practice regenerative agriculture, ranching and holistic land management. Therefore, as part of the strategy to diversify farm-scale production, achieve climate goals and ensure farm viability, attention must be given to reversing the economic pressures, value chain infrastructure limitations and market realities that have driven dairy farms to the current state of production, scale and management practices.*

Again, these strategies are critical in the short term, as they address critical sources of GHG emissions within the livestock sector. However, they do not address the root cause of these problems, and they rely on the existence of highly concentrated animal production systems to contribute to emissions reductions, and therefore should not be treated as long-term solutions.

In order to achieve long-term durable impact, *we should further reduce and eliminate the sources of these emissions by achieving appropriate, distributed scale and diversifying production systems through the adoption of regenerative practices.* Programs that have been designed to implement these strategies should do so in a way that also incorporates incentives supporting pathways to system adoption that are more sustainable and regenerative in the long-term, incorporating practices such as composting, management-intensive rotational grazing, diversified forage production, and the integration of additional enterprises to reduce herd size without affecting net farm income.

² See National Agricultural Statistics Service, USDA 2017 Census of Agriculture, U.S. National Level Data tbl. 12 (2019).

5. Mid- & Long-Term Strategies (The Long Game)

Whole-system adoption of climate-smart, regenerative practices across New York State's farm and forest land is critical to achieving the goals laid out in the CLCPA, and to maintaining the long term durable impact across the spectrum of climate, ecosystem, and community.

The statewide-effort to transition New York's farms and forests to regenerative production systems requires a significant amount of design, planning, technical skills, peer support, and iteration, as well as a firm understanding of the existing systems currently in place, in terms of the geospatial distribution of production systems and cultural management practices across the state. In addition, as transitioning to regenerative production systems most often requires diversification of production and stacking of enterprises, with farmers producing several new types of crops and products, long-term success of regenerative transition requires access to value-chain infrastructure and markets to support diverse production systems.

There are strategies within *the Draft Scoping Plan* that, to varying degrees, address the requirements of practice adoption for climate mitigation. These strategies seek to leverage existing Payment for Practice (PFP) programs at the state and federal level. In order to increase adoption, NECA supports rapid scaling up of investment in Payment for Practice programs while the necessary policy infrastructure is developed to implement more targeted Payment for Ecosystem Services Programs.

The severity and urgency of the climate crisis requires that we use all available strategies to curtail emissions and sequester carbon. However, strategies to scale and evolve these PFP programs must be done so in a way that sets the stage at the farm scale for a robust, impactful PES program with diversified regenerative farms serving as a critical source of supply of ecosystem services.

In order to ensure that PFP programs contribute to harnessing the full power of regenerative agriculture & forestry systems to mitigate the effects of climate change while also contributing to whole ecosystem health, producing diverse, healthy food, feed, fuel, fiber and medicine, and supporting the health and vitality of our communities, sophisticated, integrated planning and implementation strategies are also required to ensure that we don't aim solely at GHG reductions at the expense of other key goals.

6. Farm Planning Adoption: Soil Health, Agroforestry & Climate Mitigation

The following strategies are concerned, to varying degrees, with supporting practice adoption and farm planning for the purposes of soil health, carbon sequestration and GHG emissions reductions:

- **AF12. Adopt Soil Health Practice Systems**
- **AF13. Increase Adoption of Agroforestry**

- **AF14. Develop AEM Planning for Climate Mitigation and Adaptation**

AF12. Adopt Soil Health Practice Systems does well to highlight a diverse set of practices, indicates the need for “system adoption” in its title, and frequently calls out the need for increasing perennial plant systems. **AF14** is concerned with farm planning, including piloting, outreach & education, and integrating carbon farm planning with other programs. **AF13** is exclusively concerned with increasing the adoption of agroforestry in New York, a powerful set of practices that can be integrated into larger regenerative production systems to maximize natural carbon removal in agricultural systems.

These three strategies, if executed in a strategic, integrated fashion, and adequately supported by state PFP programs, could go a long way towards catalyzing successful, long-term adoption of diverse, regenerative production systems across NY. However, further investment in existing NYS programs is necessary to provide adequate incentives, funding streams, and technical assistance to drive rapid systems change in a way that aligns with the CLCPA's ambitious goals.

In regards to the AEM Framework and the CRF Grant program, the following should be considered:

- **Tiers 2 & 3 of the AEM framework** should focus more on incentivizing practice adoption at the systems-level, encouraging incremental transitions to pasture-based livestock production & composting, long annual-perennial crop rotations with cover crops, organic no-till, and agroforestry practices like alley cropping and silvopasturing. *As such, the AEM program should adopt more long-term engagement and funding streams to this end.*
- **Integrating AEM and CRF funding to de-risk experimentation for New York's cutting edge farmers** who are driving innovation in the space of complex climate-smart, regenerative systems.
- **Farmers learn best from their peers** and are more likely to adopt proven strategies and systems that they can experience in practice at on-farm demonstrations or farmer-led soil health workshops. We strongly recommend that educational programs significantly increase funding for technical assistance and farmer networking to ensure the success of this approach. *The state must recognize the profound impact that farmers at the vanguard of regenerative, climate-smart agriculture can have on the rest of New York State farmers, and should develop well-funded program components that support farmers who are driving regenerative system innovation in New York State.*
- Because of their immense potential for generating durable, long-term carbon removals, and their potential for seamless integration into livestock, grain, and specialty crop production systems, **agroforestry practices must be at the center of any state-level program that is aimed at incentivizing climate-smart agricultural system adoption.** The United States has been significantly lagging behind the EU and the rest of the world in levels of funding allocated to scaling agroforestry

practices, despite their proven potential³. *There is a tremendous opportunity for NYS to step in as a leader in this regard, and specific near-, mid- and long-term targets for agroforestry adoption should be set as a parameter of these state incentive programs.*

- **New York State must also focus on supporting and developing university-level education programs that are in line with the goals of the CLCPA.** Through its SUNY programs, as well as in collaboration with other leading New York institutions, the state must capitalize on the opportunity to integrate the principles and practice of agroecology and regenerative agriculture, particularly agroforestry, *to provide students in pursuit of degrees in agricultural sciences, agronomy, and sustainable crop production, with the foundational knowledge and technical skills necessary to successfully meet the challenges of farm system adaptation and diversification in the face of a changing climate.*

7. Agroforestry Projects Provide Significant Land & Climate Protections / Benefits

In addition, because of the fact that **a large portion of NYS forested land is farmer-owned**, the following strategies must also be considered in holistic, farm-scale planning and implementation to maximize carbon removals, improve water quality and enhance biodiversity:

- **AF2. Prevent Forest Pests, Diseases, and Invasive Species and Restore Degraded Forests**
- **AF3. Maintain and Improve Sustainable Forest Management Practices and Mitigation Strategies**
- **AF4. Assist Landowners in Implementation of Sustainable Forest Management and Mitigation Strategies**

Strategy AF4. Assist Landowners in Implementation of Sustainable Forest Management and Mitigation Strategies *highlights a recent integration of Forest Conservation Planning and BMP implementation into the AEM framework, providing access to funding for farmers and landowners to better manage their forested land.*

This strategy is the kind of integrated thinking that is critical for the success of the CLCPA, and the state should not shy away from expanding funding for this portion of AEM, and should further pursue other integrated approaches, such as including agroforestry as an eligible project type for the Regenerate NY program. ***New York State Farmers must be encouraged through state programs to consider themselves as foresters, in addition to farmers.***

³ “[USDA’S] EQUIP provided almost \$1.4 billion in financial assistance to farm operations for conservation practices in FY 2018, but less than .05% of that amount went to the only two eligible perennial production practices, silvopasture and alley cropping.” Lehner and Rosenburg, *Farming for our Future: The Science, Law, and Policy of Climate Neutral Agriculture*, 171.

This new forestry framework will allow farmers to not only take ownership of forest health on their land, but ***opens the door to increased revenue streams, both from traditional forestry and agroforestry products, as well as payments for ecosystem services***, as healthy forests can be a significant source of PES revenue in the right market context.

8. Adoption of Climate-Smart, Regenerative Practices Must Increase to Meet the Reality of New Climate Threats

The current and historic pace of adoption of climate-smart, regenerative practices as a result of state and federal level programs is much too slow to realistically achieve the ambitious goals of the CLCPA.

This is often the case because of:

- a lack of long-term engagement,
- a lack of near-, mid-, and long-term planning to ensure long-term success of practice adoption,
- a lack of synergistic, systems-level planning for the incremental adoption of additional practices,
- and, most importantly, additional support/investment in value-chain and markets to ensure economic viability of practice adoption over the long term.

The best way to ensure faster adoption and long-term engagement in climate-smart, ecologically friendly agricultural and forestry practices is to provide a solid policy framework that rewards farmers, landowners for best practices and encourages investment in technical assistance and producer-led training that combine the latest in scientific research on soil health and climate adaptation.

Without proper on-the-ground education and technical assistance and investments in rural infrastructure, we fear the rate of adoption will be significantly slower than is necessary to achieve CLCPA's ambitious goals and could jeopardize the long-term security of New York's food supply.

9. Expand Local Ag Economies, Increase Markets for Climate-Smart, Low-Carbon Products and Technical/Financial Assistance for Scaling Regenerative Production

A critical component of de-risking experimentation to ensure long-term success and viability of regenerative enterprises is guaranteeing markets for agricultural products that will inevitably stem from farm system diversification. ***Thus further integration of A&F strategies is necessary to ensure that farmers have markets for their products, and value-chain infrastructure to get them to market.***

The following strategies are critical to the success of long-term adoption of regenerative practices at the systems-level:

- **AF17. Bolster Local Agricultural Economies**
- **AF20. Develop a Sustainable Biomass Feedstock Action Plan and Expand the Use of Bioenergy Products**
- **AF21. Increase Market Access for New York Low-Carbon Products**
- **AF22. Provide Financial and Technical Assistance for Low-Carbon Product Development**

The components of **AF17. Bolster Local Agricultural Economies** very clearly lay out the necessary pieces needed to bolster New York's agricultural economy. In order to know what kind of market infrastructure to invest in, and where it is best placed geospatially, decision-makers that are driving the execution of these strategy components must be acutely aware of what kinds of new products are emerging **as a result of of successful farm system diversification and enterprise stacking in service of implementing long-term, whole-system transitions to regenerative production at scale.**

It is critical to know what works at field and farm-scale in terms of practice integration. In addition, new & niche food products that emerge from system diversification as a result of regenerative practice adoption should be included as NYS Low-Carbon Products highlighted in strategies **AF21 & AF22.**

Through accurate, scalable MRV approaches being developed by organizations such as NECA, agricultural products, especially pasture-based livestock products, must be considered and integrated into strategies to track emissions intensities throughout the food system.

In addition, as regenerative agricultural systems, including those that incorporate agroforestry practices, lend themselves well to the integration of regenerative, bio-based feedstocks, such as willow, poplar, switchgrass, & hemp, the strategies highlighted above, namely **AF12, 13, & 14, should be closely integrated with components of AF20,** particularly in how the state defines "sustainable bio-based feedstocks," **as well as components of AF21,** particularly the call to increase innovation of bio-based feedstock production.

There is also an opportunity here to integrate bio-energy production with efforts to protect water quality by increasing the establishment of riparian buffer strips with bio-energy crops like willow, as they are particularly suited to riparian zones, and can serve to absorb nutrient runoff, increase carbon sequestration, while producing sustainable bio-based feedstocks for energy production.

10. Land Use, Monitoring Outcomes and PES Market Development

Incentivizing the management of natural and agro-ecosystems for the creation of ecosystem services must remain a core, foundational strategy of the CLCPA Draft Scoping Plan. Whole, healthy, functioning ecosystems are the critical pieces of infrastructure necessary to ensure maximal, long-term flows of ecosystem services, including GHG emissions reductions and removals.

The commentary in the above section has focused heavily on how New York State (NYS) should support the implementation of efficient, regenerative land management systems for agriculture and forestry that have the potential to generate durable, long-lasting carbon removals and GHG emissions reductions, while simultaneously contributing to the regeneration of soil health, water quality and biodiversity.

The above recommendations also focus on the importance of ensuring the long-term success of these land management systems with adequate up-front capital, as well as investment along the value chain, and market access. **Having these pieces in place lays a critical foundation for the development of a state-sponsored payment for ecosystem service market**, as it is only upon a foundation of viable farm businesses and markets for regenerative agricultural products with supporting value-chain infrastructure that a PES market can properly function to achieve its long-term mandate.

11. Enact Payment for Ecosystem Services Program

Chapter 15 includes a specific strategy focused on PES market development, entitled:

- **AF16. Establish a Payment for Ecosystem Services (PES) Program**

It is absolutely critical that this strategy be executed thoughtfully and strategically, with careful attention paid to the myriad examples of similar market frameworks that have been deployed in the past, especially to where they have succeeded, and where they have failed.

Carbon offset markets operating on the foundational principle of Cap-and-Trade have been in place since the establishment of *the Clean Development Mechanism*, one of the first international emissions offsetting schemes that emerged out of *the Kyoto Protocol*. This framework has not adequately evolved in the ensuing decades to meet **the increasing demand for emissions reductions and land-based carbon sequestration**.

On the contrary, this framework has failed on multiple fronts to incentivize the kind of behavior necessary to achieve net-positive ecological and climate impact. This is due, in part, to the fact that markets that have been built on the foundation of the CDM and Cap-and-Trade have not set adequate goals, primarily in terms of a target atmospheric concentration of GHGs, the necessary emissions reductions & carbon removals to achieve the target, **and** “ancillary” metrics (including water quality and biodiversity).

12. Build Regenerative Principles, Practices and Outcomes-Based Markets

The foundational problem is that these markets lack a robust ecological economic framework, one that regards whole, healthy, functioning ecosystems as the critical infrastructure necessary to ensure maximal flows of ecosystem services, including GHG emissions reductions and removals.

Because of the failures of the carbon registry paradigm to incentivize the proper management of ecosystems, there is emerging interest in leveraging existing frameworks within the finance sector **to develop more powerful, outcomes-based market mechanisms for ecosystem services**.

The financial sector, and the public entities that regulate it, are well equipped to **establish a new, complex, ecological asset class, and flows of ecosystem service dividends based on real, measured, and verified outcomes across multiple environmental health indicators**.

In order to succeed, *this new paradigm will require comprehensive, scalable MRV protocols and tools* that can adequately quantify outcomes at the systems-level, across multiple metrics, thus assessing changes in asset value over time. Members of NECA, as well as others across the state, nation, and globe, are engaged in the development of tools that can be leveraged to implement **strategies AF7 & AF15**, as well as broader efforts to quantify and monitor changes in ecological and climate health over time.

13. New York Posed to Lead on Ecosystems-Services Markets and Adoption of Regenerative, Climate-Smart Practices

New York State is uniquely positioned to address the past failures of cap-and-trade markets by leading the way in a regional effort to adopt more powerful market mandates that are grounded in adequate, actionable goals for GHG emissions reductions and removals, water quality, biodiversity, and other important ecosystem services, economic health, and community vitality.

The CLCPA has indeed set extremely ambitious, yet achievable goals for emissions reductions and removals. However, more is to be done to develop a framework and mandates that will ensure these goals are met, along with the myriad other ecological, social, and community goals laid out in this legislation.

To this end, the following core principles should be implemented:

- Healthy ecosystems are **the engines that produce & sustain the flow** of ecosystem services.
- **Ecosystem regeneration must outpace resource extraction and pollution** to avoid crossing major ecological and climate thresholds.
- Market frameworks must have **clear, holistic, outcomes-based goals** for GHG emissions reductions and removals, water quality and biodiversity enhancement,

which will ensure a steady supply of a suite of ecosystem services, without causing unintended ecological harm elsewhere in the ecosystem.

- **Market mandates must** aggregate a wide variety of “buyers” through regulation, ensuring capital flows towards regenerative land management efforts.
- **Market mechanisms must incentivize preservation of natural capital, as well as regeneration.** *It is critical that land stewards be incentivized to not only enhance the value of natural capital through regenerative agriculture, forestry and ecosystem restoration efforts, but that they are also paid to preserve existing stores of natural capital, to avoid dangerous reversals of stored carbon within the biosphere, disrupting critical hydrological cycles, and harming biodiversity.*
- **Market tools must support transparent data and transactions** to adequately quantify real impact.

With these core principles, New York has tremendous potential to be a leader in the development of functioning PES markets that achieve real, net ecological and climate impact, while bolstering the health and vitality of our communities.

New York City is the premier financial hub of the world, being home to the New York Stock Exchange, as well as many other financial institutions that are becoming increasingly interested in the concept of establishing natural assets as a new asset class. New York is also a leading member state within the Regional Greenhouse Gas Initiative, and can leverage its position to further develop this multi-state initiative by implementing a more robust framework that enables multi-state investment and transactions of natural assets and PES dividends.

14. Build World’s Leading Ecological Asset and Ecosystem Service Market

In order to successfully implement an exemplary market for ecological assets and ecosystem service dividends, the following must be considered:

- **In addition to emissions caps, carbon removal targets, as well as biodiversity and water quality targets,** must be set in order to avoid unintended negative ecological impacts, most often occurring downstream.
- **Because the “service shed,” or geographical area of benefit** of different ecosystem services varies significantly, **market development and project management should be organized at the watershed level.** This will engage stakeholders at the community level, and encourage collaboration at the regional level. To this end, it is critical to empower state-recognized and funded watershed alliances, led by the local SWCDs, and to include other local stakeholders such as counties, municipalities, Indigenous Nations, farmers, foresters and universities. This will build upon and empower the work of existing entities like WAC, FLOWPA, and others to manage and protect their watershed health and ecosystem services. It will also help provide a funding avenue for local PES pilots and for baseline measurement efforts.

- **Through multi-faceted Monitoring, Reporting, and Verification (MRV)** across multiple ecosystem and climate indicators, initial baseline assessments are critical for valuing and managing PES projects. This will:
 - Establish a baseline of ecosystem health across natural and working lands,
 - Benchmark GHG agricultural emissions sources as called for in **AF15**,
 - Identify critical priority ecosystems for preservation and regeneration, as called for in **AF1, AF3, LU4, & LU7**.
 - Allow for the establishment of baseline asset value to enable preservation efforts.

15. Fund and Build Local & Regional Regenerative Farm, Forest or Land Projects

There are many regional efforts underway for establishing baseline measurements, and **significant funding should be allocated for these local efforts to execute measurement and modeling, to collaborate and share knowledge**, and to aggregate, analyze and calibrate data collected across the state.

However, it is critical that these efforts use similar, standardized approaches, such that broader, state-wide benchmarking and baselining of soil health and GHG emissions is possible using regionally-sourced, multi-stakeholder data, further *paving the way for quantification standards to be utilized by a multi-state-sponsored PES marketplace*.

These projects must utilize the best cutting-edge approaches that leverage satellite remote sensing, modeling, and direct measurement, to cover a variety of ecosystem health indicators beyond GHG emissions, as well as to balance accuracy with cost. **Organizations based in New York State**, like Hudson Carbon, AgMIP, and others, are on the leading edge of these quantification efforts, using soil sample stratification approaches like **conditioned Latin hypercube sampling (cLHS)**, as well as **ensemble modeling**, an approach that leverages multiple process-based models to improve accuracy. State funding to continue the advancement of these approaches is critical to the success of the CLCPA.

16. Aggregate Demand for Ecosystem Services via Market Design and Mandates

It is critical to carefully and strategically aggregate demand for ecosystem services through a variety of regulatory strategies including aggressive emissions caps, which must include sectors that generate high levels of methane and nitrous oxide emissions, or using an emissions permitting system, much the same as the EU-ETS, where permit revenue is directed towards remunerating land stewards for providing critical ecosystem services.

By implementing a Cap-and-Invest approach, the state can ensure that a portion of revenue from emissions fees/permits is directed towards regenerative agriculture, forestry,

and ecosystem restoration, such as regenerating valuable carbon sinks like forests and wetlands.

PES market development is inherently complex, especially markets that transact in diverse sets of interrelated services. However, the most promising approach to tackling this wicked problem is to look at underlying ecosystems as assets whose value is directly tied to the level of services it provides, in the form of ecosystem service *dividend* payments. Determining who pays for these non-excludable public goods is the most complex piece, and will take a multi-stakeholder planning and implementation effort. **This is arguably one of the most critical pieces of the CLCPA to get right, as it has the potential to set in place powerful market mechanisms that will achieve the long-sought-after goal of internalizing land and its critical functions into financial transactions and calculations of economic growth.**

17. Conclusion

New York State's Climate Leadership and Community Protection Act has the potential to cement the state's position as a powerful global leader in the effort to tackle one of the most pressing challenges of our time, particularly in how we can leverage the management of natural and working landscapes to address climate change and other related concerns. The pressures of biodiversity loss, water pollution, and the broader impacts brought on by climate change and environmental degradation are immense challenges that *we as a society have the duty to address with every available resource, such that future generations are equipped with the resources and knowledge necessary to continue to restore and preserve New York's vital ecosystems in service of maintaining healthy forests, diverse and abundant agricultural production, human health, and community vitality across the Empire State for centuries to come.*

The programs and funding streams currently available at the state level provide a solid foundation upon which we can begin to implement the strategies laid out in CLCPA Draft Scoping Plan. However, in order to ensure the success of agriculture, forestry and land use strategies, we must scale up and evolve existing programs; develop new, integrated approaches & supporting tools; *and most importantly, come together as a diverse community of stakeholders with a clear, shared, long-term vision for New York's natural & working landscapes.*