Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-427

Proposal Title: Climate Change Effects of a Clean Transportation Standard

Project Manager Information

Name: Jason Hill

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

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Project Basic Information

Project Summary: This project will use newly-developed life cycle analysis methods to assess the potential for a Clean Transportation Standard in Minnesota to reduce greenhouse gas emissions and mitigate climate change.

ENRTF Funds Requested: $300,000

Proposed Project Completion: June 30, 2029

LCCMR Funding Category: Small Projects (G)

Secondary Category: Energy (E)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

For over a decade, there has been interest from many in Minnesota in the establishment of a Clean Transportation Standard (CTS), also known as a Low Carbon Fuel Standard (LCFS). Such a mechanism for promoting the use of alternative transportation fuels with reduced greenhouse gas (GHG) emissions has been implemented in other states. In 2024, the Clean Tranportation Standard Work Group issued its report to the Minnesota Legislature, concluding that a CTS could contribute substantially to a reduction in GHG emissions. The methods they used to arrive at this result, however, were unsuited to the analysis they performed. Namely, they used a form of life cycle analysis (LCA) that was developed for small-scale engineering projects rather than policy analysis. Common errors such as this were highlighted in the National Academies of Science, Engineering and Medicine's (NASEM) recent report, "Current Methods for Life Cycle Analyses of Low-Carbon Transportation Fuels in the United States". In fact, there is no currently available analysis of a Minnesota CTS that uses a proper life cycle greenhouse gas accounting method—one suited to policy-level analysis. It therefore remains unknown how to design a CTS for Minnesota that would maximize its likelihood of achieving its intended effect.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

This project proposes to evaluate the potential for a Minnesota CTS to reduce greenhouse gas emissions, and to propose design elements that would increase the probability of it achieving its intended effect. The proposed method to be used is "consequential LCA," a method espoused by the NASEM for the purpose of policy evaluation. This project hypothesizes that a CTS, if constructed well, could reduce GHG emissions, but if constructed poorly, could increase them. The project would also explore how to craft a CTS to work in tandem with other public and private emission reduction efforts.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

The specific outcome of this project is greater public understanding of the potential for a Clean Transportation Standard to contribute to reduced greenhouse gas emissions from Minnesota. This project will provide actionable information for farmers, agribusiness, investors, environmental non-governmental organizations, policymakers, regulators, and consumers.

Activities and Milestones

Activity 1: Develop scenarios for the design and implementation of a Minnesota CTS

Activity Budget: $100,000

Activity Description:
The objective of this activity is to develop scenarios for the design and implementation of a Minnesota CTS. This activity will consider a range of possible fuels and transportation options. It will then describe a range of scenarios that consider deployment of these fuels under a variety of economic and policy-relevant conditions. These scenarios will inform the life cycle greenhouse gas modeling in Activity 2.

Activity Milestones:

Description	Approximate Completion Date
Completed description of options qualifying for a Minnesota CTS	December 31, 2026
Completed scenario design for CTS deployment	July 31, 2027

Activity 2: Apply consequential life cycle assessment methods to assess climate effects various Minnesota CTS designs and scenarios

Activity Budget: $175,000

Activity Description:
The objective of this activity is to apply consequential life cycle assessment methods to analyze the climate effects of various Minnesota CTS designs and scenarios. The first task of this activity is developing the emissions inventories based upon the scenarios developed in Activity 1. These inventories will then serve as inputs for computer models that estimate net greenhouse gas emissions using consequential life cycle assessment methods. The overall outcome of this activity will consist of quantified changes in emissions across the different CTS scenarios.

Activity Milestones:

Description	Approximate Completion Date
Completed parameterization of consequential LCA methods specific to Minnesota CTS	May 31, 2028
Completed application of consequential LCA methods specific to Minnesota CTS	November 30, 2028

Activity 3: Prepare and publish the final report and dissemination of conclusions

Activity Budget: $25,000

Activity Description:
The objective of this activity is to prepare the final report and public engagement surrounding it. This will be accomplished by writing the final results and submitting the report for peer comment and review. The outcome, a final report and accompanying database, can be used directly by stakeholders to understand the key design parameters and potential outcomes of a Minnesota CTS, and their potential to meet greenhouse gas reduction targets.

Activity Milestones:

Description	Approximate Completion Date
Completed preparation of the final report	April 30, 2029
Completed publication of the final report and public engagement	June 30, 2029

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?

We will communicate our findings through publications and at conferences, by presenting to state and local elected officials, and by discussing results at state agencies including MNDOT, MDA, and MPCA. We will collaborate with the Minnesota Climate Adaptation Partnership to ensure that outcomes are disseminated to relevant policymakers and stakeholders. All modeling and analysis results will be permanently archived and made publicly available at the Data Repository for the University of Minnesota. No additional work will be needed, but we anticipate seeking funding for subsequent work from a combination of federal, state, and foundation sources.

Project Manager and Organization Qualifications

Project Manager Name: Jason Hill

Job Title: Distinguished McKnight University Professor

Provide description of the project manager's qualifications to manage the proposed project.

Dr. Jason Hill is Distinguished McKnight University Professor in the Department of Bioproducts and Biosystems Engineering at the University of Minnesota. He is also a Resident Fellow of the University's Institute on the Environment. His research focuses on the consequences of food, energy, agriculture, and natural resources from a life-cycle perspective. Dr. Hill is a co-author of the Mitigation Chapter of the Fifth National Climate Assessment (NCA5). He served on the National Research Council's (NRC) Committee on the Economic and Environmental Impacts of Increasing Biofuels Production, the National Academies of Sciences, Engineering, and Medicine (NASEM) Committee on Current Methods for Life Cycle Analyses of Low-Carbon Transportation Fuels in the United States, and on the US-EPA's Science Advisory Board's Biogenic Carbon Advisory Panel. He has managed numerous sustainability related projects from funding sources that include the US-EPA, U.S. Dept. of Energy, USDA, U.S. Dept. of State, and USAID. He currently teaches the University of Minnesota's "Environmental Life Cycle Analysis" course at the undergraduate and graduate levels. Dr. Hill received his AB in Biology from Harvard College and his PhD in Plant Biological Sciences from the University of Minnesota.

Organization: U of MN - College of Food, Agricultural and Natural Resource Sciences

Organization Description:

The University of Minnesota is one of the largest US universities and offers a rich research and academic infrastructure.

PI Hill is in the Department of Bioproducts and Biosystems Engineering, which has a mission to develop solutions for the sustainable use of renewable resources and the enhancement of the environment. The department discovers innovative solutions to advance sustainable production and consumption of energy, food, feed, fiber, materials, and chemicals through engineering, science, technology, and management.

Research will also make use of the University of Minnesota Supercomputing Institute (MSI), which provides extensive software options and an array of high-performance computing systems.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Post Doc Researcher		Conduct calculations and experiments			25.9%	3		$245,505
Lead PI - summer salary only		Direct all research and personnel, implement models			36.6%	0.3		$54,495
							Sub Total	**$300,000**
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
							Sub Total	-
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								

							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$300,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**-**

Total Project Cost: $300,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: 54a50dca-f77.pdf

Alternate Text for Visual Component

This figure is an overview of the proposal and includes supporting images of a graphic of outcomes of a clean transportation standard, the cover of the Clean Transportation Standard Work Group report, and the cover of the NASEM report on Low-Carbon Fuel Standards....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Letter of Authorization to Submit	45cebcdf-e49.pdf
Audit	76956e21-3ad.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

N/A

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing $10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care,

treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Sponsored Projects Administration of the University of Minnesota

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

N/A