

**Environment and Natural Resources Trust Fund  
2016 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 153-E**

Solar Solutions to Minnesota Energy Poverty

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**Category:** E. Air Quality, Climate Change, and Renewable Energy

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**Total Project Budget:** \$ 490,429

**Proposed Project Time Period for the Funding Requested:** 2 years, July 2016 to June 2018

**Summary:**

This project reduces carbon emissions, produces clean energy and changes the energy assistance landscape by installing a 200 kW solar array and distributing electricity to Minnesotans qualifying for energy assistance.

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**Name:** Jason Edens

**Sponsoring Organization:** Rural Renewable Energy Alliance

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Pine River MN 56474

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**Email** jason@rreal.org

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**Location**

**Region:** Central

**County Name:** Cass, Crow Wing

**City / Township:**

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**Alternate Text for Visual:**

Solar Installation Site and Design Graphics

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



**PROJECT TITLE:** Solar Solutions to Minnesota Energy Poverty

**I. PROJECT STATEMENT**

The *Solar Solutions to Minnesota Energy Poverty* project will install a 200 kilowatt community solar garden, a centrally-located solar photovoltaic system that provides electricity to participating subscribers off-site, as a new fiscally appropriate model of low-income energy assistance. The electricity generated from this community solar garden will be designated to recipients of Minnesota’s Low-Income Housing Energy Assistance Program (LIHEAP). The system will be installed in Backus, Minnesota and demonstrate the efficacy of utilizing community solar gardens to meet the energy needs of low-income households to local, state, and national Energy Assistance and Weatherization Assistance Programs. Currently, energy assistance and weatherization programs don’t provide a long-term solution and depend on imported fossil fuels. Utilizing Minnesota solar energy to meet this need is innovative and desirable in preserving Minnesota’s valuable natural resources.

This project responds to the growing natural resource impacts of using imported, fossil fuels to supply Minnesota’s low-income energy needs. The solar energy system will increase the state’s annual renewable energy production by an estimated 285,705 kilowatt hours<sup>1</sup>, thereby offsetting an estimated 217 tons of annual carbon dioxide emissions.<sup>2</sup> Project goals include reducing carbon emissions to prevent further climate change, increasing utilization of local power generation, improving energy security and affordability, and creating low-income access to renewable energy.

<sup>1</sup> National Renewable Energy Laboratory (NREL) PV Watts® Calculator

<sup>2</sup> Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** *Solar Assessment, Analysis and Design at Community Solar Site* **Budget: \$10,000**  
*RREAL will perform a comprehensive solar site assessment and analysis for the 200 kilowatt Community Solar Garden Photovoltaic array in Backus, Minnesota.*

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Creation of comprehensive solar site assessment at Backus property.</i>	<i>Fall 2016</i>
<i>2. Generation of a site-specific solar design for site.</i>	<i>Fall 2016</i>

**Activity 2:** *Community Solar Garden Procurement and Construction* **Budget: \$424,479**  
*Procurement of solar equipment and ancillary materials and permits as required by utility and local authorities.*

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Preparation of project management plan.</i>	<i>Winter 2017</i>
<i>2. Procurement of the following permits, and utility agreements: - Cass County building permit - Interconnection agreement from Minnesota Power</i>	<i>Winter 2017</i>
<i>3. Purchase of equipment and materials to be used in the construction of the community solar garden, including approximately 488 Minnesota-made photovoltaic modules, racking, inverters, electrical parts, hardware, fencing, and additional system components.</i>	<i>Winter 2017</i>
<i>4. All equipment and materials will have been received and placed in inventory until construction start date.</i>	<i>Spring 2017</i>



**Activity 3: Construction and Commissioning of Community Solar Garden Array**  
*RREAL will construct and commission the community solar garden.*

**Budget: \$50,950**

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Installation phase 1: footings</i>	<i>Summer 2018</i>
<i>2. Installation phase 2: racking</i>	<i>Summer 2018</i>
<i>3. Installation phase 3: modules and inverters</i>	<i>Summer 2018</i>
<i>4. Installation phase 4: trenching and electrical, production meter</i>	<i>Summer 2018</i>
<i>5. Installation phase 5: inspection and commission</i>	<i>Summer 2018</i>

**Activity 4: Report Generation and Project Dissemination**

**Budget: \$5,000**

*RREAL will summarize results and create how-to model to the U.S. low-income energy assistance community.*

<b>Outcome</b>	<b>Completion Date</b>
<i>1. Report generation.</i>	<i>Summer 2018</i>
<i>2. Dissemination to national energy assistance and weatherization community.</i>	<i>Summer 2018</i>

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

The Rural Renewable Energy Alliance (RREAL) will be the project lead and recipient of the funding request to the Environmental and Natural Resources Trust Fund. RREAL will lead the site assessment process, design, and installation of the community solar garden. RREAL will work alongside project partners including Minnesota Community Action Partnership and Minnesota Power to ensure the project design aligns with necessary utility needs and energy assistance programming frameworks. These partners will contribute to the implementation of the community solar array through in-kind donations.

**B. Project Impact and Long-Term Strategy**

RREAL will develop a planning, financing and implementation model for low-income community solar gardens. This information will be disseminated to statewide, regional and national Energy Assistance and Weatherization Assistance service providers so that the project can be successfully replicated and scaled in other geographies, thereby expanding the impact that solar contributes to Minnesota’s environment and renewable energy production.

**C. Timeline Requirements**

The activities for this project proposal will begin in fall 2016 and be completed in summer of 2018. The fall 2016 – summer 2018 timeline accounts for any delays attributed to unpredictable weather events and factors.

## 2016 Detailed Project Budget

**Project Title:** *Solar Solutions to Minnesota Energy Poverty*

### IV. TOTAL ENRTF REQUEST BUDGET [2] years

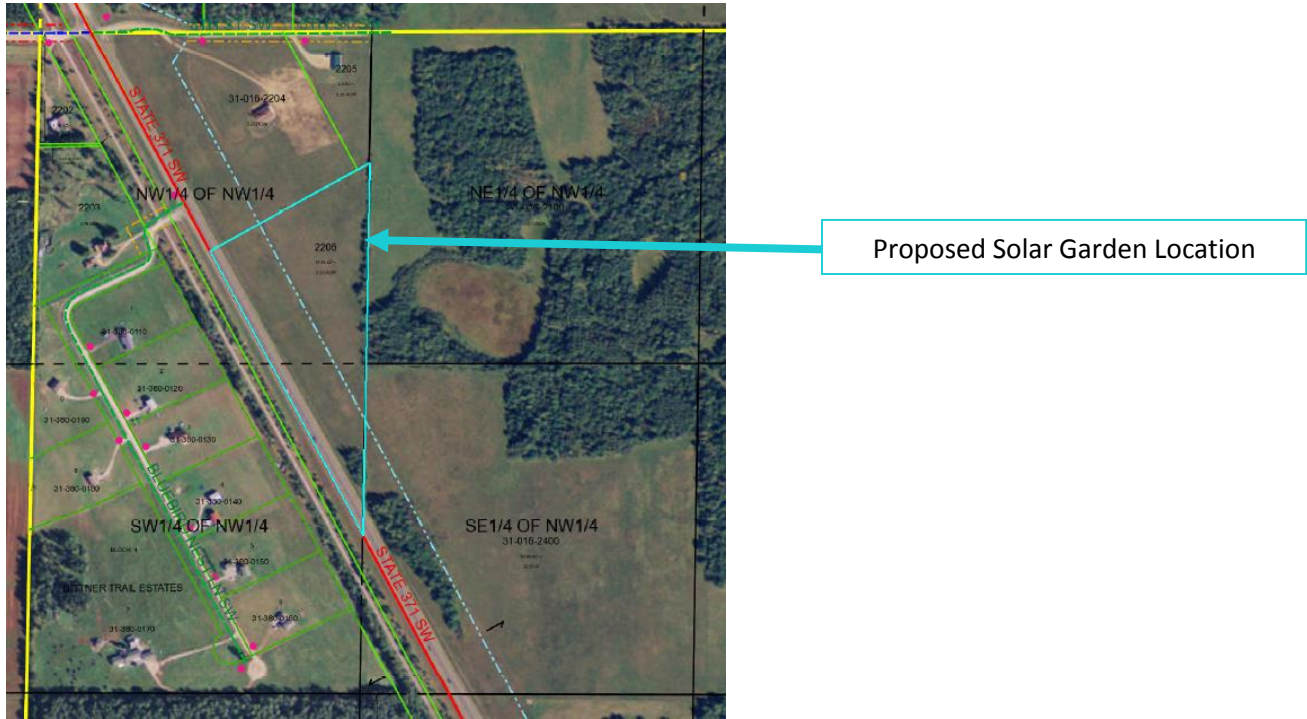
<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>Personnel:</b>	
RREAL Master Electrician Joel Lindstrom at 325 hours at \$90 per hour for system's electrical work.	\$ 29,250.00
RREAL Technical Director Roger Garton at 160 hours at \$125 per hour for system design, engineering and on-site project foreman.	\$ 20,000.00
RREAL Installation Crew - 195 hours at \$60 per hour for system construction.	\$ 11,700.00
Jason Edens and program support staff report generation and project dissemination 100 hours at \$50 per hour	\$ 5,000.00
<b>Professional/Technical/Service Contracts:</b>	\$ -
Electrical Permits & Inspection	\$ 5,646.00
Electrical Engineering Subcontract with Gausman and Moore	\$ 3,500.00
Geotechnical Report Subcontract with Meyer Borgman and Johnson	\$ 1,500.00
Structural Review Subcontract with Meyer Borgman and Johnson	\$ 6,000.00
<b>Equipment/Tools/Supplies:</b>	\$ -
488 Minnesota Made Photovoltaic Solar Modules - 410W, 72-Cell (with Shipping)	\$ 211,311.00
tenK Ground-Mount Racking - Custom (with Shipping)	\$ 73,032.00
Sunergy Inverters (with Shipping)	\$ 32,080.00
Electrical Parts - Array, Underground, & Balance of Systems	\$ 23,527.00
260 of Helical Piles for System Foundation	\$ 31,820.00
Equipment Rental of Helical Anchor Drive-attachment	\$ 820.00
Code required fencing	\$ 35,243.00
<b>Acquisition (Fee Title or Permanent Easements):</b>	N/A
<b>Travel:</b>	N/A
<b>Additional Budget Items:</b>	N/A
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 490,429.00</b>

### V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ To Be Applied To Project During Project Period:</b>	\$ 75,000	<i>Secured</i>
McKnight Foundation		
<b>Other State \$ To Be Applied To Project During Project Period:</b>	N/A	<i>Indicate: Secured or Pending</i>
<b>In-kind Services To Be Applied To Project During Project Period:</b>	\$ 30,000	<i>Secured</i>
The Rural Renewable Energy Alliance will provide 5 acres of land as the installation site.		
<b>Funding History:</b>	\$ 75,000	<i>Secured</i>
McKnight Foundation		
<b>Remaining \$ From Current ENRTF Appropriation:</b>	N/A	<i>Indicate: Unspent? Legally Obligated? Other?</i>



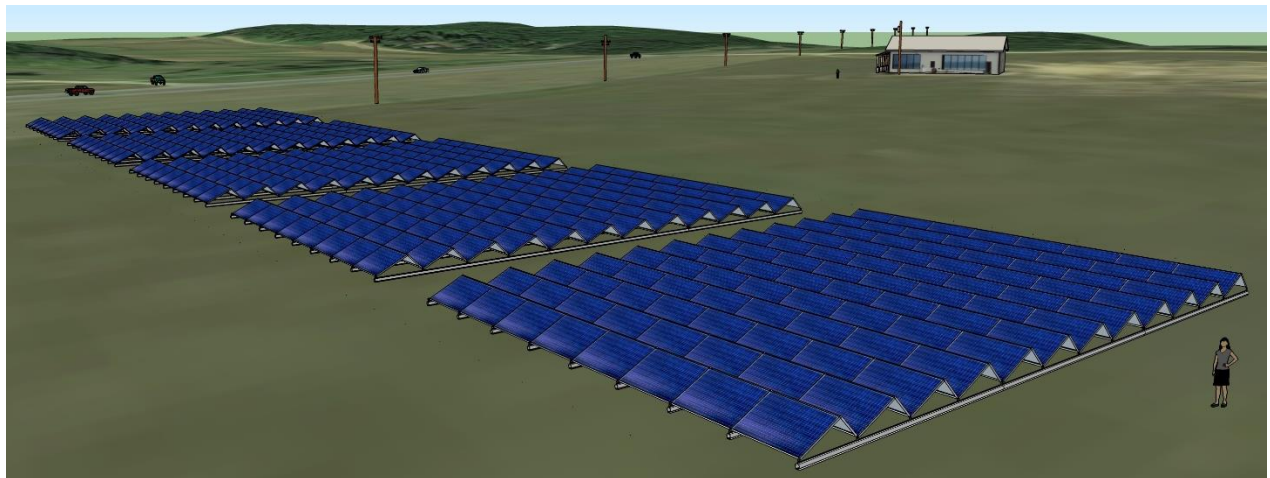
**Map 1.** Solar Installation Site – 3963 8<sup>th</sup> St SW, Backus, MN 56435.



**Visual 1.** Site & System Design Rendering from East.



**Visual 2.** Site & System Design Rendering from South.





**Environment and Natural Resources Trust Fund (ENRTF)**  
**Project Manager Qualifications & Organization Description**  
**Project Title: *Solar Solutions to Minnesota Energy Poverty***

**Project Manager Qualifications:**

Jason Edens is the founding Director of the Rural Renewable Energy Alliance (RREAL). Jason holds a Masters in Environmental Studies from Bemidji State University, is a licensed contractor in Minnesota and North Dakota, and is certified as a solar heating installer by the North American Board of Certified Energy Practitioners (NABCEP). Jason has grown RREAL from a small, grassroots efforts operating out of a garage to a 501(c)3 nonprofit organization that has performed hundreds of solar energy installations for both low-income clients and market-rate customers in the residential, commercial, and municipal sectors. Of these installations, Jason has shepherded the development of Minnesota's first Community Solar Garden with the Wright Hennepin Electric Cooperative Association and a 40 kilowatt solar electric system for a multi-family workforce housing complex with the Central Minnesota Housing Partnership. Both projects are highly relevant in size, scope, and nature to the first Community Solar for Community Action demonstration project. Under Jason's leadership, RREAL has been recognized by the Minnesota Council of Nonprofits for the Mission Award in Innovation, by the Initiative Foundation as an Outstanding Green Venture, and most recently, as an Energy & Climate finalist for the Environmental Initiative Awards.

**Organization Description:**

The Rural Renewable Energy Alliance (RREAL) is a 501(c)3 nonprofit solar manufacturer and design-build firm with the mission of making solar energy accessible to communities of all income levels. Founded in 2000, RREAL has been pioneering the use of solar technologies to address low-income fuel poverty throughout the Midwest.

RREAL accomplishes its mission primarily through Solar Assistance, a program which provides residential solar energy systems to low-income households in partnership with community action agencies, the State of Minnesota, Housing and Redevelopment Authorities, Habitat for Humanity affiliates, affordable housing providers and tribal communities. In addition to Solar Assistance, RREAL is home to several other programming efforts including an Education & Community Outreach (ECO) program which provides hands-on educational and training opportunities for learners of all ages. RREAL also operates two social enterprises, Manufacturing & Distribution and REAL Solar Design-Build, in an effort to provide financial sustainability and self-sufficiency.