Note: This workplan is current as of May 6, 2026, but is undergoing revisions and redesign. These changes are pending approval from the U.S. Environmental Protection Agency. The revised workplan will be posted once it is approved.

NEBRASKA CLIMATE POLLUTION REDUCTION IMPLEMENTATION GRANT WORKPLAN

Nebraska Department of Environment and Energy

State/Territory Point of Contact:

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Total Amount of Award: ***$307,000,000***

Period of Performance: October 1, 2024, through September 30, 2029

Section 1. Project Summary and Scope of Work

Nebraska's Priority Climate Action Plan (PCAP) identifies priority measures to reduce greenhouse gas (GHG) and other air pollutant emissions in the six EPA-identified economic sectors (Agriculture, Energy Production, Industry, Waste & Wastewater, Commercial & Residential Buildings, and Transportation). The plan identifies voluntary, incentive-based measures to reduce greenhouse gas emissions throughout Nebraska.

Nebraska's ONE RED (Opportunity for Nebraska: Reducing Emissions and Decarbonization) Program will implement the eight GHG reduction measures listed below that will impact key economic sectors and form a comprehensive strategy for emissions reductions specific to Nebraska. The measures are also expected to stimulate economic growth, create high-quality jobs, provide specific benefits to low-income and disadvantaged communities, and enhance the quality of life for all Nebraskans.

1. Energy Efficiency and Electrification Upgrades for Non-Residential Facilities
2. Residential Pre-Weatherization Program
3. Irrigation Well Conversion from Diesel to Electric
4. Micro-Solar Arrays for Critical Infrastructure in Low-Income Rural Communities
5. Solar Projects on Unused/Contaminated Land, Facility Rooftops, and Parking Lot/Feedlot Canopies
6. Measures to Reduce Emissions in Agricultural Production
7. Hub-and-Spoke Anaerobic Digester/Biogas Hubs for Agricultural Waste

8. Incentives for Production and Use of Biochar to Reduce Organic Waste and Sequester Carbon in Soil

Introduction to GHG Reduction Projection Methodology for Measures Impacting Use of Grid Electricity

The methodology used to estimate greenhouse gas and other emissions reductions varies by measure and is described below with each measure. However, more than half of the measures will involve changes in use of grid electricity. To avoid duplication, this section provides a general description of the methodology used for future projections of emissions reductions involving the electric grid.

Three types of GHG reduction measures in this grant program will have differing levels of reduction through time as the U.S. electric grid reduces fossil fuel generation:

1. **Energy Efficiency** measures that reduce the use of electricity from the grid.
2. **Renewable Energy** (e.g., solar photo-voltaic electrical generation) measures that will displace fossil fuel electrical generation.
3. **Electrification** measures that replace fossil-fuel power sources with electrical equipment, adding to the load on the electrical grid.

NDEE elected to use projected electric grid emission rates to calculate future emissions reductions for Energy Efficiency, Renewable Energy, and Electrification measures.

Following the guidelines in the EPA *Avoided Emissions and geneRation Tool (AVERT) User Manual*, if average emission rates for the generation region are used to calculate emissions reductions for measures that decrease use of current electrical grid resources, the calculations should use "non-baseload" emission rates, which represent the electrical generation units most likely to be impacted by energy efficiency and renewable energy measures. In contrast, in the document *Using eGRID for Environmental Footprinting of Electricity Purchases* (https://www.epa.gov/sites/default/files/2020-08/documents/egrid_footprinting.pdf), EPA recommends using eGRID output emission rates for emissions inventory or footprint analysis of measures that increase electrical load. Non-baseload emission rates are higher than overall grid output emission rates.

NDEE's GHG reduction measures that use future projections of emission rates to project emissions reductions are:

Energy Efficiency (non-baseload emissions rates)
Measure 1: Promote Energy Efficiency and Electrification Upgrades for Non-Residential Facilities
Measure 2: Residential Pre-Weatherization Program

Renewable Energy (non-baseload emissions rates)
Measure 4: Incentives for Micro-Solar Arrays for Critical Infrastructure in Low-Income Rural Communities
Measure 5: Funding for Solar Projects on Unused/Contaminated Land, Agricultural (Barns/Confinement/etc.) & Industrial Facility Rooftops etc., and Parking Lot/Feedlot Solar Canopies

Electrification (baseload emissions rates)
Measure 3: Incentives for Irrigation Well Conversion from Diesel to Electric

The projected emissions rates that NDEE elected to use were selected from the National Renewable Energy Laboratory (NREL) Standard Scenarios 2023 (https://www.nrel.gov/analysis/standard-

scenarios.html). NREL's Standard Scenarios are a suite of forward-looking scenarios of the U.S. power sector that are updated annually to support and inform energy analysis. The scenarios have been designed to capture a range of possible power system futures and consider a variety of factors from high vehicle electrification to major cost declines for electricity generation technologies. These scenarios provide data on generation, emissions, and emissions rates for the nation and for individual states for two-year intervals from 2024 to 2050. Emissions and emission rates are provided for CO_2e, CO_2, CH_4, N_2O, SO_2, and NOx. These rates represent baseload emission rates.

NDEE downloaded scenario data from the NREL Scenario Viewer (https://scenarioviewer.nrel.gov) and selected two scenarios to use to calculate GHG and co-pollutant emission reductions: **Mid Case with 95% Decarbonization by 2050**, and **High Natural Gas Price with 95% decarbonization by 2050**. The 95% Decarbonation by 2050 constraint accords with the Net Zero Carbon goals set by the largest electrical utilities in Nebraska. The Mid Case scenario has median values for core inputs such as technology costs and fuel prices, end-use electricity demand growth averaging 1.8% per year, and state and federal electricity sector policies as they existed in September 2023. The High Natural Gas Price scenario incorporates a slower reduction in fossil fuel generation and GHG emission rates than the Mid Case scenario. Together, these two scenarios encompass most of the range in decline of emission rates through 2050 exhibited by the entire suite of 17 NREL scenarios.

The NREL scenario data are aggregated for the United States as a whole and for individual states. Nebraska is part of the eGRID MROW region, and Nebraska electrical utilities belong to the Southwest Power Pool (SPP). To approximate the region that potentially supplies electricity to Nebraska, NDEE considered the five states included in the eGRID MROW region (Nebraska, Iowa, Minnesota, North Dakota, and South Dakota) along with the adjacent states Kansas and Missouri. Kansas and parts of western Missouri are in the SPP. For each of the two selected NREL scenarios, NDEE summed the annual electrical generation data and the projected emissions to calculate aggregate emission rates for the seven-state region for each of the future years in the dataset. The summation calculations are shown on the following **Mid Case 95by2050** and **High NG 95by2050** sheets in the GHGcalcs_NebraskaDEE.xlsx workbook. Because the NREL scenarios provide data only for even-numbered years, NDEE then interpolated emission rate values for the odd-numbered years by averaging the rates for the preceding and following years. These baseload rates were used to project emissions reductions for Measure 3: Irrigation Well Conversion from Diesel to Electric, with the mean emissions reduction value from the two scenarios used as the final value for each pollutant.

The NREL scenarios do not provide data on non-baseload electrical generation and emissions or non-baseload emissions rates. To estimate non-baseload emission rates for the seven-state model region, NDEE compared eGRID output emission rates to non-baseload emission rates for the MROW region. CO_2e and NOx non-baseload emission rates for the MROW region for 2020 through 2022 are about 1.9 times the output emissions rates, while the factor for SO_2 is about 1.8. To estimate non-baseload emissions rates for 2025, NDEE multiplied the output emission rate for each pollutant by the appropriate non-baseload adjustment factor. NDEE further assumed that in the future these non-baseload adjustment factor would decrease to 1.1 by 2050 due to grid decarbonization. Adjustment factors were assumed to decrease linearly from 2025 through 2050. The estimated aggregate GHG baseload and non-baseload emission rates for both scenarios are shown on the **CO2e Rates** sheet along with a chart graphing their declines through 2050. Rates for the individual GHGs are listed on the **GHGs Rates** sheet. Rates for SO_2 and NOx are shown on the **CoPol** Rates sheet. The mean emissions reduction value from the two scenarios was used as the final value for each pollutant.

Measure 1: Promote Energy Efficiency and Electrification Upgrades for Non-Residential Facilities

Measure Concept
Provide incentives for energy efficiency, electrification, and weatherization upgrades for industrial, commercial, agricultural, public, and nonprofit buildings and facilities.

Description and Background
Addressing energy use in non-residential buildings, and especially in industrial facilities, is one of the highest impact measures that can be implemented to reduce greenhouse gas emissions. Nonresidential buildings and facilities present considerable opportunities for saving energy and reducing greenhouse gas emissions, as all such facilities require heating, cooling, and lighting. In addition, the over 1,600 manufacturing facilities in Nebraska also utilize energy for process heating and machine drive (motors). A recent energy savings analysis of small- and medium-sized industrial facilities in the United States concluded that motors, electrical demand management, and process heat recovery provide the largest opportunity for energy savings. This measure would provide incentives for energy efficiency, electrification, and weatherization upgrades for industrial, commercial, agricultural, public, and nonprofit buildings and facilities. Grant funds would cover 50% of the project costs.

This measure is limited to nonresidential facilities in order to fund larger, more cost-effective projects. In addition, funding will be available for residential projects in Nebraska through U.S. Department of Energy grants beginning as soon as 2025.

Nebraska's public electric utilities offer financial incentives to commercial and industrial customers to undertake energy efficiency upgrades to reduce electricity consumption and save on annual energy costs. Simpler upgrades, such as switching lighting to LED technology, are prequalified, whereas larger projects for industrial facilities require an energy audit to identify the cost-effectiveness of different upgrades. Commercial companies and the Nebraska Industrial Assessment Center (NIAC) at the University of Nebraska Lincoln provide energy audits for small to mid-sized industrial facilities. However, existing utility incentives are not sufficient to spur all facility owners to proceed with the identified upgrades. Funds from this grant can be combined with the existing utility incentives to increase the overall incentive funding, which should increase the rate of adoption of the identified upgrades.

Energy assessments by NIAC have also identified many efficiency upgrades that would reduce natural gas use at industrial facilities. Currently there is little funding available to assist facilities in implementing these upgrades. This measure would provide funding for those upgrades.

The greenhouse gas emissions reductions forecasted from the use of these grant funds will be in addition to those already achieved by existing utility energy efficiency programs.

Administration
This measure will use CPRG implementation funding to expand the reach of the electrical energy efficiency programs already operated by Nebraska public utilities as well as to implement a new program of incentives to reduce natural gas use.

Electrical Energy Efficiency Projects

Nebraska is a 100 percent public power state; all electric consumers receive power from public nonprofit entities, including public power districts, electric cooperatives, municipal electric systems, joint action agencies, or a combination of the above. The Nebraska Public Power District (NPPD) provides wholesale electricity to many smaller rural public power districts, cooperatives, and communities across most of the state. The Municipal Energy Agency of Nebraska (MEAN) similarly provides wholesale electricity to smaller municipalities across Nebraska. NPPD and MEAN collaborate with their wholesale customers in the development of energy efficiency and other incentive programs. The Omaha Public Power District serves a 13-county area in southeastern Nebraska, while the Lincoln Electric System is the municipal utility for the City of Lincoln. Both entities also administer energy efficiency and other incentive programs in their service areas. The energy efficiency incentive programs operated by Nebraska public electric utilities are funded directly by the utilities and their ratepayers.

Funds will be subawarded to the Nebraska Public Power District, Municipal Energy Agency of Nebraska, Omaha Public Power District, Lincoln Electric System, and other eligible electric cooperative power suppliers/entities to expand their current electrical energy efficiency and electrification programs. The allocation of funds to the different utilities will be determined based on their differing levels of non-residential electricity demand; that information has been requested from the prospective subawardees. Subawardees will use these funds to increase the number of projects funded through their energy efficiency incentive programs. Subawardees will continue to fund projects through internal funding sources as well as additional projects using these grant funds. Facilities interested in funding for energy efficiency measures will apply directly to the utility that provides their electrical service.

Total project costs for electrical efficiency upgrades vary widely depending on the type and size of the facility and the nature of the upgrades proposed. Typical utility incentives (partial funding) for the projects listed below have ranged from $1,000 to $15,000 in recent years. Funds from this grant will allow utilities to increase the number of projects funded. Utility and CPRG grant funds may also be "stacked" to provide an overall 50% reimbursement for high-impact projects to increase participation. The utilities will separately track use of utility and CPRG grant funds in such projects. The project facility owners will be responsible for covering all other project costs.

Natural Gas Energy Efficiency Projects

NDEE will create and administer a program to provide incentives for energy efficiency actions that reduce natural gas consumption in non-residential facilities. These projects could include installing or upgrading a boiler economizer or replacing an old, inefficient boiler. Interested facilities will apply directly to NDEE for funding. Based on data provided by the Nebraska Industrial Assessment Center, NDEE estimates total costs for these projects to range from $40,000 to $500,000. NDEE will provide 50% reimbursement for the projects selected. The project facility owners will be responsible for covering all other project costs.

Equipment Replacement

For projects that involve replacement of equipment, the equipment being replaced must be disabled and not reused or sold in working condition. Recipients of incentives for such projects will be required to submit photographic evidence that the equipment has been physically rendered inoperable. Different scrappage procedures may be required depending on the nature of the equipment. NDEE will determine

appropriate scrappage procedures for each such project based on the type of equipment being replaced.

Eligibility

Minimum eligibility requirements are as follows:

- Energy efficiency, electrification, and weatherization upgrades for non-residential facilities such as industrial, commercial, agricultural, public, and nonprofit buildings and facilities are eligible.
- Projects must be located in Nebraska.
- The applicant must be in compliance with all Nebraska environmental laws and with the Department's regulations and permits at all Nebraska locations.
- For natural gas energy efficiency projects, the project assessment must demonstrate a simple payback period greater than two years absent funding through this grant.

Additional eligibility requirements will be dependent upon the specific program and will vary among subawardees.

Project Requirements

All projects must be in Nebraska and must demonstrate a reduction in electricity or natural gas consumption. Projects should be cost effective and maximize GHG reductions. Additional project requirements will be dependent upon the specific program. The subawardees must clearly specify all project requirements in their program materials.

Some Nebraska electric utility incentive programs designate certain simpler efficiency upgrades, such as replacing fluorescent lighting with LED lighting, as prequalified for reimbursement. Larger and custom upgrades will require assessment by a Certified Energy Manager. Some utilities require upgrade work to be performed by a Trade Ally, a company that has completed utility training, is familiar with program requirements, and is bound to follow best practices.

For natural gas energy efficiency projects, NDEE will require an energy efficiency assessment of the facility to identify the upgrades that are most cost-effective and created the greatest GHG emission reductions. The assessment must be performed by the Nebraska Industrial Assessment Center or by a Certified Energy Manager and Professional Engineer licensed by the State of Nebraska.

Application

NDEE and the subawardees must require the following information on the application form:

- Location of the project: Address, City, Zip code
- Type(s) of upgrades and the costs
- Simple payback period
- Estimate of the annual GHG reductions to be achieved
- Cost-effectiveness of each upgrade in terms of energy use reduction and GHG reduction
- Quotes for all equipment and installation expenses
- Three sets of dated quotes if the total project costs exceed $250,000

Additional application requirements will be dependent upon the specific programs. The subrecipient must develop general guidelines, application procedures, forms, and payment procedures prior to commencement of projects.

Applicant Selection

All applications that meet the eligibility requirements and provide the required information will be considered for a rebate. Applications may be accepted on a rolling basis or within set program timelines. The subrecipient will have the discretion to develop their selection process for their electrical efficiency incentive programs. Utility staff will screen applications to determine if the project will result in reasonable demand and annual energy reduction. Preference should be given to first time recipients vs repeat awards. The subrecipient must clearly specify the selection process in their program materials.

NDEE will select natural gas energy efficiency projects for funding that maximize GHG reduction and cost-effectiveness. Project assessments must show a simple payback period greater than two years. Preference will also be given to projects within low-income and disadvantaged areas.

Reimbursement

Upon satisfactory completion of the project, the subawardee will submit a signed reimbursement request to NDEE. Reimbursements requests are to be submitted no more frequently than monthly, but not more than quarterly. NDEE will reimburse the up to 50% of the project costs directly to the subawardee. The subawardee will provide the rebate directly to the recipient. A request for reimbursement for each project must be made using the form provided by NDEE and must include:

- Project type
- Project location
- Date project was completed
- Copies of invoices for all equipment and work
- MMBTU or MWh Reduced
- Summary of any post-completion inspection
- Electric cost savings, if applicable
- Natural Gas cost savings, if applicable
- Total project cost
- Requested reimbursement amount

Additional reporting measures may be required upon program development and will be incorporated into the subaward agreement.

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 (types of programs/projects) 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.

Program Timeline and Targets

Project Timelines

NDEE proposes to fund an array of cost-effective energy efficiency and electrification upgrades from a portfolio of measures provided by Nebraska electric utilities and the Nebraska Industrial Assessment Center. The tables below list sample actions to reduce electricity and natural gas use and the number of incentive projects for each that could be implemented annually from 2025 through 2029.

Annual Electricity Reductions for sample actions implemented each year 2025-2029.			
Data from Nebraska Public Power District, Lincoln Electric System, and University of Nebraska Industrial Assessment Center			
Action	**Annual Electricity Reduction per Unit (kWh)**	**Annual Number of Incentives**	**Annual Electricity Reduction (MWh)**
Energy Management System	22,481	100	2,248.1
Variable Frequency Drive (VFD)	65,191	25	1,629.8
VFD Air Compressor	47,694	10	476.9
Air Compressor Optimization	240,000	10	2,400.0
Prescriptive Industrial / Agricultural Lighting	21,929	100	2,192.9
Corner Pivot VFD	51,529	50	2,576.4
Hog Heat Mat	144,900	20	2,898.0
Automate pressure control in refrigeration	674,431	20	13,488.6
Upgrade HVAC Unit	381,677	10	3,816.8
Install Economizers of Rooftop Air Handlers	210,762	10	2,107.6
ANNUAL TOTAL			**33,835.1**

Annual Energy Savings for Natural Gas Energy Efficiency Measures each year 2025-2029			
Data from Nebraska Industrial Assessment Center at the University of Nebraska College of Engineering			
Action	**Annual Energy Savings Per Unit (therms)**	**Annual Number of Units**	**Total Annual Energy Savings (therms)**
Upgrade Boiler Economizer	261,000	5	1,305,000
Boiler Replacement w/ more Efficient	188,180	5	940,900
Replace Boiler with Water Heater	840,000	5	4,200,000
Install Economizer for Heat Recovery	153,980	5	769,900
ANNUAL TOTAL			

Administrative Timeline

Federal Fiscal Year	Milestones	Tasks
2025	Nov-Dec. 2024	EPA Funding received in October 2024. Subawards to participating electrical utilities. NDEE will follow EPA subaward policies and will educate recipients by providing training and guidance on the terms of the agreement.
	Jan-Mar 2025	Develop general guidelines, application procedures, forms, and payment procedures. Evaluation and development of QAPP if needed.
	April-Oct 2025	Open applications on a rolling basis or within set program timelines. Submission of semiannual report and LIDAC report to EPA.
2026		Select and fund additional projects. Subaward recipients submit semi-annual reports to NDEE. NDEE submission of semiannual reports to EPA.
2027		Select and fund additional projects. Subaward recipients submit semi-annual reports to NDEE. NDEE submission of semiannual reports to EPA.
2028		Select and fund additional projects. Subaward recipients submit semi-annual reports to NDEE. NDEE submission of semiannual reports to EPA.
2029		Select and fund additional projects. Subaward recipients submit semi-annual reports to NDEE. NDEE submission of semiannual reports to EPA.
2030	January 2030	Submission of final report to EPA.

Expected Outputs and Outcomes

Outputs / Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
# and type of Industrial Equipment Electrified	Reduction in metric tons CO2e, including those in LIDAC
# and type of Industrial Equipment Optimized	Electric $ Savings, including those in LIDAC
# and type of Buildings/Facilities Optimized	Natural Gas $ Savings including those in LIDAC
MMBTU or MWh Reduced for each type/total	$ Funding distributed to facilities in LIDAC
Semi-annual progress reports and final report	Semi-annual progress reports and final report

Greenhouse Gas Emissions Reductions

This measure includes potential energy efficiency actions that will reduce electricity consumption and consumption of natural gas. For both energy types, the energy savings from a suite of example actions were used with appropriate emission factors to calculate cumulative emissions reductions by 2030 and 2050. The calculations for this measure are detailed in the M1-Energy Efficiency sheet in that file.

NDEE calculated emission reductions directly from the estimated energy savings to be achieved through the example sets of actions. Data on energy savings were derived from past energy efficiency projects and provided by the Nebraska Public Power District, Lincoln Electric System, and the University of Nebraska Industrial Assessment Center. Assumptions regarding emission factors are covered below.

Methodology

The following key assumptions about measure implementation were used to quantify emissions reductions for this measure:

- A sample set of actions reducing electricity and natural gas consumption would be implemented annually from 2025 through 2029.
- Project costs would vary depending on the type and scale of the energy efficiency action.
- Grant funds would cover 50% of the cost of each energy efficiency project.
- For projects reducing natural gas consumption, the emission factor for CO_2 was drawn from the EPA Greenhouse Gas Emission Factor Hub (https://www.epa.gov/climateleadership/ghg-emission-factors-hub), and the emission factors for CH4 and N2O were drawn from the IPCC Emission Factor Database (https://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php) using factors for Manufacturing Industries and Construction.
- For projects reducing electricity consumption, emission rates were assumed to decline through time due to grid decarbonization. Emission reductions were computed using emission rates estimated from two National Renewable Energy Lab (NREL) 2023 Standard Scenarios. Details are provided on the *Elec Grid Methodology* sheet in the GHGcalcs.xlsx spreadsheet.

Emissions reductions were calculated from the estimated energy savings. Emission reductions for actions reducing natural gas consumption were calculated assuming no future change in the proportion of fossil-fuel and renewable natural gas in the supply chain. Emission reductions for actions reducing electricity consumption assumed declining GHG emissions due to grid decarbonization. Details are provided on the *Elec Grid Methodology* sheet in the GHGcalcs.xlsx spreadsheet.

NDEE considers the emissions reductions listed below as annual targets to be achieved through a mix of different types of energy efficiency projects. NDEE will track the emissions reductions achieved as part of semiannual reporting to EPA and compare them to these targets to gauge progress and adjust programs if necessary.

Cumulative Avoided Emissions for All Energy Efficiency Projects 2025-2029						
	GHG Emissions Reductions (MT CO_2e)	CO_2 Emissions Reductions (MT)	CH_4 Emissions Reductions (MT CO_2e)	N_2O Emissions Reductions (MT CO_2e)	NOx Emissions Reductions (MT)	SO_2 Emissions Reductions (MT)
2025	67,231	65,0767	1,904	132	51	27
2026	192,086	186,319	5,092	359	147	74
2027	364,025	353,871	8,966	638	280	130
2028	573,476	558,804	12,957	929	444	186
2029	827,100	807,357	17,435	1,261	643	249
2030	1,072,785	1,048,529	21,419	1,563	836	303
2050	5,867,089	5,271,294	60,196	5,124	4,289	742.5
Cumulative Avoided Emissions for 50% Grant Funding						
2030	536,393	524,264	10,710	782	418	152
2050	2,933,544	2,635,647	30,098	2,562	2,114	371

Longevity of GHG Reductions

The non-residential energy efficiency upgrades undertaken through this measure will reduce energy costs for facility owners and assist them in maintaining their economic viability. Upgrades are expected to be installed in commercial, industrial, and municipal buildings that have long life spans, making it more likely that these efficiency improvements will remain in place through the entire 2025-2050 time frame. Targeting natural gas projects with simple payback periods greater than 2-years will help ensure facility owners are planning for long term operation.

LIDAC Benefits

Many industrial and commercial facilities are located in low-income and disadvantaged communities. Energy efficiency upgrades in such facilities may reduce not only greenhouse gas emissions, but emissions of other air pollutants. In evaluating applications for natural gas energy efficiency upgrades, NDEE will give preference to projects located in LIDAC areas, which include both urban and rural areas of Nebraska. NDEE will also track the locations of electrical energy efficiency projects to assess their impact on LIDAC communities.

The Nebraska Industrial Assessment Center provided NDEE with an Environmental Justice (EJ) analysis of small and medium-sized industrial facilities that received energy efficiency assessments from 2017 through 2022. EJ census tracts were identified using the EPA Environmental Justice Facility Mapping Tool (https://awsedap.epa.gov/public/extensions/P2_EJ/P2_EJ.html). Of the 129 facilities that received assistance, 47% were within EJ census tracts and 55% were adjacent to an EJ census tract. Based on this analysis, NDEE expects that between 40 to 50% of facilities receiving energy efficiency incentives through this grant will be within LIDAC areas.

Cost-Effectiveness

NDEE has budgeted $30,302,420 for Measure 1 to achieve a cumulative total of 536,393 metric tons of greenhouse gas reductions by 2030. The resulting cost-effectiveness for this measure is therefore $56.49 per metric ton CO_2e reduced, making it one of the most cost-effective measures in NDEE's CPRG program.

Budget

Category	Budget	Narrative
Personnel	$256,140	Estimated at 0.85 per year. Includes portions of salary of NDEE full-time staff to perform tasks such as grant management, program design and implementation, program oversite, engineering review. Salaries for NDEE Project Manager (50% time, $52,000 annual salary; NDEE Environmental Supervisor (15% time, $74,000 annual salary); Professional Engineer (15% time; $72,520 annual salary); and Federal Aid Administrator III (5% time, $65,000 annual salary).
Fringe Benefits	$81,324	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	$1,965	Includes costs for mileage, vehicle rental, meals, and lodging necessary to implement the program and to oversee projects. Costs are estimated for 600 miles per year at $0.655/mi) of travel to conduct sub-recipient monitoring of activities and project site visits.
Equipment	$0	There is no anticipated additional equipment needed to implement these activities.
Supplies	$0	Includes usual office materials necessary to implement tasks. Office supplies are considered part of this category also and include things such as furniture, staff desk supplies and computers. There are no anticipated additional supplies needed to implement these activities.
Contractual	$25,000	Contractual work for a grant management system via subscription service to develop an electronic application database for application 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	$29,834,894	Includes subawards to the Nebraska public electric utilities to expand commercial, industrial, and agricultural electrical energy efficiency programs across the State of Nebraska. Projects to upgrade natural gas equipment would be administered by NDEE or through agreements with natural gas utilities in the state. Potential subawards could include Nebraska Public Power District, Omaha Public Power District, Lincoln Electric System, the Municipal Energy Agency of Nebraska, and other eligible electric public power districts. Subrecipients would allocate the

		majority of their funding towards participate support costs Assumes cost share of 50%, partial funding of total project costs. NDEE anticipates that a small percentage of each subrecipients allocation will be used for administrative purposes (personnel and indirect), with the remaining going towards program support costs via rebates for eligible projects.
Total Direct Charges	$30,199,323	
Indirect Charges	$103,096	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$30,302,420	

Additional Budget Narrative Description: Other

As described in the Administrative section of this workplan**,** funds will be subawarded to the Nebraska Public Power District, Municipal Energy Agency of Nebraska, Omaha Public Power District, Lincoln Electric System, and other eligible electric cooperative power suppliers/entities to expand their current electrical energy efficiency and electrification programs. The allocation of funds to the different utilities will be determined based on their differing levels of non-residential electricity demand; that information has been requested from the prospective subawardees. NDEE anticipates that a small percentage of each subrecipients allocation will be used for administrative purposes (personnel and indirect), with the remaining going towards program support costs via rebates for eligible projects.

Facilities interested in funding will apply directly to the utility that provides their electrical service. Specific projects are to be Determined. Total project costs for electrical efficiency upgrades vary widely depending on the type and size of the facility and the nature of the upgrades funded. Typical utility incentives (partial funding) for the projects have ranged from $1,000 to $15,000 in recent years. Utility and CPRG grant funds may also be "stacked" to provide an overall 50% reimbursement for high-impact projects to increase participation. The project facility owners will be responsible for covering all other project costs.

Measure 2: Residential Pre-Weatherization Program

Measure Concept

Provide funding for a Pre-Weatherization Program for low-income residents to cover 100% of the pre-weatherization costs. This program would be an expansion of Nebraska's Weatherization Assistance Program (NeWAP) to address critical home repairs in low-income homes that would cause a home to be deferred from the Weatherization Assistance Program (WAP). The Program will result in enhanced energy efficiency, greenhouse gas reduction, lower utility bills, and improved health for low-income residents.

Description and Background

Energy expenses constitute an economic drain on low-income households. Energy bills for low-income households commonly account for more than 20 percent of a family's gross income. Nebraska's Weatherization Assistance Program (WAP) is an energy efficiency program that helps low-income households reduce their home's energy use, helping them manage the increasingly high cost of energy

while protecting their health and safety. This program fully funds upgrades such as adding insulation, sealing air leaks, performing efficiency inspections, and completing tune-ups and replacement of furnaces, boilers, and water heaters. The Nebraska Department of Environment and Energy administers this program using funding from the U.S. Department of Energy (DOE) and the U.S. Department of Health and Human Services. Weatherization services are offered at no cost to eligible households.

Since the inception of the NeWAP, it has evolved from simple air-leak sealing to a program that utilizes highly-trained workers using advanced diagnostic and evaluation tools. Locally-based, professionally-trained weatherization crews and contractors use advanced diagnostic equipment, such as blower doors, monometers, and infrared cameras, to provide data for comprehensive energy assessments of the home. Each home's audit creates a customized work order that guides trained crews in the installation of the specified energy efficiency upgrades along with health and safety measures. A certified Quality Control Inspector ensures all work is completed appropriately.

The first priority of the weatherization program is homeowner health and safety. NeWAP utilizes construction standards from regulatory bodies such as the Occupational Safety and Health Administration (OSHA), the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the Building Performance Institute (BPI). Weatherization standards require checking the house for high levels of harmful gases such as carbon monoxide, running diagnostics to measure the building's leakage and mechanical system airflows, and by helping to prevent or treat problems with mold or radon gas.

However, homes that have significant health and safety issues must be "deferred" from the weatherization program pending rectification of these issues. Examples of issues that trigger deferral are outdated electrical wiring, roof leaks, deteriorating foundations, moisture and mold, mechanical malfunctions, and the presence of asbestos or vermiculite.

Although a small portion of federal weatherization funding is set aside to deal with these pre-weatherization issues, that funding is not adequate to meet the need. Nationally, community action agencies that administer weatherization funds report deferral rates of 15 to 60% of otherwise eligible homes. Many low-income homeowners cannot afford the cost of these pre-weatherization upgrades, so their homes remain ineligible for weatherization.

This measure would provide financial incentives through a Pre-Weatherization Program to address these critical home repairs for low-income residents to remove the deferred status and allow eligibility for the Weatherization Assistance Program. The program will fund 100% of pre-weatherization project costs for selected projects. The program will be available to low-income residents across the state who are eligible for the Weatherization Assistance Program. NDEE will track the locations of projects by address and Zip code to determine the proportion that occur within designated low-income disadvantage communities.

This pre-weatherization program is estimated to allow an additional 75 homes per year to become eligible for weatherization assistance services through NDEE. The weatherization program includes both home energy and health and safety audits. Correcting deficiencies revealed by these audits will result in energy efficiency, lower utility bills, and improved health for low-income residents in addition to overall reduction in greenhouse gas emissions.

Administration

NDEE will manage this pre-weatherization program as an adjunct to the current weatherization program. However, funds from this grant will be used only for pre-weatherization services and not for standard weatherization activities.

Pre-weatherization services will be available to weatherization program applicants who have been deferred due to the health and/or safety issues detailed above. The pre-weatherization services and funds will be directly administered by Nebraska subgrantees that receive federal weatherization funds. These subgrantees are currently responsible for establishing eligibility for weatherization, performing an energy audit on the residence, and scheduling the weatherization work. Under separate subaward agreements with NDEE, they will also be responsible for determining pre-weatherization needs, scheduling the pre-weatherization upgrades, and reimbursing pre-weatherization contractors.

Subgrantees

NDEE, as a federal weatherization program grantee, is mandated to ensure that each subgrantee is a Community Action Agency or other public or nonprofit entity. If additional subgrantees are deemed necessary, interested organizations will be solicited through a competitive Request for Proposals (RFP) issued by the Department. Subgrantees are required to abide by the Nebraska Department of Environment and Energy Financial Assistance Subaward agreement, the latest *Retrofitting Nebraska Field Guide and Installation Standards*, and the *NeWAP Policies and Procedures Manual* in administering the program.

The existing Nebraska weatherization subgrantee network consists of eight organizations, each of which covers a different geographic area:

- Blue Valley Community Action Partnership
- Central Nebraska Community Action Partnership
- Community Action Partnership of Lancaster and Saunders Counties
- Community Action Partnership of Mid-Nebraska
- Northeast Nebraska Community Action Partnership
- Northwest Nebraska Community Action Partnership
- Southeast Nebraska Community Action Partnership
- United Way of the Midlands (Douglas County)

Pre-weatherization funds under this grant will be allocated to the subgrantees using the same formula that the NDEE Weatherization Program uses for DOE weatherization funds. This formula is based on census data from each subgrantee's geographic area, including total population, number of elderly, and proportion of the population in poverty.

Subgrantee Program Management: All subgrantees are required to administer and manage their programs to ensure that weatherization work is completed for all properties accurately and in a timely fashion, and that all funding allocations are spent within the designated program year. Subgrantees are required to maintain staffing sufficient to meet all production and client service goals. Subgrantees will be responsible for determining if costs for pre-weatherization upgrades are reasonable before authorizing pre-weatherization work.

Subgrantees provide oversight of all work while it is in progress. Oversight can include review of information provided by auditors to ensure accuracy, completeness, sufficient detail is provided in all work orders, timeliness of scheduling and conducting assigned audits, and customer service and satisfaction. Subgrantees are encouraged to have staff, as possible, to perform unannounced visits to job sites where work is in process. This allows the Subgrantee to determine that contractors and staff or crews are completing work appropriately, and to also verify compliance with OSHA, RRP, LSW and employee compliance with program requirements.

For pre-weatherization work, each subgrantee will be required to perform a Final Inspection on the work performed with this grant funding to ensure that the completed work is satisfactory, allows for the completion of weatherization work, and meets state, local, and agency code and contractual requirements. Documentation is required to be kept in each client file as evidence that a final inspection has been performed.

NDEE monitors will also complete inspections on a minimum of 10% of pre-weatherization units after submission of subgrantee inspection reports as part of the onsite in-progress and Quality Control Inspection program.

Historic Preservation: Structures will be assessed for compliance with the State Historic Preservation Office (SHPO) Programmatic Agreement. Weatherization and pre-weatherization services or select measures may not be eligible on certain homes as identified by a Section 106 review.
On November 6, 2020, the NDEE extended the Programmatic Agreement (PA) with the Nebraska State Historical Preservation Office (NSHPO) and the USDOE until December 31, 2030. Properties funded under the WAP are considered "undertakings" subject to review under Section 106 of the National Historic Preservation Act, 16 U.S.C. 470f (NHPA) and its implementing regulations at 36 CFR 800, and include rehabilitation, energy efficiency, retrofits, renewables, and weatherization (undertakings). Subgrantees and their contractors shall avoid taking any action that results in an adverse effect to historic properties pending compliance with Section 106.

Subgrantee Procurement and Contracting: Subgrantees are required to comply with federal standards, as set forth in 2 CFR 200.317-327, in the purchase of supplies, equipment, and services. All subgrantees must establish written procurement procedures to govern local procurement and contracting activities.

Subgrantees must follow detailed guidelines on procurement and contracting provided in the *NeWAP Policies and Procedures Manual*.

Subgrantee Case Tracking and Reporting: Subgrantee staff have internet access to the NeWAP database. All approved applications are entered into this database by the subgrantee, and case information is updated as each project progresses. The database provides data for case management by the subgrantee and by NDEE, and it serves as the data source for federal reports on the NeWAP. Each pre-weatherization project will be reported to the NeWAP database when completed. Reporting will include client demographics, income, required pre-weatherization forms, and a breakdown of measure costs. Reporting successful completion of pre-weatherization will remove the project from Deferral status and enter it into the queue for weatherization. Subgrantees will ensure that projects that successfully complete pre-weatherization projects are moved to weatherization actions in a timely fashion.

Subgrantees will continue to work with NDEE to develop a Deferral Tracking System as part of the NeWAP database. This system will provide consistent tracking across the NeWAP program and be used in the development of an Avoided Deferrals Summary as part of the annual reporting system.

Subgrantee Financial Management: NDEE enters into a Financial Assistance Agreement with each subgrantee for each different weatherization funding source. NDEE will develop a Financial Assistance Agreement for each subgrantee for pre-weatherization work under this grant. Subgrantees will be responsible for using grant funds to pay contractors at the completion pre-weatherization upgrades and a successful final inspection. Subgrantees can request a cash advance of up to 10% of the annual subaward at the beginning of the agreement to begin making these payments. After the initial cash advance, subgrantees will be reimbursed by NDEE through submission of monthly fiscal reports.

Greenhouse gas reductions benefits under this grant are dependent on pre-weatherization clients also completing full weatherization projects. Subgrantees will work to ensure that each pre-weatherization project funded by this grant is successfully moved to completion of weatherization upgrades in order to achieve the energy efficiency and greenhouse gas reduction goals. Subgrantees may pursue legal action if pre-weatherization clients violate their agreement with the subgrantee by refusing to consent to completion of weatherization upgrades after having pre-weatherization work completed. If for any reason the weatherization phase is not completed, the subgrantee will move pre-weatherization project costs to Department of Energy pre-weatherization funding. Greenhouse gas reductions reported by NDEE under this grant will be based only on pre-weatherization projects that have completed weatherization.

Application

Potential clients apply for the Weatherization Assistance Program directly to the Subgrantee Service Provider that serves their location. Each subgrantee has a written procedure in place to process applications and ensure eligibility, including these key steps:

- Enter the client into the NDEE weatherization database.
- Ensure application completion.
- Ensure client income eligibility.
- Confirm building/structure eligibility.
- Notify applicant of receipt and status.

Applicants are required to provide the residence address as well as information needed to assess building and income eligibility. NDEE and the subgrantees are required to protect the privacy interests of individuals who participate in these assistance programs, per CFR 200.338. Personally identifying client information is kept confidential and not made available to the public.

Eligible Housing Types

Eligible housing types for weatherization include owner-occupied and renter-occupied single-family homes, manufactured (mobile) homes, and multifamily buildings. However, only owner-occupied units are eligible for pre-weatherization.

Income Eligibility

A dwelling unit is eligible for weatherization assistance if it is occupied by an income-eligible family unit and the structure is eligible. Eligibility is limited to households with incomes at or below 200 percent of

the federal poverty level. Eligibility income levels rise based on the number of persons living in the home. Households receiving Aid to Dependent Children, Supplemental Security Income, or LIHEAP Utility Assistance from the Nebraska Department of Health and Human Services are automatically eligible for weatherization. Preference is also given to persons over age 60, persons with disabilities, and families with children under age six.

The applicant must provide evidence or income documentation satisfactory to the outreach worker that the household meets the eligibility requirements. Applicant income must be verified or calculated for the one-year period prior to the certification month. Income documentation for a minimum of three months must be provided. Applications on file for one year or more must be recertified for the year prior to the pre-inspection. The income of all household members, regardless of eligibility, must be documented, verified, and included in the calculation of the benefit amount.

Building/Structure Eligibility and Deferral

A pre-audit Health & Safety Inspection is conducted by and Energy Auditor at each dwelling unit prior to completing an Energy Audit. The purpose of this inspection is to identify any actions that need to be taken to maintain the physical well-being of the occupants, to allow weatherization workers to effectively perform weatherization work, and to assess if any health and safety actions will become necessary as a result of weatherization work.

Weatherization program funds may be used to remediate a limited number of health and safety issues identified by the inspection:

- Problems posing an immediate threat to the occupants and/or weatherization personnel
- Problems resulting from or exacerbated by the weatherization work
- Problems with heating/cooling/ventilation equipment or water heaters.

Identified health and safety issues beyond the approved scope of the weatherization program result in the deferral of the dwelling unit. Eligible dwelling units deferred from the weatherization program will be eligible for pre-weatherization services under this grant.

Project Tracking

The NeWAP database system is currently used by subawardees and NDEE to monitor and track weatherization projects. The NeWAP database system will also be used to monitor and track the pre-weatherization projects, which will be included in an annual Avoided Deferrals Summary report. The summary will include the number of dwelling units made weatherization ready with these funds and for each building or unit the following information will be provided:

- Year of construction,
- Housing Type (site-built single family, manufactured housing),
- Nature of repairs needed which prohibit weatherization (where applicable, identify multiple repairs or remediation reasons for a single building). Including but not limited to:
    - Roof repair/replacement
    - Wall repair (interior or exterior)
    - Ceiling repair
    - Floor repair
    - Foundation or subspace repair
    - Exterior drainage repairs (e.g., landscaping or gutters)

- Plumbing repairs
- Electrical repair
- Removal of asbestos and vermiculite
- DOE WRF or EPA expenditure per unit and building; and,
- Leveraged fund expenditure per unit and building (i.e., funds such as LIHEAP, HUD, nonfederal, etc. braided with DOE WRF or EPA funds to make building weatherization ready)

Program Timeline and Targets

NDEE expects to undertake pre-weatherization of 75 homes annually from FFY 2025 through 2029, making them eligible for weatherization upgrades. In previous years the eight subawardees have had sufficient numbers of potential clients on waiting list to participate in weatherization and sufficient numbers of clients in deferred status to justify that annual target.

Tasks and Milestones		
Task Description	**Anticipated Milestone Dates**	**Assumptions**
EPA to make awards	October 2024	
NDEE subawards to existing Weatherization Network	October 2024	NDEE will distribute the Pre-Weatherization funds among the state's existing subgrantees utilizing the formula allocation for the Annual Weatherization Funding, which is a weighted average based on population. Evaluation and development of QAPP if needed.
Recipients carry out projects and submit requests for reimbursement with documentation of activities and expenses.	December 2024 -October 2029	Reimbursements issued by NDEE after proper documentation received. NDEE will conduct onsite monitoring on a percentage of the projects.
Semi-Annual Reports	Semi-Annual 2025-2029	NDEE submit to EPA
LIDAC report	October 2025	NDEE submit to EPA
Final Report	January 2030	NDEE submit to EPA

Expected Outputs and Outcomes

Outputs/ Performance Measures	**Outcomes / Projected Environmental or Programmatic Improvement**
# of homes pre-weatherized Energy savings (MMBTU or MWh) per project # of new jobs created Semi-annual progress reports and final report	Energy Savings for LIDAC individuals Electric cost savings for LIDAC individuals Natural Gas cost savings for LIDAC individuals Reduction in metric tons CO2e for LIDAC individuals Reduction in CAP for LIDAC individuals Semi-annual progress reports and final report

Greenhouse Gas Emissions Reductions

Greenhouse gas emissions reductions for this measure were calculated using software developed by a research team at the University of Nebraska for Nebraska's Weatherization Assistance Program. The software model estimates the energy, economic, and environmental benefits associated with weatherization improvements. Energy savings for electricity and natural gas were calculated using statistical analysis of a large number of previous projects. This model is used by the NDEE Weatherization program to calculate annual energy savings for electricity and natural gas from weatherization projects. The modeled energy savings for electricity and natural gas from weatherization projects over the five year period 2019-2023 were used to calculate average energy savings per home. These average savings for both energy types were used with appropriate emission factors to calculate emission reductions.

The calculations assume that the implementation grant will fully fund pre-weatherization of 75 homes annually from FFY 2025 through 2029, making them eligible for weatherization upgrades that otherwise would not occur. The emissions reductions are those resulting from those weatherization upgrades. The average cost for pre-weatherization upgrades is estimated to be from $10,500 to $11,000 based previous pre-weatherization projects.

For emission reductions from reduced natural gas consumption, GHG emission rates from the EPA Greenhouse Gas Emission Factor Hub (https://www.epa.gov/climateleadership/ghg-emission-factors-hub) were used. For emission reductions from reduced electricity consumption, emission reductions were computed using emission rates estimated from two NREL 2023 Standard Scenarios. Details are provided on the *Elec Grid Methodology* sheet in the GHGcalcs.xlsx spreadsheet.

Emissions reductions were calculated from the estimated energy savings. Emission reductions for actions reducing natural gas consumption were calculated assuming no future change in the proportion of fossil-fuel and renewable natural gas in the supply chain. Emission reductions for actions reducing electricity consumption assumed declining GHG emissions due to grid decarbonization. Details are provided on the Elec Grid Methodology sheet in the GHGcalcs.xlsx spreadsheet.

Cumulative Avoided Emissions for 75 Pre-Weatherization Projects per year 2025-2029 (100% grant funding)						
Year	Avoided GHG Emissions (MT CO_2e)	Avoided CO_2 Emissions (MT)	Avoided CH_4 Emissions (MT CO_2e)	Avoided N_20 Emissions (MT CO_2e)	Avoided SO_2 Emissions (MT)	Avoided NOx Emissions (MT)
2025	732	720	10.5	0.9	0.2	0.5
2026	2,142	2,110	27.9	2.5	0.4	1.4
2027	4,170	4,113	49.0	4.6	0.7	2.7
2028	6,762	6,680	70.4	7.0	1.0	4.4
2029	9,995	9,845	94.2	9.7	1.4	6.5
2030	13,103	12,969	115.3	12.2	1.7	8.5
2050	72,405	73,782	304.6	49.4	4.1	46.8

Longevity of GHG Reductions

Weatherization and Pre-Weatherization are viewed as long-term investments with benefits such as energy savings and increased property value, home health, and safety for the occupants. The pre-weatherization program funded by this grant will provide durable structural and safety upgrades such as repairing foundation and roof problems, bringing electrical wiring up to code by replacing knob-and-tube wiring, and remediating mold. Correcting these problems will make residences eligible for standard weatherization upgrades, including sealing air leaks, checking the efficiency of heating and cooling systems, and add insulation. In addition to increased energy efficiency, these weatherization measures reduce the likelihood of outdoor air pollutants and allergens entering homes. Homes that receive weatherization services may apply for evaluation and upgrades after 15 years. Pre-weatherization and weatherization investments in housing stock aid upkeep and increase the value of housing in these communities.

Cost-Effectiveness

NDEE has budgeted $4,078,027 for Measure 2 to achieve a cumulative 13,103 metric tons of greenhouse gas reductions (attributed to 100% grant funding). The resulting cost-effectiveness of this measure is therefore $311.23 per metric ton CO_2e reduced.

Budget

Category	Budget	Narrative
Personnel	$109,500	Estimated at 0.30 FTE per year. Includes portions of salary of full-time staff to perform tasks.
Fringe Benefits	$34,776	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	$6,887	Includes costs for mileage, vehicle rental, meals, and lodging necessary to implement the program and to oversee projects. Costs are estimated annually for staff travel to project site visits. Costs are estimated for 1000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 2 overnight stays, 4 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	$0	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 and computers. There are no anticipated additional supplies needed to implement these activities.
Contractual	$0	There are no contractual costs.
Other	$3,882,800	NDEE would utilize existing program structure to subaward to Community Action Partnership Agencies in Nebraska and other non-profit programs that have current authority to receive federal weatherization assistance funds through NDEE and would be responsible for the home weatherization improvements. To ensure equal distribution across the State, NDEE will

		distribute the Pre-Weatherization funds among the state's existing subgrantees utilizing the formula allocation for the Annual Weatherization Funding, which is a weighted average based on several factors including the number of low-income Nebraskans living in the counties served by the local nonprofit organization. Assumes cost share of 100%. Subawards will cover subrecipient personnel, contractual, and indirect costs.
Total Direct Charges	$4,033,953	
Indirect Charges	$44,074	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$4,078,027	

Measure 3: Incentives for Irrigation Well Conversion from Diesel to Electric

Measure Concept

Provide financial incentives (rebates) to farmers to replace diesel engines powering irrigation well pumps with electric motors/pumps connected to the electric grid, with a goal of funding 50 engine replacements per year from 2025 through 2030. The incentives would cover a percentage of the costs of new electrical equipment, wiring and installation, and utility upgrade and connection charges.

Description and Background

Nebraska's agricultural economy is highly dependent on groundwater to irrigate crops such as corn, soybeans, and edible beans. As of November 2023, the state had over 96,000 active irrigation wells registered, and previous surveys have indicated at least 24% of well pumps were still powered by diesel engines. Replacement of these diesel engines with electric motors connected to the electric grid can reduce GHG and other emissions and save farmers money in the long term due to the low cost of electricity in Nebraska compared to fuel costs as well as reduced maintenance costs. However, the up-front capital costs for the conversion can be a barrier to adoption. The financial incentives provided by this program are expected to spur more widespread adoption.

This is an electrification measure designed to replace fossil fuel combustion at the well location with electricity from the grid, some portion of which is produced from sources other than fossil fuel combustion (nuclear, wind, and solar). This measure is distinct and independent from the agricultural programs in Measure 6, which provide incentives for farmers to change practices in several ways to reduce tillage and fuel use, rebuild soil health to improve long-term yield and sequester carbon in the soil, and reduce application of nitrogen fertilizer. NDEE expects that at least 30% of the project locations will be in low-income and disadvantaged areas, based on results of the pre-existing program.

Farmers undertaking these projects work with an irrigation service company, which assesses the wellsite (state of well, depth to water, required pumping rate) to determine needed physical modifications to the well (e.g., new headshaft) and the optimal size (horsepower rating) of the replacement electric motor. In some cases, variable frequency drives are installed to adjust the flow pressure by controlling the frequency of the electrical current, achieving significant power savings. Installation of the pump panel and underground wiring is done either by the irrigation company or a separate electrical

contractor. In cases where three-phase power is not already in place, the electric utility constructs overhead lines to the field boundary along with a transformer.

Administration

NDEE will administer this program directly. It will be an expanded version of the Department's current irrigation engine rebate program that has been funded since 2017 through the annual state DERA allocation supplemented by Nebraska's Volkswagen Trust fund. New irrigation engine projects will be administered solely through this CPRG implementation grant during fiscal years 2025 through 2029, allowing annual DERA and remaining supplemental Volkswagen Trust funds to be used for diesel vehicle replacements during that time period.

The program will provide rebates to farmers to reimburse 60% of the cost of a new electric motor, wiring and installation, required well work, and required electrical infrastructure (including electric utility charges) up to a maximum reimbursement set annually by the Department. These rebates will be treated by NDEE as participant support costs. The diesel engine owner is responsible for the remainder of the project costs (recipient cost-share). No part of the recipient cost-share can be provided by any other federal grant program (such as the USDA REAP program). However, replacement incentives offered by the electric service provider may be used to cover a portion of the recipient cost-share. Recipients that receive the scrap value of their disabled diesel engine from a scrap yard must report that amount as program income as part of their reimbursement request, but they will be allowed to apply that amount to their recipient cost-share.

The reimbursement cap applied by NDEE avoids reimbursing excessive utility costs for longer-distance electric service line buildout. We plan to set the reimbursement cap at $23,000 for the first funding cycle beginning in fall 2024. Projects that do not include large utility costs should receive full 60% reimbursements below the cap. However, for some higher-cost projects a 60% reimbursement would exceed the reimbursement limit, so these projects would receive reimbursement of less than 60% of the project costs. With the proposed cap of $23,000 and considering historic project costs, we expect that the average rebate will be $20,000, and that rebates will cover approximately 50% of aggregate project costs.

<u>Eligibility</u>

- Any farming operation that owns a diesel engine powering an agricultural irrigation pump located in Nebraska will be eligible to apply for one irrigation engine replacement per year.
- The applicant must have owned the engine to be replaced for at least two years prior to submission of the application.
- The applicant must be in compliance with all Nebraska environmental laws and with the Department's regulations and permits at all Nebraska locations.
- The diesel engine must be in operating condition and have operated at least 250 hours each year during the two years prior to applying. There are no restrictions on engine model year.
- The diesel engine must have a remaining service life of at least three years in the owner's estimation.

<u>Project Requirements</u>

- The diesel irrigation engine must be replaced by an electric motor or by connecting an existing submersible pump to the electric grid.

- The replacement equipment must operate in the same location as the replaced engine.
- Electrical work must be performed by a licensed electrical contractor.
- The replaced diesel engine must be disabled within 90 days of replacement by cutting or drilling a 3-inch by 3-inch hole through the wall of the engine block into the piston area.
- Awardees must sign a project agreement with the Department outlining the project requirements prior to initiating work.
- Only expenses incurred after the signed agreement is received are eligible for reimbursement.

Application

Applicants will submit the following information on or attached to the application form:

- Diesel engine information: manufacturer, model year, serial number, EPA Engine Family (if available), and horsepower rating.
- Photos of the wellsite, the diesel engine, and any plates with the engine serial number and emissions information
- Location of the engine: county, township, range, section, and quarter-section
- Primary fuel (must be diesel), and annual fuel consumption for the previous two years
- Annual hours operating in each of the previous two years
- Documentation of fuel use and operating hours for the previous two years if available
- Estimate of remaining years of service (minimum 3 years)
- One set of dated quotes for the replacement electric motor and electrical equipment, installation, and electrical utility costs.

Applicant Selection

All applications that meet the eligibility requirements and provide the required information will be considered for an award. If the number of eligible applications exceeds the funding allocated for the project year, preference will be given to applications for project locations within low-income disadvantaged communities as designated by the Climate Pollution Reduction Grant program and to applicants who have not previously received an irrigation engine rebate from NDEE.

Reimbursement

Upon satisfactory completion of the project, NDEE will reimburse the recipient 60% of the project costs up to the stated annual maximum rebate. A request for reimbursement must be made using the form provided by NDEE and must include:

- Manufacturer, model number, and serial number of the replacement electric motor
- Name, address, phone number, and email address for all vendors and the cost of the equipment and/or service provided
- Copies of all invoices and proof of payment for each (copy of canceled check front and back, bank statement showing dates cleared, or credit card statement)
- Photos of the wellsite and the new equipment, including close-up photo of the electric motor and of the motor serial number plate (if applicable)
- Completed Certification of Engine Scrappage Form signed by the engine owner and party who completed the scrappage
- Photos of the diesel engine before and after scrappage.

The information submitted in the reimbursement request is used to verify completion of the project and conformance with the program requirements. Each applicant's application, agreement, and reimbursement request are archived in the Nebraska's Electronic Content Management system as public records.

Project Agreement

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

Annual Federal Fiscal Year Program Timeline

The irrigation engine replacement program will hold annual application periods beginning in October 2024, for a total of five annual project cycles from FFY 2025 through 2029. Most individual irrigation engine replacement projects should be completed within a 12-month period, but some may experience delays until after the subsequent harvest if utility work and equipment installation cannot be completed prior to spring planting.

Annual Milestone Date Commencing FFY 2025	**Task Description**
October 1	NDEE opens application period, posting program information and application. Publicize program via press release, social media, and statewide & regional contacts.
December 15-31	Review of applications, selection and notification of awardees.
January	Project agreements provided to awardees; Commence Work notifications sent when signed. In most cases notification timing should allow time for work to be completed before spring planting.
February – September	Recipients carry out projects; NDEE answers questions as needed. Recipients submit reimbursement requests and documentation of activities and expenses. Reimbursements issued by NDEE after receipt and review of complete documentation. Project extensions may be granted if work cannot be completed within the one-year timeframe due to supply issues or utility construction schedules.

Program Timeline and Targets

NDEE proposes to replace an average of 50 irrigation engines annually from FFY 2025 through 2029.

In years when both DERA and VW funds were available, NDEE has completed between 20 and 41 irrigation engine replacements annually since 2018, averaging 28 projects per funding cycle. In some years the number of projects was constrained by funding limits; the highest number of eligible applications received in a year was 49. We anticipate that the publicity surrounding this implementation grant, and in particular Measure 6, will draw more public attention to the irrigation engine program and increase participation to the target of 50 projects each year. The planned increase in the maximum reimbursement from $20,000 to $23,000 will also make participation more attractive.

Federal Fiscal Year	**Projects Completed**	**Tasks and Milestones**

2025	50	October 2024: Grant awarded. Open yearly project application period. March 2025: Submit Semiannual Report to EPA.
2026	50	October 2025: Open yearly project application period. Submit Semiannual Report to EPA including LIDAC Benefit Analysis. March 2026: Submit Semiannual Report to EPA.
2027	50	October 2026: Open yearly project application period. Submit Semiannual Report to EPA. March 2027: Submit Semiannual Report to EPA.
2028	50	October 2027: Open yearly project application period. Submit Semiannual Report to EPA. March 2028: Submit Semiannual Report to EPA.
2029	50	October 2028: Open yearly project application period. Submit Semiannual Report to EPA. March 2029: Submit Semiannual Report to EPA.
2030	0	January 2030: Submit Final Grant Report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	**Outcomes / Projected Environmental or Programmatic Improvement**
# of replacements Age and operating characteristics of engines Semi-annual progress reports and final report	Reduction in metric tons CO2e in LIDAC Reduction in metric tons CO2e Reduction in criteria air pollutants (CAP) Reduction in CAP in LIDAC Semi-annual progress reports and final report

Greenhouse Gas Emissions Reductions

This measure will replace diesel irrigation engines with electric motors. Replacement and scrapping of diesel engines eliminates emissions at the wellsite, but these reductions are partially offset by emissions from generation of the electricity needed to power the replacement motors, resulting in net reductions that are less than the direct reductions (net emissions reductions = direct emission reductions minus generation emissions).

NDEE calculated the direct emission reductions from engine replacement, the average annual electricity usage needed for the replacement motors, and the emissions from corresponding electricity generation and transmission. The calculations and complete explanations of the methodology for this measure are presented in the *M3-Irrigation-Eng-1* and *M-3-Irrigation-Eng-2* sheets in the GHGcalcs_NebraskaDEE.xlsx workbook. A summary of the methodology is presented below.

Methodology

Direct emissions reductions of CO_2, CH_4 and N_2O from engine replacement were calculated using the average annual diesel fuel use from 138 previous projects from 2018-2022 and emission rates from the EPA Greenhouse Gas Emission Factor Hub: (https://www.epa.gov/climateleadership/ghg-emission-factors-hub). Direct emissions reductions of NOx were calculated from the average historic engine data (horsepower, annual operating hours, and diesel fuel use) using the EPA online Diesel Emissions Quantifier (https://cfpub.epa.gov/quantifier/index.cfm?action=main.home). Annual direct emissions

reductions for greenhouse gases at the wellsite for the average engine replacement were calculated to be 49.36 metric tons annually, and 0.39 tons annually for NOx.

To begin estimating the offset emissions from electricity generation, the annual electricity use per motor was calculated from the annual average operating hours (968) and average electric motor horsepower (85 hp = 63.41 kW) of the previous projects, yielding annual single motor electricity usage of 61.38 MWh. Emissions from generation of this electricity in Nebraska were estimated from 2025 through 2050 for each pollutant from the mean of emission rates provided in two representative National Renewable Energy Laboratory 2023 Standard Scenarios of electric grid emission rates from 2025 through 2050 (see previous workplan section on projections methodology for measures impacting grid electricity). These scenario rates were also used to project the cumulative net emissions for this measure through 2050. The calculated single engine-project annual emissions from electricity generation in 2025 were calculated to be 21.96 metric tons for greenhouse gases and 0.37 ton for NOx.

The net emissions reductions per project in 2025 are therefore 27.4 metric tons of greenhouse gases and 0.02 metric tons of NOx. Using the NREL Standard Scenarios, these net reductions are modeled to increase somewhat by 2030 due to decreased fossil fuel generation of electricity in the region.

Cumulative Net Emissions Reductions for 50 irrigation engine projects per year 2025-2029					
	Net GHG Emissions Reductions (MT CO_2e)	Net CO_2 Emissions Reductions (MT)	Net CH_4 Emissions Reductions (MT CO_2e)	Net N_20 Emissions Reductions (MT CO_2e)	Net NOx Emissions Reductions (MT)
2025	1,098	1,148	(80)	30	19
2026	3,712	3,833	(212)	91	57
2027	8,327	8,510	(370)	187	114
2028	9,820	10,407	(883)	296	187
2029	19,023	19,618	(1,055)	460	283
2030	28,581	29,159	(1,204)	626	379
2050	249,803	248,049	(2,307)	4,061	2,331
Cumulative Net Emissions Reductions attributed to 50% Grant Funding:					
2030	14,291	14,580	(602)	313	190
2050	124,901	124,024	(1,154)	2,031	1,166

Longevity and Durability of GHG Reductions

Conversion of an irrigation well from a diesel engine to electric requires a significant investment in equipment and often in electrical infrastructure. Once this investment in conversion is made, and an electrical connection is available at the site, it is highly unlikely that the well would revert to power from a diesel engine in the future. Even if the life expectancy of the specific electrical equipment (motor, panel) would be less than 25 years, we would expect that replacement equipment would be supplied by the owner to maintain overall cost savings, which would maintain the emissions differential documented here for electric versus diesel power for the well. Thus, NDEE expects that this measure will produce permanent emissions reductions through the grant period and to 2050.

Cost-Effectiveness

As noted above in the Administration section, this measure offers a 60% reimbursement of project costs but sets a maximum reimbursement amount ($23,000 for project year 1). This means that higher-cost projects will receive less than 60% reimbursement. Based on costs from previous projects, we expect that the proposed rebate limit will result in an average rebate of $20,000 and that rebates will cover approximately 50% of the aggregate project costs.

NDEE has budgeted $6,140,507 for Measure 3 to achieve a cumulative 14,291 metric tons of greenhouse gas reductions (attributed to 50% grant funding).

The resulting cost-effectiveness of this measure is therefore $429.67 per metric ton of CO_2e emissions reduced.

Budget

Category	Budget	Narrative
Personnel	$209,550	Estimated at 0.70 FTE per year. Includes portions of salary of full-time staff to perform tasks including managing the grants and awards and participating in the day-to-day activities of the program administration; preparing reports; conducting on-site compliance, monitoring visits, and program inspections and documents findings; and program outreach and presentations. Reviewing and approving reimbursement requests and documentation.
Fringe Benefits	$66,532	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	$5,081	Includes costs for mileage, vehicle rental, meals, and lodging necessary to implement the program and to oversee projects. Costs are estimated annually for staff travel to project site visits. Costs are estimated for 1000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 2 overnight stays, 4 travel days for 1 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	$0	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 and computers.
Contractual	$25,000	Contractual work for a grant management system via subscription service to develop an electronic application database for application 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	$5,750,000	Participant Support Costs: Irrigation Engine Replacement Rebates, 50 replacements/yr @ $23,000 each. NDEE would implement an annual program soliciting applications and awarding projects to applicants, with a goal of awarding funds for at least 50 engine replacement projects to be completed within each program year. The program design would follow and

		expand upon the existing program funded by an annual EPA DERA (Clean Diesel) grant. Assumes cost share of 50%.
Total Direct Charges	$6,056,163	
Indirect Charges	$84,344	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$6,140,507	

Measure 4: Incentives for Micro-Solar Arrays for Critical Infrastructure in Low-Income Rural Communities

Measure Concept

Provide financial incentives (rebates) to rural low-income and disadvantaged communities to install solar arrays at municipal water and wastewater treatment facilities. The solar arrays are expected to range in size from 50 to 500 kW, with a goal of adding total new capacity of 4 MW by 2030.

Description and Background

Many rural communities in Nebraska have a struggling economy. The Nebraska Public Power District (NPPD) has identified about 75 rural communities in its retail and wholesale service area designated as low-income and disadvantaged and that operate drinking water and/or wastewater treatment facilities. Other such communities are found in the thirteen-county service area of the Omaha Public Power District (OPPD), and among the smaller rural communities served by the Municipal Energy Agency of Nebraska (MEAN). Operating these facilities places an economic burden on low-income communities. Solar photovoltaic (PV) arrays generating electricity at these facilities would reduce energy costs for their communities and residents while reducing fossil-fuel generation of grid electricity.

The solar arrays are expected to range in size from 50 to 500 kW, with a goal of adding total new capacity of 4 MW by 2030. The arrays will be sized to significantly reduce, but not replace, the use of grid electricity to power these critical facilities during routine operation. The array sizes will be determined by the community and their electric utility based on the power requirements of the facility and the area available for constructing the array. Full replacement of grid power needed for short-term peak loads, such as startup of pumps, would require cost-prohibitively large arrays. No electricity generated by these arrays will be fed back to the electric utility, so there will be no program income associated with the electricity generation. The community facilities will remain connected to the electric grid, ensuring continuity of operation in the event that the solar array is temporarily offline.

Adding solar arrays will reduce demand for grid electricity and reduce the amount of grid generation from fossil-fuels, with corresponding reduction in GHG emissions. Reductions in CO_2, NOx, and SO_2 will potentially directly benefit five Nebraska counties (Adams, Douglas, Lancaster, Lincoln, and Otoe) that host coal-fired generating stations as well as surrounding areas.

Low-income and disadvantaged rural areas, as defined by CJEST and EJScreen, will be targeted and prioritized for solar projects as part of this program. The electricity generated by the solar arrays will reduce energy costs for these communities, and the construction of the arrays will stimulate economic activity in rural areas across the state. Construction of these community arrays may also familiarize residents with the economic benefits of solar energy and spur interest in more solar projects in and around these communities.

Administration

This measure will subaward grant funds to NPPD, OPPD, and MEAN to provide financial incentives (rebates) to between eight and twenty rural low-income disadvantaged communities to install solar arrays at drinking water or wastewater treatment facilities.

Nebraska is a 100 percent public power state; all electric consumers receive power from public entities, including public power districts, electric cooperatives, municipal electric systems, joint action agencies, or a combination of the above. NPPD provides wholesale electricity to many smaller rural public power districts, cooperatives, and communities across most of the state, and NPPD collaborates with these entities in developing incentive programs serving their rural areas. OPPD serves a 13-county area in southeastern Nebraska. MEAN provides wholesale electric service to smaller municipalities across the state, many of which are rural communities in low-income and disadvantaged areas.

Equipment purchases and installation for each solar facility will be fully funded by the program (up to 100% of the project costs minus all available alternative revenue streams) if the community provides access to the land and commits to maintenance of the arrays. NDEE expects that the solar array in each community would be owned by that community, directly reducing the community's dependence on grid electricity and eliminating issues of program income if the utility owned the array. The estimated cost savings would make the project feasible for a community and be a hedge against future operating/ maintenance costs and inflation. Any savings to wholesale power costs, from the distributed generation and federal loan forgiveness would minimize the need for rate increases and allow for possible rate reductions. Ground-mounted arrays will be used to minimize costs and utility upgrades and to achieve favorable sun exposure. NDEE and the utilities will work with potential host community leaders and organizations to communicate the project benefits and gain consensus community buy-in prior to submission of a project application.

Utilities will submit project proposals eligible rural communities through an open solicitation process to NDEE. NDEE will review the proposals and rank/select projects based on a priority ranking system. NDEE will enter into a subaward agreement with the respective utility. The selected community would have an agreement with the Utility for the development of the project, until completion of the project**.** NDEE would provide administrative funding to the utility to provide technical assistance for the project, including community outreach coordination.

<u>Eligibility</u>

- Low-income and disadvantaged communities in rural areas of Nebraska, as defined by CJEST and EJScreen
- Community provides access to the land
- Community commits to maintenance of the arrays
- The applicant must be in compliance with all Nebraska environmental laws and with the Department's regulations and permits at all Nebraska locations.

<u>Project Requirements</u>

- The project must be in compliance with all state and local regulations and ordinances and obtain any required permits. NDEE may require the applicant to submit project information to the Nebraska Game and Parks Commission using the Nebraska Conservation and Environmental

Review Tool for review of potential impacts to threatened and endangered species, protected lands, and other natural resources.

- Solar equipment installers must be a part of a Nebraska electrical utility trade alley program or vetted by the electric utility provider.
- The solar project will be community owned.
- Ground-mounted solar arrays
- Photo voltaic panels must have a 20-year or more manufacturers performance warranty and inverters must a 10-year or more warranty.
- The installer warranty must include all costs of repair or replacement for a minimum of two years.
- Subawardee or the solar installer will provide the host community with a maintenance schedule for the equipment and the projected costs for performing the scheduled maintenance.

Application

NDEE and the subawardees must require the following information on the application form:

- Detailed project scope, timeline, and cost
- Identification of Tax Credits being pursued
- Annual Energy Use (MWh)

Applicant Selection

NDEE will develop a Priority Ranking System which shall be used to rank the projects submitted. Priority ranking for the projects may utilize the following categories to determine total points awarded. The greater the total number of points, the higher the ranking.

- Project Benefit,
- Readiness to proceed,
- population,
- sustainability risk using NDEE's AWIN Sustainability Model, and
- Compliance status.

Reimbursement

NDEE will reimburse the subawardee utility up to 100% of the project costs minus all available alternative revenue streams (i.e., tax credits and/or rebates) applied to the project.

The subawardee utility will be required to submit monthly or quarterly invoices and documentation of costs for which reimbursement is sought pursuant to the terms of the agreement and the Scope of Work. All disbursements of costs incurred and paid by the subawardee for the project shall be reviewed by NDEE for eligibility during the reporting and reimbursement process. Eligible costs include costs directly related to a preapproved workplan. All invoices will be reviewed pursuant to the provisions of the Nebraska Prompt Payment Act. No expenses incurred prior to the effective date of the agreement, or outside of the terms of the Agreement are eligible unless amended per the Agreement. The statement of costs shall be signed by the subawardee' s authorized representative.

Project Agreement

Before commencing work, selected subawardee electric utilities 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 subawardee agreement to EPA Project Officer (PO) if requested. Each agreement will contain a workplan 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 subawardees by providing training and guidance on the terms of the agreement. NDEE will require monthly progress calls with subawardees and the community to monitor expenditures, milestones, and overall program success. Subawardees will be required submit semi-annual reports to NDEE.

Program Timeline and Targets

This measure proposes to install a total of 4 MW of solar generation capacity over a four year period at critical public facilities in rural low-income disadvantaged communities. Two or more projects would be installed each year (total capacity 1.0 MW annually) from 2026 through 2029. Supply-chain issues with transformers and other electrical equipment could introduce delays in this schedule, but the small size of the proposed solar installations reduces this risk.

Federal Fiscal Year	Projects Completed	Milestones	Tasks
2025	0	Nov-Dec. 2024	EPA Funding received in October 2024.
		Dec 2024 – March 2025	Develop general guidelines, application procedures, forms, and payment procedures. Evaluation and development of QAPP if needed.
		Jan-Mar 2025	Open applications on a rolling basis or within set program timelines. Select projects.
		April-Oct 2025	Subawards to participating electrical utilities. NDEE will follow EPA subaward policies and will educate recipients by providing training and guidance on the terms of the agreement. Submission of semiannual report and LIDAC report to EPA.
2026	2 or more, 1.0 MW		Select and fund additional projects. Submission of semiannual reports to EPA.
2027	2 or more, 1.0 MW		Select and fund additional projects. Submission of semiannual reports to EPA.
2028	2 or more, 1.0 MW		Select and fund additional projects. Submission of semiannual reports to EPA.
2029	2 or more, 1.0 MW		Select and fund additional projects. Submission of semiannual reports to EPA.
2030		January 2030	Submission of final report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
MW of solar capacity added Semi-annual progress reports and final report	Reduction in metric tons CO2e for LIDAC Reduction in criteria air pollutants for LIDAC

	Reduced energy costs Semiannual and final reports

Greenhouse Gas Emissions Reductions

This measure would install a total of 1.0 MW of additional solar capacity annually. Emissions reductions (avoided emissions) were calculated from the reduced need for grid electricity based on the added solar capacity. The calculations for this measure are detailed in the *M4-Solar-Crit-Inf* sheet in the GHGcalcs.xlsx spreadsheet.

Methodology

Power output corresponding to the annual additional solar capacity was estimated using the National Renewable Energy Laboratory PVWatts Calculator (https://pvwatts.nrel.gov). A location near the center of the state was used for the power output modeling. The resulting annual reduction in needed grid electricity was used to directly calculate annual avoided emissions.

Emission rates from electricity generation were assumed to decline through time due to grid decarbonization. Emission reductions were computed using emission rates estimated from two representative National Renewable Energy Laboratory 2023 Standard Scenarios of electric grid emissions rates from 2025 through 2050 (see previous workplan section on projections methodology for measures impacting grid electricity).

Cumulative Avoided Emissions for 1.0 MW Solar Capacity Added Annually 2026-2029						
	GHG Emissions Reductions (MT CO_2e)	CO_2 Emissions Reductions (MT)	CH_4 Emissions Reductions (MT CO_2e)	N_20 Emissions Reductions (MT CO_2e)	SO_2 Emissions Reductions (MT)	NOx Emissions Reductions (MT)
2025	0	0	0	0	0	0
2026	1,126	1,048	70	4	1.1	0.8
2027	2,899	2,695	181	11	2.8	2.1
2028	4,862	4,516	306	19	4.8	3.5
2029	7,171	6,660	454	27	7.1	5.1
2030	9,183	8,526	584	35	9.1	6.6
2050	25,148	23,311	1,639	127	33.7	18.1

Longevity of GHG Reductions

According to the U.S. Department of Energy, the estimated operational lifespan of a photovoltaic module is about 30 to 35 years. The solar arrays constructed using this grant funding are expected to produce useful electric power throughout the 2025 to 2050 timeframe considered here. As these arrays will reduce power costs for the host communities, it is anticipated that these communities will be motivated to utilize and maintain these arrays throughout this time period, resulting in sustained greenhouse gas reductions.

LIDAC Benefits

All projects funded through this measure will be sited in small, low-income disadvantaged rural communities. Installing solar arrays at the water or wastewater treatment facilities in the selected communities will provide direct economic benefits to the communities and their residents by reducing facility operating costs.

Cost-Effectiveness

NDEE has budgeted $16,406,847 for Measure 4 to achieve a cumulative total of 9,183 metric tons of greenhouse gas reductions by 2030. The resulting cost-effectiveness for this measure is $1,786.65 per metric ton of CO_2e reduced.

Budget

Category	Budget	Narrative
Personnel	$218,000	Estimated at 0.75 FTE per year. Includes portions of salary of full-time staff to perform tasks.
Fringe Benefits	$69,215	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	$6,887	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 community outreach meetings. Costs are estimated for 1,000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 2 overnight stays, 4 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	$0	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 and computers. There are no anticipated additional supplies needed to implement these activities.
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	$16,000,000	Subawards to Nebraska Public Power Utilities to provide financial incentives to install solar arrays at water and wastewater treatment facilities in 4-10 rural LIDACs. Each solar facility would be fully funded by the program if the community provides access to the land and commits to maintenance of the arrays. The solar arrays are expected to

		range in size from 50 to 500 kW, with a goal of adding total new capacity of 4 MW by 2030. Assumes cost share of 100%.
Total Direct Charges	$16,139,102	
Indirect Charges	$87,745	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$16,406,847	

Budget Narrative: Other

As described in the Administrative section of this workplan**,** funds may be subawarded to the Nebraska Public Power District, Municipal Energy Agency of Nebraska, Omaha Public Power District, and other eligible electric cooperative power suppliers/entities to work with selected LIDAC communities to install solar at their wastewater treatment facilities. NDEE anticipates that a small percentage of each subrecipient's allocation will be used for administrative purposes (personnel and indirect), with the remaining going towards contractual costs for the selected solar projects. Estimation of contractual costs under each subaward are based on a proposed 500kW (AC) photovoltaic solar tracking facility connected to a power line supplying wastewater plant load. NDEE is estimating a project cost of approximately up to 2.1 million dollars per project.

Measure 5: Incentives for Solar Projects on Unused/Contaminated Land, Ag & Industrial Facilities and Parking Lot/Feedlot Solar Canopies

Measure Concept

Provide incentives for purchase and installation of solar panels on unused/contaminated land, rooftops of agricultural, industrial, and commercial facilities, and solar canopies over parking lots and animal feedlots.

Description and Background

By early 2023, Nebraska had nearly 70 megawatts of solar photovoltaic capacity, including about 28 MW of customer-sited, small-scale (less than 1-MW) capacity. However, Nebraska has enormous potential for additional solar development. Solar generation projects can not only reduce GHG emissions, but also reduce electricity costs and foster economic development.

Community feedback has shown that some residents are concerned about solar facilities competing with other land uses such as agriculture. Solar development projects located at unused/contaminated lands, agricultural and industrial facilities, and commercial and residential properties can be a means of generating electricity locally and saving on electricity costs while avoiding development in greenfield areas.

This measure will provide incentives for solar projects in non-greenfield locations, reimbursing up to 60% of project costs. Remaining project costs will be the responsibility of the solar equipment owner. Grant funds could be combined with incentives provided by the public electric utility and with federal tax credits; however, in those cases the grant reimbursement percentage could be reduced to 30% to extend the reach of CPRG grant funds to a larger number of projects while still providing significant incentives to spur interest.

Projects that could be funded through this measure include solar panels on industrial, commercial, and multifamily residential rooftops, small ground arrays at agricultural center-pivot corners, and canopies above parking lots and cattle feedlot pens.

One potential commercial site program could provide incentives for solar projects for grocery stores in small rural communities, which would reduce utility costs for these stores, making them more economically viable and more likely to survive to provide local food supplies to their communities. Many such communities are in low-income disadvantaged areas, and such groceries could be prioritized if interest in such a program develops.

Residential projects could include rooftop or ground installations at apartment or condominium complexes. The Lincoln Electric System (LES) has recent experience with this type of project in new construction. LES has developed administrative procedures to credit unit residents virtually with reduced usage without needing to install separate wiring and solar panel disconnects for each unit, which reduces project costs for the solar component. In addition, NDEE's utility partners have pointed out that there are 99 public housing authorities in the state, many of which are master-metered (one metered electric service to many low-income housing units). In these cases, one solar array could easily provide power to multiple low-income units with direct reductions in grid usage for each unit.

Parking lot solar canopy project locations could include parking lots at apartment complexes. If these projects were co-located with separately funded installation of EV charging equipment, the canopies would shelter the vehicles and charging equipment while providing electrical power to offset the cost of grid electricity for the apartment complex owner.

During the summer, consistent exposure to sun and heat can be extremely detrimental to cattle. As a result, some cattle feedlot operators construct shade structures over portions of their facilities. Adding solar panels to the shade structures would reduce the feedlot's dependence on grid electricity and enable the canopy structure to serve a dual purpose. Although dust from the feedlot could accumulate on the panels and reduce their generation, rainfall and periodic manual cleaning during dry periods would alleviate that potential problem. The economic benefit from the reduced electric bills from the local utility would provide a financial incentive for the owner to properly maintain the panels.

Other specific project ideas will be solicited through marketing efforts around the state. All of these projects would reduce dependence on grid electricity and reduce the amount of grid generation from fossil fuels. Reductions in CO_2, NOx, and SO_2 will potentially directly benefit five Nebraska counties (Adams, Douglas, Lancaster, Lincoln, and Otoe) that host coal-fired generating stations as well as surrounding areas.

Administration

Funds will be subawarded to the Nebraska Public Power District, Municipal Energy Agency of Nebraska, Omaha Public Power District, and Lincoln Electric System to administer the solar projects. The allocation of funds to the different utilities will be determined based on their differing levels of electricity demand.

Nebraska is a 100 percent public power state; all electric consumers receive power from public entities, including public power districts, electric cooperatives, municipal electric systems, joint action agencies, or a combination of the above. The Nebraska Public Power District (NPPD) provides wholesale electricity to many smaller rural public power districts, cooperatives, and communities across most of the state.

The Municipal Energy Agency of Nebraska (MEAN) similarly provides wholesale electricity to smaller municipalities across Nebraska. NPPD and MEAN collaborate with their wholesale customers in the development of energy efficiency and other incentive programs.

The Omaha Public Power District serves a 13-county area in southeastern Nebraska, while the Lincoln Electric System is the municipal utility for the City of Lincoln. Both entities currently administer energy efficiency and other incentive programs in their service areas.

This program will provide rebates or other financial incentives to reduce the upfront costs of installing solar, helping make solar energy a more viable option for customers.

Eligibility

- Projects must be located in Nebraska.
- The applicant must be in compliance with all Nebraska environmental laws and with the Department's regulations and permits at all Nebraska locations.
- The applicant provides access to the land or structure
- Recipient commits to maintenance of the arrays via the project agreement
- Project must be pre-approved prior to purchase and installation of the equipment.
- Applicant must own the property/building where the system will be installed

Additional eligibility requirements will be dependent upon the specific program and will vary among subawardees.

Project Requirements

- The project must be in compliance with all state and local regulations and ordinances and obtain any required permits. NDEE may require the applicant to submit project information to the Nebraska Game and Parks Commission using the Nebraska Conservation and Environmental Review Tool for review of potential impacts to threatened and endangered species, protected lands, and other natural resources.
- Photo voltaic panels must have a 20-year or more manufacturers performance warranty and inverters must a 10-year or more warranty.
- The installer warranty must include all costs of repair or replacement for a minimum of two years.
- Solar equipment installers must be a part of a Nebraska electrical utility trade alley program or vetted by the electric utility provider.
- Solar arrays must be properly orientated and be free from excessive shading.
- Subawardee or the solar installer will provide the host community with a maintenance schedule for the equipment and the projected costs for performing the scheduled maintenance.
- If the solar project owner enters into a net metering agreement to sell excess energy to the local utility, that income is considered as program income and must be applied to the maintenance and upkeep of the solar installation to insure its continued operation and delivery of environmental benefits.

Application

The subawardees must require the following information on the application form:

- Location of the project: Address, City, Zip code
- Quotes for all equipment and installation expenses
- Require three set of dated cost estimates if the total project costs exceed $250,000
- Detailed project scope, timeline, and cost
- Identification of Tax Credits being pursued
- System design specifications

Additional application requirements will be dependent upon the specific programs. The subawardee must develop general guidelines, application process and procedures, forms, and payment procedures and submit these to NDEE for review and approval prior to commencement of projects.

Applicant Selection

All applications that meet the eligibility requirements and provide the required information will be considered for a rebate. The subrecipient will have the discretion to develop their selection process for their incentive programs. Applications may be accepted on a rolling basis or within set program timelines. Preference should be given to first time recipients vs repeat awards. The subawardee must clearly specify the selection process in their program materials.

Reimbursement

Upon satisfactory completion of the project, the subawardee will submit a reimbursement request to NDEE. NDEE will reimburse the recipient 60% of the project costs minus all available revenue streams. A request for reimbursement must be made using the form provided by NDEE and must include:

- Project type
- Project location
- Date project was completed
- kW of solar capacity added
- Projected electricity cost savings, if applicable
- Total project cost
- Request for reimbursement

The subawardee will be required to submit, monthly or quarterly invoices and documentation costs for which reimbursement is sought pursuant to the terms of the agreement and the Scope of Work. All disbursements of costs incurred and paid for the project shall be reviewed by NDEE for eligibility during the reporting and reimbursement process. Eligible costs include costs directly related to a preapproved program/project. All invoices will be reviewed pursuant to the provisions of the Nebraska Prompt Payment Act. No expenses incurred prior to the effective date of the agreement, or outside of the terms of the Agreement are eligible unless amended per the Agreement. The statement of costs shall be signed by the Subrecipient authorized representative.

Subaward Agreement

Before commencing work, selected subawardees must sign an Agreement with NDEE 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) if requested. Each agreement will

contain a workplan (types of programs/projects) 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 submit semi-annual reports to NDEE.

Program Timeline and Targets

NDEE proposes to implement solar projects according to the tentative timeline presented in the table below, which was determined during initial discussions with Nebraska electric utilities. This schedule does not include all of the potential types of solar project that could be initiated under this measure. In addition, supply chain issues with transformers and other equipment could cause project delays that would affect this timeline.

Solar Project Timeline

This measure will fund solar projects with a variety of sizes and locations. The table below establishes the number of expected location types and capacity targets for the duration of the grant. NDEE will use the solar capacity data provided in subawardee reports to track compliance with these targets, calculate emission reduction benefits, and provide guidance for any program adjustments during the term of the grant.

Federal Fiscal Year	# Projects Completed	Project Types	Total Capacity (kW)	Annual Generation (kWh)
2025	15	Solar at Pivot Corners	1,125	
	1	Parking Lot Solar at NPPD Office	150	2,102,526
	1	Parking Lot Solar Statewide	50	
Annual 2026 - 2029	15	Solar at Pivot Corners	1,125	
	1	Parking Lot Solar Statewide	50	2,340,523
	3	Cattle Feedlot Solar Canopies	300	

Administrative Timeline and Milestones

Federal Fiscal Year	Milestones	Tasks
2025	Nov-Dec. 2024	EPA Funding received in October 2024. Subawards to participating electrical utilities. NDEE will follow EPA subaward policies and will educate recipients by providing training and guidance on the terms of the agreement.
	Jan-Mar 2025	Develop general guidelines, application procedures, forms, and payment procedures. Evaluation and development of QAPP if needed.
	April-Oct 2025	Open applications on a rolling basis or within set program timelines. Submission of semiannual report and LIDAC report to EPA.

2026		Select and fund additional projects. Submission of semiannual reports to EPA.
2027		Select and fund additional projects. Submission of semiannual reports to EPA.
2028		Select and fund additional projects. Submission of semiannual reports to EPA.
2029		Select and fund additional projects. Submission of semiannual reports to EPA.
2030	January 2030	Submission of final report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	**Outcomes / Projected Environmental or Programmatic Improvement**
# and type of projects kW of solar capacity added Semi-annual progress reports and final report	Reduced energy costs Reduction in metric tons CO2e, including those in LIDAC Amount of funding distributed to projects in LIDAC Semi-annual progress reports and final report

Greenhouse Gas Emissions Reductions

This measure would install 7.225 MW of solar capacity in various locations that would not displace other productive activities. Emissions reductions (avoided emissions) were calculated from the reduced need for grid electricity based on the added solar capacity. The calculations for this measure are detailed in the M5-Solar-Unused-Land sheet in the GHGcalcs_NebraskaDEE.xlsx workbook.

Methodology

Annual power output corresponding to the annual additional solar capacity was estimated using the National Renewable Energy Laboratory PVWatts Calculator (https://pvwatts.nrel.gov). A location near the center of the state was used for the power output modeling. The resulting annual reduction in needed grid electricity was used to directly calculate annual avoided emissions.

These calculations assumed:

- A total of 7,225 kW DC of solar capacity will be installed from 2025 through 2029.
- Projects with 1,325 kW total capacity would be installed in 2025. Projects with 1,475 kW capacity annually would be installed from 2026 through 2029.
- Installation costs vary with the type of facility.
- Emission rates from electricity generation were assumed to decline through time due to grid decarbonization.
- Emission reductions were computed using declining emission rates estimated from two NREL 2023 Standard Scenarios.

Details are provided on the *Elec-Grid-Methodology* and following sheets in the GHGcalcs.xlsx spreadsheet.

Cumulative Avoided Emissions						
	GHG Emissions Reductions (MT CO_2e)	CO_2 Emissions Reductions (MT)	CH_4 Emissions Reductions (MT CO_2e)	N_20 Emissions Reductions (MT CO_2e)	SO_2 Emissions Reductions (MT)	NOx Emissions Reductions (MT)
2025	1,791	1,665	112	7	1.7	1.3
2026	4944	4,598	307	19	4.7	3.5
2027	8,733	8,119	545	34	8.5	6.2
2028	12,495	11,610	785	48	12.2	8.9
2029	16,666	15,480	1,052	64	16.3	11.9
2030	20,300	18,851	1,286	77	20.0	14.5
2050	49,135	45,556	3,192	182	48.5	35.2
Cumulative Avoided Emissions for 60% Grant Funding						
2030	12,180	11,311	772	46	12.0	8.7
2050	29,481	27,334	1,915	109	29.1	21.1

Longevity of GHG Reductions

According to the U.S. Department of Energy, the estimated operational lifespan of a photovoltaic module is about 30 to 35 years. The solar projects constructed using this grant funding are expected to produce useful electric power throughout the 2025 to 2050 timeframe considered here. As these solar arrays will reduce power costs for their owners, it is anticipated that they will be motivated to utilize and maintain the solar equipment throughout this time period, resulting in sustained greenhouse gas reductions.

LIDAC Benefits

This measure is not specifically targeted toward low-income and disadvantaged communities. However, the prospective utility subawardees have pointed out several opportunities for maximizing LIDAC benefits of solar projects, including working with public housing authorities as well as grocery stores in low-income rural communities. NDEE will work with the subawardees to encourage marketing of the funding opportunities to LIDAC areas and will track the locations of the projects funded to determine the proportion of economic and emission reduction benefits to LIDACs.

Cost-Effectiveness

NDEE has budgeted $28,081,847 for Measure 5 to achieve a cumulative total of 12,180 metric tons of greenhouse gas reductions by 2030. The resulting cost-effectiveness for this measure is $2,305.57 per metric ton CO_2e reduced.

Budget

Category	Budget	Narrative
Personnel	$218,000	Estimated at 0.35 FTE per year. Includes portions of salary of full-time staff to perform tasks.
Fringe Benefits	$69,215	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	$6,887	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 community outreach meetings. Costs are estimated for 1000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 2 overnight stays, 4 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	$0	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 and computers. There are no anticipated additional supplies needed to implement these activities.
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	$27,675,000	Subawards to Public Electric Utilities (assumes 60% of the project is funded with CPRG share). Funds would be subawarded to the Nebraska Public Power District, Municipal Energy Agency of Nebraska, Omaha Public Power District, Lincoln Electric System and other eligible entities to expand current and pilot solar project programs in non-greenfield areas, including arrays on industrial, commercial, and multi-family residential rooftops, at agricultural center-pivot corners, and on canopies above parking lots and cattle feedlot pens.
Total Direct Charges	$27,994,102	
Indirect Charges	$87,745	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$28,081,847	

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 (NOx) 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 date 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 (CH_4), nitrous oxide (N_2O), and carbon dioxide (CO_2) 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.

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

LIDAC report	*October 2025*	*NDEE submit to EPA*
Final Report	*January 2030*	*NDEE submit to EPA*

Federal Fiscal Year	**Programmatic Tasks and Milestones**
2025	November 2024: • NDEE signs subaward contract with Nebraska nonprofit • Governing Council recruited and convened January 2025: • 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 March 2025: • 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 May 2025: • Initial grant awards made (if not already done) • Full launch of Registry IT platform and initial dashboards June-September 2025: • Grant solicitations released on rolling basis, Registry records CI Scores, quarterly and semiannual reports filed, marketing continues
2026	October 2025-September 2026: Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed, marketing continues
2027	October 2026-September 2027: Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed
2028	October 2027-September 2028: Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed
2029	October 2028-September 2029: Grant solicitations released on rolling basis, Registry records CI Scores, research from Registry data published, quarterly and semiannual reports filed
2030	January 2030: Submit Final Grant Report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
• # 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	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 CO_2e 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 CO_2e 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 CO_2e year."[1]

If fully realized, these reductions total 4.07 MMT CO_2e 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 CO_2e per year:

CI Score	Total MMT of GHG	MMT CO_2e 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 CO_2e 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 gCO_2eq/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 gCO_2eq/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				
Year	**CI of State Harvest**	**Total (MT CO_2e)**	**CO_2 (metric tons)**	**N_2O (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
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 CO_2e 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)
TOTALS	$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.

Measure 7: Establishing Hub and Spoke Anaerobic Digester/Biogas Hubs for Agricultural Waste

Measure Concept

Provide incentives to develop an anaerobic digester/biogas hub near an existing natural gas pipeline. These facilities would receive and process cattle and/or hog manure from farm operations in the surrounding region. They would be designed and managed to ensure efficient and environmentally friendly operation.

Description and Background

Anaerobic digester (AD) systems convert organic matter such as animal manure, wastewater biosolids, and food waste into a nutrient-rich mixture of liquid and solids (digestate) and a blend of different gases, including methane. Methane produced in AD is referred to as "biogas" because it is a by-product of microorganisms breaking down the organic compounds found in the feedstock of the digester.

Biogas can be purified to remove inert or low-value components to create renewable natural gas that can be sold and injected into the natural gas distribution system, reducing the need for fossil fuels. Digestate can be treated in different ways to create valuable byproducts, such as fertilizer and soil amendments, bioplastics, and animal bedding.

Nebraska has over 10 million head of cattle and over 3 million head of swine. Manure management for cattle and swine account for between 1.93-2.12 MMT CO_2e and 0.968 MMT CO_2e annually, respectively.

When used for animal manure management, the typical, self-contained AD consists of:

- A reliable, large volume of manure as feedstock
- Tanks or covered lagoons containing the microorganisms required to decompose the manure

- Systems to extract biogas

Methane (also called "renewable natural gas" or RNG) refined from the biogas extract can be used on site as a fuel substitute for natural gas or concentrated to match the chemical composition of natural gas and injected into commercial pipeline grids. In its refined form, RNG is indistinguishable from natural gas in either its chemical composition or performance as a fuel.

The carbon intensity of RNG tends to be substantially lower than natural gas, however, and can be an effective strategy for reducing GHG emissions. Depending on the production efficiencies, RNG's carbon intensity can be anywhere from half to one-third of natural gas. RNG is a true drop-in fuel that can be directly substituted for natural gas in utility pipelines, natural gas vehicles, and natural gas industrial applications.

The digestate from AD systems provides additional emission reductions as a direct substitute for chemical fertilizer. Crops can use the nitrogen and other nutrients of the digestate just as well as those contained in chemical fertilizers. The use of digestate can be an integral part of nitrogen management plans to reduce nitrous oxide emissions.

AD configurations and feedstocks can make a dramatic difference in how effectively GHGs are reduced and whether the project is technically and financially sustainable over time. The hub-and-spoke configurations discussed below create flexible, professionally managed platforms for AD into which many different sized livestock producers can participate.

The hub-and-spoke configuration here is designed around the following:
- AD tanks are located on-site at cattle, hog, or dairy facilities (the "spokes").
- The biogas extract produced at the cattle, hog, or dairy facility is either transported by low-pressure, low-volume pipeline to a central cleaning and injection site (the "hub") or compressed and driven there.
- The central cleaning site refines the raw biogas into RNG and injects into a natural gas pipeline.
- The digestate from the tanks is then extracted and applied as a nutrient and soil amendment in the farm fields and pastures surrounding the livestock operations.

Administration

NDEE will utilize a competitive Request for Proposals (RFP) process and solicit interested organizations to construct and operate one hub-and-spoke demonstration AD project near an existing natural gas pipeline.

The department will review proposals and evaluate them based on GHG reduction, LIDAC proximity, and long-term viability of the endeavor. This measure will fund 70% of the cost of equipment, installation, and construction activities including AD tanks, pipelines, and cleaning facilities.

<u>Eligibility</u>

- Projects must be entirely within Nebraska.
- Entities must be in good standing with the Nebraska Secretary of State.
- The applicant must be in compliance with all Nebraska environmental laws and within the Department's regulations and permits at all project locations.
- The Applicant must commit to abide by and follow all state and federal subgrantee regulations, financial agreements, and reporting requirements

Project Requirements

- Project design must be approved by licensed professional engineer.
- The project must conform to all state and local ordinances and regulations and obtain any necessary permits. NDEE may require the applicant to submit project information to the Nebraska Game and Parks Commission using the Nebraska Conservation and Environmental Review Tool for review of potential impacts to threatened and endangered species, protected lands, and other natural resources.
- Project construction must be performed by licensed contractors.
- Project management and operations must be performed by licensed operators.
- Awardees must sign a project agreement with the Department outlining the project requirements prior to commencing work
- Each anaerobic digester must be equipped with a system to temporarily flare produced biogas during brief periods when the biogas cleaning facility is offline and/or when cleaned gas cannot be delivered to the natural gas pipeline.
- The applicant must commit to keeping the equipment in good working order through the project lifespan.
- During the grant period, revenue generated from the sale of the renewable natural gas produced must be utilized for the maintenance and operation of the anaerobic digesters and biogas cleaning facility.
- Project environmental and safety measures must be approved by a licensed engineer and the Department.
- During the term of the grant, the project operator will submit semiannual reports to NDEE. These reports shall include:
    - the amount of waste processed at each digester
    - the amounts of biogas and renewable natural gas produced
    - the amount of digestate applied to agricultural land and the total area of application
    - the number and duration of any flaring events
    - estimates of the greenhouse gas reductions being achieved
    - the amount of revenue earned from the sale of the renewable natural gas.

Additional project requirements may be required upon program development. NDEE will clearly specify all project requirements in the Request for Proposal.

Request for Proposals

Interested parties must submit the following information in their proposals:

- A detailed project proposal and business plan describing the project including:
    - Location of the proposed hub biogas cleaning facility and all anaerobic digester facilities
    - Feedstock details across the project lifespan, including annual volume of manure to be processed (Commitment letters from participating livestock operations)
    - Anaerobic digester design information
    - Design of biogas transfer system from spoke digesters to hub cleaning facility
    - Design of Biogas cleaning and injection facility

  - Agreement with pipeline owner ensuring biogas will be accepted into existing natural gas line
  - Installation details
  - Estimate of annual amount of digestate to be produced
  - Plan for digestate management and use
  - Environmental compliance plans
  - Project longevity and maintenance plans
  - Project funding for remaining 30%
- Quotes and details describing each anaerobic digester spoke, biogas transfer infrastructure, biogas cleaning and injection hub, electrical equipment, installation, and utility connections costs.
- Estimate of the annual amount of renewable natural gas to be produced and the expected annual net reduction in greenhouse gases from all components of the project.

Additional information may be required upon RFP development.

Proposal Selection

Proposals that meet the eligibility requirements and provide the required information will be considered for an award. NDEE will develop a scoring system to rank proposals based on the quality of the designs and plans, the annual quantity of RNG to be produced, and the estimated greenhouse gas emission reductions. Preference will also be given to applications with projects resulting in positive outcomes for low-income disadvantaged communities as designated by the Climate Pollution Reduction Grant

Reimbursement

Upon satisfactory completion of the project, NDEE will reimburse the recipient up to 70% of the project costs minus all available alternative revenue streams (i.e., tax credits and/or rebates) applied to the project.

A request for reimbursement must be made using the form provided by NDEE, signed by an authorized representative, and must include:

- Equipment manufacturer and model numbers for any equipment with cost over $5,000
- Name, address, phone number, and email address for all vendors/contractors and the cost of the equipment and/or service provided
- Copies of all invoices and proof of payment for each (copy of canceled check front and back, bank statement showing dates cleared, or credit card statement)
- Photos of the of the new equipment installation, including close-up photo of the equipment model and serial number plate (if applicable)

Project Agreement

Before commencing work, the selected 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.

Program Timeline and Targets

Federal Fiscal Year	Milestones	Tasks
2025	Nov-Dec. 2024	EPA Funding received in October 2024. NDEE will open a public question and answer platform for potential applicants.
	Jan-Mar 2025	Develop general guidelines, application procedures, forms, and payment procedures. Develop guidelines for reporting and tracking of hub and spoke system construction and operation. Evaluation and development of QAPP if needed. Release Request for Proposals. Answer all received questions from applicants.
	April 2025	Close application window. Evaluate proposals, Oral Interview/Presentations
	May 2025	Select bidder, begin contract finalization.
	July 2025 – July 2026	Recipient obtains all necessary permits, conducts outreach,
	October 2025	NDEE Submits LIDAC Report to EPA
	August 2026-December 2027	Commence Construction of Hub and Spoke System
2026		Recipient submits semi-annual reports to NDEE, including any program income. NDEE submission of semiannual reports to EPA. Quarterly meeting with recipient for project status updates
2027		Recipient submits semi-annual reports to NDEE, including any program income. NDEE submission of semiannual reports to EPA. Quarterly meeting with recipient for project status updates
2028	January 2028	Commence Operation of Hub and Spoke System
2028		Recipient submits semi-annual reports to NDEE, including any program income. NDEE submission of semiannual reports to EPA. Quarterly meeting with recipient for project status updates
2029		Recipient submits semi-annual reports to NDEE, including any program income. NDEE submission of semiannual reports to EPA. Quarterly meeting with recipient for project status updates
2030	January 2030	Submission of final report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
# of anaerobic digester spokes built # of tons of manure processed # of MMBTUS of biogas produced # of tons of land applied digestate # of new jobs created Semi-annual progress reports and final report	Decreased methane emissions from the decomposition of manure. Decreased synthetic fertilizer use Decreased nuisance odor emissions Reduction in metric tons CO2e, including those in LIDAC Workforce Development

	Amount of funding distributed to projects in LIDAC Semi-annual progress reports and semi-annual reports

Greenhouse Gas Emissions Reductions

Methodology

The emission reductions from the establishment of a hub-and-spoke anaerobic digester system come in several forms. The first is the recovery of methane (CH_4) from biogas produced from the digested animal waste. That methane can be injected into existing natural gas lines, reducing the amount of fossil fuels required to provide energy. Secondly, the digestate can be land-applied as green manure. Green manure is used as a fertilizer instead of synthetic nitrogen fertilizers, which require large amounts of energy to manufacture, and which break down after application to produce the greenhouse gas nitrous oxide.

Net greenhouse gas reductions were calculated for the grant application assuming three hub-and-spoke biogas/AD systems in different Nebraska counties, each processing feeder cattle manure. These systems assumed different numbers of feeder cattle providing different volumes of manure to the digesters. Operation-scale data were input into the joint EPA and Global Methane Initiative's Anaerobic Digestion Screening Tool, Version 2.3 and the USDA Comet-Planner tool to calculate the overall greenhouse gas reductions for the three systems. For this workplan the program has been modified to fund only one such system that is assumed to be installed and operational by 2028. The M7-AD-Biogas-Hubs-1 sheet in the GHG calcs.xlsx file has been modified to add GHG emissions reductions for all GHG components for one system using the average of the annual reductions for the three modeled systems. In addition, minimum and maximum values for total GHG reductions were also calculated based on the range of annual reductions from the three modeled systems. The results are summarized in the table below. The range of emission reductions may also be affected if the funded project includes other sources of animal waste, such as dairy cattle and swine.

During the course of the project, NDEE will review the data and GHG estimates provided in the project operator's semiannual reports to check and track the amount of GHG reductions being achieved.

Cumulative Emissions Reductions for One Biogas/Anaerobic Digester Hub and Spoke System to be Installed by 2028, attributed to 70% grant funding						
	Avg GHG Emissions Reductions (MT CO_2e)	Avg CO_2 Emissions Reductions (MT)	Avg CH_4 Emissions Reductions (MT CO_2e)	Avg N_2O Emissions Reductions (MT CO_2e)	Minimum GHG Emissions Reductions (MT CO_2e)	Maximum GHG Emissions Reductions (MT CO_2e)
2025	0	0	0	0	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	87,302	19,492	4,384	63,426	65,401	100,040
2029	174,605	38,985	8,768	126,852	130,803	200,080
2030	261,907	58,477	13,152	190,278	196,204	300,121
2050	2,007,957	448,326	100,832	1,458,798	1,504,230	2,300,925

Longevity of GHG Reductions

Establishing a hub-and-spoke anaerobic digestion demonstration system for manure management and biogas production is significant infrastructure and considered as a long-term investment in Nebraska's bioeconomy. Benefits of this program include additional income to agriculture operators from selling biogas, decreased methane and odorous air emissions in agricultural communities, reductions in synthetic fertilizer usage from switching to land application of digestate, and creation of jobs to build and operate the hub and spoke system.

LIDAC Benefits

Two of the hub-and-spoke anaerobic digestion projects modeled for the grant application are in rural counties with significant portions designated as low-income and disadvantaged. Many other rural counties in the state also have significant areas so designated. Anaerobic digesters sited in LIDAC areas would reduce local emissions of greenhouse gases and odors from open-air decomposition of manure. Application of digestate in these areas would also reduce use of nitrogen fertilizer, reducing associated greenhouse gas emissions and negative impacts on groundwater. Operation of the digesters and the biogas cleaning facility would provide well-paying jobs in these rural areas. NDEE will give preference to project application that include facilities in LIDAC areas.

Cost-Effectiveness

NDEE has budgeted $57,182,628 for Measure 7 to achieve a cumulative 261,907 metric tons of greenhouse gas reductions (attributed to 70% grant funding). The resulting cost-effectiveness of this measure is therefore $218.33 per metric ton CO_2e 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 grant application, therefore a deduction of $34,399,719 from the workplan to match the award amount was necessary. Keeping in mind the original application submittal and the need to minimize effects on GHG emission reductions, NDEE shifted the initial reduction of $34,399,719 from the Anaerobic Digester measure. Furthermore, based on cost effectiveness, other factors such as timing, and potential other sources of available funding, NDEE made the following finical shift in the workplan from the Anaerobic Digester measure into the Agricultural Production measure increasing the investment into that measure and leaving $57,182,628 in the Digester measure for one Digester Hub & Spoke project. Overall, this will result in more potential GHG reductions through implementation of all eight (8) funded measures than originally proposed.

Category	Budget	Narrative
Personnel	$670,175	Estimated at 2. 0 FTE per year. Includes portions of salary of full-time staff to perform tasks and assumes decrease in time after initial program set up.
Fringe Benefits	$212,781	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	4,927	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 community outreach meetings. Costs are estimated for 1000 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits, and 2 overnight stays, 4 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	$0	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 and computers. There are no anticipated additional supplies needed to implement these activities.
Contractual	$56,025,000	Contractual work for a grant management system ($25,000) 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. NDEE will utilize a competitive Request for Proposals (RFP) process and solicit interested organizations to construct and operate one hub-and-spoke demonstration AD project near an existing natural gas pipeline. The department will review proposals and evaluate them based on GHG reduction, LIDAC proximity, and long-term viability of the endeavor. This measure will fund 70% of the cost of equipment, installation, and construction activities including AD tanks, pipelines, and cleaning facilities up to $56,000,000.
Other		
Total Direct Charges	$56,912,883	
Indirect Charges	$269,745	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$57,182,628	
Program Income	$1,200,000	Estimated Program Income generated during the project period.

Budget Narrative:

Contractual: As described in the Administrative Section of the is measure, NDEE intends to issue a competitive Request for Proposals (RFP) process and solicit interested organizations to construct and operate one hub-and-spoke demonstration AD project near an existing natural gas pipeline. This measure will fund 70% of the cost of equipment, installation, and construction activities including AD tanks, pipelines, and cleaning facilities. Estimated ranges for Anaerobic Digestion (Manure pretreatment system, Digester Tanks and Equipment, Digestate Processing Systems, Digestate Storage, and Site Work) is anticipated to be between $ 9-11Million per individual Digester. Gas Collection and Upgrading (pipeline interconnect, Biogas Pipelines to Hubs, Other infrastructure) is estimated to be $12-16 Million. Like the calculated GHG emission reductions for this measure, the $57 million allocated for this measure is based on the average of a model of three regional hub-and-spoke biogas/anaerobic digester clusters of different sizes in different Nebraska counties. NDEE has downsized this measure to one regional hub-and-spoke anaerobic digester cluster. This allocation retains the initial three clusters as the basis for the one-cluster estimate. Because the original three location-specific clusters had different expected numbers of digesters and other components, we calculated average values for cost estimates for the one-cluster from those previously calculated for the three clusters. We view those averages as best estimates for a single cluster.

Program Income: It is anticipated that there will be program income generated from implementation of this measure. The subrecipient will be required to report the amount of program income earned, expended, and a description of how the program income is being used on a semi-annual basis. NDEE will report this information in each of the required performance reports and submit with the Federal Financial Report.

Measure 8: Incentives for purchase of Biochar Processing Equipment

Measure Concept

Provide financial incentives to establish biochar processing facilities to convert woody organic waste into biochar and sequester carbon in soils. The incentives would cover a percentage of the costs of material handling equipment, pyrolysis unit, wiring and installation, and utility upgrade and connection charges.

Description and Background

As plants and trees grow, they absorb atmospheric carbon dioxide in their organic makeup. Natural decomposition and deforestation release this stored carbon back into the atmosphere. The creation of biochar from plant material sequesters carbon, preventing it from being released back into the environment for long periods of time. Biochar is a carbon-rich, highly stable soil amendment that improves soil health and can store carbon in soils for over 100 years. Production of biochar through conversion of wood waste can help with sustainable agricultural practices (increase crop yields, decrease synthetic fertilizer use, and improve water retention of soils). Additionally, it can help with managing woody invasive species in grassland and rangeland. Encroachment by eastern red cedar is a threat to Nebraska's Great Plains grasslands and can reduce forage production by up to 75% in heavily invaded locations. In 2019, Nebraska rangelands lost over 419,000 tons of plant biomass forage production due to woody plant encroachment. Responsible management and harvesting of Eastern Red Cedar trees can boost carbon sequestration. Sustainable practices like selective harvesting and thinning,

along with utilizing biochar as soil amendments for improved soil health, creates an integrated approach. Mechanical removal is one method for controlling red cedar but is expensive. Establishing a market for the resulting wood waste as a biochar feedstock would reduce the net expense for removal of red cedar from rangelands.

Administration

This measure would provide incentives to aid up to four entities, including the City of Lincoln for their Biochar Initiative, to purchase and install biochar processing equipment to convert organic waste into biochar and sequester carbon in soils. The incentives would cover a percentage of the costs of the material handling equipment, pyrolysis unit, wiring and installation, and utility upgrade and connection charges. CPRG grant funds would reimburse 80% of project costs, minus all available revenue streams. Remaining project costs will be the responsibility of the biochar processing equipment owner. Grant funds could be combined with incentives or grants provided by the other federal entities, such as USDA wood innovations program grants. Through this measure, identified on page 46 of Nebraska's PCAP, a portion of the funds awarded to NDEE would be sub-awarded to the City of Lincoln to complete the city's biochar processing facility. In addition, NDEE would establish a program to solicit applications and award projects to other applicants desiring to sequester carbon through conversion of wood waste into a marketable soil amendment product, with a goal of awarding funds for up to three additional projects by 2030. Awards for the remaining three projects would be capped at $800,000 to any one entity over the span of the grant period. Future biochar projects will be evaluated based on locations not detrimental to LIDAC communities, ability to begin operations quickly, and tons of woody biomass proposed to be processed annually among other criteria yet to be finalized.

Subaward to City of Lincoln

The City of Lincoln previously used Bloomberg Foundation grant funds to purchase a pyrolysis unit to process wood waste into biochar. However, the city has lacked funds to install and operate the unit. NDEE's subaward through this grant will provide the City of Lincoln with funds to construct a building to house and operate the biochar unit at Lincoln's solid waste transfer station, along with funds for operating costs for two years.

The City of Lincoln will be required to sign a project agreement with the Department outlining the project requirements prior to initiating work. NDEE will follow EPA subaward policies and will provide training and guidance to the City of Lincoln on the terms of the agreement. NDEE will require monthly or quarterly progress calls with the City of Lincoln to monitor expenditures, milestones, and overall project success. The City of Lincoln will be required to submit semi-annual reports to NDEE.

Rebates for Future Projects

Rebates for future projects will be treated by NDEE as participant support costs. The biochar equipment owner is responsible for the remainder of the project costs (recipient cost-share). Recipients that receive income from sale of biochar must report that amount as program income as part of their reimbursement request, but they will be allowed to apply that amount to their recipient cost-share.

The reimbursement cap applied by NDEE to future projects avoids excessive reimbursement costs. Projects that do not include startup costs should receive full 80% reimbursements below the cap. However, for some higher-cost projects an 80% reimbursement may exceed the reimbursement cap, so these projects would receive reimbursement of less than 80% of the project costs. With the proposed

cap of $800,000, we expect that the average rebate will be $750,000, and that rebates will cover approximately 80% of aggregate project costs.

Eligibility

- Projects must be located in Nebraska.
- Entities must be in good standing with the Nebraska Secretary of State.
- The applicant must be in compliance with all Nebraska environmental laws and with the Department's regulations and permits at all Nebraska locations.

Project Requirements

- Electrical installation work must be performed by a licensed electrical contractor.
- Construction work must be performed by licensed contractors.
- Awardees must sign a project agreement with the Department outlining the project requirements prior to initiating work.
- Only expenses incurred after the signed agreement is received are eligible for reimbursement.
- The applicant must commit to operate through 2030.
- The applicant must commit to produce a minimum of 500 cubic yards of biochar annually within a year of receiving the award.
- The applicant must commit to keeping the equipment in good working order through 2030
- The project must be in compliance with all state and local regulations and ordinances. Selected applicants must obtain any required federal, state, and local permits prior to commencement of the project. NDEE may require the applicant to submit project information to the Nebraska Game and Parks Commission using the Nebraska Conservation and Environmental Review Tool for review of potential impacts to threatened and endangered species, protected lands, and other natural resources.

Application

Applicants for future projects will submit the following information on or attached to the application form:

- A detailed project proposal and business plan describing the project including;
    - Location details
    - Feed stock details for a minimum of two years
    - Pyrolysis unit information
    - Ancillary Equipment
    - Installation details
    - Planned use(s) for the biochar produced
- Quotes for all equipment and installation expenses
- Three sets of dated quotes if the total project costs exceed $250,000
- Estimate of the annual carbon sequestration to be achieved by the project
- List of necessary permits and anticipated date of issuance

Applicant Selection

Applications that meet the eligibility requirements and provide the required information will be considered for an award. Multiple eligible applications may be funded in early years if all criteria are met and high-quality desirable projects are proposed. NDEE will develop a scoring system to rank

applications based on the quality of the project planning and the annual sequestration of carbon to be achieved. Preference will be given to applications with projects resulting in positive outcomes for low-income disadvantaged communities as designated by the Climate Pollution Reduction Grant program and to applicants who have not previously received an NDEE rebate under other programs.

Reimbursement

Upon satisfactory completion of the project, NDEE will reimburse the rebate recipient 80% of the project costs up to the stated annual maximum rebate. A request for reimbursement must be made using the form provided by NDEE, signed by an authorized representative, and must include:

- Equipment manufacturer and model numbers for any equipment costing over $5,000
- Name, address, phone number, and email address for all vendors/contractors and the cost of the equipment and/or service provided
- Copies of all invoices and proof of payment for each (copy of canceled check front and back, bank statement showing dates cleared, or credit card statement)
- Photos of the of the new equipment installation, including close-up photo of the equipment model and serial number plate (if applicable)

All disbursements of costs incurred and paid for the project shall be reviewed by NDEE for eligibility during the reporting and reimbursement process. Eligible costs include costs directly related to a preapproved program/project. All invoices will be reviewed pursuant to the provisions of the Nebraska Prompt Payment Act. No expenses incurred prior to the effective date of the agreement, or outside of the terms of the Agreement are eligible unless amended per the Agreement. The statement of costs shall be signed by the Subrecipient authorized representative.

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. NDEE will provide copies of each subrecipient agreement to EPA Project Officer (PO), upon request. Each project agreement will contain a workplan and specific budget allocations.

Program Timeline and Targets

The biochar carbon sequestration program will open a rolling application period beginning in March 2025 with the goal of funding three biochar projects by 2028. Most individual projects should be operational within a 12-month period, but some may experience delays if equipment acquisition and installation or utility work cannot be completed as planned. The City of Lincoln should begin operation in 2025 with the remaining three projects beginning operation in years 2026 – 2028.

Federal Fiscal Year	Projects Completed	Milestones	Tasks
2025		Oct 2024 – February 2025	EPA Funding received in October 2024. Subaward to City of Lincoln. Develop general rebate program guidelines, application procedures, forms, and QAPP if needed.
	1	March 2025 & October 2025	Open rolling project application period.

			Submit Semiannual Report to EPA including LIDAC Benefit Analysis, and program income
2026	1	March 2026 & October 2026	Accept applications as needed. Submit Semiannual Report to EPA
2027	1	March 2027 & October 2027	Accept applications as needed. Submit Semiannual Report to EPA, including program income
2028	1	March 2028 & October 2028	Accept applications as needed. Submit Semiannual Report to EPA, including program income
2029	0	March 2029 & October 2029	Submit Semiannual Report to EPA, including any program income.
2030	0	January 2030	Submission of final report to EPA.

Expected Outputs and Outcomes

Outputs/ Performance Measures	**Outcomes / Projected Environmental or Programmatic Improvement**
Cubic Yards/tons of organic waste processed Cubic Yards/tons of biochar produced Semi-annual progress reports and final report	Sequestration of metric tons CO2e in LIDAC Sequestration in metric tons CO2e $ Funding distributed to projects in LIDAC CAP in LIDAC

Greenhouse Gas Emissions Reductions

This measure involves the conversion of organic waste into a material called biochar with the overall goal of reducing GHGs through the sequestration of carbon. Biochar is a long-lasting material (stable for more than 100 years) that can be used as a soil amendment and animal feed supplement among other uses. Processing the woody waste that will be converted into biochar requires energy and transportation to the processing facility. The pyrolysis process used to produce biochar involves the use of both electricity and propane or other similar fuel to 'start' the process each time production is paused.

A summary of the methodology is presented below and is based on the calculations supplied by the City of Lincoln and performed by their contractor, Stantec.

Methodology

In the CPRG implementation grant application, emissions reductions for this measure were calculated assuming that one new biochar production facility would be operational each year from 2025 through 2029 for a total of five, with facility designs similar to that of the City of Lincoln's facility. For the workplan, NDEE modified this measure to reduce the total number of projects in the rebate program to three additional facilities between 2026 and 2028, for a total of four facilities. The City of Lincoln facility is anticipated to be completed in 2025. The GHGcalcs spreadsheet has been updated to reflect the reduction in total number of facilities implemented to four and the current estimated timetable for installation and completion.

Emissions reduction estimates continue to be based on the Lincoln facility and were calculated by a consultant using the Verra VM0044 Methodology for Biochar Utilization in Soil and Non-Soil Applications, v1.1.16. This methodology quantifies the carbon dioxide removals resulting from the conversion of waste biomass into biochar at new biochar production facilities. The calculations assumed that the biochar production process will utilize a high-technology pyrolysis production facility meeting the following conditions:

- Pyrolytic greenhouse gases will be recovered or combusted
- At least 70% of the heat energy produced by pyrolysis will be recovered
- Emissions controls meet local and national standards
- The facility will operate 24 hours per day, 250 days per year
- Electricity consumption at 50 amps, 220 volts, with a power factor of 80%
- 0.22 gallons of diesel fuel consumed per cubic yard of biomass during screening and grinding
- 10,000 cubic yards of biomass annually provided by the City of Lincoln
- 6,000 cubic yards of biomass annually transported 43 miles (round trip) to the facility
- Biomass is transported to the facility using a 100 cubic yard diesel tractor trailer
- A small diesel bulldozer is operated in the facility
- 75% organic content of biochar produced

Using these conditions, Stantec estimated that the Lincoln facility will result in net reduction of 836.84 million metric tons of carbon dioxide equivalent (MTCO2e) annually. This GHG reduction estimate did not account for the transportation of the biochar to its end-use location or the soil or non-soil application. The installation and operation of one facility annually between 2025 and 2029 will result in cumulative GHG reductions of 12,050 metric tons by 2030, as shown in the table below. The Stantec analysis also did not include estimates of criteria air pollutants emitted during pyrolysis and other operations. NDEE will work with the City of Lincoln to obtain information on these additional emissions in order to accurately track GHG emissions reductions as well as criteria air pollutant disbenefits.

Cumulative Net Emissions Reductions for one biochar project per year 2025-2028	
	Net GHG Emissions Reductions (MT CO_2e)
2025	837
2026	2,511
2027	5,021
2028	8,368
2029	11,716
2030	15,063
2050	82,010
Cumulative Net Emissions Reductions attributed to 80% Grant Funding:	
2030	12,050
2050	65,608

Longevity of GHG Reductions

Because biochar can drastically reduce wood waste through conversion into a beneficial material and help with sustainable agricultural practices (increase crop yields, decrease synthetic fertilizer use, and improve water retention of soils) as well as play a role in woody invasive species management for grassland and rangeland, it is believed that investments into this technology will have long-lasting sustainable effects and grow this fledgling industry. In addition, with the support of UNL through its research projects and other funding, biochar may become a widely used soil amendment throughout agriculture and gardening alike.

Woody waste and other organic material feedstock are plentiful across Nebraska and construction and installation of biochar processing facilities requires a significant investment of commercial equipment and infrastructure with long lifespans. Once this investment is made and the facility operational, it is unlikely its use will diminish as the market for biochar continues to grow. Thus we expect that this measure will produce permanent emissions reductions through the grant period and to 2050.

LIDAC Benefits and Disbenefits

The state as a whole will benefit from the GHG reductions associated with creating four new biochar production facilities. However, biochar production and the transport of feedstock and product will likely increase criteria air pollutant (CAP) emissions in the vicinity of the facilities.

The Lincoln solid waste transfer station, where the city's biochar facility will be installed, is not within a LIDAC census area, and it is in an open nonresidential area about one-half mile from two such tracts. The installation will be far enough away from residences so that impacts of CAP emissions on residents will likely be minimal.

All parts of the state will be eligible to apply for rebates for future biochar production projects. NDEE will work to ensure that projects are not sited in locations that would create disbenefits to low-income disadvantaged communities.

Cost-Effectiveness

NDEE has budgeted $4,373,035 for Measure 8 to achieve a cumulative 12,050 metric tons of greenhouse gas reductions (attributed to 80% grant funding) through 2030. The resulting cost-effectiveness of this measure is therefore $362.91 per MT CO_2e sequestered.

Budget

Category	Budget	Narrative
Personnel	$199,500	Estimated at 0.70 FTE per year. Includes portions of salary of full-time staff to perform tasks.
Fringe Benefits	$63,341	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	$4,895	Includes costs for mileage, vehicle rental, meals, and lodging necessary to implement the program and to oversee projects. Costs are estimated

		annually for staff travel to project site visits. Costs are estimated for 600 miles per year of travel to conduct sub-recipient monitoring of activities and project site visits.
Equipment	$0	EPA definition of equipment is any item over $5,000. There is no anticipated additional equipment needed to implement these activities.
Supplies	$0	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 and computers. There are no anticipated additional supplies needed to implement these activities.
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	$1,700,000 $2,300,000 $4,000,000	Subaward to the City of Lincoln. Includes contractual costs for the construction of a building to house the biochar unit and Equipment. Financial assistance program soliciting applications and awarding projects to applicants desiring to sequester carbon though conversion of wood waste into marketable soil amendment product, with a goal of awarding funds for a total of four projects by 2030. Participant Support Costs: Biochar projects at 80% of cost, up to 3 total over the grant project period. TOTAL
Total Direct Charges	$4,292,736	
Indirect Charges	$80,299	40.25% Calculated as a percentage of salary cost (approved FY24 rate)
TOTALS	$4,373,035	
Program Income	$800,000	Estimated Program Income generated during the project period.

Budget Narrative

Program Income: It is anticipated that there will be program income generated from implementation of this measure. The subrecipient will be required to report the amount of program income earned, expended, and a description of how the program income is being used on a semi-annual basis. NDEE will report this information in each of the required performance reports and submit with the Federal Financial Report.

Section 2. Summary of Impact of GHG Reduction Measures

Magnitude of GHG Reductions

The table below lists the estimates of cumulative greenhouse gas emissions reductions in metric tons of carbon dioxide equivalent ($mtCO_2e$) anticipated from implementation of these measures. Estimates are provided for two time-periods: 2025 to 2030 and 2025 to 2050. Details of the quantification methods are provided above for each measure and in the GHGcalcs_NebraskaDEE.xlsx workbook.

GHG Emissions Reductions, 2025 - 2030				
Measure	**GHG ($MT CO_2e$)**	**CO_2 (MT)**	**CH_4 ($MT CO_2e$)**	**N_2O ($MT CO_2e$)**
1: Energy Efficiency (50% funding)	536,393	524,264	10,710	782
2: Pre-Weatherization (100% funding)	13,103	12,969	115	12
3: Irrigation Well Conversion (50% funding)	14,291	14,580	(602)	313
4: Micro-Solar Array Incentives (100% funding)	9,183	8,526	584	35
5: Solar Projects (60% of funding)	12,180	11,311	772	46
6: Ag Emission Reduction (90% of funding)	25,128,828	9,365,135	0	15,763,694
7: Ag Waste Reduction (70% funding)	261,907	58,477	13,152	190,278
8: Biochar Incentives (80% funding)	12,050	NA	NA	NA
Total, 2025 - 2030	**25,987,176**	**638,785**	**24,685**	**15,955,157**
GHG Emissions Reductions, 2025 - 2050				
1: Energy Efficiency (50% funding)	2,933,544	2,635,647	30,098	2,562
2: Pre-Weatherization (100% funding)	72,405	73,782	305	47
3: Irrigation Well Conversion (50% funding)	124,901	124,024	(1,154)	2,031
4: Micro-Solar Array Incentives (100% funding)	25,148	23,311	1,639	127
5: Solar Projects (60% of funding)	29,481	27,334	1,915	109
6: Ag Emission Reduction (90% of funding)	155,051,209	57,140,364	0	97,910,845
7: Ag Waste Reduction (70% funding)	2,007,957	448,326	100,832	4,303,933
8: Biochar Incentives (80% funding)	65,608	NA	NA	NA
Total, 2025 - 2050	**160,310,253**	**60,472,788**	**133,635**	**99,374,519**

Implementation of these measures will result in durable GHG emission reductions. Many of the proposed measures provide incentives for energy efficiency, electrification, and weatherization upgrades and conversions for industrial, commercial, agricultural, and public buildings and facilities as well as residential homes. These projects are viewed as long-term investments and include additional benefits such as energy savings, increased property value, and increased home health and safety for the occupants.

Most manufactures of solar panels offer lifespans of 25 years or more, resulting in sustainable emission reductions from solar measures. Changes in market dynamics and the planned incentives for technology costs to implement regenerative and precision agriculture will drive an unprecedented interest among producers and agribusiness to embrace CI scores as a crop attribute to be managed and lowered. The establishment of hub-and-spoke anaerobic digester/biogas networks will further GHG emission

reduction across Nebraska's agriculture, waste, and energy sectors. The scale of operations and production at these facilities will deliver a sufficient volume of gas to sustain professional oversight, maintenance, and security enabling durable GHG emission reductions will result.

Cost-Effectiveness of GHG Reductions

The cost-effectiveness of the measures, based on the cumulative GHG reductions through 2030, are listed in the table below. The costs associated with each measure are listed in the budget sections of the measure descriptions above and in the Budget spreadsheet accompanying this workplan.

Measure	CPRG Grant Funding	Cumulative GHG Emissions Reductions (MT CO_2e)	Cost Effectiveness of GHG Reductions ($/MT CO_2e)
1: Energy Efficiency (50% funding)	$30,302,402	536,393	$56.49/MT
2: Pre-Weatherization (100% grant funding)	$4,078,027	13,103	$311.23/MT
3: Irrigation Well Conversion (50% grant funding)	$6,140,507	14,291	$429.68/MT
4: Micro-Solar Array Incentives (100% funding)	$16,406,847	9,183	$1,786.65/MT
5: Solar Projects (60% of funding)	$28,081,847	12,180	$2,305.57/MT
6: Ag Emission Reduction (90% of funding)	$160,434,689	25,128,828	$6.38/MT
7: Ag Waste Reduction (70% funding)	$57,182,628	261,907	$218.33/MT
8: Biochar Incentives (80% grant funding)	$4,373,035	12,050	$362.91/MT
Total	$307,000,000	25,987,935	$11.81/MT

Section 3. Environmental Results: Outputs, Outcomes, and Performance Measures

All of the measures described in this workplan contribute to EPA's strategic plan goal No. 1, "tackle the climate crisis", by demonstrating solutions that increase energy efficiency and reliability, save money, and reduce GHG emissions.

Outputs and Outcomes

Expected outputs and outcomes for each measure are listed in the relevant workplan sections and summarized in the table below.

Measures	Outputs/ Performance Measures	Outcomes / Projected Environmental or Programmatic Improvement
1: Energy Efficiency	# and type of industrial equipment electrified # and type of Industrial Equipment optimized # and type of buildings and equipment optimized	Reduction in metric tons CO2e, including those in LIDAC Electric cost savings, including those in LIDAC Natural Gas $ Savings including those in LIDAC $ Funding distributed to facilities in LIDAC

	MMBTU or MWh reduced for each type/total Semi-annual progress reports and final report	
2: Pre-Weatherization	# of homes pre-weatherized Energy savings (MMBTU or MWh) per project # of new jobs created Semi-annual progress reports and final report	Energy Savings for LIDAC individuals Electric cost savings for LIDAC individuals Natural Gas cost savings for LIDAC individuals Reduction in metric tons CO2e for LIDAC individuals Reduction in CAP for LIDAC individual Semi-annual progress reports and final report
3: Irrigation Well Conversion	# of replacements Age and operating characteristics of engines Semi-annual progress reports and final report	Reduction in metric tons CO2e in LIDAC Reduction in metric tons CO2e Reduction in criteria air pollutants (CAP) Reduction in CAP in LIDAC Semi-annual progress reports and final report
4: Micro-Solar Array Incentives	MW of solar capacity added Semi-annual progress reports and final report	Reduction in metric tons CO2e for LIDAC Reduction in criteria air pollutants for LIDAC Reduced energy costs Semi-annual progress reports and final report
5: Solar Projects	# and type of projects kW of solar capacity added Semi-annual progress reports and final report	Reduced energy costs Reduction in metric tons CO2e, including those in LIDAC Amount of funding distributed to projects in LIDAC
6: Ag Emission Reduction	Acres Registered in CI Registry # and type of Precision Ag Incentives # and type of Regenerative Ag Implemented # of events/attendees Semi-annual progress reports and final report	Reduction in metric tons CO2e, including those in LIDAC $ Funding distributed to projects in LIDAC Greater knowledge of community needs and ability to make improvements
7: Ag Waste Reduction	Tons of Manure Processed # of MMBTUs RNG Produced # of tons of land applied digestate # of new jobs created Semi-annual progress reports and final report	Reduction in metric tons CO2e, including those in LIDAC Decreased synthetic fertilizer use Workforce Development Amount of funding distributed to projects in LIDAC Reduction in criteria air pollutants Improved Water Quality Semi-annual progress reports and final report

8: Biochar Incentives	# and type of biochar projects Operational Hours # cubic yards of biomass # acres cleared Semi-annual progress reports and final report	Reduction in metric tons CO2e, including those in LIDAC $ Funding distributed to projects in LIDAC Land returned to productive use, including acres in LIDAC

Performance Measures and Plan

NDEE has established performance measures as identified in Outputs and Outcomes table above to track progress concerning successful processes, strategies, and associated expenditures. These performance metrics will be tracked for each associated measure with assistance from subrecipients. Subrecipients will be required to track progress for each associated performance measure and report progress to NDEE in semi-annual and final reports. NDEE will provide a status update with respect to each performance measure to EPA in the semi-annual reports and in the final report. These responsibilities will be incorporated in Agreements signed by all subrecipients.

Authorities and Implementation Timelines

NDEE has legal authority to carry out the roles and responsibilities under the proposed measures. A detailed implementation timeline—including tasks, key milestones, and key actions needed to meet measure goals and objectives by the end of the grant period—is presented for each measure in the relevant sections above.

Section 4. Low Income and Disadvantaged Communities

Nebraska's Low Income and Disadvantaged Communities (LIDACs) include both urban and rural areas. These areas cover 21% of the land area of the state and are home to 32.5% of the population. LIDACs are particularly vulnerable to the climate impacts and risks that Nebraska is facing, including drought, wildfire, extreme weather events, flooding, and extreme heat. Implementation of the measures included in this application aim to deliver equitable GHG reductions for LIDACs while also improving public health, promoting economic development, creating jobs, building resiliency, increasing energy efficient housing, and helping LIDACs reduce their energy burden.

Several measures in this workplan are targeted specifically to low-income residents or LIDAC areas. The descriptions of each measure above include summaries of potential benefits to LIDAC areas. For other more general measures that will be open statewide, NDEE will give preference to projects benefiting LIDACs where feasible and will track project locations to provide a basis for evaluating benefits to LIDACs.

Community Benefits

The proposed measures are anticipated to provide significant benefits and avoid disbenefits to LIDACs state-wide. These state-wide measures will have co-benefits localized to the area where the measure is implemented. Specific measures such as the residential pre-weatherization assistance program and incentives for micro-solar arrays for critical infrastructure are designed to directly target LIDACs. While

it's difficult to estimate the associated benefits to LIDACs quantitatively, the following descriptions qualitatively describe expected benefits to LIDACs as a result of grant measures:

- Less pollution in the ambient air due to expected reductions of GHG, criteria air pollutants, and toxic air pollutants at the county level in identified LIDAC communities.
- Financial benefits from residential energy efficiency resulting in decreased energy costs.
- Lower food prices due to increased crop yields from improved soil health and precision practices.
- Creation of many high-paying prevailing wage jobs in identified communities as a result of the grant measures. Residents are working, but a large segment of the population is underemployed. The grant will help build a highly trained workforce in energy efficiency and other GHG reduction areas, primarily through community colleges or apprenticeship programs, helping underemployed Nebraskans secure high paying jobs.
- Reduced risk from shifting production practices allows disadvantaged farmers to decrease emissions by adopting and adapting to production practices that will improve crop yields and preserve their land and livelihoods. For measures to reduce emissions in agricultural production, Nebraska's crops and farmers occupy nearly every corner of every county in the state, including LIDAC areas.
- Improving rural energy resiliency in LIDACs. For hub-and-spoke digesters, about 1/4th of projects may be located in LIDAC areas of the state. Constructing these facilities will generate economic benefit to surrounding communities. Diverting the manure from leaching or running off in current practices can greatly decrease local water pollution in affected LIDAC areas. Local community benefits also include protection of animal and human health by reducing pathogens, increasing production of biogas, and reducing odors from livestock manure.

Community Engagement

NDEE sought public participation and input throughout the development of the proposed GHG reduction measures. Because LIDAC areas are located throughout Nebraska in both rural and urban areas, a combination of in-person and virtual events helped overcome the barrier of geographic representation, especially in rural areas, ensuring that individuals could attend. NDEE contacted municipalities, nonprofit groups, other government agencies, tribes, and residents through various media to inform communities about the state-wide climate plan and to solicit project ideas to be included in the plan.

NDEE held five virtual sector-specific meetings to solicit ideas on possible GHG reduction measures. This was followed by a second round of virtual meetings focused on the five working groups to invite additional ideas and to rank the priority of GHG measures. NDEE reached approximately 500 people through the sector meetings. A project website was created where visitors could submit GHG reeducation ideas as well as provide project feedback, yielding 124 project ideas. NDEE also held five in-person public meetings across the state in both rural and urban areas, in which feedback on potential GHG reduction measures was gathered and discussed. NDEE considered places trusted by the community for meeting locations, such as local libraries and community colleges, and readily accessible by community members. The meetings included a discussion of each community's specific needs followed by a question-and-answer session. For the public meetings, NDEE translated key documents into Spanish and offered translation, interpreters, and other needed accommodations to make meetings as accessible as possible. Through public meetings, NDEE reached approximately 105 individuals.

NDEE plans to continue meaningful community engagement outreach efforts through public meetings, community conversations, and surveys to assess benefits, barriers, and lessons learned relative to each GHG reduction measure in LIDAC areas as the measures are developed and implemented. This feedback will allow sector and community-specific feedback on each measure. NDEE will build relationships with LIDAC areas by learning the demographics through EJScreen, identify key community stakeholders, use credible sources within the LIDAC community to help with our messaging, and find opportunities for collaboration. NDEE will seek input from LIDACs during the development of promotional materials and guidance documents. For pass-through grants, NDEE will require project sponsors to develop outreach and community engagement strategies with LIDACs. Strategies will include listening sessions as well as question and answer meetings. Through targeted outreach, NDEE will prioritize what LIDAC areas value most. When creating programs for all measures, NDEE will give a scoring preference to projects and locations that maximize benefits to LIDAC.

Communication strategies will include a social media presence, updating the NDEE website, and using traditional media such as press releases and radio spots. NDEE and recipients of subawards will translate key documents and offer translation, interpreters, and other needed accommodations to make meetings and programs as accessible as possible. Meetings, conversations, and surveys will be held in partnership with trusted local entities, such as nonprofit organizations, industry partners, and cultural centers. All perspectives are welcome and valued. Feedback will be integrated into implementation to strengthen or mitigate strategies that impact LIDAC areas each year; if a disproportionate negative impact is identified, efforts will be made to mitigate such impacts. NDEE will assess, quantify, and report a more thorough analysis of associated community benefits based on actual data collected during implementation. NDEE will track the deployed measures in and near identified LIDAC census tracts to quantify reduction in GHG and co-pollutant emissions and other community benefits. NDEE will include results of these assessments in semi-annual reports to EPA and make the information publicly available.

Section 5. Job Quality

NDEE will make efforts to generate high-quality jobs through the implementation of GHG reduction measures. While Nebraska has one of the nation's lowest unemployment rates, ranked 5th with an unemployment rate of 2.5% in the nation (Bureau of Labor Statistics, Jan. 2024), local and state Chambers of Commerce, state and local governments, and business partners have emphasized a need to upskill Nebraskans and offer high quality jobs. NDEE will utilize the "Good Jobs Toolkit" to coordinate with Workforce Innovation and Opportunity Act (WIOA) programs and workforce boards at a state and local level to enhance hiring and placement into quality job associated with these programs. NDEE has existing partnerships with community colleges, Nebraska Dept of Labor (NDOL), local workforce boards, unions (IBEW locals and SMART locals), and Community Action Partnership Agencies to bolster workforce development and career pathways into quality jobs including through NDEE's Training for Residential Energy Contractors grant program. Nebraska prioritizes pre-apprenticeship and apprenticeship programs in partnership with the Nebraska Chamber of Commerce and the Nebraska Department of Labor. Nebraska's GHG reduction measures projects will support H3 occupations (high-demand, high skill, & high wage; http://h3.ne.gov), such as electricians, project management specialists, certified energy managers, HVAC installers, environmental scientists, mechanical engineers, agricultural inspectors, and more.

The Program will promote equal opportunity for all businesses including those that are disability-owned businesses, veteran-owned businesses, women-owned businesses, and minority-owned businesses. The Program will require subrecipients to promote equal opportunity for all historically overlooked and underutilized business groups and recruit qualified applicants, particularly from LIDACs, underserved communities, or justice-involved populations, where possible. Pay will be "fair, transparent, and equitable," per the Department of Labor's *Good Jobs Initiative*. All construction activities for public works funded by CPRG will be required to comply with Davis-Bacon requirements. Programs will be developed to minimize the hiring of temporary or contract employees. Throughout the implementation of GHG reduction measures, NDEE will review and apply the *Job Quality Principles* whenever hiring, partnering, contracting with individuals, organizations, or businesses.

Section 6: Budget

A detailed budget description for each measure is in Section 1 of this workplan and in the Budget Spreadsheet.

BUDGET BY PROJECT			
Project Number	**Project Name**	**Total Cost**	**% of Total**
1	*Energy Efficiency Non-Residential*	*$30,302,420*	*10%*
2	*Pre-Weatherization Program*	*$4,078,027*	*1%*
3	*Irrigation Well Replacements*	*$6,140,507*	*2%*
4	*Micro-Solar at Critical Infrastructure*	*$16,406,847*	*5%*
5	*Solar Unused Land*	*$28,081,847*	*9%*
6	*Agricultural Production*	*$160,434,689*	*53%*
7	*AD Hub & Spoke*	*$57,182,628*	*19%*
8	*Biochar*	*$4,373,035*	*1%*
Total		*$307,000,000*	*100%*