

**Environment and Natural Resources Trust Fund
2014 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 142-E

Reduction of Carbon Emissions in Residential Buildings

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

Total Project Budget: \$ 500,000

Proposed Project Time Period for the Funding Requested: 3 Years, July 2014 - June 2017

Summary:

The goal of this proposed project is to quantify the reduction in green house gas emissions from 40 homes by implementing comprehensive energy saving retrofits in each home.

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Location

Region: Metro

County Name: Hennepin, Ramsey

City / Township:

<input type="checkbox"/> Funding Priorities	<input type="checkbox"/> Multiple Benefits	<input type="checkbox"/> Outcomes	<input type="checkbox"/> Knowledge Base
<input type="checkbox"/> Extent of Impact	<input type="checkbox"/> Innovation	<input type="checkbox"/> Scientific/Tech Basis	<input type="checkbox"/> Urgency
<input type="checkbox"/> Capacity Readiness	<input type="checkbox"/> Leverage	<input type="checkbox"/> Employment	<input type="checkbox"/> TOTAL <input type="checkbox"/> %



PROJECT TITLE: *Reduction of Carbon Emissions in Residential Buildings*

I. PROJECT STATEMENT

According to the U.S. Energy Information Administration, the carbon dioxide (CO2) emissions from the residential sector grew by around 27% from 1990 to 2008. The average yearly increase in CO2 emissions of 1.3% outpaced the 1.1% increase in population growth. Despite the improvements in new single family homes, we are still increasing our energy usage in the home and adding climate-impacting gases at rapid rates. The housing sector emits nearly as much green houses gases as the transportation sector. CAFE standards are constantly putting positive pressure on the transportation sector to reduce emissions, while there is no such pressure on energy use in existing homes. Since houses last for decades longer than cars, addressing home energy usage in a comprehensive manner offers the opportunity to gain large reductions in green house gas emissions (GHGE).

The goal of this proposal is to quantify the reduction in GHGE from existing residential buildings, associated with energy saving retrofits. **Sustainable Resources Center** will: establish a comprehensive energy usage baseline through detailed field monitoring in 40 houses in the Twin Cities metro area, identify specific energy-related retrofits (air sealing, attic insulation, mechanical system upgrades, etc), and work with qualified contractors to make identified improvements to each home. We will then monitor the impacts those retrofits have on the energy consumption of these homes. Reductions in energy usage per fuel type will be used to infer the reductions in GHGE emissions. The results of this study can then be used for the development of GHGE reduction programs.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: (Home Owner Outreach) Budget: \$16,000

Create literature describing project scope, conduct outreach, tour potential homes, and enroll homeowners.

Outcome	Completion Date
1. Outreach and Enrollment	12/31/14

Activity 2: (Initial Home Energy Audit) Budget: \$24,000

Conduct extensive energy audit to establish baseline conditions in the home. Model the home with energy modeling software, run various retrofit options against base condition to determine the most effective retrofits.

Outcome	Completion Date
1. Energy Audits and Energy Modeling conducted, baseline energy usage established	2/28/15

Activity 3: (Acquire, Configure, and Install Monitoring Equipment) Budget: \$180,000

Purchase high resolution data loggers and sensors. Configure and install monitoring system in each house.

Outcome	Completion Date
1. Acquire and Install Monitoring Equipment	1/31/15

Activity 4: (Oversee Energy Retrofits and Conduct Inspection) Budget: \$16,000

Consult with contractors on the execution of the energy retrofits and conduct quality control inspection.



Outcome	Completion Date
1. Oversee Energy Retrofits and Conduct Inspection	11/1/15

Activity 5: (Quarterly Data Collect) **Budget: \$32,000**
 We will collect and catalog data from the monitor equipment on a quarterly basis for two years.

Outcome	Completion Date
1. Quarterly Data Collect	12/31/16

Activity 6: (Analyze Data and Craft Final Report) **Budget: \$71,000**
 All data will be collated and analyzed with the result being a full and thorough report of our findings.

Outcome	Completion Date
1. Analyze Data and Craft Final Report	6/30/17

III. PROJECT STRATEGY

A. Project Team/Partners

Sustainable Resources Center

- Jake McAlpine: Project Manager-Project oversight and management
- Chris Petroskas: Lead Energy Auditor-Conduct energy audits and computer modeling
- Andrew Toutant: Lead Inspector-Quality control on energy retrofits
- Dia Lor: Community Outreach Specialist-Conduct outreach and enrollment

University of Minnesota

- Pat Huelman: Lead Researcher-Research design, data analysis, author final report

Both Sustainable Resources Center and the University of Minnesota will be receiving funds.

B. Timeline Requirements

Outreach and enrollment of 40 homes will occur by late 2014. Energy audits and installation of monitoring equipment will occur in early 2015. Monitoring equipment will gather baseline data through the summer of 2015 to establish a baseline usage for comparison with the post retrofit data. Retrofits will be conducted in the fall of 2015 and post retrofit monitoring will continue through the 2016 heating season. Data analysis and reporting will be completed by June of 2017.

C. Long-Term Strategy and Future Funding Needs

This project is designed to be a pilot example of the impact of specific energy saving retrofits on residential GHGE. We expect the data from this project to inform policy and program development with the goal of further reducing GHGE from the residential sector at the state and national level.

2014 Detailed Project Budget

Project Title: *Reduction of Carbon Emissions in Residential Buildings*

IV. TOTAL ENRTF REQUEST BUDGET - 3 years

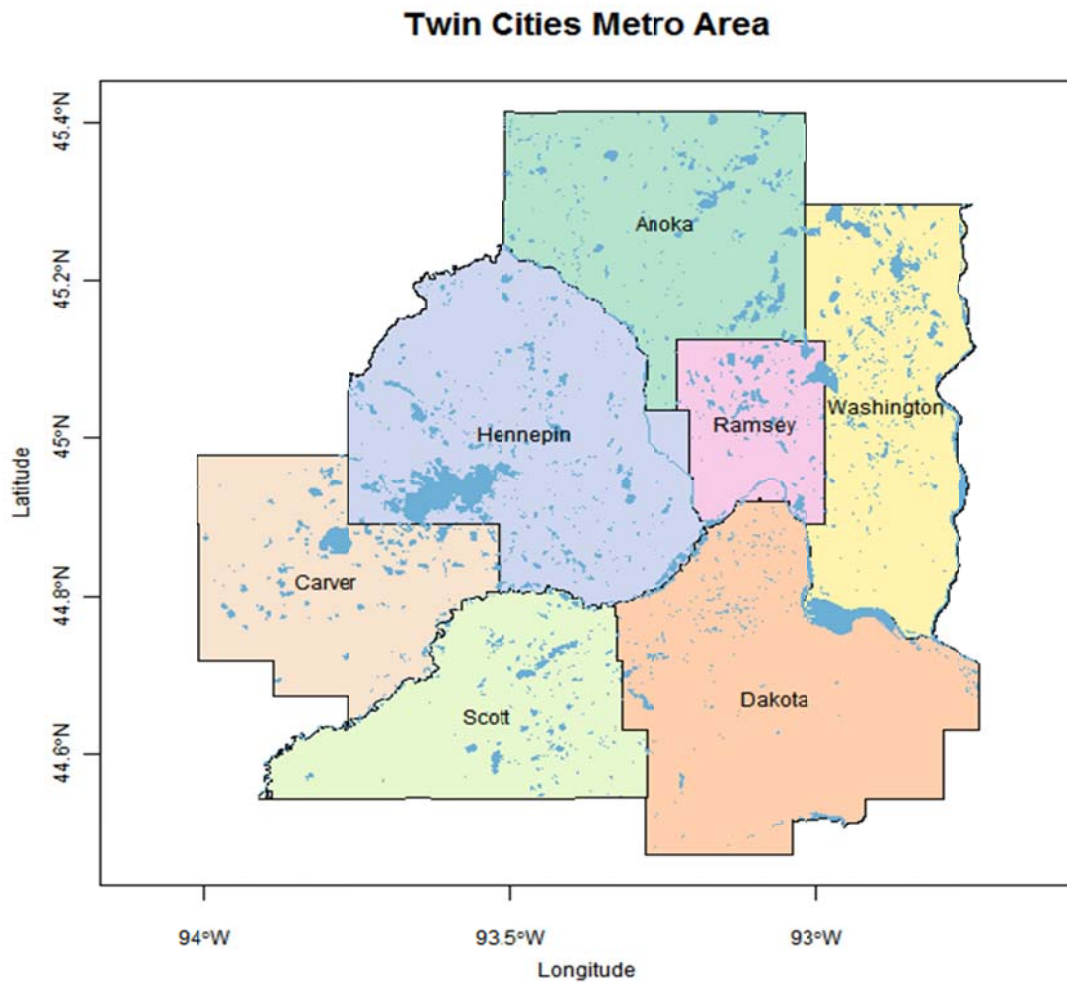
<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	\$ -
J. McAlpine, Project Manager, 650 over 3 Yrs @\$65/hour	\$ 32,500
C. Petroskas, Auditor, 480 hrs over 3 yrs @\$65/hour	\$ 24,000
A. Toutant, Inspector, 320 hrs over 3 yrs @\$50/hour	\$ 16,000
D.Lor, Community Outreach Specialist, 790 hrs over 3 yrs @\$18/hour	\$ 39,500
Taxes and Benefits estimated at 25% of Gross Wages	\$ 28,000
Contracts: University of Minnesota Study, study design, data analysis and report	\$ 71,000
Equipment/Tools/Supplies: Monitoring equipment estimated at \$4,100 per house for 40 homes	\$ 164,000
Acquisition (Fee Title or Permanent Easements): <i>In this column, indicate proposed number of acres and name of organization or entity who will hold title.</i>	n/a
Travel: <i>Be specific. Generally, only in-state travel essential to completing project activities can be included.</i>	n/a
Additional Budget Items: \$3,125 buy down per house for 40 homes	\$ 125,000
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 500,000

V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Other Non-State \$ Being Applied to Project During Project Period: \$500 Utility rebates per home	\$ 20,000	<i>Pending</i>
Estimated Homeowner cost: \$10,060 per home for 40 homes	\$ 402,400	<i>Pending</i>
Other State \$ Being Applied to Project During Project Period: <i>Indicate any additional state cash dollars (e.g. bonding, other grants) to be spent on the project during the funding period. For each individual sum, list out the source of the funds, the amount, and indicate whether the funds are secured or pending approval.</i>	n/a	<i>Indicate: Secured or Pending</i>
In-kind Services During Project Period: <i>Indicate any in-kind services to be provided during the funding period. For each type of service, list type of service(s), estimated value, and indicate whether it is secured or pending. In-kind services listed must be specific to the project.</i>	n/a	<i>Indicate: Secured or Pending</i>
Remaining \$ from Current ENRTF Appropriation (if applicable): <i>Specify dollar amount and year of appropriation from any current ENRTF appropriation for any directly related project of the project manager or organization that remains unspent or not yet legally obligated at the time of proposal submission. Be as specific as possible. Describe the status of funds in the right-most column.</i>	n/a	<i>Indicate: Unspent? Not Legally Obligated? Other?</i>
Funding History: <i>Indicate funding secured prior to July 1, 2014, for activities directly relevant to this specific funding request, including past ENRTF funds. State specific source(s) of funds.</i>	n/a	

Map/Visual

Our project doesn't require a map, but in order to submit our proposal, here is a map/visual of the Twin Cities Metro Area.





Project Manager Qualifications

Jake McAlpine is the current Program Director of the Weatherization Department at Sustainable Resources Center (SRC). He currently supervises four employees and four AmeriCorps members in this department, has performed residential audits and inspections for Hennepin County and Dakota County, and works with many building contractors to ensure quality assurance, as well as negotiating contracts.

Jake has served SRC as a Program Manager for a recent Department Of Energy (DOE) Sustainable Energy Resources for Consumers (SERC) grant with a budget of \$1,700,000 where he created detailed audit and inspection procedures, training manual for partner agencies; conducted trainings for Weatherization staff, state monitors, code officials, and HVAC contractors; negotiated with manufacturers, product reps, and local distributors to lower cost and facilitate installations; screened potential clients for project participation and conducted outreach; reviewed site data for four Weatherization agencies and provided specifications for replacement systems; helped facilitate research partnership with Building American North Star Team; assisted research engineers in conducting idle loss, steady state, and partial load tests in a lab setting; coordinated the installation of data collection systems for a 20 house field monitoring research project, and presented project details at a variety of professional conferences across the country about project scope and results.

Certifications & Education

- Building Analyst and Online Test Proctor through Building Performance Institute (BPI)
- Radon Measurement and Mitigation Specialist through the National Environmental Health Association (NEHA)
- Level 1 Infrared Thermography Technician through the Snell Group/American Society for Nondestructive Testing
- HERS Rater through Residential Energy Service Network
- BS in Bio-Based Products: Residential Building Science and Technology from the University of Minnesota, while also serving the department as a Building Science Lab Assistant

Organizational Description

The Sustainable Resources Center, Inc. (SRC) is a 501(c)(3) nonprofit organization dedicated to advancing the cause of healthy homes in Minnesota. Our mission is to create healthy, safe and energy-efficient home environments in partnership with families and communities. SRC's primary goals are:

- To provide comprehensive healthy, safe and energy efficient housing services to low income families and communities
- To bring about policy and systems changes, and provide public education that will support comprehensive approaches for healthy, safe and energy efficient housing