



Environment and Natural Resources Trust Fund

2024 Request for Proposal

General Information

Proposal ID: 2024-056

Proposal Title: Modeling Emissions Data from Consumption and Waste

Project Manager Information

Name: Colleen Hetzel

Organization: Minnesota Pollution Control Agency

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Project Basic Information

Project Summary: The MPCA would hire a contractor to develop an efficient and standardized process to quantify the greenhouse gas emissions generated by Minnesotans' consumption and to create an environmental impact calculator.

Funds Requested: \$500,000

Proposed Project Completion: June 30, 2026

LCCMR Funding Category: Air Quality, Climate Change, and Renewable 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?

In the Future

Narrative

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

According to the Environmental Protection Agency (EPA), our everyday products and materials contribute 42% of total greenhouse gas emissions (GHGe) in the United States across their lifecycle, including: raw materials extraction, manufacturing and processing, transportation, usage, and waste disposal. While Minnesota has a strong waste management system and notable efforts around increasing landfill abatement, additional focus needs to be placed on changes to the state's consumption and resource/material use. Minnesota needs to modernize and invest in statewide data and tools to track the environmental impacts from materials and waste, identify priorities for source reduction, reuse, recycling, and composting, and quantify the associated measurements of those efforts. This type of information will enable state and local government, businesses, communities, and individuals to make more informed, sustainable choices by creating tools that can be used by public and private entities working on climate change mitigation.

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 proposal includes the development of two tools to quantify the climate and environmental impacts of Minnesota's materials and waste in order to better prioritize efforts for source reduction, reuse, recycling, and composting based on the maximum potential environmental benefit: The first tool is the Consumption Based Emissions Inventory (CBEI) tool, which will report the GHGe of the goods and materials Minnesotans buy and/or consume. This includes impacts during manufacturing in addition to the impacts of materials when they are recycled or thrown away. The second tool is the Material Impact Calculator, which will use data on how materials are managed and the environmental impacts from the CBEI to model the benefits of increasing source reduction, reuse, or recycling of materials (as opposed to landfilling or waste-to-energy) across the state. The modeled scenarios would highlight ways to mitigate and adapt to climate change impacts and be useful for development of city climate action plans, county planning, and sustainable business practices. The Material Impact Calculator would also provide data on more environmental indicators than GHGe such as, water consumption, toxicity, and air emissions. This provides several sets of data so programming can be specialized to the intended environmental focus.

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?

Results from the CBEI provide performance indicators for the state to track progress and the Material Impact Calculator helps make that data more accessible for program planning purposes. Other states have modernized their data and tracking and have seen measurable success in strengthening efforts to reduce environmental impacts for individuals, businesses, and government entities. The proposed deliverables can be used to create educational campaigns and programming, identify opportunities for design/manufacturing changes or modifications to purchasing, and develop policy proposals. These efforts can decrease the demand for new production, reduce generation of emissions, and use less water and chemicals.

Activities and Milestones

Activity 1: Create a Minnesota-specific consumption-based emissions inventory model

Activity Budget: \$250,000

Activity Description:

The CBEI is a method used to estimate the environmental impacts (currently GHGe) generated from the goods and services Minnesotans buy or consume every day. It is particularly useful for looking at household and citizen consumption behaviors and prioritizing changes for the best environmental outcomes. The CBEI is a complementary measure to the in-boundary or sector-based emissions inventory, which is currently produced every two years by the MPCA. Together these two inventories tell a more complete story of how Minnesota contributes to climate change and thereby shows opportunities to reduce those emissions through changing producer operations and consumption patterns. The current process for completing a statewide CBEI is arduous and requires the development of a new data model to become efficient and standardized. The MPCA will contract to work on economic and emissions data analysis and database creation to support the completion of the CBEI. The result will be a user-friendly tool to ensure staff may easily complete the CBEI in future iterations, saving time and resources. The contractor would also assist with updating data needs to make the sector-based emissions inventory more standardized. This information is necessary for the CBEI. The MPCA will review and approve the final report.

Activity Milestones:

Description	Approximate Completion Date
RFP developed and posted	January 31, 2025
Contractor selected	April 30, 2025
MPCA staff reviews and approves work from contractor on the CBEI model	March 31, 2026
A CBEI model and data updates completed that enable the model to be run efficiently	April 30, 2026
A written report on the methodology and data analysis of opportunities for GHGe reductions	May 31, 2026

Activity 2: Create a Minnesota specific Material Impact Calculator

Activity Budget: \$250,000

Activity Description:

Historically waste management measurements were weight-based, without considering the broader environmental and climate impacts of activities. Having a defined methodology and multiple environmental impact measurements, such as water, energy consumption, and toxicity can more accurately document the success of managing materials and waste, prioritizing the most beneficial strategies at the state and local levels. Minnesota-specific calculations must be defined for current management methods, waste streams, material types, transportation distances, facilities, and end-markets. These calculations can be used to build a calculator that models the impacts associated with preventing, reusing, recycling, or composting most material types. This data can also be used to show “what if” scenarios to help guide policy, programming, and investments. This is different than the CBEI model because it models changes and additional environmental impacts. The following is an example of the type of calculator that will be built during this project activity (developed by Oregon’s Department of Environmental Quality): www.oregon.gov/deq/mm/Pages/Waste-Impact-Calculator.aspx The MPCA will draft an RFP and hire a contractor to develop Minnesota-specific emissions factors and the Material Impact Calculator. The MPCA will provide input throughout development and review/approve the final product.

Activity Milestones:

Description	Approximate Completion Date
RFP developed and posted	January 31, 2025
Contractor selected	April 30, 2025
MPCA meets with the contractor and approves progress	February 28, 2026
Final report submitted	May 31, 2026
Material Impact Calculator created	May 31, 2026

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?

This effort provides data on products and materials being consumed, recycled/composted, and disposed in Minnesota, along with the GHGe, water use, and toxicity impacts. Longer-term implementation of this data includes focusing programming on greater reduction of environmental impacts and creating transparency on progress over time. Cities and counties can use this data in the development and execution of climate action plans, supporting individuals and businesses in the community. By building two tools, this project has ongoing value. It creates the ability to rerun the consumption and impact models without additional funding needs, as opposed to being a one-time report.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Pilot Program to Optimize Local Mechanical and Pond Wastewater-Treatment Plants	M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 04a	\$700,000
Reducing Municipal Wastewater Mercury Pollution to Lake Superior	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 04h	\$250,000
Optimizing Local Mechanical and Pond Wastewater-Treatment Plants	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 11b	\$500,000
Groundwater Contamination Mapping Project - Phase II	M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 03f	\$800,000
Developing Strategies To Manage PFAS In Land-Applied Biosolids	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 04d	\$1,404,000
Wastewater Pond Optimization Implementation	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 20a2	\$700,000
Chloride Pollution Reduction	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 20a4	\$500,000
Replacing Failing Septic Systems to Protect Groundwater	M.L. 2022, , Chp. 94, Art. , Sec. 2, Subd. 10h	\$2,000,000

Project Manager and Organization Qualifications

Project Manager Name: Colleen Hetzel

Job Title: Planner Principal- Sustainable Materials Management

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

Colleen has a degree in Biological Aspects of Conservation and an Environmental Certificate from the University of Wisconsin-Madison. She has been with the MPCA for over 20 years and has worked on various aspects of prevention and materials management. She has 10 years of experience leading organizations on climate-based modeling with the U.S. Environmental Protection Agency and the West Coast Forum -Colleen was a peer reviewer on the first state Consumption Based Emissions Inventory done in the United States for the State of Oregon. She has worked on modernizing the waste system to reflect the positive and negative impacts of how waste is managed in Minnesota for several years and worked with others to add greenhouse gas emissions saved or generated from solid waste management programming to the annual SCORE report found at <https://www.pca.state.mn.us/waste/report-2020-score-programs>. She is currently leading the Sustainable Materials Management team and has led several contracts resulting in successful outcomes.

Organization: Minnesota Pollution Control Agency

Organization Description:

The Minnesota Pollution Control Agency is a state agency committed to ensuring that every Minnesotan has healthy air, sustainable lands, clean water, and a better climate. Through the authority of state and federal statutes and guidelines, the Agency focuses on preventing and reducing the pollution of air, land, and water, and leads Minnesota's efforts to protect against the devastating effects of climate change. We work with regulated parties, businesses, governments, organizations, and Minnesota's 11 tribal nations to develop innovative, community-centered approaches that protect our natural resources, improve human health, and foster strong economic growth.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
							Sub Total	-
Contracts and Services								
TBD	Professional or Technical Service Contract	Create a Minnesota CBEI model that is user-friendly to ensure staff may easily complete the CBEI in future iterations, saving time and resources in the long-term. This will include updating data needs for the sector-based inventory, and creating a final report that documents the process, methodology, and possible emission reductions.				3		\$250,000
TBD	Professional or Technical Service Contract	Minnesota-specific calculations for current management methods, waste streams, material types, transportation distances, facilities, and end-markets. Build a calculator that models the impacts associated with preventing, reusing, recycling, or composting most material types. This data can also be used to model alternative scenarios in "real time".				3		\$250,000
							Sub Total	\$500,000
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	\$500,000

Classified Staff or Generally Ineligible Expenses

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

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

Attachments

Required Attachments

Visual Component

File: [2d56095b-ad9.docx](#)

Alternate Text for Visual Component

The CBEI estimates life cycle GHGe from goods and services purchased by Minnesotans and is useful for looking at citizen consumption choices and prioritizing specific emissions reductions. The Material Impact Calculator models emissions from different material and/or management scenarios and the resulting environmental impacts from the varied inputs....

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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

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?

No

Does the organization have a fiscal agent for this project?

No

Does your project include the design, construction, or renovation of a building, trail, campground, or other capital asset costing \$10,000 or more?

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?

No

