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

Project Title: **ENRTF ID: 144-E**

Geotargeted Distributed Clean Energy Initiative

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

Total Project Budget: $ 1,850,000

Proposed Project Time Period for the Funding Requested: 3 years, July 2016 to June 2019

Summary:

This project will determine the potential for geographically targeted clean, distributed energy resources to replace planned transmission and distribution upgrades by testing the concept in three communities.

Name: Carl Nelson

Sponsoring Organization: Center for Energy and Environment

Address: 212 3rd Ave N, Suite 560

Minneapolis MN 55407

Telephone Number: (612) 335-5871

Email cnelson@mncee.org

Web Address www.mncee.org

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Figure 1 on this visual attachment shows a graphic representation of the generation, transmission, and distribution of electricity, from power plant to home or business. Figure 2 shows that the electricity sector is the highest contributor to Minnesotas greenhouse gas emissions, at 34 percent of the total. And Figure 3 shows that an estimated 1.6 billion dollars needs to be invested in the US Electricity grid before 2030.

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

PROJECT TITLE: Geotargeted Distributed Clean Energy Initiative

I. PROJECT STATEMENT

Strategic geotargeted distributed clean energy investments – energy efficiency, load control and distributed renewable generation – can defer capital investments in upgrading electric utility transmission and distribution (T&D) assets and avoid environmental emissions like greenhouse gases, mercury and fine particulates. Traditional utility planning is to forecast electric load growth by T&D service area and build larger T&D to supply areas in which electric demand growth will eventually exceed installed capacity. But a larger grid may not always be the best and most cost-effective method for meeting reliable electric demand. The goal of this project is to reduce the environmental impact of the electric utility sector by determining the potential for energy efficiency, solar PV and other distributed energy resources to be applied in a very focused and localized way to replace planned T&D upgrades.

We know that geotargeted distributed clean energy can replace the need for or defer traditional T&D upgrades in certain cases, but it has never been done in Minnesota. We lack practical information about how to do it, and the policy framework does not exist. This project will plan and implement distributed clean energy projects in three communities within Xcel Energy's territory, to test the viability of a geotargeting strategy, and to gain practical information about how to do it. Xcel Energy's existing energy efficiency programs will provide the base for these efforts, but will be enhanced with innovative program strategies that will achieve the extremely high participation that will be necessary for success, and consider advanced technologies that are not currently used in Xcel's programs. Based on the findings from these communities, a final report will document policy recommendations, including the total potential for emissions reduction and local energy investment if the policy were to be adopted on a wide scale.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Planning for Distributed Clean Energy Investment **Budget: $400,000**

The project will choose and conduct planning in three communities to pilot a new method of distributed clean energy investment. The communities would be selected based on technical criteria including need for T&D investments and likelihood of success in deferring investment needs. A planning phase in each of these communities will establish technical potential of energy efficiency and distributed resource technologies in these communities, and develop a plan to reach this potential.

Outcome	Completion Date
1. Develop dataset of qualified T&D deferment projects, and develop selection criteria.	*Aug 31, 2016*
2. Choose three pilot communities.	*Sept 31, 2016*
3. Conduct technical potential of energy efficiency and other distributed energy resources to defer T&D investment.	*Feb 28, 2017*
4. Develop innovative program strategies to deploy energy efficiency and distributed energy resources.	*Mar 31, 2017*
5. Complete community plans, leveraging Xcel Energy existing programs.	*Apr 30, 2017*

Activity 2: Implement Programs **Budget: $1,250,000**

Based on the planning phase, the project would implement innovative program strategies to achieve distributed clean energy investments in three communities. This is expected to include aggressive programs and outreach to get homes and businesses to adopt more energy-efficient equipment and other distributed energy resources like rooftop solar, and participate in sufficient numbers to achieve the necessary electric demand reductions. Project funds would go into outreach and implementing programs, while the capital dollars to install equipment would come from the utility and individual homeowners and businesses.

Outcome	Completion Date
1. Launch innovative programs in three communities.	*Jun 1, 2017*
2. End program implementation in three communities.	*Mar 31, 2019*

Activity 3: Recommendations on Utility Regulatory Reform **Budget: $200,000**

The project would synthesize findings from pilot programs, assess statewide potential, and provide recommendations to Minnesota regulators for reforming utility regulation to defer T&D investments with energy efficiency and other distributed energy resources when appropriate.

Outcome	Completion Date
1. Conduct technical potential study of statewide potential for smart-grid community distributed energy resources investment.	*May 31, 2019*
2. Synthesize findings from pilot programs.	*May 31, 2019*
3. Provide final report, with utility reform recommendations.	*Jun 30, 2019*

III. PROJECT STRATEGY

A. Project Team/Partners

This project will be a collaboration between Center for Energy and Environment (CEE), Xcel Energy and Energy Systems Consulting Services.

Project Partners Receiving Funds:

- Center for Energy and Environment will lead the project and is responsible for all outcomes ($1,505,000)
- Energy Systems Consulting Services (Matt Schuerger) will provide electrical engineering and distributed energy technology technical consulting ($200,000)
- Energy analysis consulting firm, TBD, will assist with the assessment of technical potential ($100,000)
- Survey firm, TBD, will assist with program evaluation activities ($45,000)

Project Partners Not Receiving Funds:

- Xcel Energy will advise, provide technical support and provide funding for energy efficiency programs (matching funds estimated at $800,000, including energy efficiency program investments and in-kind staff contributions)

B. Project Impact and Long-Term Strategy

This project will help catalyze and inform a shift in Minnesota energy policy, to focus on deferring T&D investments when it is feasible to do so with distributed clean energy options. This would result in decreases in carbon dioxide and other air emissions. Our partnership with Xcel Energy and state regulators will help to ensure that our recommendations are not only practical, but will also be adopted by regulators. Once adopted as regulatory practice, it would be funded as part of routine utility operations.

Furthermore, the program strategies developed here may be more broadly applicable in utilities' cost-effective energy efficiency portfolios. Because we would deliberately develop more aggressive and cutting edge program strategies, the efficacy of these program strategies could help inform the whole of a utilities program portfolios.

C. Timeline Requirements

This would be a 36-month project, with a 10-month planning phase, a 22-month implementation phase, and several months to synthesize the information learned from the pilot into a final report. For some communities, the implementation phase may take longer than 22 months. In this case, only Xcel Energy funding would be used for any implementation after the LCCMR project period. For the final report, the lessons learned as of March 2019 would be used.

2016 Detailed Project Budget

Project Title: Geotargeted Distributed Clean Energy Initiative

IV. TOTAL ENRTF REQUEST BUDGET 3 years

BUDGET ITEM	AMOUNT
Personnel:	
Carl Nelson, Project Manager (70% salary, 30% benefits); 60% FTE yr 1; 50% FTE yr 2&3	$ 229,000
Mike Bull, Policy Reform Lead (70% salary, 30% benefits); 10% FTE yr 1&2; 30% FTE yr 3	$ 107,000
Mark Hancock, P.E., Technical Lead (70% salary, 30% benefits); 40% FTE yr 1; 20% FTE yr 2&3	$ 149,000
Program Coordinator (70% salary, 30% benefits); 30% FTE yr 1; 90% FTE yr 2&3	$ 165,000
Engineering support (70% salary, 30% benefits); 90% FTE yr 1; 20% FTE yr 2&3	$ 158,000
Program outreach and implementation staff (70% salary, 30% benefits); 13% FTE yr 1; 4 FTE yr 2&3	$ 697,000
Professional/Technical/Service Contracts:	
Energy Systems Consulting, LLC: Technical support for distributed clean energy technology analysis and implementation, Activities 1, 2 & 3	$ 200,000
Energy analysis consulting firm TBD: Assist with technical potential, Activity 1	$ 100,000
Survey evaluation firm TBD: Part of program evaluation, Activity 3	$ 45,000
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 1,850,000

V. OTHER FUNDS

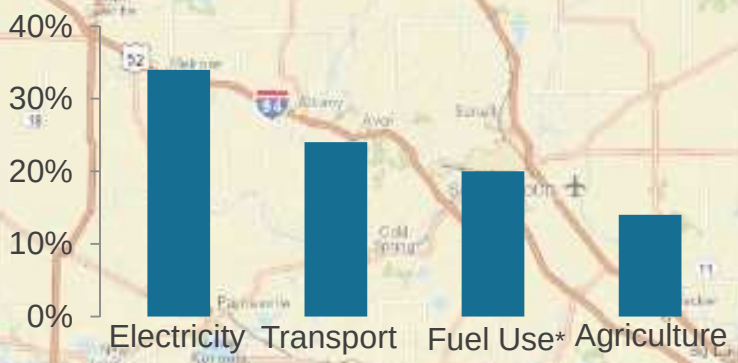
SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period:		
Utility partner	$ 800,000	*Pending*
Private foundations	$ 200,000	*Pending*
In-kind Services To Be Applied To Project During Project Period: *CEE organizational expenses associated with the project (office space, donated time from CEE President & personnel expenses, such as paid time off, that are not recoverable from ENRTF)*	$ 200,000	*Secured*

Project Title: Geotargeted Distributed Clean Energy Initiative

Strategic use of distributed energy efficiency and renewable resources in Minnesota's growing load centers can help avoid expensive infrastructure investments and reduce emissions.

Figure 1: The Generation, Transmission, and Distribution of Electricity

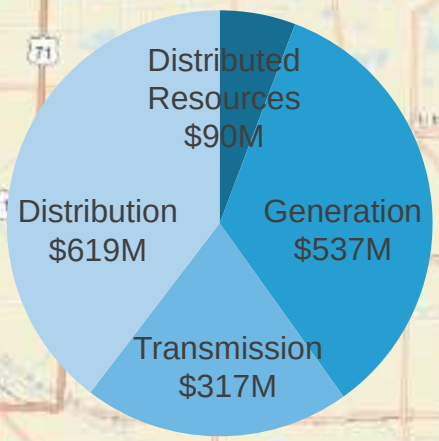
Figure 2: Top Greenhouse Gas Sectors in Minnesota



**Direct fuel use such as for industry or space heating*

Source: Minnesota Climate Change Advisory Group (2008)

Figure 3: US Power Sector Capital Investment Needs (2010-2030)



Source: The Brattle Group (2008)

Geotargeted Distributed Clean Energy Initiative

Project Manager Qualifications

Carl Nelson is CEE's Director of Program Development. Carl has over 15 years' experience in the assessment and implementation of a broad array of energy efficiency and community-scale renewable energy projects, including wind, solar and biomass. He currently coordinates the development of new program initiatives at CEE, as well as overseeing CEE's residential energy efficiency programs. Carl is one of Minnesota's leading experts in the design and implementation of energy efficiency programs. Two energy efficiency programs he has overseen while at CEE have won awards for "Exemplary Programs" from the American Council for an Energy-Efficient Economy (ACEEE). Carl was the project manager for the previously-funded ENRTF project "Energy Efficient Cities." This ambitious project exceeded program goals, leveraging more dollars than projected, and creating a new model for cost-effective residential energy efficiency program delivery. Over 6,922 households participated in the project (goal was 6,000) in 7 cities throughout Minnesota with 1,474 of those households completing major energy upgrades, generating $4.8 million in contractor work and saving homeowners $13.8 million on their energy bills. A majority of these programs continue to be funded by electric utilities to this day, succeeding in the program goal of creating an ongoing and a sustainable source of funding for the programs that were jumpstarted by ENRTF grant funds.

Organization Description

The Center for Energy and Environment (CEE) works to discover and advance the most effective energy solutions to strengthen the economy while improving the environment. CEE conducts research and develops programs so that:

- Businesses operate more efficiently and profitably;
- Government agencies and nonprofits spend less on facilities and functions;
- Utilities achieve their energy efficiency goals at least cost; and
- Households save money and improve comfort.

CEE has four integrated areas of expertise:

Research: We have a staff of PhD's and Research Engineers that are unmatched outside of the national energy labs, doing nation-leading technical research on building science, HVAC systems, indoor air quality, and a host of related issues.

Programs and Services: We run a number of energy efficiency programs to help homeowners and businesses reduce their energy bills. Xcel Energy's Minnesota small business customers will save more than $400 million dollars as a result of the work we have done to date with this customer segment.

Financing: Our Lending Center at CEE has provided nearly $200 million dollars in low-cost financing to residential and commercial customers throughout the state for energy efficiency installations and building retrofits.

Policy Innovation and Engagement: Our technical expertise combined with our deep understanding of policy making in both legislative and regulatory venues results in a practical and consensus-based orientation to policy-making.