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*Serving Lenawee, Macomb, Monroe, Oakland,  
St. Clair, Washtenaw and Wayne Counties*

## **EXPLORING WOODY BIOMASS RETROFIT OPPORTUNITIES IN MICHIGAN BOILER OPERATIONS**

### **REQUEST FOR PROPOSALS (RFP)**

#### **PART A - PROGRAM ANNOUNCEMENT & CONTRACT DETAILS**

##### **PROJECT SUMMARY**

The Southeast Michigan Resource Conservation and Development Council has been working since 2004 to identify value-added uses for urban wood residues, driven largely by the need for wood disposal options following the state's emerald ash borer outbreak. At this time, the Council is seeking an outside contractor to conduct a study of Michigan's boiler systems to identify statewide opportunities for using wood residues within nearby buildings for heating or other energy needs.

The planned study is modeled after a similar project done in Montana in 2004 (*Assessment: Potential for Expanding the Fuels for Schools Concept to other Institutions and Industries.*) However, due to the large number of boilers present in Michigan, a sampling strategy will be used to characterize boilers, rather than a complete inventory. Additionally, the contractor will design interactive educational tools to promote the potential for localized woody biomass boiler conversions.

The selected contractor must understand the technologies involved and have expertise in wood energy. Projects are expected to follow a tight timeline (with completion by October 1, 2007) and to fit within a budget of no more than \$40,000. All project proposals must be submitted to the SE Michigan RC&D by March 30, 2007 to be considered.

##### **BACKGROUND INFORMATION**

The emerald ash borer (EAB) has killed approximately 15 million ash trees in southeastern Michigan, causing massive environmental and economic damages to this region of the state. In response to the destruction, the Southeast Michigan Resource Conservation and Development Council (RC&D) began work on its Ash Utilization Options Project in early 2004 through funding from the U.S. Forest Service Economic Action Program. This project aimed to reduce wood waste disposal costs for communities, promote sustainable use of urban wood resources, and create economic development opportunities for the area. Through continued additional financial support from the U.S. Forest Service's Wood Education and Resource Center, this project has been very successful in creating new market opportunities for EAB-impacted ash wood and in building public support for urban wood utilization programs.

Many of the Council's previous efforts have focused on characterizing the resource supply within the urban wood "waste" stream and on boosting the production of solid wood products from this material source. In addition to funding several demonstration projects with local businesses and communities, the RC&D currently has multiple research initiatives underway including 1.) a study of the quantity and quality of urban wood residues generated annually throughout southeastern Michigan (expected to be completed in early 2007) and 2.) a study of wood disposal yard availability and efficiency in southeastern Michigan.

Based upon the RC&D's experiences, there is additional need to further explore opportunities in using the state's abundant wood residues as a biomass energy resource. In particular, given rising fuel prices nationwide, this issue is a timely one for large public institutions (schools, prisons, hospitals, etc.) facing high energy costs.

Energy costs represent a huge burden to school districts and other public institutions. The U.S. Department of Energy reports that energy costs represent the second highest budgeting expense for many school districts, behind only salaries. Use of biomass energy, especially where wood chips are plentiful and cheap, can result in significant savings for these types of institutions. In Vermont, where the Fuels for Schools program was pioneered, fuel costs for institutions converting to wood boilers were lowered 15% - 20% as compared to natural gas and 40%-50% compared to fuel oil. Savings when compared with propane or electricity were even more significant.

The RC&D has begun directing significant effort toward increasing use of urban and other wood residues in biomass energy production in the region. Current funding that the Council has already received from two Forest Service grants and a grant from the Michigan Department of Labor and Economic Growth (DLEG) will enable us to 1.) conduct a study of existing boilers in the state that could be potential sites for future conversion to wood-fueled systems, 2.) provide funding for several institutions to conduct complete feasibility studies for such conversions, and 3.) contribute funding toward the retrofit/installation of a wood-fueled boiler in a local institution.

At this time, the Council is seeking a qualified contractor to perform a broad analysis of wood-fuel conversion potential in existing boilers statewide.

### **PROGRAM DESCRIPTION AND SERVICES REQUESTED**

Using an outside contractor, a statewide study of Michigan's boilers will be performed to identify candidates for a biomass boiler retrofit or replacement. This identification will be further characterized not only by technology type—a determinant of whether it is mechanically possible to retrofit the existing technology, but also by location—a determinant of whether it is environmentally possible to generate and/or manage the necessary fuel supply feedstock and delivery infrastructure.

The planned study is modeled after a similar project done in Montana in 2004 (*Assessment: Potential for Expanding the Fuels for Schools Concept to other Institutions and Industries.*) Montana's boiler inventory, which sampled the state's entire population of 7,500 boilers, cost approximately \$25,000. Given that Michigan has approximately 65,000 boilers and that the budget for this survey is limited, a sampling strategy will be used to characterize existing boilers, rather than a complete inventory.

The Michigan Department of Labor and Economic Growth (DLEG) has a master boiler database, and the Michigan Department of Environmental Quality (MDEQ) also has a much smaller boiler database for those requiring permits. The grantee would need to access these databases, screen the technologies existing, identify subsets of boilers based upon ease of retrofits, and identify another subset of boilers that, unless being preserved for historical value, should be replaced. The grantee would also need to provide a discussion on boiler efficiencies, identify cost savings on lack of energy efficiency of older boilers that should be replaced, discuss advantages and disadvantages of retrofitting versus replacing in terms of lifetime energy savings and lower fuel demand, and discuss the workings and specialized needs of the biomass boiler alternatives suggested in the report.

Working with the RC&D Council's current web designer, an interactive website should additionally be developed from this information that will educate potential biomass users and will allow them to enter their specific site characteristics in order to gain a rough estimate of the potential costs and benefits they would find if undertaking a conversion project.

The selected contractor must understand the technologies involved and have expertise in wood energy. Applicants are also encouraged to discuss pellet-fueled boiler technologies (as used in Europe) and their potential for replacing boilers here in Michigan. Other biomass fuel potential, such as corn, should be addressed in the report, although wood fuel technology is of primary focus for this program. Environmental impacts such as sustainability of fuel supply and air quality must be discussed. Analysis of issues associated with permitting of newer biomass fuels will be required. The grantee shall collaborate with MDEQ's Air Quality Division to provide a description of emissions and permitting issues and recommendations for the report.

The SE Michigan RC&D Council, the Michigan DLEG Energy Office, the USDA Forest Service, and the Michigan DNR will be invited to play an integral role in all facets of the project's development and ongoing management.

The following specific products are expected as a result of this study:

- A **“demographic” summary of existing boilers in Michigan**, including (but not limited to) descriptions of
  - Institution/industry types (both public and private)
  - Existing heating costs & requirements (fuel, equipment, maintenance, staffing)
  - Maintenance staffing available
  - Current capacities/sizes (BTU/hr)
  - Capacities/sizes needed (Are current systems sized appropriately?)
  - Current fuel sources
  - Years of manufacture/installation
  - Condition of existing boilers
  - Technology types used
  - Applications at facilities (heat/power/etc.)

(Note: This is not intended to be a comprehensive inventory or directory of characteristics of *each* of Michigan's 65,000 boilers; rather, an appropriate sampling strategy should be used.)

- A **sampling system for efficiently “narrowing the field” of Michigan boilers suitable for retrofit or replacement**. (Specifically, given Michigan's 65,000 boilers, how can we quickly identify/predict subset groups of good candidates to target for further outreach and assistance? Which key characteristics serve as the best indicators of retrofit/replacement suitability? Of these, which are best suited for retrofit and which for replacement?)

Within these priority subset groups, specific candidates should be identified and the following topics addressed for each group:

- Geographic locations/trends (Are they concentrated around urban areas? Are they more rural?) Please include a graphic spatial presentation of these trends if possible.
  - Inclination (Are replacements already required? Is other new construction planned? Are candidates already exploring other options due to high fuel costs?)
  - Proximity to wood residue resources and/or major transportation corridors
  - Estimated costs of retrofit/construction (equipment/installation/maintenance)
  - Timeframes of payback through savings
  - Efficiency comparisons for old/new systems (energy, costs, etc.)
  - Advantages and disadvantages of retrofitting versus replacing in terms of lifetime energy savings and lower fuel demand
  - Workings/specialized needs of biomass boiler alternatives suggested
- A **discussion of statewide opportunities and barriers**:
    - What is the overall size/scope of Michigan market for localized woody biomass energy?
    - What is the extrapolated potential for wood fuel conversions statewide?
    - How would this change the demand on wood fuel resources statewide?
    - What is the potential in statewide fuel cost savings?
    - Where do other opportunities/barriers lie (effect of government drivers, economic development & service infrastructure, environmental/political issues, feedstock supply, air quality, facility issues, etc.)?
  - An **outline of strategic recommendations for promoting boiler conversions**. What are the “next steps” in terms of policy, government assistance, technology transfer, etc. that could make conversions more feasible?

- **An interactive website that will educate potential biomass users** and will allow them to enter their specific site characteristics in order to gain a rough estimate of the potential costs and benefits they would find if undertaking a conversion project. This site should also include links for further reading, technical assistance, and funding opportunities.

Please see the timeline “tasks” section for additional discussion of expected deliverables.

Overall, the completion of this boiler inventory project should create opportunities for the following outcomes:

- Increased awareness of Michigan’s biomass energy resources.
- Information sharing among organizations and new interest in services of the wood industry.
- Technology transfer to local businesses, communities, and governments.
- More exposure/competition for wood industry.
- Use of sustainable local resources in community programs.
- Development of strong partnerships among various stakeholder groups (public institutions, local governments/agencies, urban foresters, primary wood processors, etc.).
- Systems applicable for handling invasive species outbreaks in Michigan and other regions.
- Greater interest in use of local wood in renewable energy markets.

**TASK LIST, TIMELINES, AND ALLOWED BUDGET**

<b>Time Period</b>	<b>Responsibility</b>	<b>Funding Source</b>	<b>Tasks</b>
April 15, 2007 – May 15, 2007	Committee* Contractor	Forest Service	Meet contractor, arrange contract, finalize timetables and work plan, finalize paperwork.
June 1, 2007 – July 1, 2007	Contractor	Forest Service	Obtain DLEG/DEQ boiler databases, review data.
		Forest Service	Examine similar previous studies (ex: Montana 2004 assessment).
		Forest Service	Review conversion successes in other areas. What are key characteristics that identify successful projects?
		Forest Service	Create “demographic” overview/summary of Michigan data.
		Forest Service	Refine/identify best indicators for initial conversion feasibility.
		Forest Service	Develop profile of ideal conversion candidates.
		Forest Service	Overlay profile with demographic data to create list of possible candidates. Prioritize if possible.
		Forest Service	Create spatial representation of priority projects. Examine fuel supply/feedstock/delivery issues for key regions.
		Forest Service	Analyze costs, savings, and payback scenarios. Summarize.
		Forest Service	Determine what additional data (ex: seasonal fuel needs, fuel costs, local fuel sources, institutional commitment, etc.) is needed to determine more accurate feasibility estimates. Design simple web survey system that would allow users to enter this information to obtain a more complete analysis.
		MBEP	Develop educational guides, analytical tools (simple initial feasibility assessment, as listed above), and payback/savings estimators for interested parties. Educational guides should include a “what to expect” list for conversion projects (including, but not limited to, equipment needs, maintenance, staffing, EPA/DEQ regulations, timelines, technical and financial resources). These materials will be featured on the website.
		Forest Service/MBEP	Report progress to Committee*.
July 1, 2007 – August 1, 2007	Contractor Web Designer	MBEP	Create work plan with web designer. Provide guides, tools, and materials created for web survey/educational site.
	RC&D	MBEP	Negotiate/finalize plan with web designer. (Plan to use Loracs Creations, current designer used by Council.)
August 1, 2007 – September 1, 2007	Web Designer Contractor	MBEP	Design, create, and edit website and tools. Test system.
	Committee	MBEP	Review website and tools.
September 1, 2007	Web Designer Contractor	MBEP	Launch website.
	RC&D	Forest Service	Publicize site launch; conduct outreach.
September 15, 2007	Contractor	Forest Service	Final project report due. Will be published online as part of website.

\* Committee includes representatives from the Southeast Michigan RC&D Council, the Michigan DNR, and the DLEG Michigan Biomass Energy Program. Additional members may include staff from the USDA Forest Service, the Michigan DEQ, and/or other qualified parties.

**Current funding for this project is limited to a total of \$40,000**, including research, analysis, design of educational tools, reporting, and website design/testing/execution. Project proposals exceeding this allowed budget will not receive further consideration.

Jessica Simons, the Southeast Michigan RC&D Council's natural resources specialist, will act as primary contact for this project.

## **EVALUATION CRITERIA & SELECTION PROCEDURES**

Parties seeking funding under this contract grant program must submit a completed application packet, including the following information:

- 1. Introduction and general information about the applicant**
- 2. Staffing Plan (including any subcontractors)**
- 3. Qualifications of key personnel and description of experience with similar projects**
- 4. Statement of Work (including any revisions to the suggested timeline)**
- 5. Detailed Budget**

A Review Committee appointed by the RC&D will review each application thoroughly based on the following review criteria:

1. Scientific or technical merit of project
2. Experience of project manager(s) in biomass energy, pollution prevention, and sustainable forestry issues
3. Background in managing grants and successfully completing grant funded projects
4. Ability to work within suggested budget and timeline framework

*The Review Committee will not evaluate incomplete applications. The Council reserves the right to revise the suggested timeline and/or to reissue the RFP if no proposals adequately meet the evaluation criteria. Applicants may be asked to modify objectives, work plans, or budgets prior to final approval of each proposal. Applicants may also be asked to complete additional application forms or other documents, as necessary. Subsequent grant and/or contract procedures will be in accordance with all RC&D Council policies and procedures. A summary statement of the review and evaluation by the committee will be provided to applicants upon request.*

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## **SUBMISSION GUIDELINES & DEADLINES**

All proposal materials must be received by the RC&D Council no later than 5:00 p.m. on **March 30, 2007**. Electronic proposal submissions, e-mailed as an MS Word attachment or PDF, are preferred.

Applicants will be notified of their project status within 4 weeks of the application deadline.

### **SEND THE COMPLETED PROPOSAL PACKAGE TO:**

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Southeast Michigan RC&D Council  
7203 Jackson Road  
Ann Arbor, MI 48103-9506

Phone: (734) 761-6722 ext. 105  
Fax: (734) 662-1686  
E-mail: [jessica.simons@semircd.org](mailto:jessica.simons@semircd.org)

*About us --*

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The Southeast Michigan Resource Conservation and Development Council is a non-profit organization that helps the people of southeast Michigan care for, conserve, and protect their natural resources in a way that will improve the community's economy, environment, and quality of life. RC&D provides a framework for partnerships between local citizens, governments, and technical experts to solve resource concerns and to manage and utilize resources wisely.

Although Resource Conservation and Development Councils exist nationwide, each one is organized and directed by local people to meet local needs. The Southeast Michigan RC&D Council is made up of representatives appointed by 18 sponsor organizations within the council area: Lenawee, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties.

More information about the Ash Utilization Options Project may be found on the Council's website at: [www.semircd.org/ash](http://www.semircd.org/ash). The website also features a link to sign up for the project's periodic e-newsletter.

Major funding for the Ash Utilization Options Project is provided by the USDA Forest Service Wood Education and Resource Center. Additional funding is provided by the Michigan Department of Labor and Economic Growth's Energy Office. Significant technical assistance is provided by the Michigan Department of Natural Resources.

**RFP PART B – PROPOSAL COVER SHEET**

<b>FOR RC&amp;D USE</b>
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<b>PROPOSAL #</b>

Date: \_\_\_\_\_

Name of Company: \_\_\_\_\_

Name of Owner or Chief Operating Officer: \_\_\_\_\_

Contact Person (if different than above): \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_ County: \_\_\_\_\_

Daytime Business Telephone: \_\_\_\_\_ Business Fax: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Project Title: \_\_\_\_\_

Estimated Project Costs: \_\_\_\_\_

Planned Project Start Date: \_\_\_\_\_ Planned Project Completion Date: \_\_\_\_\_

Authorized Signature: The signature below is that of the person authorized to testify as to the accuracy of this application.

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_

**FOR RC&D COUNCIL USE ONLY**

Date Reviewed: \_\_\_\_\_ Proposal Approved:  Yes  No

Signature of Review Committee Chairman: \_\_\_\_\_

Signature of RC&D Council Officer: \_\_\_\_\_