

Measure 6: Measures to Reduce Emissions in Agricultural Production

Measure Concept

NDEE will use funds from this grant to establish the Nebraska Ag Registry and Grants Program. This program will provide incentives for a carbon intensity (CI) scores registry that fosters the wide-spread adoption of CI scores as a key performance metric for crops and land usage. In parallel, it will initiate community-based programs to encourage adoption of regenerative agriculture practices and provide incentives to farmers to acquire precision agriculture technology to facilitate adoption of these practices. The increased availability of CI scores in agribusiness, coupled with these programs and incentives, will lead producers towards regenerative agriculture and precision agricultural technologies that minimize nitrous oxide and nitrate emissions, restore soil fertility and moisture levels, and increase carbon dioxide sequestration.

Description and Background

Nebraska has an extensive and diverse cropland base of nearly 22 million acres, ranking sixth nationally in total cropland acres and first in irrigated cropland acres. In addition, Nebraska has over 23 million acres of grazing land, ranking first with 6.5 million head of cattle and calves. According to the EPA, the agricultural sector accounts for 42% of Nebraska's greenhouse gas (GHG) emissions in 2020, ranking fifth highest among states. If fully healthy, U.S. agricultural soils could store up to 250 million metric tons of carbon annually. Three agricultural sectors account for the largest sources of GHG emissions in agriculture production: enteric and manure emissions of livestock, nitrous oxide emissions from fertilization of row crops, and fossil fuels for operations and transportation.

For the past 100 years, Nebraska's crop and livestock growers' laser focus on increasing yields and lowering inputs has demonstrated producers' commitment to preserving the state's natural resources and productive capacity. At the state-wide level, these efficiencies generate more food and fuel stock by the fewest producers on the least land in the history of agriculture.

The Blonk report confirms that Nebraska crop producers can achieve even greater efficiencies and reduce ag-related emissions by shifting their practices. To optimize yields relative to minimized reductions, however, is a three- to five-year process. During the shift across multiple growing seasons, yields are likely to be reduced, but for now, profitability as an ag producer tracks almost exclusively with yields. The decarbonization of agriculture is further complicated by the vested interests of all the constituencies in which farmers operate: co-ops have annual sales targets for chemical fertilizers, processors are reluctant to pay premiums for sustainably produced commodities, and some areas of federal ag policy have not kept pace with other federal programs to push sustainable production and have created risks that range from crop insurance to lending.

The measure proposed here is intended to engage growers and support their understanding and acceptance of carbon intensity and more aggressive adoption of regenerative ag practices using precision technologies and information. Every producer is at a different point in this journey and this measure meets and resources them wherever they are and at whatever their capacity. This measure acknowledges that there are multiple technical, structural, and economic challenges to effectuating this change and, therefore, empowers every producer to improve their operation within their unique context and circumstances.

The first component of this three-pronged approach—CI Registry incentives—increases the rate at which growers accept the emergence and management of carbon intensity as a crop performance metric. The second element—regenerative agriculture—provides the framework and principles by which farmers can decarbonize crop production. The third part—precision agriculture technology—enables producers to monitor and verify field and plant performance across the growing season in order to successfully maintain viable yields while reducing emissions, water usage and, at the same time, improving the productive capacity of soil.

Until the IRA created tax credits to decarbonize the fuel stock supply-chain, smaller (aka: “low income”) farm operations might produce high yields, but ultimately delivered small inventories of common commodities. The Registry and attendant grant programs level the playing field for all farm operations through incentive payments and cost-share initiatives that empower even the smallest to access the technical assistance and technology needed to produce “low carbon” corn and beans—a market attribute that positions their crops for premium price contracts.

In addition to incentivizing farmers’ shifts in practice, the Carbon Intensity Registry’s multi-year record of data will also reflect the impact of these grant programs at county and regional levels to help the communities in which farms operate, and on which they rely, to quickly shift towards a new, low carbon paradigm for crop production. The carbon-scored inventories of corn and beans will differentiate those crops from common commodities and set the stage for sales contracts that pay premium prices for lower carbon feed and fuel stocks. As crops become more valuable for their low carbon profile, economic pressures on farmers to meet margins on yield will decrease.

The following subsections provide detailed description and background for the individual components of this multi-pronged, integrated strategy.

Carbon Intensity Score Registry

As a general principle, “carbon intensity” typically refers to carbon dioxide emissions per joule of energy generated during the production of a raw material within the lifecycle assessment of a finished product. The estimation of CI scores for corn and soybeans has steadily moved towards standardization as a result of the alternative fuels industry. Companies that optimize crop production through precision and regenerative agriculture track and account for the values critical to CI estimates.

The Inflation Reduction Act creates a number of incentives to reduce the carbon intensity of corn and soybeans as feedstocks for alternative fuels. The ability to produce valid CI estimates is converging with the clear evidence that regenerative and precision agriculture directly reduce carbon intensity in row crops while simultaneously improving soil health and reducing co-pollutants.

As DOE reports at <https://afdc.energy.gov/laws/13321>, “beginning January 1, 2025, the Treasury Department will offer tax credits for the production and sale of low emission transportation fuels, including sustainable aviation fuel (SAF). The tax credit amount is \$0.20 per gallon for non-aviation fuel and \$0.35 per gallon for SAF. For facilities that satisfy the prevailing wage and apprenticeship requirements, the credit amount is \$1.00 per gallon for non-aviation fuel and \$1.75 per gallon for SAF.”

Nebraska is the 2nd largest ethanol producer in the US at 2.18 B gallons annual production. Ethanol producers consume about 800 M bushels, or 40% of Nebraska’s corn production. The tax credits

available to ethanol producers will create market demand for corn with low carbon intensity scores, for which ethanol producers are expected to pay premium prices to corn farmers.

Early analyses estimate a premium price of 5.4 cents per CI point below the baseline of 29.1. The Registry and Grants Program increases growers' access to the approved 3rd party service required to obtain a valid CI score, establishes a baseline for the grower, then provides grant funding to help them develop and implement a crop management plan that will drive future CI scores lower.

Nebraska's Carbon Intensity Registry and its incentive for registering CI scores for corn and soybeans (and potentially other crops) will accelerate producers' adoption of carbon intensity as a performance metric for crops and fields. The registry will provide a platform to assemble a critical mass of growers with crops with low CI scores, enabling them to negotiate premium pricing with local ethanol plants.

During the first three years of the grant, in exchange for logging a CI score in the registry from a third-party provider, growers will receive a small incentive payment per bushel of corn registered. This incentive will help spur adoption of the registry model. The market demand for crops with lower CI scores will spur farmers to adopt sustainable practices that lower their CI scores and reduce their costs for inputs. After the registration incentive program terminates, market forces and the benefits of lowering CI scores and input costs should provide sufficient motivation for farmers to continue utilizing the registry and maintaining sustainable practices.

Benefits of a Nebraska-Based CI Score Registry

Developing Nebraska's own Carbon Intensity (CI) Registry has distinct advantages over using existing systems such as the Climate Registry, International Carbon Registry, or the Low Carbon Fuel Standard (LCFS) Pathway Certified Carbon Intensities or others. First, and foremost, the Nebraska Registry is being designed and built **WITH farmers and ag leaders**.

A Nebraska-specific CI Registry provides the state with greater control, customization, and alignment with local agricultural needs and sustainability goals. It enhances the state's ability to build trust with farmers, ensure data privacy, and design incentive programs that work for Nebraska's unique economic and environmental landscape. Additionally, by retaining control over methodologies, incentives, and data governance, Nebraska can drive long-term change in agricultural practices, positioning itself as a leader in sustainable agriculture and helping its producers capture the economic benefits of lower-carbon production.

The following discusses these distinctions in more detail:

1. Tailored to Nebraska's Agricultural Sector: Nebraska's CI Registry will be customized to the unique characteristics of the state's agricultural industry to ensure the system is better aligned with the farming practices, regional climate, and soil conditions specific to Nebraska. This flexibility enables the Registry to adjust models and analysis and create a feedback loop to make CI assessments more accurate and relevant. The state's agricultural output in biofuels and renewable energy feedstocks plays a significant role in the national and global markets. A Nebraska-specific registry can more precisely measure the carbon intensity of these crops, mass balance across different inventories, and support the development of book and trade/credit accounting protocols to protect the integrity of scoring across the entire supply chain.

2. **Greater Control Over Data and Incentive Structures:** Nebraska can retain control over the data generated by its farmers and producers. This ensures that the Nebraska Corn Board, Soybean Association, Farm Bureau and other ag leaders can reassure their members about how the data is used, protect farmers' privacy, and build trust with local producers. This also allows the Registry to be responsive to the local feedback and needs—critical to cultivating long-term engagement and buy-in. Similarly, Nebraska can design incentive structures that best fit the state's specific agricultural and economic landscape. By controlling the payment structure and criteria for earning incentives, the state can ensure that the program maximizes farmer participation and encourages long-term sustainability efforts.

3. **Alignment with State-Level Sustainability Goals:** Nebraska's own CI Registry will be closely aligned with state environmental goals, such as reducing greenhouse gas emissions in agriculture, improving soil health, and promoting water conservation. Existing national or international registries may not reflect or prioritize Nebraska's local sustainability objectives. Nebraska's registry and grants program is intended to integrate with other state-level initiatives, such as precision agriculture grants, regenerative farming programs, or water conservation efforts. This alignment enables a more holistic approach to sustainability and resource management.

4. **Economic Development and Competitiveness:** To make the shift to regenerative and precision ag permanent, market incentives must eventually emerge. A Nebraska-focused CI Registry helps the state's agricultural products differentiate themselves in the marketplace. With verified low-carbon intensity crops, Nebraska's farmers will capture market premiums in low-emissions sectors, such as renewable fuels and sustainable food markets. The Registry is expected to attract investment in Nebraska's precision ag technologies, carbon markets, and agribusiness innovations.

5. **Flexibility and Adaptability:** Existing registries often use general methodologies for calculating CI scores, which may not fully account for the specific inputs, farming practices, and environmental factors relevant to Nebraska. By developing its own registry, Nebraska can create more accurate and context-specific CI methodologies. A Nebraska-controlled registry allows for more rapid adaptation to feedback from farmers and stakeholders. It can evolve based on local needs and experiences, ensuring continuous improvement and long-term buy-in from the state's agricultural producers.

6. **Building a Regional Model:** Developing Nebraska's own CI Registry could serve as a model for neighboring states with similar agricultural profiles. Nebraska could become a leader in the Midwest for carbon intensity tracking, offering a framework that other states can collaborate with. Nebraska can work more closely with neighboring states and regional agricultural groups to create consistent CI standards across the Midwest, facilitating better cooperation and regional data sharing.

7. **Greater Engagement with Local Farmers:** A locally governed CI Registry gives Nebraska farmers more confidence that their data is being used fairly and transparently. Farmers are more likely to participate when they know that the program is run by their state, with governance from agricultural leaders they trust. These leaders can provide workshops, and technical support specifically tailored to the unique practices and challenges of local farmers, encouraging more effective adoption of sustainable practices.

8. **State-Specific Incentive Payments and Financial Flows:** National and international CI registries do not offer the flexibility Nebraska needs to design incentive payments that reflect the state's specific economic conditions or agricultural cycles. A Nebraska-specific system allows the state to set incentive

amounts, payment schedules, and eligibility criteria that best align with local farmers' needs and behaviors. Nebraska can structure its incentives and funding streams to ensure the program's sustainability and, over time, build the case for state-specific funding sources, grants, or public-private partnerships that align with local priorities.

Interaction With other CI Score Registries

While this will be a local and industry-specific registry, it cannot operate in isolation. The CI Registry provides the state with an opportunity to customize its approach to the agricultural sector while maintaining compatibility and interaction with established registries. Through strategic collaboration, data sharing, mutual recognition agreements, and alignment with broader market demands, Nebraska's registry can complement existing systems while ensuring that local farmers have access to the best opportunities for emissions reduction incentives and sustainability certifications.

The highest objective is for Nebraska farmers to grow confident in the security and benefits that come from participating in data sharing and analysis projects like the Nebraska Registry by working with local resources to produce their estimates and devise management plans to reduce carbon intensity. The second most important objective is to create the process and infrastructure by which this data production work can eventually provide evidence of workable standards in sustainable agriculture that reflect actual production practices and conditions. Estimation models and data protocols must ultimately converge with emerging, prevailing measurement, reporting and verification (MRV) criteria if growers are going to realize the full financial benefits of premium pricing and market access.

For example, Nebraska will work with established registries to develop its registry in a way that will support mutual recognition agreements in the future. Nebraska will incorporate proven methodologies and benchmark its CI scoring models and methodologies against those used by international or national registries to make it easier for the state's farmers to transition between platforms if needed. This would allow CI scores generated through Nebraska's registry to be recognized by other systems, such as LCFS or voluntary carbon markets, without requiring farmers to undergo duplicative assessments.

Nebraska's agricultural products, particularly in biofuels and grains, are integral to export markets that increasingly demand sustainability and low carbon intensity. By creating a CI Registry that aligns with international standards, Nebraska can ensure its producers' CI scores are recognized in key export markets that rely on other registries. The state's CI Registry will seek alignment with international sustainability certifications, facilitating Nebraska's participation in global low-carbon agricultural supply chains.

As other states or regions establish their own low-carbon fuel standards, Nebraska's CI Registry could facilitate participation in these programs by providing easily transferable data. This could be beneficial for biofuel producers in Nebraska who may want to sell into regions with strict carbon intensity requirements. As Nebraska builds expertise and data through its own registry, it could coordinate with other states to influence national agricultural sustainability policies and carbon markets. A regional approach could create a powerful bloc shaping the future of national sustainability frameworks.

Similarly, Nebraska's registry will collaborate with industry stakeholders and other registry systems to establish consistent standards and best practices for calculating and reducing carbon intensity. This collaboration could lead to the creation of common guidelines that benefit both Nebraska's farmers and those operating under other registry systems.

Obtaining CI Scores

Presently, a number of 3rd party service and tech providers possess the capacity to provide a verifiable CI score to farmers. The administrative body for the CI Registry will allow these vendors to apply for approval to log CI scores with the registry on behalf of farmers. To become an approved provider, vendors will need to:

- confirm their estimation models utilizing Argonne Laboratory's GREET model
- assure the security and privacy of ag producer data
- show the ability to load CI scores and supporting data via an approved API
- confirm a process for obtaining and preserving producer consent to register a CI score
- agree to the inspection and/or audit of their estimations and supporting data to guard against fraud and misrepresentation
- agree to participate in efforts by the registry and producers to reduce variability between estimation models and drive towards a standardized calculation method through review and testing of registry data and actual measurements.

Farmers seeking to participate in the Registry will provide the required input data related to fossil fuel use, tilling methods, and fertilizer, etc., to one of the approved providers. The provider will produce an estimated CI, obtain the grower's consent to log the score, and then load the CI score to the Registry with sufficient data to allow the Registry to electronically issue an incentive payment to the farmer.

Farmers for whom a CI score is logged through an approved third-party vendor will be paid an average of \$0.03/bushel, or the equivalent of \$6.00/acre. As explained elsewhere, vendors will receive an enrollment fee the first time they enroll an operation. It is expected that the enrollment fee of no more than \$500 will be sufficient to cover all or most of the vendor's price for estimating a CI score for the first time for a producer. Those growers participating in the Grants Program for regenerative and precision ag, must agree to provide a CI score for their most recent crop and the next one to be impacted through their use of grant funds.

As scores accumulate, the Registry will produce public facing dashboards of CI estimates by region, soil-type, and other attributes. These dashboards allow producers to compare their CI scores with local benchmarks. This encourages competition and motivates the adoption of best practices such as cover cropping, no-till farming, and crop rotation that reduce emissions while improving soil health. A focus on CI scores can push producers to invest in precision agriculture tools, which optimize input use (e.g., water, fertilizer, pesticides) and result in fewer emissions and lower input costs. Local estimates of carbon intensity will support both existing and new outreach efforts from trade groups, governmental agencies, and higher education intended to boost productivity, reduce emissions, and improve producers' profitability.

The CI Registry:

- Enables producers to gain familiarity and comfort with CI scores as a performance attribute
- Provides a revenue bridge through incentive payments for producers to work on CI scores until market premiums mature
- Motivates agribusiness, precision agriculture, and regenerative agriculture companies to supply growers with CI forecasts during the growing season to drive crop management decisions

- Creates a source of localized CI estimates on which growers and their producer groups can rely to understand emissions reduction in corn and soybeans
- Motivates producers to seek out regenerative and precision agriculture opportunities that reduce CI scores at the farm and field level

As growers increase their management of CI scores during production, significant secondary benefits can be expected:

- **Reduced Emissions Beyond CO₂:** By focusing on practices that reduce carbon intensity, other environmental benefits, such as reduced nitrogen oxide (NO_x) emissions from more efficient fertilizer use, can be realized. This reduces air and water pollution, leading to better public health outcomes and potentially lowering regulatory costs for producers.
- Tracking and optimizing CI scores may prompt producers to adopt more energy-efficient machinery or renewable energy sources (solar, bioenergy), reducing on-farm energy use and emissions.
- As regenerative agriculture practices improve soil health, water retention, and nutrient availability, the overall resource efficiency increases, which sets a positive feedback loop by which the need for fertilizers and irrigation decreases, leading to lower emissions.
- A robust registry can drive research into crop varieties, fertilizers, and cultivation techniques that are optimized for low-carbon outcomes. It can spur public and private investment in technological innovations, improving farm productivity and sustainability.
- Practices that reduce carbon intensity often also build resilience to climate impacts (e.g., drought-resistant farming techniques), helping protect long-term farm productivity and profitability.

Over the life of the grant, the CI Registry constitutes an archive of data reflecting the funded projects' impact on reducing GHG emissions, improving water usage, and securing soil health. These data, the benchmarks, the dashboards, and the multi-year evidence of impact promise to accelerate and advance the national discussion around sustainable crops and reasonable standards reflecting the pragmatic realities of production across different agro-ecological regions.

The CI Registry perfectly connects both the generalized pressures to shift practice and the potential economic benefits from tax credits in the Inflation Reduction Act with the wide-scale availability of proven methods and technology to decarbonize agricultural production. If implemented as described here, the CI Registry catalyzes substantial change across millions of acres and ushers in a new agricultural revolution.

Regenerative Agriculture

Healthy US soils can store up to 250 million metric tons of carbon annually—nearly enough to zero out current emissions from U.S. croplands (Regenerative Agriculture: Farm Policy for The 21st Century). Multiple other estimates from the literature also say that Regenerative Agriculture (Regen Ag) has the potential to move agriculture to a net zero GHG emissions.

However, transition to Regen Ag has been slow. Studies have shown that approaches which only address a subset of the barriers, such as through incentive payments alone, are necessary but not sufficient. The barriers to adoption are complex, therefore more complex system-based solutions are needed that require a purposeful portfolio of projects working together.

Among the foremost barriers: farmers are besieged on a daily basis by a blizzard of competing claims and criticisms about their operations. At one extreme, they are chided for using too much fertilizer, water, or marginally productive land. At the other, they are promised premium pricing, or carbon credit revenue, or higher yields on lower inputs. Almost none of these claims ever translate directly into a more secure financial position for the grower or their rural communities. Put differently, none of these claims ever propose how to share or hedge the risk a farmer faces when considering a change to more sustainable practices.

The CI Registry begins to address this particular barrier by clearly delineating carbon intensity as a material performance metric for production. Growers are being paid for calculating a score for their crop. Taking a bit of time with a service provider to obtain the score is the only risk they're being asked to assume. In exchange, they receive a modest incentive payment that substantiates our claim that carbon intensity and its management has direct economic value.

The CI Registry is the core strategy by which emission reductions will be tracked. As part of the incentive program, Farmers are being paid to log CI scores. Over the five-year span of the grant, the budget for incentive payments is enough to cover between 3-4 M acres per year. Moreover, every grant awarded will require a carbon intensity score for the impacted crops/fields to be registered. It is expected that the combination of these strategies will lead to millions of acres to be repeatedly registered with a baseline and updated CI scores over the five-year period. The supporting data supplied with each CI score will ensure that emission reductions for particular fields and crops can be tracked over time along with impacts from shifts in production management practices.

The CI Registry will be administered through the subaward with the non-profit. The CI Registry is a project that requires administration by the subrecipient, including development of software to track carbon intensity. NDEE anticipates that the subrecipient will procure the services of a developer who will create the software necessary for the CI Registry. Under this approach, NDEE anticipates that the subrecipient will take title to the software, subject to the conditions of 2 CFR 200.313. This approach is anticipated because NDEE is not aware of an off-the-shelf software system capable of meeting the CI Registry requirements. However, the subrecipient may alternatively utilize existing software if it identifies an existing software capable of being modified to meet the CI Registry requirements. Under this approach the subrecipient may purchase the underlying software with reasonable modifications, or it may lease, purchase a license, or subscribe to use of the existing software with reasonable modifications. Purchase of the software will be subject to the conditions of 2 CFR 200.313. If software is leased, licensed, or subscribed to for use, then such agreement will be subject to the requirements of 2 CFR 200.315.

It is anticipated that cloud computing resources will be necessary to deploy the CI Registry in a manner that allows producers to input required carbon intensity data. NDEE anticipates that cloud computing resources will be procured under subscription model. Any computing devices purchased for purposes of developing or deploying the CI Registry will be subject to 2 CFR 200.313.

It will be the subrecipient's responsibility to manage the Intellectual property and data as a public asset and ensure both its security and utility. NDEE, the Governing Council, subaward recipient, and other stakeholders will provide additional support and care to develop strategies and funding mechanisms by which the Registry can be sustained beyond the period of the grant.

Regenerative Ag Grant Program:

That first CI score serves as the baseline metric for the producer. The obvious question for them: “If this score is higher than it could be, how do I lower it next year?” The two-part answer: 1) through the principles of regenerative agriculture using, 2) the information and technology of precision agriculture. The grant programs for regenerative and precision ag provide resources that directly offset the fiscal risk a farmer faces when implementing a change that requires additional equipment, data support, or documentation.

The CI Registry and grant programs work hand-in-glove to confirm for the grower what they really need to pay attention to among competing claims and criticisms and provides a source of funding to ensure that operations of all size can make changes unimpeded by cost. Together, these three strategies provide credible evidence of the need and means by which to shift practices.

The Regenerative Ag Grant program will award full or cost-share funds to producers attempting to implement things such as cover crops, no-till, reduced chemical fertilizer, and grazing strategies. As discussed in detail under “Administration”, the Governing Council will designate regenerative ag practices to be funded that fit the progress of an individual farmer as well as eliminate the barriers to wide-spread implementation. Special care will be taken to ensure that small and medium operations are eligible for funding that reflects the smaller margins and, by extension, the greater challenges they face in any change.

It is one thing to say that cover crops reduce emissions and deliver long-term benefits for soil health. Even if grants pay for seeds and planting, farmers need to understand potential impact on nutrient management, insect and weed control, and, ultimately, whether cash crop yields will decline and for how many seasons. What are the new margin estimations for input and yields under a model that implements no-till, cover crops and reduced fertilization? How do the results from an operation in another state translate to local growing conditions? How far are local lenders willing to go to support this change? Will crop insurance coverage be impacted through this change in practice? Will local elevators still be able to process and market this crop if it has other plant material or pest material in it? Will this limit the crop’s ability to be sold as livestock feed, fuel stock for ethanol, or otherwise on the open market?

These questions illustrate the last group of barriers farmers face in adopting regenerative practices. Aside from the technical questions raised, the dynamics of the social and economic context present challenges beyond the direct control and will of any individual producer. It is critical to remember that farmers are part of the food production system and also the local community in which they live. The success and health of the producer, the ecosystem, and their community are intertwined. It is imperative that the community is a partner with the producer in the successful transition to regenerative agriculture.

The Regenerative Ag Demonstration Project is intended to tackle these issues. The pilot project concentrates regenerative and precision ag practices in several communities located in a single region. The terms and conditions of the subaward will require CI scores to be recorded over time for operations within the pilot region. The data tracking over the course of the pilot project will allow for localized impacts to be assessed; those estimates will be included in the GHG emissions estimates aggregated by the CI Registry and Grants program.

Regenerative Ag Demonstration Project:

In addition to the regenerative ag grants for individual producers across the state, this award will also fund a community-based pilot project in south-central Nebraska, followed by expansion to other areas in Nebraska. The innovative pilot project will cover a multi-county area including several low-income disadvantaged community areas. The pilot is based on a three-prong integrated approach that involves the establishment of connections between a stakeholder visioning group, producer-to-producer learning groups, and local educational and demonstration sites relevant to regional producers. This cohesive community-based collaboration will focus on producers, landowners, financial lenders, water providers, health care, urban-rural consumers, policymakers, K-12 education, and other key influencers of sustainability. This group will foster a landscape in which the more typical producer-to-producer learning groups and educational sites will be successful.

The program will address focus areas integral to the success of the community group:

1. Economic risk analysis and information
2. Credible soil health benchmarking tools and methods that align with the proposed Carbon Intensity Score Registry
3. Facilitating solutions to barriers for the necessary mentoring and group learning for socio-behavioral change.
4. Facilitate the development and implementation of a communication plan.

Following the completion of the pilot project, this hub model will be expanded to multiple regional locations across Nebraska. The first hubs would likely be 12 counties centered around North Platte, and 10 counties centered around Columbus and Fremont. These new hubs will encompass up to 10 additional underserved communities, addressing grasslands as well as irrigated and rainfed agriculture, helping them reduce costs and maximize benefits. Activities will build upon key learnings from the pilot project and will focus on awareness, education, assistance, and sharing of information on implementation of soil health practices that will reduce GHG emissions as well as improve water quality and quantity concerns, including the effects on human health. It is also critical to understand that this effort will build on, amplify, and complement other ongoing projects conducted by groups who are striving to increase the number of acres transitioning to regenerative agriculture practices.

Within each area, producers, local agribusinesses, representatives of municipalities, various local governmental and civic groups, and other non-ag stakeholders will be brought together as a Stakeholder Advisory Group. They will discuss best practices for addressing soil health and water quality and guiding the activities within the area to best serve the needs of the community, each with their own unique conditions and concerns. Local involvement that bolsters municipal/rural partnership always helps with the adoption of new practices and helps ensure that activities will continue and change as the local needs change. Likewise, the members of this Stakeholder Advisory Group will change as needs and expertise needs change.

A key education and demonstration site will be established in each hub area to show the soil health practices in use and used for field days and other educational activities. When possible, data will be collected to show the benefits of soil health practices and to help analyze the cost/benefit ratio of adopting the practices. Similar data collection and analysis may be done with cooperating producers as they are implementing soil health practices.

As with all projects funded through the Regenerative Ag Grants, the Regenerative Ag Demonstration Project will submit data to the Registry and provide sufficient information to assess impact. A comprehensive workplan and timeline will be developed as part of the subaward negotiations for the pilot project.

Precision Agriculture

Precision Agriculture, the third component of this measure, represents a mix of new and established technology that provides a farmer crucial leverage in reducing the carbon intensity of a crop.

“Precision Agriculture” refers to the application of water, nutrients, and pest control according to the specific needs of a plant given its genetics and the environment in which it is being cultivated. In practical terms, precision agriculture utilizes soil sampling, satellite imagery, and real-time sensors to track growing conditions. From these data, growers deploy an arsenal of GPS-programmed technologies, advanced equipment designs, and chemically engineered interventions that meet the individualized needs of particular crops and their specific conditions.

More than field technologies, though, precision agriculture includes farmers’ growing reliance on digital field/crop management systems. These information management systems incorporate machine learning and artificial intelligence to convert environmental data and plant performance into specific interventions that improve crop yields balanced against the need to preserve and build the productive capacity of a field and its supporting resources.

Carbon intensity scores can be readily calculated from the data streams running through precision agriculture and crop management systems. CI scores reflect both the emissions generated during crop production as well as the carbon dioxide sequestered. In this way, precision agriculture becomes a critical pathway by which producers can create the best of both worlds: 1) strong, sustained yields over time, and 2) emissions approaching net-zero.

The precision ag grants program will operate similarly to those for regenerative ag. The Governing Council, in consultation with a broad body of expertise, will identify and prioritize suitable technology and systems for advancing sustainable production. The objective of these grants will focus on driving measurable improvements in environmental sustainability, farm profitability, and resilience to climate change. The program will empower farmers to adopt technologies and practices that optimize resource use, reduce emissions, and promote long-term soil health and ecosystem balance. The grants’ focus will include:

1. Encouraging Data-Driven Decision Making: Provide farmers with the tools and training needed to use precision agriculture data (e.g., soil moisture, weather patterns, yield maps) to make informed, real-time decisions that optimize production and environmental outcomes.
2. Supporting Economic Viability and Scalability: Ensure that precision agriculture tools and practices are cost-effective, scalable, and accessible to farms of all sizes, with particular focus on small and medium-sized farms that may face financial or technical barriers to adoption.
3. Enhancing Resource Efficiency: Optimize the use of water, fertilizers, pesticides, and other inputs through precision technology (e.g., sensors, drones, satellite imagery) to minimize waste and environmental impact while maintaining or improving yields.

4. **Reducing Carbon Intensity and Greenhouse Gas Emissions:** Support the adoption of farming practices and technologies that lower carbon intensity by improving efficiency in fuel usage, reducing fertilizer-related emissions, and enhancing carbon sequestration in soils.
5. **Building Resilience to Climate Change:** Support farming practices and technologies that mitigate climate-related risks, such as drought, floods, and extreme temperatures, by improving adaptive capacity and resource management.
6. **Supporting Regulatory Compliance and Market Access:** Assist farmers in meeting evolving environmental regulations and sustainability standards, while creating pathways to access premium markets that reward sustainable practices (e.g., low-carbon, organic, or regenerative certifications).
7. **Facilitating Collaboration and Knowledge Sharing:** Promote collaboration among farmers, research institutions, agribusinesses, and government agencies to share knowledge, experiences, and innovations related to precision agriculture and sustainable farming practices.
8. **Monitoring and Measuring Sustainability Outcomes:** Establish systems for monitoring, reporting, and verifying the sustainability impacts of precision agriculture practices, ensuring that grant recipients achieve measurable environmental benefits and providing accountability for program success.

The Regenerative and Precision Agriculture Grants Program will likely include a range of equipment eligible for funding, with a focus on technologies and tools that help farmers implement sustainable practices, optimize resource use, and reduce carbon intensity (CI) in their operations. Eligible equipment will support key areas such as precision application of inputs, soil health management, water conservation, and data collection. Below is a detailed list of equipment that could be eligible under the regenerative and precision grants program:

1. Precision Agriculture Equipment:

- **GPS-Guided Tractors and Machinery:** Tractors and farm machinery equipped with GPS technology allow for precise planting, fertilization, and pesticide application, reducing overlap and waste.
- **Variable Rate Technology (VRT) Systems:** Equipment that adjusts the rate of seed, fertilizer, or pesticide application in real-time based on soil or crop needs. This includes VRT-enabled planters, spreaders, and sprayers that help reduce input use and emissions.
- **Autonomous and Robotic Systems:** Autonomous tractors, weeding robots, and precision harvesters that improve efficiency, reduce fuel consumption, and minimize soil disturbance.
- **Precision Planting Equipment:** Planters and seed drills with precision placement technology ensure optimal spacing, depth, and population density, improving yield and reducing input needs.

2. Soil Health and Regenerative Agriculture Equipment

- **No-Till and Strip-Till Equipment:** No-till drills, planters, and strip-till equipment that minimize soil disturbance, enhance soil structure, and increase carbon sequestration. These tools help reduce erosion, improve water retention, and enhance soil biodiversity.

- Cover Crop Seeders and Interseeders: Equipment designed for planting cover crops, which improve soil health, prevent erosion, and enhance soil organic matter. Interseeders allow farmers to plant cover crops into standing cash crops, promoting year-round soil cover.
- Roller-Crimper Systems: Equipment used to terminate cover crops without the need for herbicides, providing a natural mulch that protects the soil, retains moisture, and suppresses weeds.

3. Water Management and Irrigation Systems

- Drip Irrigation Systems: Drip systems deliver water directly to the plant root zone, minimizing evaporation and water waste. These systems are highly efficient and reduce the overall water footprint of crop production.
- Variable Rate Irrigation (VRI) Systems: VRI systems equipped with sensors and control technologies allow farmers to apply water only where and when it's needed, improving water use efficiency and reducing energy consumption.
- Soil Moisture Sensors: Sensors that monitor soil moisture levels in real-time, providing data to optimize irrigation scheduling and prevent over-watering.

4. Data Collection and Monitoring Technologies

- Remote Sensing Drones in compliance with the American Security Drone Act: Drones equipped with multispectral or thermal cameras provide aerial imagery and data on crop health, soil conditions, and water stress, allowing farmers to identify issues early and apply targeted solutions.
- Field Sensors and IoT Devices: Sensors placed in the field to monitor soil moisture, nutrient levels, temperature, and other environmental factors. These sensors transmit data to a central platform, helping farmers adjust their practices in real-time.
- Yield Monitoring Systems: Equipment installed on harvesters to measure crop yields in real-time, providing data that helps farmers assess the effectiveness of their practices and refine their management strategies.
- Farm Management Software and Data Analytics Platforms: Software tools that integrate data from various sources (e.g., sensors, drones, satellite imagery) and provide actionable insights for precision management of crops, soil, and water resources.

5. Carbon Measurement and Monitoring Equipment

- Soil Carbon Measurement Kits: Portable kits that allow farmers to test and monitor soil carbon levels, helping track the impact of regenerative practices on carbon sequestration.
- Greenhouse Gas Emission Monitoring Systems: Equipment that measures methane (CH₄), nitrous oxide (N₂O), and carbon dioxide (CO₂) emissions from soil and crop management activities, providing data for carbon intensity tracking and reporting.

7. Livestock Management and Regenerative Grazing Equipment (For integrated crop-livestock systems that support regenerative practices and enhance soil health)

- Portable Electric Fencing Systems: Equipment that facilitates rotational grazing, which can improve pasture health, increase soil carbon sequestration, and reduce overgrazing.

- Watering Systems for Rotational Grazing: Mobile watering systems that support managed grazing practices, ensuring livestock have access to water as they move between paddocks

The eligibility requirements for a precision grant will be tailored to engage small- and medium-sized operations while advancing the overall objective of this measure—shifting to more sustainable practices at scale. For example, each grant will require applicants to demonstrate how the award fits into their farm management plan and the impact it's expected to have. Awardees will need to show that they have adequate documentation practices to report sufficient information and data for the award after it has been implemented.

While the early emphasis will be on less expensive systems and support for individual producers, it is expected that in the third to fifth year of the grant that opportunities will ripen for more expensive equipment and interventions. As an example, seed drills are a critical piece of equipment for no-till cultivation and can plant a precisely defined number of seeds per interval. Costing more than \$50,000 per unit places them beyond the reach of small and medium farms. However, the local co-ops who support these farms routinely lend or rent out expensive or specialized equipment. It is expected that in some instances, farming groups will be awarded funds to secure equipment that will be used by several member operations, further routinizing the local context towards sustainable practices.

All precision ag grant contracts will obligate awardees to submit progress and outcomes data and allow access for inspection and auditing purposes reflecting the scope and amount of any particular award. Lessons gleaned from the precision grant and regenerative grant programs will be publicized and promoted back to Nebraska's agriculture producers through meetings, web sources, and the media.

To ensure that equipment purchased through the regenerative and precision grants program is used for the intended purpose and in the spirit of the grant award, a combination of best practices for grants management will be considered, including:

- Binding legal agreements with clawback clauses
- GPS and IoT tracking to monitor equipment usage, if deemed appropriate
- Regular inspections and audits to verify compliance
- Detailed reporting and documentation from recipients such as CI scores and activity data
- Title registration or lien placement to restrict resale
- Engagement with suppliers and industry networks to prevent grant-funded equipment from being resold through their channels and glean information from maintenance and supply records

By implementing these strategies, the program can maintain accountability, ensure that equipment investments are achieving their intended sustainability outcomes, and build trust with stakeholders that the grant funds are being used effectively.

Measurement, Reporting and Verification (MRV)

Since MRV systems are still in their early stages, particularly in the agricultural sector, the CI Registry and the associated grants can act as catalysts for the development, testing, and scaling of the technology, processes, and expertise required to implement effective MRV practices. The CI Registry and Grants Program will create the conditions for the evolution of MRV in Nebraska agriculture by driving the early

adoption of MRV technologies, establishing robust data infrastructure, fostering research and innovation, building local expertise, promoting public-private partnerships, and supporting the long-term scaling of MRV practices. By playing an active role in funding, testing, and refining MRV systems, Nebraska can lead the agricultural sector toward more accurate and efficient measurement of carbon intensity and other sustainability metrics, ensuring that MRV becomes a key pillar of the state's sustainable agricultural transformation.

Here's how the CI Registry and Grants Program will contribute to the evolution of MRV in Nebraska agriculture:

- 1. Incentivizing Early Adoption of MRV Technologies:** Through the CI Registry and precision ag grants, farmers will be incentivized and supported to adopt emerging MRV technologies, including sensors, drones, satellite imagery, and IoT devices. These technologies can monitor key factors like soil health, carbon sequestration, and resource use in real time. Grants can provide financial support for the purchase and integration of MRV-enabling tools, such as carbon tracking software, precision agriculture equipment, and data analytics platforms. By reducing the upfront costs for farmers, the program encourages early adoption and experimentation with MRV technologies.
- 2. Creating a Feedback Loop:** Early implementation of MRV tools will generate data and practical insights that can be fed back into the design and improvement of MRV systems. As farmers begin to use these tools, they will provide valuable feedback to developers and policymakers, accelerating the refinement and evolution of MRV technologies.
- 3. Establishing Data Infrastructure for MRV:** The CI Registry will serve as a centralized data platform for carbon intensity scores and environmental performance data from farms across Nebraska. Validation and analysis of the Registry data facilitate the standardized reporting and verification of carbon intensity and sustainability outcomes, creating the foundation for more advanced MRV processes. The approved third-party vendors who calculate the CI scores will integrate data from multiple sources, such as satellite imagery, soil health data, water usage reports, and yield measurements. By streamlining data collection and aggregation, the registry will make it easier for farmers to report their sustainability metrics and for third-party verifiers to audit these reports. The registry's open data architecture and use of API's will allow for collaboration between different MRV systems.
- 4. Standardizing Data Collection:** The registry will promote standardized data collection methods for monitoring and reporting sustainability metrics. This includes setting uniform guidelines for data reporting on carbon intensity, resource use, and regenerative practices, ensuring consistency and accuracy across Nebraska's farms.
- 5. Driving Research and Development in MRV Technologies:** The practical reality of operating the CI Registry in coordination with third-party vendors will reveal gaps and difficulties that need to be solved to increase the integrity and effectiveness of nascent MRV processes. These lessons can spur collaborative research projects between universities, research institutions, and agtech companies aimed at developing cutting-edge MRV technologies. These research efforts can focus on improving the accuracy, scalability, and cost-effectiveness of tools that measure carbon sequestration, emissions reductions, and other sustainability metrics in real time. Field trials and demonstration projects will test the effectiveness of various MRV tools and processes under real-world farming conditions and help identify best practices and the technological solutions for the ag sector.

6. Building MRV Expertise and Capacity: The presence of the Registry will elevate the need to train specialists in MRV-related fields, such as environmental data analysis, precision agriculture, and carbon verification. With this emerging demand made more plain to educational institutions, the program can foster educational pathways that prepare students for careers in agtech, sustainability analytics, and carbon accounting. This will help Nebraska build long-term capacity for the management and improvement of MRV systems.

7. Supporting Long-Term Evolution of MRV Practices: As the CI Registry generates data and facilitates the adoption of MRV tools, it will provide a foundation for scaling MRV systems to cover larger areas, more complex agricultural practices, and broader sustainability goals. Over time, the registry can expand its capabilities to include more sophisticated metrics, such as biodiversity, water conservation, and social sustainability outcomes. The CI Registry and Grants Program's feedback mechanisms will allow farmers, technology providers, and researchers to continuously improve MRV processes to be more accurate, efficient, and scalable.

8. Developing a National or Global MRV Model: By leading the way in MRV development for agriculture, the lessons learned, and technologies developed in Nebraska could be applied to national and international efforts to monitor and reduce carbon emissions in agriculture.

9. Utilizing Lab-based soil testing: To improve the understanding of the relative accuracy and precision of the non-lab approaches to validate estimates and claims.

Administration

Subaward Agreement

Before commencing work, selected subrecipients must sign an Agreement that codifies all the program requirements. The agreement also includes applicable Federal Requirements from the EPA Terms and Conditions along with standard Nebraska state government requirements. NDEE will provide copies of each subrecipient agreement to EPA Project Officer (PO) upon request. Each agreement will contain a workplan with timelines and specific budget allocations to include administrative costs, indirect rates, if applicable, and program support costs.

NDEE will follow EPA subaward policies and will educate recipients by providing training and guidance on the terms of the agreement. NDEE will require monthly status calls with subaward recipients to monitor expenditures, milestones, and overall program success. Subaward recipients will be required to submit semi-annual reports to NDEE.

Overview

For the main responsibilities of this measure, the (NDEE) will partner with a non-profit organization that advocates for the economic interests of farmers, ranchers, and feeders, that understands the current shift in agriculture to more sustainable practices, and that has a record for disbursing grants and/or other funding. This non-profit will serve as the sub-award recipient and will be responsible for the day-to-day administration of the Carbon Intensity (CI) Registry, the Precision Agriculture Grant Program, and the Regenerative Agriculture Grant Program. In addition, the non-profit will recruit and support a Governing Council composed of key agricultural stakeholders, including the state's major check-off

programs and farm representative groups, to win producer buy-in and utilize specialized expertise to develop priorities for the grant fund programs.

It is anticipated that over the five-year period of this agreement, the subrecipient providing administrative oversight will distribute approximately \$150 M in pass-through funds as either incentive or grant payments to accelerate the adoption of sustainable ag production practices. Subrecipient will coordinate between NDEE, the Governing Council, producers, contractors, and third-party service providers to ensure that 90%, or more of all funds go towards supporting transitions in agriculture, and that 10% or less apply to direct and indirect expenses.

Personnel

Personnel funded under the subaward include:

1. Executive Director (.8-1.0 FTE) will provide daily administrative oversight for the Registry and grant programs, develop/implement strategic objectives for successfully executing the registry and grant programs, supervise supporting personnel, act as the primary liaison between NDEE and the Governing Council, oversee and negotiate procurement processes with subcontractors, and serve as the public face of the registry and grant program.
2. Finance Director (1.0 FTE) will handle operational accounting requirements, ensure compliance with federal and state award/reporting requirements, and secure the transfer and rapid distribution, and accounting of pass-through funds.
3. Grants Administrator (1.0 FTE) will provide logistical and documentation support for grant proposals and application review groups, serve as the front-line liaison with grantees, develop performance indicators for grants expended, and ensure compliance with federal/state subaward requirements.
4. Research Director (1.0 FTE) will assess and monitor validity of registry data, develop reports and public-facing dashboards of registry and sustainable ag data, prepare background research for Executive Director, Governing Council and NDEE, and act as a liaison for research work conducted outside of the registry and grants' administrative body.
5. Communications Director (1.0 FTE) will promote programs and drive high levels of participation and engagement, coordinate with internal and relevant external websites to keep Registry information and activities current, and manage and coordinate key events, including Governing Council and community meetings to promote the registry and grant programs.
6. Associate Director (.5-.8 FTE) will assist with procurement and oversight of subcontracts, project management to meet timelines and benchmarks, and stand-in as necessary for the executive director.

Subcontracts

The CI Registry and Grants measure requires subcontracts for IT Development, Marketing, and Legal. Each of these resources will be obtained through subcontract procurement practices consistent with federal and state requirements.

The Registry: The software company tasked with building the Carbon Intensity (CI) Registry must ensure that the system is secure, efficient, user-friendly, and capable of managing the critical functions of storing CI score data, facilitating third-party score uploads, and issuing incentive payments to farmers. Here's a breakdown of the key responsibilities:

- 1) System Design and Development
 - a) Develop a secure, scalable, and user-friendly digital platform that allows third-party vendors to upload verified CI scores for participating farmers.
 - b) Create an intuitive interface where farmers can access their CI scores, track payment status, and monitor their historical data.
 - c) Design a backend system capable of storing and organizing large volumes of CI score data, with advanced search, filtering, and reporting capabilities.
 - d) Integrate a payment system that automates the issuance of incentive payments once a valid CI score has been received, verified, and confirmed.
 - e) Ensure API integration with third-party vendors who will upload CI scores, including verification of authorized vendors and standardizing data formats for seamless input.
- 2) Data Security and Privacy
 - a) Implement robust cybersecurity measures to protect sensitive data, including encryption of both in-transit and at-rest data.
 - b) Ensure data privacy compliance with relevant regulations (e.g., GDPR, CCPA, or applicable federal/state regulations) to protect farmers' confidential information.
 - c) Authenticate and verify third-party vendors to ensure only approved, verified entities can upload CI scores, minimizing the risk of fraudulent or erroneous data entries.
 - d) Conduct and report on an annual cybersecurity audit whose team includes Certified Information Systems Auditors (CISA), Certified Information Security Managers (CISM), or Certified Information Systems Security Professionals (CISSP).
 - i) The entity should have expertise in SOC 2 (System and Organization Controls), ISO/IEC 27001 (Information Security Management Systems), and NIST (National Institute of Standards and Technology) cybersecurity frameworks to ensure a high level of technical scrutiny.
- 3) Payment Processing Integration
 - a) Automate incentive payments to growers based on predefined rules and thresholds once a valid CI score is confirmed.
 - b) Integrate with banking or payment systems (e.g., ACH, digital wallets, or direct deposit platforms) to facilitate timely and accurate payments to farmers.
 - c) Track and report payments in real-time, offering farmers a clear view of payment status and transaction history.
- 4) System Validation and Quality Assurance
 - a) Test the platform thoroughly for functionality, scalability, security, and usability before launch.
 - b) Perform continuous quality assurance (QA) and updates to ensure system stability and performance as usage scales up.
 - c) Provide support for future upgrades, including the ability to adapt to changing requirements or integration with additional functionalities (e.g., integration with carbon markets).
- 5) User Training and Support
 - a) Develop training materials (e.g., user manuals, video tutorials) to help both farmers and third-party vendors navigate the platform.

- b) Provide ongoing customer support for technical issues, including troubleshooting and real-time problem resolution.
 - c) Set up a help desk or support center with multiple communication channels (e.g., phone, email, chat) to handle queries from farmers, vendors, and administrators.
- 6) Data Reporting and Analytics
- a) Build robust data reporting features that allow program administrators to track submissions, analyze CI score trends, and generate customized reports.
 - b) Enable advanced analytics that can monitor key performance indicators (KPIs), such as average CI reductions across the state, incentive payout totals, and farm-level improvements.
 - c) Integrate data export functionalities for ease of reporting to stakeholders, including the EPA and other regulatory bodies.
- 7) Maintenance and Updates
- a) Provide ongoing system maintenance to ensure the platform remains secure, up-to-date, and optimized for performance.
 - b) Offer post-launch updates to enhance functionality, fix bugs, and incorporate new features based on user feedback or evolving program requirements.
 - c) Monitor system performance to ensure uptime reliability and quick resolution of any issues that arise.

Aside from requiring the obvious qualifications to deliver the specifications above, the Registry developer will also need to demonstrate:

- Experience working with government agencies or large-scale grant programs, ensuring familiarity with public-sector requirements, regulatory standards, and reporting protocols.
- Expertise implementing secure platforms to handle sensitive data, encryption protocols, cybersecurity best practices, and compliance with data privacy regulations such as GDPR, CCPA, or other applicable state/federal standards.
- A record of building systems to handle digital payment systems and integrating automated payment solutions, such as ACH transfers, digital wallets, and other direct payment methods that streamline financial disbursements.
- A strong background in user experience and interface design to ensure the platform is intuitive, especially for non-technical users.
- Experience with mobile-friendly design to ensure the platform is accessible across devices, particularly for users in rural or remote areas.
- An established track record of providing customer support through multiple channels, ensuring real-time help with system navigation or technical issues.

Marketing: The Nebraska Department of Agriculture estimates the state had 44,400 farms and ranches in 2023 with the average operation consisting of roughly 1,000 acres. The PCAP and original grant proposal aspired to enroll 1 B bushels of corn and beans in the Registry over five years. At a reasonable average of 200 bushels per acre, the Registry aims to record CI scores for roughly 1 M acres a year, or 1,000 row crop operations.

As described earlier, one of the biggest barriers for farmers to shift practices is confusion due to an onslaught of competing claims about profitability and sustainability. For the Registry and grant

programs to rise above the noise, a subcontract will be sought with a marketing group to develop and launch a multi-media, multi-channel campaign publicizing the programs.

In addition to pursuing traditional and social media marketing strategies, the subcontractor will be required to work closely with each of the major ag leadership groups. To ensure that Farm Bureau, the Corn Board, the Soybean Association, and others have sufficient bandwidth and resources, the marketing subcontractor will build bespoke messaging programs specially tailored to their memberships.

Enrollment Fee: In addition to the indirect methods of traditional marketing, the Registry will pay \$500 for every new crop operation the approved third-party vendors enroll with the Registry. Limited to one fee per new operation, this payment will incentivize the CI Score vendors to more actively recruit growers to participate in the Registry program and stimulate more direct contact between farmers and vendors.

When combined with the marketing campaign, this fee provides an additional signal to producers of the value and importance of CI scores. From these initial engagements, deeper conversations about managing carbon intensity are expected to follow and drive high levels of participation in the regenerative and precision ag grant programs.

Legal: As the grant programs will vary over time in their structure and requirements, it is anticipated that several different templates will need to be drafted and approved for each award contract. Similarly, significant legal work will entail with each of the subcontracts. Participation in the Registry incentive program requires consent from producers and agreements from the vendors connecting to the database.

As time is of the essence in both the implementation and execution of these programs, a subcontract will be sought to provide ongoing legal services. This support will be used to prepare initial and advanced drafts which can then be submitted to counsel for the State of Nebraska for final edit and approval. This will enable state counsel to quickly review and approve documentation on which efforts may depend prior to launch.

Operations

The Governing Council: To ensure the grant programs are aligned with the needs and expertise of Nebraska's agricultural community, the non-profit will assemble a governing council consisting of key stakeholders, including representatives from the Nebraska Corn Board, Soybean Association, Nebraska Renewable Fuels, Nebraska Cattlemen, Nebraska Farm Bureau, and other agricultural organizations. The council will include representatives from organizations that together represent over 90% of Nebraska's farmers and livestock producers. This ensures that grant decisions are guided by the practical experience of the state's agricultural leaders.

The council will provide strategic guidance on structure and use of the Registry and which types of precision and regenerative agriculture projects to prioritize, ensuring that the grant funds target the adoption of sustainable, low-emission farming practices. As membership organizations, these leaders are particularly tuned to the objections and reservations producers have about shared data or exploring new operating plans.

The council will meet regularly to review grant applications, offer expertise on innovative technologies, and advise on the most impactful ways to reduce agricultural emissions while supporting farm profitability. The council will review and provide feedback on the reports and dashboards being developed to create greater understanding and transparency around carbon intensity and regenerative ag.

Through the subaward agreement, NDEE reserves the right to review, ratify and rescind any recommendations or actions by the Governing Council, including the constitution of its membership. Accordingly, NDEE may install representatives from Nebraska's state departments of Agriculture, Natural Resources, or other agencies in order to maintain alignment between the Registry and Grants Program and existing governmental priorities and initiatives.

Grant Programs: While the Registry is intended to instill an impetus for reflection and even motivate change, the two grant programs are designed to create option sets and solutions to reinforce commitment. Every row crop operation reflects some version of a field management plan on which a producer relies for decisions about irrigation, fertilizer, weed control, seed selection, and a hundred other considerations. The grant programs provide the mechanisms by which each producer can access planning and strategy resources to build an alternative management plan oriented towards lower emissions and stronger stewardship.

The subaward recipient will handle all aspects of grant program management, including solicitations, application, selection, funding disbursement, and monitoring. Through the guidance of the Governing Council, investments that facilitate shifts in practice will be prioritized. In recognition that change requires assessment and planning, producers will have access to resources that enable a systematic strategy to be developed, understood, and accepted. With that guidance in hand, additional funding opportunities will support farmers' purchase of agronomic services that expand regenerative ag principles as part of their operational toolkit. Other grants will bridge gaps in data or information that impact the timing and dosage of specific interventions through precision ag infrastructure and technology.

The bias for grant programs will be in favor of opportunities that lift the effectiveness of all operations through greater insight, automation, and digital monitoring and documentation. Grant programs will emphasize reach and scale. Solicitations will leverage existing, alternative programs with USDA and Nebraska's state-funded opportunities but will also try to backfill demand in programs which are over-subscribed.

In those instances when participation must be capped, representatives from the Governing Council will serve as a review body and apply transparent and objective scoring systems to prioritize applications that offer the greatest sustainability benefits. Grant projects involving significant competition or award amounts will require NDEE review of award recommendations. Awards will secure the access required for the subaward recipient to work with farmers to track the results of their regenerative and precision ag implementation and to ensure that the projects deliver measurable improvements in resource efficiency, carbon intensity, and farm productivity.

The subaward recipient will ensure full transparency and accountability through regular reporting. The subaward recipient will submit quarterly and annual reports to the EPA and NDEE detailing program progress, financial management, and environmental outcomes (e.g., reductions in carbon intensity,

improvements in soil health, water conservation). The grant programs will implement a robust monitoring and evaluation system to track the environmental impact of grant-funded projects and the CI Registry, using clear metrics (e.g., tons of CO₂ reduced, acres of regenerative practices adopted).

Project Agreement: Before commencing work, successful applicants must sign a Project Agreement that codifies all of the program requirements. The agreement also includes applicable Federal Requirements from the EPA Terms and Conditions along with standard Nebraska state government requirements.

Data Management and Security: The Registry and Grants Program will need to manage and secure various types of sensitive and operational data. These data types include both personal and organizational information, as well as technical data related to carbon intensity (CI) scores, financial transactions, and environmental performance. Proper management and security protocols are crucial to ensure compliance with privacy laws, maintain trust with participants, and prevent data breaches. Below are the key types of data that must be managed and secured:

- 1) Farmer and Vendor Personal Data
 - a) Personal Identifiable Information (PII) that can include names, addresses, contact information (phone numbers, emails), and possibly government-issued identifiers (e.g., tax ID numbers or Social Security numbers).
 - b) Financial Information: Bank account details, payment preferences, and transaction histories related to incentive payments and grants.
 - c) Vendor Information: Registration data for third-party CI score providers, including their credentials, contact information, and any certification or validation documents.
- 2) Carbon Intensity (CI) Scores and Environmental Data
 - a) CI Scores: Data submitted by third-party vendors detailing carbon intensity values for specific crops or farming operations, potentially including crop type, input use (fertilizer, pesticides), fuel usage, and carbon emissions data.
 - b) Farm-Level Environmental Data: This may include soil health metrics, water usage, fertilizer application, energy consumption, and carbon sequestration practices (e.g., cover crops, no-till farming).
- 3) Grant Application Data
 - a) Grant Application Information: This includes details about the precision or regenerative agriculture projects, the types of technology or practices farmers are seeking funding for, and detailed business cases or proposals.
 - b) Supporting Documentation: Technical specifications of precision agriculture equipment, farm plans, environmental impact assessments, or other documents submitted as part of the grant application process.
- 4) Financial Data for Incentive Payments and Grant Disbursements
 - a) Payment Records: Data related to the financial disbursement of incentives and grants to farmers and vendors, including amounts, payment dates, and bank account details.
 - b) Tax Information: Data related to tax filings or reporting, such as tax identification numbers, if necessary for payments or reporting.
- 5) Performance Monitoring and Reporting Data
 - a) Program Performance Data: Aggregated metrics related to the effectiveness of the grants program and CI registry, such as total emissions reductions, precision ag adoption rates, and improvements in soil health or water conservation.

- b) Monitoring and Evaluation Reports: Periodic reports documenting program outcomes, grant impacts, and compliance with environmental targets.
- 6) System Access and User Activity Data
 - a) User Access Logs: Detailed records of who accessed the system, what data they viewed or modified, and when they accessed it.
 - b) Audit Trails: Comprehensive logs to track all system activity, ensuring transparency and accountability in the management of data.
- 7) Geospatial and Agricultural Data
 - a) Farm Location Data: Geospatial coordinates or addresses of farms participating in the CI Registry or grant programs.
 - b) Geospatial Data: Information collected via precision agriculture tools, such as satellite imagery, soil moisture levels, or crop health data collected via drones or sensors.
- 8) Regulatory and Compliance Data
 - a) Compliance Documentation: Records related to compliance with environmental regulations or certification for carbon credits, such as third-party validation of CI scores.
 - b) Regulatory Reports: Data submitted to regulatory bodies (e.g., EPA), including aggregated CI data, environmental performance summaries, or financial reports.

The Registry and Grants program will rely on best practices for managing and securing the data that include:

- Encrypting sensitive data while in transit and at rest. Compliance with privacy laws (e.g., GDPR, CCPA) will be ensured, with proper anonymization or pseudonymization of data where required.
- Implementing strict role-based access to limit the visibility of sensitive data only to authorized personnel. Different roles (e.g., administrators, financial officers, farmers, third-party vendors) will have access only to the data they need.
- Requiring MFA for all users accessing the system, particularly those handling sensitive financial or personal data, to enhance security and prevent unauthorized access.
- Maintaining detailed audit logs for all actions within the system, including data access, modifications, and payments. Implement continuous monitoring and alert systems to detect any suspicious or unauthorized activities.
- Ensuring regular backups of all critical data, with redundancy measures in place to avoid data loss due to system failure or cyberattacks. Regular data integrity checks will verify that information has not been altered or corrupted.
- Adhering to industry standards and certifications for data security, such as SOC 2, ISO 27001, or PCI-DSS, depending on the nature of the data being handled.

Subcontractors hired to develop, expand, maintain, or secure the systems of the Registry and Grants Program will be required to factor the costs of third-party security reviews into their budgets. Development and updates will be built in sandbox environments and tested before being pushed to production.

As part of the security plan, contingency plans will be developed to ensure that potential events that could compromise the data systems or interrupt operations are contained to prevent further disruptions.

Program Timeline

Once it goes live in June 2025, the Registry will log scores for corn and beans through October, 2029 or until funds allocated to incentive payments have been exhausted, whichever comes first. Grants opportunities and solicitations are expected to be released continuously in synch with the cadence of the agricultural production cycle.

<i>Tasks and Milestones</i>		
<i>Task Description</i>	<i>Anticipated Milestone Dates</i>	<i>Assumptions, etc.</i>
<i>NDEE selects Nebraska nonprofit, agricultural leadership organization for subaward</i>	<i>September 2024 to October 2024</i>	<i>EPA approves funding for CI Registry and Grant programs</i>
<i>EPA to make awards</i>	<i>October 2024</i>	
<i>NDEE subawards to Nebraska nonprofit agricultural leadership organization</i>	<i>November to December 2024</i>	<i>Must follow EPA subaward requirements. NDEE will educate recipients of subawards by providing training and guidance on the terms of the agreement. Evaluation and development of QAPP if needed.</i> <i>Subrecipient recruits and convenes Governance Council; Council ratifies policies and procedures.</i>
<i>Subrecipient subcontracts for a developer to design, build, operate, and secure a web-based CI Registry</i>	<i>January 2025 to February 2025</i>	<i>Developer selected through open-bidding process based on demonstrated record to deliver comparable systems</i>
<i>Subrecipient subcontracts with marketing group to develop and implement messaging campaign</i>	<i>January 2025 to December 2026</i>	<i>Marketing group selected through open-bidding process based on demonstrated record to drive engagement</i>
<i>Subrecipient implements incentive programs in regenerative and precision agriculture</i>	<i>January 2025 to February 2025</i>	<i>Subrecipient identifies qualifying criteria to receive funds and publish guidelines for first-round applications</i>
<i>CI Score Registry completes testing and launches</i>	<i>February 2025 to May 2025</i>	<i>CI Registry operational to receive estimates from approved third-party CI vendors and distribute payments to participating registrants</i>
<i>Applications open for Regenerative and Precision Ag incentive programs</i>	<i>March 2025 to October 2029</i>	<i>Applications received, reviewed, and funded by sub-recipient on a rolling basis or within set timeframe until fund spent</i>
<i>CI Score Registry logs CI scores for Corn, Soybeans and other crops</i>	<i>June 1, 2025 to October 2029</i>	<i>Scores recorded and incentive payments paid until funds spent</i>
<i>Semi-Annual Reports</i>	<i>Semi-Annual 2025-2029</i>	<i>Subrecipient reports to NDEE. NDEE submit to EPA</i>

<i>LIDAC report</i>	<i>October 2025</i>	<i>NDEE submit to EPA</i>
<i>Final Report</i>	<i>January 2030</i>	<i>NDEE submit to EPA</i>

Federal Fiscal Year	Programmatic Tasks and Milestones
2025	<p>November 2024:</p> <ul style="list-style-type: none"> • NDEE signs subaward contract with Nebraska nonprofit • Governing Council recruited and convened <p>January 2025:</p> <ul style="list-style-type: none"> • Administrative staff for Registry and Grants Program hired • RFP opens for IT vendor to develop, maintain and secure Registry • RFP opens for Marketing group • Governing Council begins to develop grant funded priorities <p>March 2025:</p> <ul style="list-style-type: none"> • Regenerative and Precision Grants open • Beta version of Registry test period begins • CI Score Vendors approved • Marketing and publicity campaign begins • 1st Quarter Report due to NDEE; Semiannual report due to EPA <p>May 2025:</p> <ul style="list-style-type: none"> • Initial grant awards made (if not already done) • Full launch of Registry IT platform and initial dashboards <p>June-September 2025:</p> <ul style="list-style-type: none"> • Grant solicitations released on rolling basis, Registry records CI Scores, quarterly and semiannual reports filed, marketing continues
2026	<p>October 2025-September 2026:</p> <p>Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed, marketing continues</p>
2027	<p>October 2026-September 2027:</p> <p>Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed</p>
2028	<p>October 2027-September 2028:</p> <p>Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed</p>
2029	<p>October 2028-September 2029:</p> <p>Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed</p>
2030	<p>January 2030: Submit Final Grant Report to EPA.</p>

Expected Outputs and Outcomes

Outputs/ Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
<ul style="list-style-type: none"> • # of farms logging original CI score • # of farms logging subsequent scores • # of acres represented in Registry per year • # of bushels recorded in Registry per year • Change in CI Scores within and across operations • # of operations applying/receiving grants • Total amount of grants/year • Geographic diversity of CI scores and grants • Participation rate of small/medium farms • Participation rate of farms in LIDAC areas 	<ul style="list-style-type: none"> Reduced CI of corn and soybeans Reduction in metric tons CO₂e in LIDAC Reduction in metric tons CO₂e Higher profits for farms in LIDAC areas Higher profits for small/medium farms

Greenhouse Gas Emissions Reductions

Methodology

The Blonk report summarized the primary pathways to reducing crop related emissions in Nebraska agriculture as follows:

- “Nitrification inhibitors in corn production: A 38% reduction in direct nitrous oxide emissions, achievable using existing nitrification inhibitors, across all NE corn production would mean 1.99 MMT CO₂e year less GHGE.
- Reduce fuel use in crop cultivation: A 30% reduction in the diesel consumption in both corn and soybeans combined – through efficiency improvements or shifts to renewable fuels – could reduce emissions by 1.18 MMT CO₂e year
- Improve N use efficiency in corn production: 20% less nitrogen fertilizer inputs achieving the same corn production levels would reduce emissions by 0.90 MMT CO₂e year.”¹

If fully realized, these reductions total 4.07 MMT CO₂e annually. While these reduction estimates might have been ambitious given the technology and practices assessed for the production years on which their analysis was based (2018-2020), recent changes related to emissions management and market dynamics make these estimates more reasonably achieved.

As Blonk noted, nitrous oxide emissions and the excess application of anhydrous ammonia are the primary drivers of crop-related emissions. In the production seasons since the report period, the means to significantly reduce nitrous oxide emissions have grown alongside the ability to assess the carbon intensity of corn and soybeans.

Global demand for bio-based, alternative fuels has driven unprecedented research and development around inputs and crop management practices with a goal of achieving net-zero emissions in corn and soybean production. Even when the specific conditions of a farming operation cannot reach net-zero,

the use of cover crops, no-till, and reduced fertilizer rates are expected to cut carbon intensity by half, or more.²

The Inflation Reduction Act provides significant financial incentives for alternative fuel producers to buy corn and soybeans with low/negative carbon intensity. These market demands will most strongly influence the adoption and implementation of field-level emissions management practices for the harvest years of 2025, 2026, and 2027.³

Assumptions made in calculating GHG reductions from rapid, widespread adoption of regenerative and precision agriculture as a means of reducing the carbon intensity of corns and soybeans in Nebraska include:

- Multiple factors are driving corn and soybean producers to immediately shift to cover crops, reduced till, reduced chemical fertilizers, and other regenerative ag strategies.
- The emissions reductions anticipated in the Blonk report will have already reduced producers’ shifts in practice since 2020.
- The increased use of CI Scores as a performance metric for corn and soybean production as a result of the CI Score Registry incentives will amplify interest in additional emissions reductions beginning in 2025.
 - Blonk reported approximately 11.7 MMT CO₂e per year for Nebraska corn. Applying the standard assumed carbon intensity score of 29 gCO₂/MJ for that harvest, every 10-point reduction in the carbon intensity score equates to a reduction of nearly 4 MMT CO₂e per year:

CI Score	Total MMT of GHG	MMT CO ₂ e reduced	% Change
29	11.7	--	--
19	7.65	4.05	-35%
15	6.04	5.66	-48%
9	3.62	8.08	-69%
5	2.01	9.69	-83%

- Cumulatively, one billion bushels of corn (only about 10% of Nebraska’s harvest) with a CI score of 15 logged with the CI Score Registry represents a 3.2 MMT CO₂e reduction in GHG emissions.
- Confidence in the profitability of farming with regenerative and precision agriculture will grow through 2030 and routinize and preserve the practices after the lapse of tax credits in 2028.

From these assumptions, it is reasonable to predict that the overall carbon intensity of Nebraska’s total harvest will decline as a result of better pricing and market access for lower CI corn, the regenerative and precision grant supports to offset transition costs for farmers, and additional, emerging solutions that reduce and replace the primary sources of GHG in corn and soybean production. Calculation of the GHG emission reductions for corn and soybeans assumed a conservative prediction of declining CI scores. The assumptions and calculations are presented on the M-6 Agriculture sheet in the GHGcalcs workbook file.

In the original PCAP and grant proposal, the rate at which farmers adopted the practice recommendations from the Blonk report appeared to be the best way to forecast reduction rates and then track progress during implementation. While preparing the workplan, it became clear that following CI scores for Nebraska’s corn and soybean harvests more directly aligned with the activities and objectives of the Registry and Grants Program.

As shown in GHGcalcs spreadsheet, if Nebraska maintains an annual total production of 11.8 B bushels of corn per year, every CI point reduction equates to just over 400,000 metric ton of GHG avoided. The Registry data and collateral resources will enable the project to calculate CI scores overall and the corresponding reduction in GHG emissions.

At the time of the Blonk report (2020) and the grant proposal (March 2024) many Nebraska farmers already pursued elements of regenerative and precision ag—it is their success that bolsters confidence in the benefits forecast from fully adopting all practices across more operations. While the impact of these patchwork changes on the carbon intensity of corn and soybean production are unknown, it is expected that the CI for 2025 will be less than the baseline 29 gCO₂eq/mJ ordinarily assumed in the absence of any efforts mediate or manage emission rates.

Should the actual CI for 2025 turn out to be higher or lower than the value selected in the forecast in the GHGcalcs spreadsheet the benchmark will be adjusted, however, progress will continue to be gauged according to the net reduction of CI scores and the corresponding reduction in emission amounts. The benchmark value is simply a placeholder against which actual changes can be measured. If the Registry and Grants Program shifts carbon intensity from 26 to 14 gCO₂eq/mj between 2025 and 2030 or 29 to 17 gCO₂eq/mj, the 12 point reduction in carbon intensity remains equivalent to 27.9 MMT of GHG, regardless of what the actual, original baseline turns out to be.

The PCAP and original grant proposal aspired to enroll 1 B bushels of corn and beans in the Registry over five years. At a reasonable average of 200 bushels per acre, the Registry aimed to record CI scores for roughly 1 M acres a year, or 1,000 row crop operations. In the period between the grant submission and the award announcement, it was determined that increasing the incentive and grant funds would improve engagement and hasten implementation at scale. The shift in funding doubles the amount available for incentive funding and, therefore, doubles the implementation targets. As a result of the funding increase, the Registry is expected to reflect scores for 2 M acres/year or 400 M bushels of corn and beans.

Similarly, doubling the engagement rate between growers and the Registry is expected to amplify interest and participation in the Regenerative and Precision ag grants programs. While the funding was not fully doubled for these initiatives, the budget was substantially increased to reflect greater demand and opportunities for broader impact.

The following table summarizes the overall GHG emission reductions anticipated as a result of the decline in statewide CI scores from 2025 through 2030 that is expected to be produced by the Registry and Grants Program.

Cumulative Net Emissions Reductions
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Year	CI of State Harvest	Total (MT CO ₂ e)	CO ₂ (metric tons)	N ₂ O (metric tons)
2025	26	1,743,182	683,632	1,059,550
2026	24	4,470,508	1,732,250	2,738,258
2027	20	8,897,554	3,373,871	5,523,684
2028	18	14,397,555	5,425,771	8,971,784
2029	16	20,703,010	7,751,526	12,951,484
2030	14	27,920,920	10,405,705	17,515,215
2050	14	172,279,121	63,489,294	108,789,828
Cumulative Net Emissions Reductions for 90% Grant Funding				
2030		25,128,828	9,365,135	15,763,694
2050		155,051,209	57,140,364	97,910,845

Calculating CI Scores

The most commonly accepted method for calculating CI scores for crops is derived from the variable groups of the GREET (Greenhouse gases, Regulated Emissions, and Energy use in Technologies) model. The primary factors influencing carbon intensity scores from the GREET model are:

1. Farming practices and inputs (e.g., fertilizer use, tillage practices)
2. Energy sources and efficiency (e.g., fuel type, equipment efficiency)
3. Soil carbon sequestration and land use changes (e.g., soil management, direct and indirect land use changes)
4. Crop yield and productivity (e.g., yield per acre, harvest quality)
5. Transportation and logistics (e.g., transport distance, fuel efficiency)
6. Processing and conversion efficiency (e.g., energy use, processing technology)
7. Co-product utilization (e.g., value and use of co-products)
8. Feedstock characteristics and growing conditions (e.g., regional climate, crop variety)
9. Carbon capture and utilization (e.g., CCU technologies at processing facilities)

CI calculators for row crops like corn while derived from GREET, typically rely on a combination of actual input values provided by farmers and assumed values based on standardized data or regional/national averages. The use of actual versus assumed values depends on the data availability, the level of detail required by the CI calculator, and the degree to which a particular factor varies from farm to farm.

Below is a breakdown of which factors commonly require actual input values and which typically utilize assumed values.

Factor Category	Actual Input Values	Assumed Values
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Fertilizer Use	Amount, type, application method	Production emissions factors
Fuel and Energy Use	Fuel consumption (quantity/type)	Emission factors for fuel types
Crop Yield and Productivity	Actual yield per acre	None (yield must be provided)
Tillage Practices	Type of tillage practice used	None
Transportation	Distance to processing, mode of transport	Average fuel efficiency of transport
Soil Management	Use of cover crops, crop rotation practices	Regional soil carbon factors
Land Use Change (LUC/ILUC)	None (standardized for region)	Assumed values from broader models
Pesticides and Herbicides	Amount used (if requested)	Emission factors for production
Processing Energy Use	Actual energy data if known (less common)	Average energy use for processing
Co-Product Credits	None (standard industry assumptions)	Standard co-product credit values
Regional Climate and Soil Data	None	Assumed regional averages

The use of actual values enables CI estimates to be calculated using quantifiable, measured values directly reflecting real-life practices. Given the full range of variables specified in GREET, however, it would be nearly impossible and, more importantly, counter-productive to delay scoring crops until the gallon of ethanol it went into was completely produced and delivered. Instead, the assumed values represent regional/national averages as they are less likely to vary significantly from one operation to another and some level of agreement exists about the range within which the assumed value falls relative to those confirmed by research.

The CI Registry will rely on the technical literature and industry expertise to ensure that the third-party vendors calculating CI estimates for growers reflect actual values on critical factors such as fertilizer amounts and nutrient management, fuel consumption, tillage, and yield. For those factors for which sound local estimates cannot be derived, the most conservative assumed values will be used.

Given the wide disagreements over soil sequestration rates and conundrum of permanency, initially soil sequestration rates are not expected to be factored into the CI score for Registry purposes. Technological assessments for changes in soil organic content and carbon sequestration over time exist but are not currently scalable to the scope of production of the Registry and Grants Program. However, both the lab and the registry would take advantage of every opportunity to validate estimates and claims using all available technologies and practices.

This creates a platform from which a variety of data samples can be collected. And then statistically combined to produce higher levels of understanding with better degrees of confidence. If there is a widely accepted assumed value for soil sequestration that is what will be used in the model. Therefore, as breakthroughs allow for sequestrations rates to be reasonably obtained and tracked across time, these values will be monitored as evidence that regenerative and precision ag are being successfully implemented. Even in such instances, the problems that come from assuming permanency remain and

it is not anticipated that the Registry protocol will allow sequestration rates to reduce emissions against assumed production baselines.

References

¹ P. 53, *Climate Neutrality for Nebraska Agriculture: Benchmarking Current Emissions*, 2022. Blonk Sustainability and Resilience Services, PLLC. <https://aksarben.org/full-value-ag>

²<https://www.cibotechnologies.com/pathway/the-definitive-guide-to-low-carbon-corn-for-carbon-neutral-ethanol/>

³<https://crsreports.congress.gov/product/pdf/IF/IF12502>

Longevity of Greenhouse Gas Reductions

The adoption of regenerative and precision agriculture practices—such as cover cropping, no-till farming, crop rotation, and GPS-guided inputs—are designed to be self-sustaining and resilient. These practices improve soil health and resource efficiency, which incentivizes farmers to continue using them due to their direct benefits in terms of cost savings and yield optimization. The Registry and Grants Program activates an extensive, existing network of Natural Resource District, USDA, Extension Services, and technical services housed within higher education to support farmers and help them understand the benefits and methodologies of sustainable farming practices. This educational and technical background equips growers with the ability to maintain these practices over the long term.

It is expected that farmers who reduce their carbon intensity and adopt sustainable practices will gain access to new markets, such as low-carbon fuel markets and sustainability certification programs, which will offer economic incentives that persist beyond the grant period. Similarly, much of the basis for regenerative agriculture’s reduction of emissions comes from reduced inputs and their attendant cost. These methods are not only a cheaper way of growing corn and soybeans, but they also reduce the producer’s dependence on outside ag services and products known to contribute to emissions.

Farming operations that document and verify emissions reductions align with emerging regulatory trends that favor low-emissions, sustainable agricultural production. As regulatory pressures to reduce emissions intensify, farmers who adopt sustainable practices early will be better positioned to comply with future regulations, reinforcing the longevity of these changes.

The Registry and Grants Program fosters a data-driven approach to decision-making. This shift helps farmers optimize their operations based on real-world results, ensuring that they continuously improve their sustainability practices over time. Through time and routine, the use of regenerative and precision ag practices will become the prevailing standard in commercial row crop production.

The CI Registry and Grants Program is intended as a bridge strategy to alleviate financial risk and barriers farmers face during the 3-5 year period required to transition to regenerative and precision ag practices. With the anticipated scale of participation in the Registry and Grants Program, premium prices in the alternative fuels industry and from other supply chain channels are expected to grow and become established. Market supports for sustainable attributes, such as low carbon-intensive corn and beans, are expected to supplant the need for incentive funding and grants.

The CI Registry can ensure sustainable funding after the initial five-year grant period by implementing a diversified approach that might include transaction fees, subscription models, carbon market partnerships, public-private sponsorships, government grants, research funding, and value-added services. As a unique source of data for the impact of sustainable practices across different growing conditions, the registry will be able to maintain and expand its role in driving sustainable agricultural practices, supporting farmers, and promoting carbon emissions reductions in Nebraska's agricultural sector. This multifaceted approach will help the CI Registry become a self-sustaining platform that continues to deliver value for farmers, industry stakeholders, and the broader community.

LIDAC Benefits

Nebraska's corn and bean operations are scattered throughout the state and can be found in all of the LIDAC communities identified for Nebraska. Without the financial incentives of a CI Score Registry, many of these lower-income, disadvantaged producers simply cannot bear the risk from shifting production practices. The three-pronged approach to be implemented through this grant provides a complete solution set, at scale, that enables all farm operations, regardless of size and location, to adopt and adapt to production practices that will preserve their land and livelihood.

The CI Registry and Grants Program relies on aggressive engagement outreach, financial incentives, and ag organizations representing more than 90% of all farmers, ranchers, and feeders. As discussed elsewhere, special care and attention will be taken to ensure high participation rates among the most financially fragile operations, the small and medium-sized farms.

NDEE will track locations of regenerative ag and precision ag incentive recipients to ascertain what proportion of recipient's operations are within formally designated low-income and disadvantaged areas.

Cost-Effectiveness

NDEE has budgeted \$160,434,689 for Measure 6 to achieve a 25,128,828 metric ton reduction in greenhouse gases by 2030. The resulting cost-effectiveness of this measure is \$6.38 per metric ton CO₂e reduced.

Budget

In late July, EPA announced its intent to award NDEE \$307M to implement eight (8) measures as part of the Climate Pollution Reduction Grant (CPRG). NDEE requested \$341,399,719 in the implementation grant application, therefore a deduction of \$34,399,719 from the workplan to match the award amount was necessary. As described in Measure 7, NDEE elected to shift this initial reduction from the Anaerobic Digester Measure. Upon further review and taking into consideration, GHG emission reductions, cost effectiveness, other factors such as timing, and potential other sources of available funding, NDEE proposed another financial shift in the workplan from the Anaerobic Digester measure into the Agricultural Production measure increasing the investment into that measure \$160,434,689 and leaving \$57,182,628 in the Digester measure. The justification for the funding shift is that the Agricultural Production measure, which includes a carbon intensity registry, regenerative ag and precision ag practices, is significantly more cost effective per dollar invested. Overall, this will result in more potential GHG reductions through implementation of all eight (8) funded measures than originally proposed. The budget outlined below includes the increase in funding.

Category	Budget	Narrative
Personnel	\$488,875	Estimated at 1.5 FTE per year. Includes portions of salary of full-time staff to perform tasks.
Fringe Benefits	\$155,218	Includes taxes, medical insurance, retirement, and other non-salary expenses estimated as a percentage of salary. The current rate for Fringe Benefits is 31.75%.
Travel	\$21,539	Includes costs for mileage, meals, and lodging necessary to implement the program and to oversee projects. Costs are estimated annually for staff travel to project site visits and outreach meetings. Costs are estimated for 1000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 4 overnight stays, 8 travel days for 2 staff per year.
Equipment	\$0	EPA definition of equipment is any item over \$5,000. There is no anticipated additional equipment needed to implement these activities.
Supplies	\$5,000	Includes usual office and laboratory materials necessary to implement tasks. Office supplies are considered part of this category also and include things such as furniture, staff desk supplies.
Contractual	\$25,000	Contractual work for a grant management system via subscription service to develop an electronic application database for applicants to submit their application, track their project status, submit required reports and track reimbursement. NDEE will also use this system to track expenditures and project metrics.
Other	\$159,542,285	NDEE will be subaward to an agricultural non-profit organization to design, build, operate, and secure a CI Score registry and implement a grant program to award funds supporting the adoption of regenerative and precision agriculture technologies and practices. Carbon Intensity Score Registry (100% CPRG Funding, \$60 M - will be paid directly to participating producers) including incentives to register, \$70M incentives for Precision Ag @ 80% CPRG Funding, \$17M incentives for Regenerative Ag Practices (100% CPRG Funding). Assumes 90% funding provided by CPRG.
Total Direct Charges	\$160,237,917	
Indirect Charges	\$196,772	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
<u>TOTALS</u>	\$160,434,689	

Additional Budget Narrative Description: Other

As described in detail under the administrative section of this measures workplan, NDEE will subaward to a non-profit organization that will serve as the subrecipient and will be responsible for the day-to-day administration of the Nebraska Ag Registry and Grants Program including the Carbon Intensity (CI) Registry, the Precision Agriculture Grant Program, and the Regenerative Agriculture Grant Program. In addition, the non-profit will recruit and support a Governing Council composed of key agricultural stakeholders, including the state's major check-off programs and farm representative groups.

It is anticipated that over the five-year period of this agreement, the subrecipient providing administrative oversight will distribute approximately \$150 M in pass-through funds as either incentive or grant payments to accelerate the adoption of sustainable ag production practices. Subrecipient will coordinate between NDEE, the Governing Council, producers, contractors, and third-party service providers to ensure that 90%, or more of all funds go towards supporting transitions in agriculture, and that 10% or less apply to direct and indirect expenses.

The subrecipient will subcontract for IT Development, Marketing, and Legal. Each of these resources will be obtained through subcontract procurement practices consistent with federal and state requirements.