

# Environment and Natural Resources Trust Fund 2009 Phase 2 Request for Proposals (RFP)

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**LCCMR ID: 093-D1**

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**Project Title:** An Analysis of Biofuel Alternatives for Minnesota

**Total Project Budget:** \$ \$180,000

**Proposed Project Time Period for the Funding Requested:** July 2009 - July 2010

**Other Non-State Funds:** \$ \$0.00

**Priority:** D1. Renewable Energy Life Cycle Costs and Impacts

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**First Name:** Kathryn

**Last Name:** Fernholz

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**Region:**

**County Name:**

**City / Township:**

Statewide

Statewide

**Summary:** Research and evaluation of the life-cycle costs, economic and environmental impacts, production practices, and climate change implications of biofuels and the various renewable energy options available in Minnesota.

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**Main Proposal:** 0908-2-005-proposal-2009\_main\_proposal\_templateDovetail.doc

**Project Budget:** 0908-2-005-budget-RFP\_2009\_Project BudgetDovetail.xls

**Qualifications:** 0908-2-005-qualifications-2009\_MgrQualorgDescDovetail.doc

**Map:**

**Letter of Resolution:**

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# MAIN PROPOSAL

## PROJECT TITLE: An Analysis of Biofuel Alternatives for Minnesota

### I. PROJECT STATEMENT

There is growing global and regional interest in renewable energy and biofuels from the standpoint of climate change mitigation, environmental impact reduction, and economic opportunity. As renewable energy options are being developed it is important to review alternatives in a thoughtful and holistic manner in order to identify the best available options, and to minimize the chances of unintended consequences linked to various courses of action. A useful strategy for assessing alternative biofuels and renewable energy options is to use a life-cycle style evaluation that considers impacts from biomass harvest through all stages of production and distribution.

This project will utilize existing data and generate new information as needed related to the life cycle costs and impacts of renewable energy options in Minnesota. Particular attention will be paid to alternative biofuel options and associated environmental and economic trade-offs. Factors to be considered in the analysis include effects on greenhouse gas emissions, carbon sequestration, water quality and quantity, biodiversity, energy balances, transportation networks, and economic considerations. Alternative production methods, best management practices, and sustainable yield rates will be considered in the analysis.

### II. DESCRIPTION OF PROJECT RESULTS

#### Result 1: Evaluation of Current Status **Budget: \$ 30,000**

The first step of the project will involve a complete review of published research and evaluation related to alternative energy and biofuels production in North America and regionally. Research findings and emerging technologies outside of North America will also be examined to determine relevancy and value to decision making in Minnesota.

<b>Deliverable</b>	<b>Completion Date</b>
1. Literature Review	December 2009
2. Report summarizing findings	December 2009

#### Result 2: Synthesis of Opportunities Matrix **Budget: \$ 125,000**

This activity will involve systematic assessment of renewable energy and biofuel options, impacts, and tradeoffs in Minnesota and development of a matrix that compares alternatives, including life-cycle costs and related impacts. The matrix will provide a summary assessment of a full range of environmental and economic factors for each alternative.

<b>Deliverable</b>	<b>Completion Date</b>
1. Narrative Report of findings	March 2010
2. Alternative Energy and Biofuels Matrix	March 2010

#### Result 3: Development of Recommendations **Budget: \$ 25,000**

This phase of the project will involve development of concise recommendations for actions that may be needed to maximize opportunities for alternative energy and biofuels development in Minnesota while minimizing environmental risks. These recommendations will be developed in consultation with project partners and other stakeholders.

<b>Deliverable</b>	<b>Completion Date</b>
1. Final Report	July 2010

### **III. PROJECT STRATEGY AND TIMELINE**

#### **A. Project Partners**

The lead investigator for the project is Dr. Jim Bowyer. The lead investigator will have responsibility for the project deliverables and coordinating partnerships and engagement with project stakeholders, including the LCCMR staff and members.

Dr. Jim Bowyer is professor emeritus, University of Minnesota Department of Bioproducts and Biosystems Engineering. He is an Elected Fellow of the International Academy of Wood Science; President of Bowyer and Associates, Inc. – a wood science and bioenergy consulting firm; Member of the Governance Board and Chairman of the Scientific Advisory Board of the Temperate Forest Foundation (Portland, Oregon); and a Member of the Blandin Foundation Vital Forests/Vital Communities Board of Advisors.

Bowyer has served as President of the Forest Products Society (1993-94) and of the Society of Wood Science and Technology (1987-88), Vice President of the Consortium for Research on Renewable Industrial Materials - CORRIM (1992-2003) – an international consortium dedicated to life cycle assessment of a wide range of wood-based construction materials and non-wood alternatives, and Chairman of the Tropical Forest Foundation (2002-2008). He was Head of the University of Minnesota's Department of Wood & Paper Science from 1984 to 1994, and Founder and Director of the Forest Products Management Development Institute at the University of Minnesota (an organization dedicated to education and development of industry professionals) from 1994-2003. He served as Project Leader of the Minnesota Agricultural Experiment Station project "Environmental Life Cycle Assessment of Bio-based Materials and Products" from 1988 to 2003 and he also led a research team focused on global raw materials consumption and supply trends for more than 30 years.

Additional project partners will include the BioBusiness Alliance of Minnesota, University of Minnesota, USDA Forest Service, Iron Range Resources, Minnesota Forest Resources Council, and additional public and private organizations as appropriate.

Dovetail Partners will maintain a project website to inform stakeholders about the development of the project and to provide opportunities for input and to allow easy access to project reports and other deliverables.

#### **B. Project Impact**

This project will provide statewide benefit, as it will identify potential problem areas in bioenergy development and environmentally best options for alternative energy and biofuel options for Minnesota. Systematic assessment will help to avoid unintended consequences of alternative energy development and potentially costly remediation of misdirected investment and action.

#### **C. Time**

The project timeframe is one-year (July 2009-July 2010) and a grant request of \$180,000.

#### **D. Long-Term Strategy (if applicable)**

Not Applicable.

## Project Budget

An Analysis of Biofuel Alternatives for Minnesota, Dovetail Partners, 2009

### IV. TOTAL PROJECT REQUEST BUDGET

<u>BUDGET ITEM</u>	<u>AMOUNT</u>	<u>% FTE</u>
<b>Personnel:</b>	\$ -	%
Project Manager	\$ 35,000	%
Lead Investigator	\$ 75,000	%
<b>Contracts:</b>	\$ -	
Additional Researchers/Project Investigators	\$ 60,000	
Project Supplies, Travel	\$ 10,000	
<b>Equipment/Tools:</b>	\$ -	
<b>Acquisition (Including Easements): \</b>	\$ -	
<b>Restoration:</b>	\$ -	
<b>Other:</b>	\$ -	
	\$ -	
<b>TOTAL PROJECT BUDGET REQUEST TO LCCMR</b>	<b>\$ 180,000</b>	

### V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Remaining \$ From Previous Trust Fund Appropriation (if applicable):	N/A	
Other Non-State \$ Being Leveraged During Project Period:	\$ -	
Other State \$ Being Spent During Project Period:	\$ -	
In-kind Services During Project Period:	\$ -	
Past Spending:	N/A	

# PROJECT MANAGER QUALIFICATION AND ORGANIZATIONAL DESCRIPTION

## Project Manager Qualifications

The project will be managed by Kathryn Fernholz, Executive Director of Dovetail Partners, Inc. The lead investigator will be Dr. Jim Bowyer and additional Dovetail Staff will contribute to the project. Background information for key staff is included below.

### Kathryn Fernholz, Executive Director

Kathryn has worked on development and forest management issues in a range of roles. With a consulting firm, Kathryn was a member of the environmental services department where her work included natural resource inventories, comprehensive planning, environmental impact assessments and the use of Geographic Information Systems (GIS). While working for the Community Forestry Resource Center, Kathryn developed and managed a group certification project for family forests and worked to increase local capacity to provide forest management and marketing services that are compatible with certification standards.

Kathryn has been a leader within the forestry community in the Upper Midwest through her service as Chair of the Minnesota Society of American Foresters and her appointment to the Minnesota Forest Resources Council. Kathryn is a member of the Advisory Board for the Blandin Foundation's Vital Forests/Vital Communities Initiative, and she is also a member of the Board of Directors of the College of Food, Agricultural and Natural Resource Sciences Alumni Society, Minnesota Environmental Partnership, and the Forest Guild. Kathryn has a B.S. in Forest Resources from the University of Minnesota, College of Natural Resources and also studied at the College of Saint Benedict in St. Joseph, MN and Sheldon Jackson College in Sitka, Alaska.

### Dr. Jim Bowyer, Director of Responsible Materials Program

Dr. Jim Bowyer is professor emeritus, University of Minnesota Department of Bioproducts and Biosystems Engineering. He is an Elected Fellow of the International Academy of Wood Science; Chairman of the Tropical Forest Foundation (Alexandria, Virginia) – an organization with major operations in Brazil, Guyana, Indonesia, and Gabon; and Member of the Governance Board and Chairman of the Scientific Advisory Board of the Temperate Forest Foundation (Portland, Oregon).

Bowyer served as President of the Forest Products Society (1993-94) and of the Society of Wood Science and Technology (1987-88), and as Vice President of the Consortium for Research on Renewable Industrial Materials (1992-2003). Jim was Head of the University of Minnesota's Department of Wood & Paper Science from 1984 to 1994, and Founder and Director of the Forest Products Management Development Institute at the University of Minnesota (an organization dedicated to education and development of industry professionals) from 1994-2003. He served as Project Leader of the Minnesota Agricultural Experiment Station project "Environmental Life Cycle Assessment of Bio-based Materials and Products" from 1988 to 2003 and he also led a research team focused on global raw materials consumption and supply trends for more than 30 years.

Bowyer has published over 230 articles dealing with wood science and technology, environmental life cycle analysis, and environmental aspects of forestry, timber harvest, and wood use. He is also coauthor of the leading introductory wood science textbook in North America – Forest Products and Wood Science-an Introduction – now in its 4th edition, and of the widely used CD-ROM The Nature of Wood and Wood Products.

Steve Bratkovich, Project Manager for Recycling & Reuse

Steve Bratkovich, Ph.D., has 32 years of forestry and forest products experience. His areas of expertise include business, marketing and strategic planning; urban wood utilization; primary and secondary wood processing; and sustainable forest management. Steve has authored over 100 forestry-related publications, articles and reports, and is a frequent contributor to forestry and industry trade journals. He currently serves as an Associate Editor to the Journal of Forestry and is Managing Editor for Independent Sawmill and Woodlot Management magazine's "Green Column."

In 2002 Steve received the Excellence in Technology Transfer award from the Chief of the USDA Forest Service. Steve has also received outstanding service awards from the Ohio and Minnesota Society of American Foresters. Steve is a self-employed forestry consultant and an Adjunct Associate Professor with the University of Minnesota's Department of Bioproducts and Biosystems Engineering.

Organizational Description:

Dovetail Partners

Dovetail Partners is a nonprofit 501(c)(3) organization that provides authoritative information about the impacts and trade-offs of environmental decisions, including consumption choices, land use, and policy alternatives. Dovetail Partners is a highly skilled team that excels at solving complex business problems and helping responsible firms to become successful. We also help regions define programs that increase the job creation and the job quality of resource-based industries. Dovetail Partners include scientists and professionals with experience in academia, government, NGOs and private industry. Dovetail's staff, associates, volunteers, interns and board members showcase depth, experience, and breadth across many fields. Our areas of expertise include forestry, land use planning, architecture, product and project certification, green building, business management, construction management, and marketing.

Additional information is available at the Dovetail website: <http://www.dovetailinc.org>

Recent Relevant Work:

*An Assessment of the Potential for Bioenergy and Biochemicals Production from Forest-Derived Biomass in Minnesota*

With support from the Blandin Foundation Vital Forests/Vital Communities Initiative and Iron Range Resources, Dr. Jim Bowyer and Dovetail Partners, Inc. and Dr. Shri Ramaswamy, Professor and Head, Department of Bioproducts and Biosystems Engineering, University of Minnesota prepared an assessment of the potential for bioenergy and biochemicals production from forest-derived biomass in Minnesota. The report was shared with attendees of the bio-economy conference in 2007 and is available at the Blandin and Dovetail websites.