

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 CO₂, NO_x, and SO₂ 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.

Eligibility

- 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.

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.
- 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 ₂ e)	CO ₂ Emissions Reductions (MT)	CH ₄ Emissions Reductions (MT CO ₂ e)	N ₂ O Emissions Reductions (MT CO ₂ e)	SO ₂ Emissions Reductions (MT)	NO _x 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.