Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2016 Work Plan

Date of Report: February 23, 2016

Date of Next Status Update Report: December 31, 2016

Date of Work Plan Approval:

Project Completion Date: June 30, 2019

Does this submission include an amendment request? _No_

PROJECT TITLE: Geotargeted Distributed Clean Energy Initiative

Project Manager: Carl Nelson

Organization: Center for Energy and Environment

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Location: The exact project locations would be determined through technical analysis, but the project would strive to include at least one Metro area as well as a non-Metro area within Xcel Energy's service territory.

Total ENRTF Project Budget: $800,000	**ENRTF Appropriation:**	**$800,000**
	Amount Spent:	**$0**
	Balance:	**$800,000**

Legal Citation: M.L. 2016, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT TITLE: Geotargeted Distributed Clean Energy Initiative

II. 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 assets and avoid environmental emissions like greenhouse gases, mercury and fine particulates. Traditional utility planning is to forecast electric load growth by transmission and distribution service area and build larger transmission and distribution 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 clean distributed energy resources to be applied in a very focused and localized way to replace planned transmission and distribution upgrades.

We know that geotargeted distributed clean energy can replace the need for or defer traditional transmission and distribution 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 conduct planning for distributed clean energy projects in three communities within Xcel Energy's territory, and select at least one project area for implementing a pilot program. The goal is 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. A final report will document lessons learned and policy recommendations, including the total potential for emissions reduction and local energy investment if the policy were to be adopted statewide.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of December 31, 2016:

Project Status as of June 30, 2017:

Project Status as of December 31, 2017:

Project Status as of June 30, 2018:

Project Status as of December 31, 2018:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Planning for Geotargeted Clean Energy Investment
Description:
The project will choose and conduct planning in 2-3 project areas to pilot a new method of distributed clean energy investment. The project areas would be selected based on technical criteria including need for transmission and distribution investments and likelihood of success in deferring investment needs. A planning phase will establish technical potential of energy efficiency and distributed resource technologies in these project areas, and develop a plan to reach this potential.

Develop dataset of qualified transmission and distribution deferment projects and develop selection criteria
The first step in Activity 1 is to determine the total potential to defer traditional transmission and distribution investments with distributed energy resources on Xcel Energy's system. Traditional transmission and distribution investments might include building more high-wire transmission lines to increase capacity at a substation, increasing transformer capacity at a substation, or other investments to serve an increased energy load. Distributed energy resources, on the other hand, would serve to decrease the energy load on the grid. Identifying and characterizing the total potential on Xcel's system will also help with identifying total statewide potential as well.

We would next prioritize projects that would be the best candidates for further feasibility analysis. We would work with Xcel Energy staff to gain baseline data on current distribution investment needs and the process for determining those needs. We would anticipate that this analysis would be done at the feeder line level (i.e., the individual distribution feeder lines that deliver power from the substation to customers). However, it could be at the whole substation level as well, depending on the specific project being analyzed. In order to determine if clean distributed energy resources would be able to meet those needs, we would work to characterize the investment potential by the types of engineering problems that the investments were trying to solve, e.g., overloading, outage recovery issues, and/or operational issues. This would allow us to be able to better tailor the distributed energy resource solutions to the problems that were being experienced.

In order to prioritize potential investment upgrade opportunities, the project team would work to develop a screening process that could be applied to potential projects. In addition to being useful for this project, we anticipate that the process developed would also be useful more broadly in defining when it makes sense to pursue geotargeting as a systematic process. The screening process is expected to include criteria to help prioritize projects, including such things such as:

- How appropriate are distributed energy resources in deferring and/or meeting the technical needs of the problem;
- Is the time frame within which the upgrades are needed sufficient to deploy distributed energy resources;
- Is the customer mix on the feeder line appropriate to the distributed energy resource technologies being targeted; and
- To what extent would the distributed energy resources defer (i.e., avoid the need for a period of time), versus avoid, the need for infrastructure upgrades, and what is the economic benefit of deferral versus avoidance.

Choose project areas for feasibility study
Because a project area is determined by technical criteria, and does not necessarily match up well with municipal boundaries, a project area could be entirely contained within one city, or encompass parts of several cities, depending on where power lines are located. The screening process, as described in the previous section, would be applied to potential project areas on the Xcel Energy system, in order to identify the top project areas that would be best suited to conduct geotargeted distributed energy resource projects.

We would strive to select a top priority, as well as 1-2 additional project areas from the screening analysis, for a total of 2-3 prioritized project areas. We would conduct more detailed feasibility analysis on each of these 2-3 project areas. We would strive to select at least one Metro and at least one non-Metro project area. Although we anticipate that only one project area would be selected for the pilot (Activity 2), the other prioritized project areas could be funded with non-ENRTF dollars if alternative funding sources were identified.

The determination of whether the project conducts detailed feasibility on either 2 or 3 project areas would be determined by the project team, and will depend on the overall size of the project areas (e.g., 2 large projects, or 3 smaller projects); the overall feasibility of the projects available (e.g., only 2 projects if the potential 3rd project is determined to be only marginally feasible); and the similarity of potential projects (e.g., only 2 projects if the potential 3rd project is substantially similar in terms of demographics and technical challenges to the 2nd project).

The project areas would be located within the Xcel Energy service territory, which includes parts of all of the following Minnesota counties: Anoka, Benton, Blue Earth, Brown, Carver, Chippewa, Chisago, Clay, Dakota, Dodge, Douglas, Faribault, Freeborn, Goodhue, Hennepin, Houston, Isanti, Kandiyohi, Lac Qui Parle, Le Sueur, Lincoln, Lyon, McLeod, Meeker, Mower, Murray, Nicollet, Norman, Olmsted, Pipestone, Pope, Ramsey, Redwood, Renville, Rice, Rock, Scott, Sherburne, Sibley, Stearns, Steele, Swift, Todd, Wabasha, Waseca, Washington, Watonwan, Wilkin, Winona, Wright, Yellow Medicine.

Conduct feasibility study

The project team will conduct a technical potential study to determine the feasibility of as well as the optimal mix of distributed energy resource technologies for the 2-3 prioritized project areas. Based on this potential study, one project area will be selected for implementing a pilot in Activity 2. The project area for the pilot will need to be selected both based on the need for upgrades as well as the feasibility of distributed energy resources to meet that need. Part of the feasibility of distributed energy resources to meet the need will depend on the community characteristics of the project area (e.g., how many commercial customers vs. residential, historic participation in conservation programs as an indicator of interest in distributed energy resources, load characteristics of customers on the feeder line, etc.).

The distributed energy resource technologies that are anticipated to be included in the feasibility study, and have the potential to be cost-effectively deployed to defer local distribution infrastructure are:

- Energy efficiency (technologies that reduce electrical load);
- Clean distributed energy generation, particularly photovoltaic;
- Demand response (this includes existing technologies that reduce peak energy demand through direct load control, such as controls that cycle air conditioners on and off during times of peak electricity demand; advanced technologies including Demand Response Management System capabilities which allow the utility to monitor and dispatch distributed resources more effectively, such as forecasting load reduction and aggregate load shaping analysis; dynamic pricing; and behavioral demand response); and
- Distributed flexibility and storage technologies (including electric vehicles, thermal storage, and battery storage - batteries along with associated controls that store energy during non-peak times, and then discharge the energy during peak hours).

Effective solutions are anticipated to aggregate multiple complementary distributed energy resource technologies.

Develop innovative program strategies

The deployment of distributed energy resource technologies will mostly or entirely be at Xcel Energy customer sites, with some level of cost-sharing done by these customers. In order to recruit customers to install distributed energy resources, as well as identify individual customer opportunities for deployment of distributed energy resources, innovative program delivery strategies will be necessary. While Xcel Energy currently runs energy efficiency programs to achieve a similar goal, the level of participation and penetration that is expected to be necessary for geotargeted distributed energy resources will be substantially greater than is typically achieved by these programs. Thus, the programs will need to be creative and innovative in going well beyond what is typically achieved by these programs.

Complete implementation plan

Based on the technical feasibility as well as the program strategies, a project area implementation plan will be developed for the selected project area. This plan will be the primary deliverable for Activity 1, as well as the basis for the completion of Activity 2 (implementation). The plan will include:

- A summary of background and demographic data on the project area, including detailed information on the customer base;
- Description of the technical problem that the distributed energy resource is attempting to solve (e.g., 10 MW overloading of feeder system);
- A description of the technologies and program strategies that will be employed; and
- A workplan, budget (including non-ENRTF budget requirements) and timeline for implementing the plan.

Summary Budget Information for Activity 1:

ENRTF Budget: $ 400,000
Amount Spent: $ 0
Balance: $ 400,000

Outcome	Completion Date
1. Develop dataset of qualified transmission and distribution deferment projects, and develop selection criteria.	Sep 30, 2016
2. Choose project areas for feasibility study.	Dec 31, 2016
3. Conduct feasibility study.	Jun 30, 2017
4. Develop innovative program strategies.	Oct 31, 2017
5. Complete implementation plan.	Nov 30, 2017

Activity Status as of December 31, 2016:

Activity Status as of June 30, 2017:

Activity Status as of December 31, 2017:

Activity Status as of June 30, 2018:

Activity Status as of December 31, 2018:

Final Report Summary:

ACTIVITY 2: Implement Programs

Description:

Based on the planning phase, the project would implement innovative program strategies to achieve distributed clean energy investments in the selected project area. 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 matching funds would be provided in the form of capital dollars to install equipment from the utility and individual homeowners and businesses.

The implementation of Activity 2 is dependent upon receiving a commitment for at least $200,000 in matching funds. Once that is received, we will submit a revised workplan for Activity 2, along with a request for matching

funds approval. Consistent with the legislative appropriation language, no activity under Activity 2 will be started and no funds spent until the revised workplan and matching funds have been approved.

The implementation plan (an outcome of Activity 1) would provide the details of the workplan for this phase. The specifics of the implementation plan will be highly dependent on the area-specific characteristics of the project area, including the demographic characteristics, the exact mix of residential, commercial and industrial customers, and the appropriate distributed energy resources that will be used. For illustrative purposes, this could involve the following range of customers that would be targeted for participating in programs:

- Residential customers: 500 – 2,000
- Small business customers: 50 – 300
- Large commercial customers: 5 – 25
- Industrial customers: 0 - 10

The activities below are likewise illustrative of what would be anticipated to be included in this plan, in order to achieve those levels of participation.

Refinement of program-specific communications

The goal of Activity 2 is to recruit participants in several target market segments (e.g., single-family residential, small business, large commercial, industrial) to participate in the distributed clean energy programs that have been defined by Activity 1.

These programs will include a range of segment-specific and technology-specific offerings, such as:

- A window air conditioner trade-in program for single-family homeowners to replace their inefficient air conditioners with more efficient models;
- A rooftop solar program for single-family homeowners to install solar on their rooftops;
- A large business emergency back-up power program, that provides financial incentives for large businesses to install an emergency back-up battery array, that the utility can also use to deploy during peak power times, and charge up with excess wind power during the night;
- A small business air conditioner optimization program, where small businesses can retrofit their rooftop air conditioning units with a controls package that can save them up to 40% on their electric bills, and reduce peak demand for electricity.

For each of these programs, messaging would be developed to outline program features and benefits, for the specific market segment that was being targeted. In addition, an overall communications frame would be developed – establishing the unique nature and limited-time nature of the opportunity, and making a compelling case for participation. This messaging may need to be validated with specific focus-group or survey research.

Targeted, intensive outreach campaign

A typical, successful utility-funded energy efficiency program might achieve 1%-5% customer up-take per year. A geotargeting approach will need a much higher up-take, in the range of 10%-30% uptake for select target customer segments. To achieve such a high penetration, typical mass-marketing techniques are necessary but not sufficient.

The outreach efforts will contain traditional marketing techniques such as email, an “earned” media strategy, and direct-mail campaigns. Local papers and e-newsletters may be interested in reporting on the project, and we would work with them closely. Direct mail and email campaigns would also be employed, and can be an effective way to build awareness.

However, to achieve the high penetration necessary for this pilot, a more personalized and one-to-one approach will need to augment traditional marketing techniques. Project staff will need to connect deeply with specific community members in the project area.

One such personalized approach is to recruit and employ influential champions in the outreach campaign, specific to the customer target market being sought out. The idea here is that locally, certain individuals are considered thought leaders, and their behavior can influence the decisions of others. For example, in the small business segment, there might be a local business leader, who is well-known to her colleagues, perhaps because of her involvement with the local chapter of the Chamber of Commerce. Other business leaders may look to her for advice and leadership. If she enrolls her business to participate in energy efficiency and solar energy efforts sponsored by the pilot, her example may bring others on board, particularly if she is willing to speak publically in favor of the programs.

Other one-on-one approaches that may be used include:

- Door-knocking campaigns;
- Presentations to local community and business organizations; and
- Hosting of "model home" or "model business" tours to demonstrate adoption of new technologies.

Technical assistance, segmented by industry sector

Once there is interest generated in the participating in one or more of the offered programs, some of the homeowners or business owners will need to have customized technical assistance. This assistance will help them determine the best scope of services for their situation, and work with them to address any concerns or challenges that they have in participating in specific programs. The technical assistance would primarily involve site-visits to the home or business to discuss site-specific issues or to develop a detailed work scope for the project. Providing technical assistance will be crucial for achieving high penetration of customer participation in the implementation programs.

Analysis of utility data, and targeted messages for high users

Within a given project area, there may be a small number of electric customers that are responsible for a large percentage of the total system electricity load. Thus, when trying to reduce overall load, these customers will be of utmost importance. Further, within a given segment, the highest-using customers may have the greatest potential for reducing their load.

The implementation pilot will identify and target high-usage customers, and also work to engage and motivate customers in energy saving strategies through utility bill analysis. Effective identification of these customers, as well as motivating them, will be important to the success of this project. Usage of 15-minute or higher-frequency utility bill data can allow even deeper insight into site-specific opportunities. Trained energy analysts can also review these energy usage patterns, along with knowledge of the building, to identify energy savings opportunities. A more simplified energy pattern analysis can be done with advanced algorithms. While Xcel does not currently have "smart-meter" technology that would enable the most advanced types of energy bill analysis, in the future these smart meters may be essential to cost-effectively implementing a geotargeting approach. Thus, where possible, the project will consider installation of advanced meters for specific high-value customers in order to utilize some of the more advanced opportunities to identify and implement energy saving strategies. This analysis can also be helpful in determining the site-specific feasibility for renewable energy systems as well.

Summary Budget Information for Activity 2:

ENRTF Budget: $ 200,000
Amount Spent: $ 0
Balance: $ 200,000

Outcome	Completion Date
1. Launch innovative programs in at least one project area.	Jan 31, 2018
2. End program implementation in at least one project area.	Mar 31, 2019

Activity Status as of December 31, 2016:

Activity Status as of June 30, 2017:

Activity Status as of December 31, 2017:

Activity Status as of June 30, 2018:

Activity Status as of December 31, 2018:

Final Report Summary:

ACTIVITY 3: Recommendations on Utility Regulatory Reform
Description:
The project would synthesize any available findings from pilot programs, assess statewide potential, and provide recommendations to Minnesota regulators for reforming utility regulation to defer transmission and distribution investments with energy efficiency and other distributed energy resources when appropriate.

The overall goal of the technical potential study is to provide an order of magnitude estimate of the statewide potential for geotargeted deployment of distributed energy resources. A secondary goal is to identify a generalized method for identifying and screening opportunities for geotargeted deployment of distributed energy resources, including a generalized method for weighting the costs and benefits of geotargeted distributed energy resources versus infrastructure investments. Data collected to assess technical potential on Xcel Energy's system would be the basis for conducting a statewide technical potential study. This will include an estimate of the benefits of distributed energy resources in replacing or deferring transmission and distribution infrastructure investments as well as an estimate of costs of installing the distributed energy resources. The project team would work with other utility companies in conducting this assessment, and modifying any findings applicable to Xcel Energy's territory to other utility service territories.

A national review would be conducted of best practices currently deployed around the country for geotargeting. The review would include in-depth review and assessment of states that have adopted geotargeting policies and programs, as well as states and specific utilities that have implemented high adoption-rate clean energy programs that are necessary for a successful geotargeting approach.

An analysis would be conducted of the barriers to geotargeted distributed energy resource investment under the current regulatory regime. For example, utilities may not have the same incentives or opportunities for cost recovery for investing in distribution infrastructure investment as investing in distributed energy resources instead of that infrastructure investment; or the risks may be different for each of these options. Based on these barriers and the results of Activities 1 and 2, recommendations would be made for utility reform.

Summary Budget Information for Activity 3:

ENRTF Budget: $ 200,000
Amount Spent: $ 0
Balance: $ 200,000

Outcome	Completion Date

1. Conduct technical potential study of statewide potential for geotargeted distributed clean energy resources investment.	May 31, 2019
2. Synthesize findings from national best practices review and pilot program(s) as applicable.	May 31, 2019
3. Provide final report, with utility reform recommendations.	Jun 30, 2019

Activity Status as of December 31, 2016:

Activity Status as of June 30, 2017:

Activity Status as of December 31, 2017:

Activity Status as of June 30, 2018:

Activity Status as of December 31, 2018:

Final Report Summary:

V. DISSEMINATION:

Description:

The project final report from Activity 3 will be disseminated widely to relevant policymakers via electronic format, and available on CEE's website (www.mncee.org). The project team will look for opportunities to present at relevant conferences and meetings. As the project is progressing and as key information is developed throughout the project, the project team will update utilities and policy staff at the Public Utilities Commission and Department of Commerce, Division of Energy Resources as appropriate.

Status as of December 31, 2016:

Status as of June 30, 2017:

Status as of December 31, 2017:

Status as of June 30, 2018:

Status as of December 31, 2018:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	$ Amount	Overview Explanation
Personnel:	$ 675,000	CEE staff are primarily responsible for meeting all project outcomes.
Carl Nelson, Project Manager: $163,000 (83% salary, 17% benefits); 45% FTE yr 1; 55% FTE yr 2; 30% FTE yr 3		
Mike Bull, Policy Reform Lead: $65,000 (81% salary, 19% benefits); 5% FTE yr 1; 10% FTE yr 2; 15% FTE yr 3		
Josh Quinnel, Ph.D., Technical Lead: 120,000 (83% salary, 17% benefits); 50% FTE yr 1 & yr 2		
Program Coordinator*: $88,000 (76% salary, 24% benefits); 15% FTE yr 1; 60% FTE yr 2; 42% FTE yr 3		Salary is based on the average salary & benefits of this job

		classification at CEE
Engineering support*: $159,000 (78% salary, 22% benefits); 75% FTE yr 1; 60% FTE yr 2; 42% FTE yr 3		Salary is based on the average salary & benefits of this job classification at CEE
Program outreach and implementation staff*: $80,000 (76% salary, 24% benefits); 60% FTE yr 2; 57% FTE yr 3		Salary is based on the average salary & benefits of this job classification at CEE
Professional/Technical/Service Contracts:	$ 125,000	Engineering and other technical consulting services
TOTAL ENRTF BUDGET:	**$ 800,000**	

Explanation of Use of Classified Staff: n/a

Explanation of Capital Expenditures Greater Than $5,000: n/a

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 6.9

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.65

B. Other Funds:

Source of Funds	$ Amount Proposed	$ Amount Spent	Use of Other Funds
Non-state			
Xcel Energy	$200,000	$0	This section will track the required matching funds for Activity 2; no ENRTF funds for Activity 2 will be spent until this match has been approved.
State			
TOTAL OTHER FUNDS:	**$200,000**	**$0**	

VII. PROJECT STRATEGY:

A. Project 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 ($650,000)
- Energy analysis consulting firm(s), TBD, will assist with the assessment of technical potential and electrical engineering and distributed energy technology technical consulting ($125,000)

Project Partners Not Receiving Funds:

- Xcel Energy will advise, provide technical support and provide funding for distributed clean energy programs (matching funds estimated at $200,000)

B. Project Impact and Long-term Strategy:

This project will help catalyze and inform a shift in Minnesota energy policy, to focus on deferring transmission and distribution 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. Funding History:

Funding Source and Use of Funds	Funding Timeframe	$ Amount
		$
		$
		$

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List: N/A

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT or MAP(S): See attachment.

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:
Periodic work plan status update reports will be submitted no later than 12/31/2016, 6/30/2017, 12/31/2017, 6/30/2018 and 12/31/2018. A final report and associated products will be submitted between June 30 and August 15, 2019.

Environment and Natural Resources Trust Fund
M.L. 2016 Project Budget

Project Title: Geotargeted Distributed Clean Energy Initiative
Legal Citation:
Project Manager: Carl Nelson
Organization: Center for Energy and Environment
M.L. 2016 ENRTF Appropriation: $ 800,000
Project Length and Completion Date: 3 years, June 30, 2019
Date of Report: 2/23/2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	**Planning for Geotargeted Clean Energy Investment**			**Implement Programs**			**Recommendations on Utility Regulatory Reform**				
Personnel (Wages and Benefits)	$300,000	$0	$300,000	$200,000	$0	$200,000	$175,000	$0	$175,000	$675,000	$675,000
Carl Nelson, Project Manager: $163,000 (83% salary, 17% benefits); 45% FTE yr 1; 55% FTE yr 2; 30% FTE yr 3											
Mike Bull, Policy Reform Lead: $65,000 (81% salary, 19% benefits); 5% FTE yr 1; 10% FTE yr 2; 15% FTE yr 3											
Josh Quinnel, Ph.D., Technical Lead: 120,000 (83% salary, 17% benefits); 50% FTE yr 1 & yr 2											
Program Coordinator*: $88,000 (76% salary, 24% benefits); 15% FTE yr 1; 60% FTE yr 2; 42% FTE yr 3											
Engineering support*: $159,000 (78% salary, 22% benefits); 75% FTE yr 1; 60% FTE yr 2; 42% FTE yr 3											
Program outreach and implementation staff*: $80,000 (76% salary, 24% benefits); 60% FTE yr 2; 57% FTE yr 3											
Professional/Technical/Service Contracts										$0	$0
TBD (competitive bid): Technical consultant for assisting with technical potential of geotargeting and technical assistance with distribution engineering analysis	$100,000	$0	$100,000		$0	$0	$25,000		$25,000	$125,000	$125,000
COLUMN TOTAL	**$400,000**	**$0**	**$400,000**	**$200,000**	**$0**	**$200,000**	**$200,000**	**$0**	**$200,000**	**$800,000**	**$800,000**

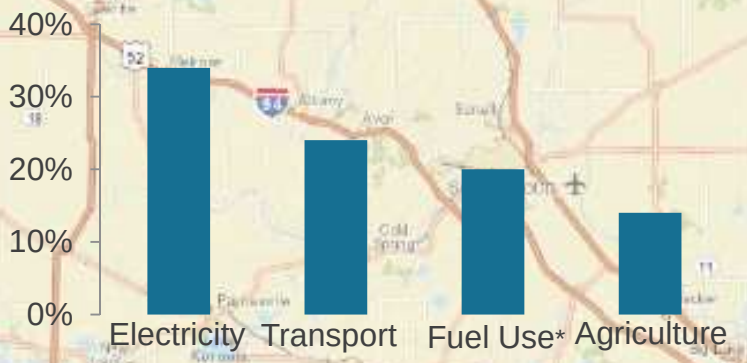
Note: for personnel categories marked as *, salaries are based on the average salary & benefits of these job classifications at CEE

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

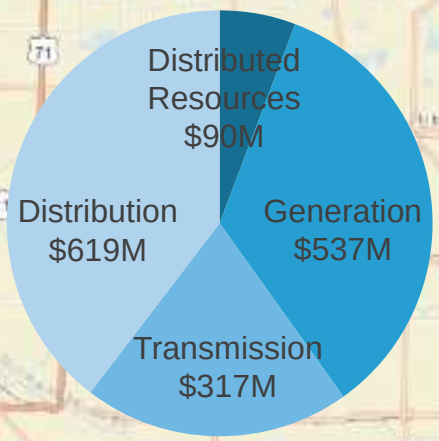
Figure 2: Top Greenhouse Gas Sectors in Minnesota



**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)