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

## PROMOTING WOOD BIOMASS ENERGY IN MICHIGAN INSTITUTIONS

### GRANT ANNOUNCEMENT AND REQUEST FOR PROPOSALS (RFP)

Release Date: June 29, 2010

#### GRANT 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 offering a \$62,600 grant to one institution to fund the retrofit or replacement of an existing boiler to accommodate wood fuel. Boiler systems in the range of 500,000 to 4 million BTU/hour are targeted for this RFP.

This initiative is modeled after the successful Fuels for Schools program used in the New England and Western States. A matching requirement of at least 1:1.5 (or \$93,900) is required. Funding preference will be given to facilities with high public demonstration potential within the Southeast Michigan RC&D Council area (Lenawee, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties). All project proposals must be submitted to the SE Michigan RC&D by July 26, 2010 to be considered.

#### BACKGROUND INFORMATION

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.

Fuel costs continue to be a major challenge in Michigan as well. Most of the fuels used in the state are imported — 100% of the coal, 96% of the oil, and 75% of the natural gas — at a cost of \$18 billion each year to our local economy. At the same time, forest health issues like the emerald ash borer and other urban activities create excess wood residues in need of costly disposal. One 2005 study of wood waste generation in southeastern Michigan found that the 2,600 companies interviewed paid nearly \$9 million each year to dispose of wood, with over a fourth of the material ending up in landfills (Sherrill and MacFarlane, 2007). A follow up study by Michigan State University showed that only 30% of the wood that enters the area's 180 wood disposal yards is ever recycled into other products, with the other 70% of material simply discarded in some form as waste (Nzokou, 2009).

As one response to the influx of wood from the area's emerald ash borer outbreak, the Southeast Michigan Resource Conservation and Development Council (RC&D) began work in early 2004 to reduce wood waste disposal costs for communities, promote sustainable use of urban wood resources, and create economic development opportunities for the area (<http://www.semircd.org/ash>). As part of this effort, the Council specifically created the Michigan Wood Energy Project to promote the use of the area's abundant wood residues as a biomass energy resource. Through funding from the U.S. Forest Service's Wood Education and Resource Center (WERC), this work has included a statewide study of wood boiler opportunities, multiple local wood energy feasibility studies, and development of the Wood Energy Calculator, an interactive tool to generate simple cost-benefit scenarios for converting to wood fuel. Please see <http://michiganwoodenergy.org> for more details.

As a next step, the RC&D is now offering grant assistance to an institution planning a wood biomass conversion project. This grant aims to create a demonstration project that can efficiently use wood residues while lowering both energy and wood disposal costs. While wood-fired boilers are now proven technology, there are important reasons to demonstrate successful systems:

- *To show that the technology works—*

Only 15 years ago, some large-scale investments in biomass boilers proved dramatic failures, leading to a mistrust of biomass boilers that pervades some engineering and energy management. However, recent technological developments have created remarkable advances in efficiency, fuel handling, and air quality protection that make wood energy a practical, affordable, and sustainable choice.

- *To show that biomass fuel purchase, handling and storage can be managed—*

Because most institutions are accustomed to having fuel be simply turned on or off, or delivered without storage issues, they may not trust the fuel supply system of biomass even if they are confident about the technology. Labor time in managing biomass boilers is also a concern for those who have never used them or seen demonstration of a successful system. (A well-planned system can require as little as 20 minutes per day—about the time a facility manager should spend managing a boiler on any other fuel.)

- *To help provide a financial incentive to switch to renewable energy—*

Most public institutions like schools, cities, and hospitals do not have enough up-front capital on hand to implement retrofits or boiler replacements easily, and incentives can help bring previously doubtful or out-of-reach proposals back onto the table.

Most wood-fired boilers in Michigan are in the Upper Peninsula, where use of biomass heat by industry and easy access to fuel have lowered the first two barriers to adoption of renewable energy. However, in the Lower Peninsula, there are not many examples that demonstrate the viability of biomass boilers, particularly in southeastern Michigan—home both to urban tree removal residues and clean industrial wood wastes that have not to date been aggregated and diverted from waste streams to productive use.

Although many similar boiler systems have been implemented through Fuels for Schools programs in Vermont and Montana, Michigan provides a unique opportunity to create a localized model for renewable energy production while combating mounting demands for wood disposal. This is a model that could be very valuable as EAB spreads to other urbanized regions. For more information about wood chip heating systems options, a good resource can be found at the Biomass Energy Resource Center website at [www.biomasscenter.org/pdfs/Wood-Chip-Heating-Guide.pdf](http://www.biomasscenter.org/pdfs/Wood-Chip-Heating-Guide.pdf). Additionally, the USDA Forest Service WERC has created a guide, *Is Your Facility a Good Candidate for a Woody Biomass Heating System?*, that outlines key characteristics of successful project sites. This guide is available at [http://semircd.org/ash/news/WERC\\_Energy\\_Assessments.pdf](http://semircd.org/ash/news/WERC_Energy_Assessments.pdf).

## **PROGRAM DESCRIPTION**

The available grant would provide funds of up to \$62,600 for a school, public facility, or other private site with a high public profile and good potential to serve as a demonstration project. The funds may be used to either retrofit an existing boiler or to put in a new boiler that would use wood residues from urban tree removals and/or other clean urban “waste” wood sources for energy. Proposals for combined heat and power projects also qualify under this grant and are encouraged.

In addition to the funding award, this grant program will additionally provide the grantee with a technical advisor to assist with various tasks and services to help develop the project. Leidel Energy Services will provide the following at no additional cost to the grantee:

- Sample documents (as contained in this RFP’s appendices):
  - o Sample system schematics and sample boiler room layouts, and
  - o Estimated system budgets for an ASME-rated automated boilers of varying sizes.
- Assistance with or review of
  - o Existing boiler room or new boiler building site,
  - o Financial payback scenarios,
  - o Procurement of the boiler system,
  - o Selection of installation subcontractors,
  - o Installation of the final project, and
  - o Procurement of the first year’s wood chip supply.

The above scope of work will remain the responsibility of the grantee. Leidel Energy Systems will provide technical review and assistance, but will not provide project management or these items in their entirety.

The grant award will be targeted toward candidates whose qualifications suggest a high probability for successfully installing and maintaining a wood energy system. While applicants may not have all of these characteristics, candidates who can provide detail on the following measures are more likely to be selected for funding:

*Required Items –*

1. An appropriate public-service or other high-visibility facility for boiler conversion/installation and fuel storage;
2. A favorable cost/savings payback scenario (in which annual fuel savings pay off installation costs in a reasonable time frame),
  - a. Every proposal must contain a printout from the Wood Energy Calculator found on the web page, <http://michiganwoodenergy.org>. Applicants should also include supporting documentation on the input data for this calculator. The calculator will create a budget based on a boiler sized at 95% of your present capacity and will calculate a payback based on 10 year financing.
    - i. It is likely that the system will be sized for a smaller portion of the load (perhaps 80%)
    - ii. Longer term financing may be necessary if no other supplemental grant sources are to be used.
    - iii. Note: The unit used for natural gas is dekatherm, or 10 therms. This equals 10 CCF, 1 MCF, or 1,000,000 BTU.
  - b. Results of any available wood energy feasibility studies for the site should be included with the proposal. If no such studies have been completed, plans should be detailed to explain when and how such an assessment is to be performed. If a full feasibility study has not been done prior to submission of the proposal, a line item to conduct such a study needs to be included in the grant budget. The USDA Forest Service WERC currently has a program to provide preliminary wood energy assessments at no cost for public facilities and privately operated commercial and industrial facilities. More information about this program is available at <http://semircd.org/ash/news/WERCenergyAssessments.pdf>.
  - c. Please include the completed WERC *Wood Energy Project Data Collection* form (listed in Part 2b above) with your proposal, along with the form’s requested information regarding your heating plant and energy consumption records and billings. *Please provide this information and the output from the Michigan Wood Energy Calculator (Part 2a above), even if you have a full feasibility study to submit.*
3. Strong institutional commitment and explicit approval for project to move forward from internal management;
4. A commitment to energy efficiency and long-term sustainability (preferably including plans that make efficient year-round use of wood energy for both heating and cooling or for electrical generation);
5. Specific identified fuel sources and providers, especially using locally generated urban or undervalued wood residues (such as from tree removals, forest residues, or clean manufacturing wastes); and
6. Proven access to adequate capital for completing all construction activities and a clear budget with significant matching funds provided.

*Desired Items –*

7. A previous engineering feasibility assessment that includes an analysis of air quality concerns, suggested emissions controls, and outlook for long-term fuel availability; and
8. A thorough, yet aggressive, timeline (ideally, resulting in a completed project within one year).

A complete boiler installation is required of the grantee. According to a leading boiler manufacturer in Michigan, most boiler retrofit projects are completed within one year. If grant administration, mobilization, and engineering are added to this, the project should be completed within 18 months of the award. In this grant program, preference will be given to projects that are likely to complete all tasks within 18 months following award (including engineering, completing bids, site preparation, equipment ordering/setup/construction, building of housing and storage sites, boiler installation, integration of system with water lines/heating distribution, installation of fuel conveyors/electrical system/control panel, bringing boiler on-line, establishing servicing and maintenance schedules, etc.).

The applicant must develop a sustainable plan for biomass aggregation and storage through partnerships in their local area in order to secure sustainable and affordable fuel sources. It is possible that the fuel source may include trees from EAB-related removals—but the plan must also cultivate partnerships for the longer term after EAB sources are no longer available.

It is recommended that you have begun conversations with contractors prior to submitting your grant application. This will assist you in creating a strong plan for the use of funds by allowing you to base your proposed activities on the advice of a qualified engineer, develop a workable timetable and work plan, and set an appropriate budget. Applications that have done this groundwork will receive preference in the application review process.

Total current grant funding available for this program is limited to \$62,600. In addition to the services offered by Leidel Energy Services, the Southeast Michigan RC&D Council and its partners may be able to provide the grantee with some technical assistance in identifying qualified contractors and engineers, identifying wood fuel resources, and completing the work plan. Jessica Simons of the Southeast Michigan RC&D Council will act as primary contact for this project.

*[Please note: These federal grant funds cannot be used directly for construction projects. Grant funds may be used for design or purchase of the boiler equipment and system, but not for actual labor or construction costs. However, construction efforts, paid for with non-federal funding, may be used as match.]*

Funds for any project approved under this program are granted using a 1:1.5 matching ratio. That means for every \$1 granted by the RC&D Council, *at least* \$1.50 must be provided to the project by the grant recipient in the form of cash holdings, in-kind services, or other outside, non-federal and non-RC&D Council funds. For a grant of \$62,600, this means that at least \$93,900 in matching assistance must be provided by the grantee, but applications with greater match amounts are encouraged. A table explaining items acceptable for matching funds is enclosed with this application.

## **EVALUATION CRITERIA & SELECTION PROCEDURES**

Parties seeking funding under this grant program must submit a completed application packet (as outlined on page 5 of the RFP) for funding consideration. In addition to the criteria included in the program description, a Review Committee appointed by the RC&D will review each application thoroughly based on the following additional standards:

1. Potential impact of proposed project on use of urban wood resources, reduction of municipal wood disposal costs, and improvement of economic sustainability in local communities;
2. Scientific or technical merit of project and strength of work plan;
3. Institutional commitment and ability to secure non-RC&D Council funds;
4. Potential for serving as a successful pilot or demonstration facility;
5. Amount of local matching funds; and
6. Background in managing grants and successfully completing grant-funded projects.

Applications will be reviewed by the committee and ranked based on the evaluation criteria. The Review Committee will not evaluate incomplete applications. Depending on the competitiveness of proposals received, representatives of the Review Committee may conduct site visits and/or interviews with finalists in order to make a final decision on the application selected for funding. The RC&D 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. 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 may be provided to applicants upon request.

## **GRANT PERIOD & PROGRESS REPORT**

The grant recipient will have until January 30, 2012 to successfully implement the project. Extended timelines may be possible, but must receive specific approval in advance.

Grant awards will be disbursed in thirds, with the first payment issued at the start of the grant project in advance of expenditures. A brief progress report will be required of the grantee midway in the project timeline. Provided that adequate progress has been made, the second payment will be issued at that time. If adequate progress is not made toward proposed goals, the RC&D reserves the right to rescind the grant funds and to redistribute them to another qualified applicant. When the project is completed and all related measures implemented, the grant recipient must submit a final report to the RC&D Council on the status of funds spent and the goals met as a result of the grant award. The remaining third of the grant award will be paid as a reimbursement of project expenses upon approval of the final report. In addition, the grantee is asked, but not required, to write a brief testimonial of the positive affects that the award has had on the organization and to describe the experience of partnering with the RC&D Council.

## **ELIGIBILITY FOR GRANTS**

Any municipality, institution, or organization is eligible to submit an application for funding under the grant program, provided that the group can demonstrate that its proposal will promote the use of locally generated wood as an energy source. Preference will be given to projects within public facilities and/or sites with high demonstration value.

Applicants do not have to be located in the RC&D Council area, but applicants from the RC&D Council area (Lenawee, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne Counties) will receive priority consideration when their applications are reviewed.

## **REQUIRED MATERIALS FOR THE GRANT APPLICATION**

Grant application materials can be recreated on your computer as long as they follow the exact format as the enclosed forms. Handwritten application materials will NOT be accepted. Additional copies of the application, including an editable MS Word version of the forms, can be obtained by contacting the RC&D Office. (Please see contact information provided below).

The following materials must be submitted as a complete package for consideration under this program:

- ❖ Completed program information form, with appropriate signatures - PART A
- ❖ Completed budget sheets - PART B
- ❖ Completed organizational plan - PART C\*
- ❖ Three references or recommendations - PART D
- ❖ A specific plan for the utilization of the grant funds - PART E\*
- ❖ A financial statement (independent audit, tax return) verifying the fiscal health of applying entity
- ❖ Output report from the Michigan Wood Energy Calculator and supporting documents (from <http://www.michiganwoodenergy.org/calculator/calculator.php>)
- ❖ Completed WERC *Wood Energy Project Data Collection* form, including supporting information regarding your heating plant and energy consumption records and billings (from <http://semircd.org/ash/news/WERCenergyAssessments.pdf>).
- ❖ Previous wood biomass energy feasibility study for the applicant site (*highly encouraged*) OR inclusion of line-item in budget and work plan to undergo immediate feasibility study

*\* If additional space is needed, please attach and label appropriately. Additional attachments, including letters of support, will be accepted and considered.*

**SUBMISSION GUIDELINES & DEADLINES**

**All proposal materials must be received by the RC&D Council no later than 4:30 p.m. on July 26, 2010.**

Electronic proposal submissions, e-mailed as an MS Word attachment or PDF, are required.

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

**SEND THE COMPLETED GRANT APPLICATION PACKAGE TO:**

E-mail: [jessica.simons@semircd.org](mailto:jessica.simons@semircd.org)

For questions, please contact Jessica Simons at 517-851-2372.

**About us –**

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 Southeast Michigan RC&D Council's Ash Utilization Options Project may be found on the Council's website at: <http://www.semircd.org/ash>. The Council also manages the Michigan Wood Energy (<http://michiganwoodenergy.org>) and Urbanwood (<http://urbanwood.org>) Projects.

Funding for these wood utilization projects is provided by the Wood Education and Resource Center (WERC). Located in Princeton, WV, WERC is a USDA Forest Service facility with offices, training facilities, and a rough mill. The WERC mission is to facilitate interaction and information exchange with the forest products industry to enhance opportunities for sustained forest products production in the eastern hardwood forest region of the United States. WERC's primary goals are to improve the knowledge, skills, and capacity of the forest industry management and workforce; increase communication, cooperation, and collaborative problem solving within the forest products industry; and improve efficiency in forest product manufacturing and wood utilization. For more information, please visit: <http://na.fs.fed.us/ea/werc/werc.shtm>.

Significant technical assistance for this project is also provided by the Michigan Department of Natural Resources and Environment.

**ITEMS ACCEPTABLE FOR MATCHING FUNDS**

All items proposed as grantee match MUST be able to be documented by an invoice, pay stub, cancelled check, or other form of traceable evidence of payment. In addition, matching items must be directly applicable to the funded project. Items purchased prior to the date on your grant acceptance notification letter WILL NOT QUALIFY for funding.

Item	Explanation
Salaries & Wages	Official payroll stubs and invoices marked "paid" are acceptable.
Fringe Benefits	Letter explaining benefits package must accompany documentation of salaries and wages
Consultants	Consultant Services
Construction Costs	If construction is to be farmed out to a contractor, copies of agreement, payment schedule and evidence of payment are required. Internal construction jobs must be documented including employee time, supplies, materials, and overhead.
Travel	Copies of receipts/credit card reports/invoices marked "paid" for tickets, lodging; food and other incidentals must be submitted in well-organized manner.
Equipment	In accordance with USDA Forest Service regulations, equipment to be used as a match CANNOT BE LEASED OR PURCHASED ON AN INSTALLMENT PLAN THAT LASTS LONGER THAN YOUR FUNDING PERIOD (1 YEAR). The UNDEPRECIATED value of owned equipment purchased prior to your funding period could be counted as a match. Owned equipment must be on a depreciation schedule in order to qualify as a match. Submit copies of invoices or titles to equipment used as match. Equipment purchases beyond those approved by the Grant Committee WILL NOT QUALIFY for a match or as an acceptable use of Federal funds. Approval by the RC&D prior to purchases is required.
Supplies & Materials	Copies of itemized receipts, cancelled checks, or invoices marked "paid" must be provided. The cost of existing supplies held by the grantee (i.e. lumber, piping, etc.) can be used for matching funds, but the cost of those supplies MUST BE DOCUMENTED by itemized receipts, cancelled checks or invoices marked "paid."
Indirect/ Overhead	Examples include: Pro-rated management and administrative support salaries; rent and utility costs. Payment stubs, receipts and invoices marked "paid" must be provided for these services. If pro-rated salaries are used as a source of matching funds, the METHODS for pro-rating MUST BE EXPLAINED and DOCUMENTED in writing.
Training	Receipts, official payroll stubs or invoices marked "paid" are acceptable for employee training as long as training is part of the grant proposal funded by the SEMI RC&D.
Other Items	All other items are examined on a case-by-case basis.

**RFP PART A - PROGRAM INFORMATION FORM**

<b>FOR RC&amp;D USE</b>  <hr/> <b>GRANT APPL. #</b>
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Date: \_\_\_\_\_

Name of Organization: \_\_\_\_\_

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

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

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

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

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

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

Project Title or Purpose of Grant: \_\_\_\_\_

Amount Requested from RC&D Council: \$ \_\_\_\_\_

Amount of Matching Funds from Applicant: \$ \_\_\_\_\_

Total Project Costs (Grant + Match): \$ \_\_\_\_\_

Source of Matching Funds: \_\_\_\_\_

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

Note: Any funds awarded from this grant program must be matched with funds from the applicant. (See grant guidelines for additional information on grant matching requirements). Please complete attached budget sheets and business plan sheets.

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: \_\_\_\_\_ Grant Approved: \_\_\_ Yes \_\_\_ No Grant Amount Approved: \$ \_\_\_\_\_

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

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

**RFP PART B - PROJECT BUDGET & FUNDING SOURCES**

Name of Organization submitting application: \_\_\_\_\_

**Section 1: Project Budget Overview**

In the table below, indicate the amount of funds requested from the RC&D Council in each category. In the "Non-Federal Match" column, indicate the amount of funds your organization will provide to match RC&D Council funds.

The total amount of Non-Federal Matching funds for a \$62,600 grant should be at least \$93,900 (a 1:1.5 ratio). Grant funds from this program cannot be used for construction. However, a grantee may use non-federal funds paid for construction as the matching contribution.

<b>Expenditure Category</b>	<b>RC&amp;D Funds Requested</b>	<b>Non-Federal Match Funds</b>	<b>Total Project Cost</b>
Salaries & Wages	\$	\$	\$
Fringe Benefits	\$	\$	\$
Consultants	\$	\$	\$
Materials	\$	\$	\$
Travel	\$	\$	\$
Equipment	\$	\$	\$
Supplies/Materials	\$	\$	\$
Indirect/Overhead	\$	\$	\$
Training	\$	\$	\$
Construction	<b>No grant funds for construction.</b>	\$	\$
Other (specify)	\$	\$	\$
<b>TOTAL</b>	\$	\$	\$

**Section 2: Specific Project Budget**

List the specific items (consultant fees, staffing time, boiler components, etc.) in the "Expenditure" column for which you are seeking funds that are summarized in Section 1. Provide an estimated cost for all requested items in the "RC&D" column. List the specific items for which you will match grant funds (owned equipment on a depreciation schedule, salaries of employees, etc.). Provide an estimated cost for matched items in the "Non-Federal" column. Total the columns to demonstrate specific requests and matching funds.

<b>Expenditure</b>	<b>RC&amp;D Funds Requested</b>	<b>Non-Federal Match Funds</b>	<b>Total</b>
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
	\$	\$	\$
<b>TOTAL</b>	\$	\$	\$

**RFP PART C - ORGANIZATIONAL PLAN**

Name of Organization submitting application: \_\_\_\_\_

Please summarize the short and long-term goals (2-5 years) for your organization and how you feel that this funding from the RC&D Council can help you achieve those goals.

**NOTE:** ALL APPLICANTS MUST ALSO SUBMIT A FINANCIAL STATEMENT WITH THE COMPLETED APPLICATION (e.g. tax return, independent audit). These statements will be only be viewed by the Review Committee.

**RFP PART D - REFERENCES**

Name of Organization submitting application: \_\_\_\_\_

Please list the names, addresses, and telephone numbers of three non-related business, legal, or financial references:

Name: \_\_\_\_\_

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

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

Phone: \_\_\_\_\_

Name: \_\_\_\_\_

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

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

Phone: \_\_\_\_\_

Name: \_\_\_\_\_

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

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

Phone: \_\_\_\_\_

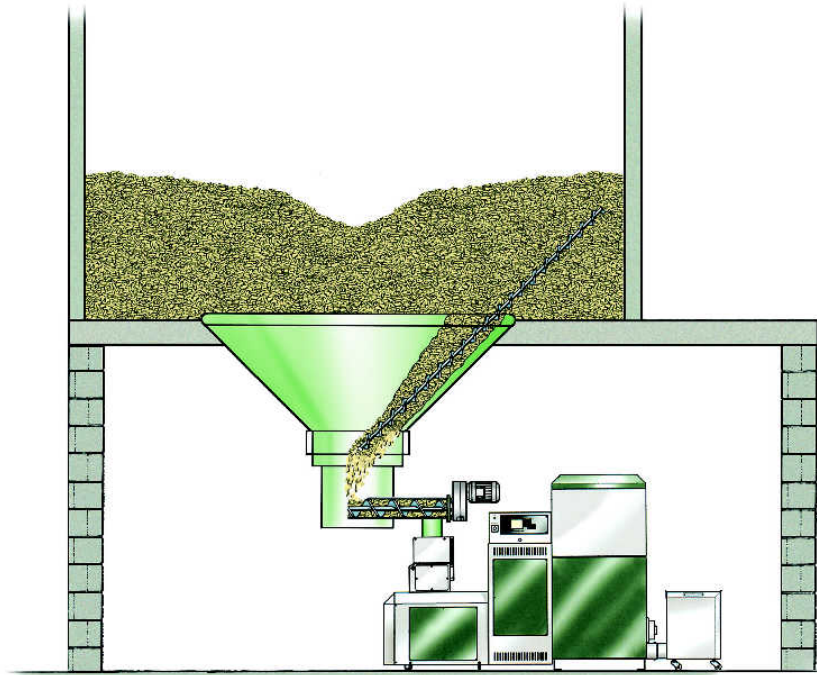
## RFP PART E - SPECIFIC PLAN FOR UTILIZATION OF GRANT FUNDS

Please indicate how your organization will use funds granted through this program. Provide as much detail as possible about your current energy outlook, how a conversion to wood fuel might assist your operation, how you will undertake this project, and how supportive your organization is of pursuing this wood energy installation. Please attach and label additional pages as necessary.

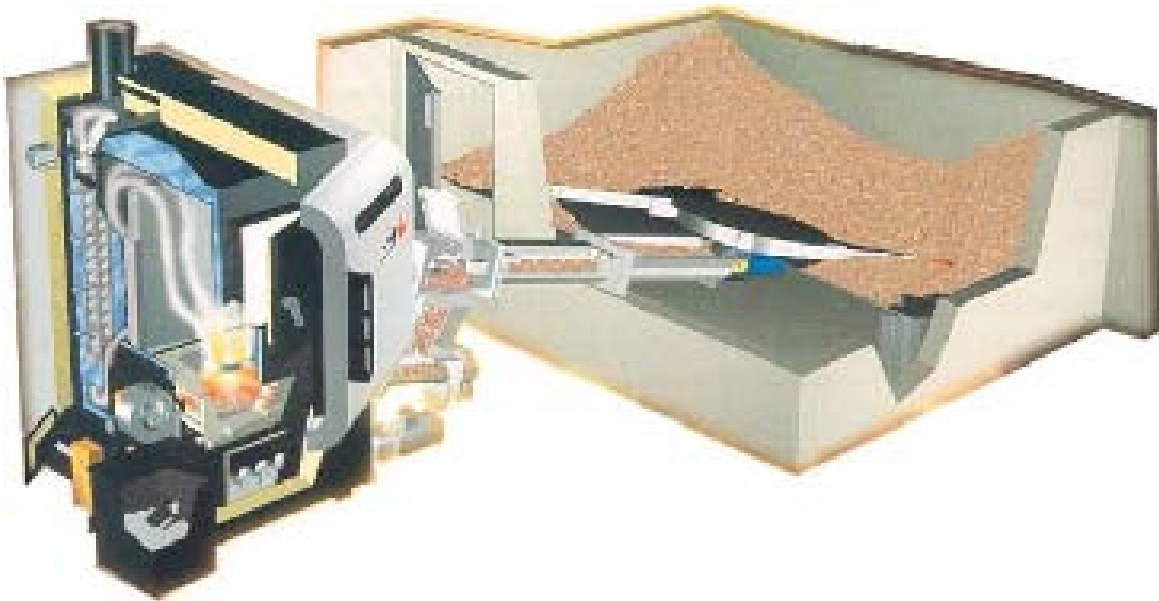
Please provide the following information about your project:

1. What type of facility do you operate and how many people does it serve? What kind of impact will this project have on the economic needs of your community? Will this wood energy project move forward if you do not receive the grant?
2. Please describe the existing (or planned) building, staffing, equipment, and fuel storage capabilities. If possible, please attach an engineering feasibility assessment, an analysis of air quality concerns and emissions control plans, and any drawn site plans.
3. Please describe the economic viability of the new system, contrasted with that of the existing system. Be sure to include information about your recent fuel consumption patterns, energy needs, estimated costs of a new system, likely savings scenarios (including descriptions of past fuel type, usage, and costs), and projected payback time.
4. Is there strong institutional commitment and explicit approval for project to move forward from your leadership? Is there support for and commitment to the wood energy conversion project from your community (elected officials, partnering organizations, local businesses, etc.)? You are encouraged to include letters of support.
5. What efforts has your facility taken toward energy efficiency/conservation and long-term sustainability? How does your plan address the shifting seasonal nature of energy needs and wood fuel supply?
6. What type of wood fuel will your system use, and how much will it consume on an annual basis? Have you already identified specific fuel sources and providers? Will this system create a more efficient and/or affordable wood disposal option for your or your partners? Please provide information regarding your fuel source, fuel cost (including both purchase and delivery), fuel availability/accessibility, likely partners, and fuel storage plans.
7. Have you already secured adequate capital for completing all construction activities? Please describe your matching funding sources. While a generalized project budget is required in Part C, a more detailed project budget description is encouraged and may be attached. [*Reminder: Grant funds from this program cannot cover any portion of the actual construction. Funds may only be used for analysis/design or purchase of equipment and boiler system components.*]
8. Please include a description of the project's timeline, likely contractors, and work plan. Projects that will be implemented and completed within one year are preferred.
9. **Optional:** Please summarize your application's strengths, further describe key impacts that this funding may have on your organization, and/or include additional supporting information that we should take into consideration when reviewing your application.

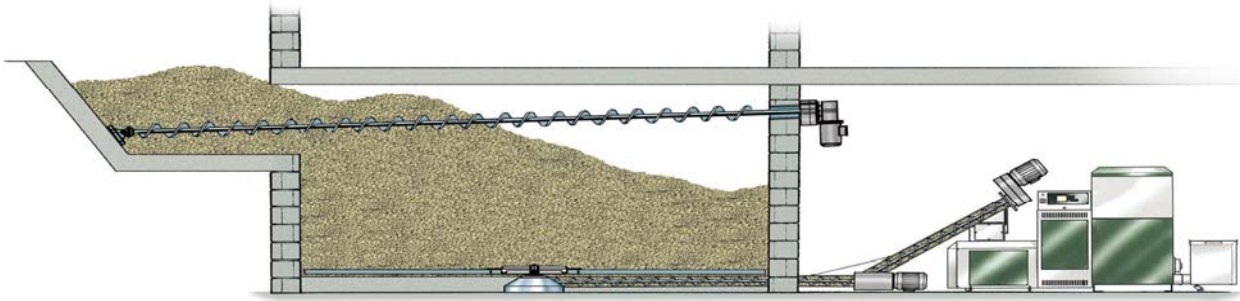
## Appendix A: Wood Storage Options



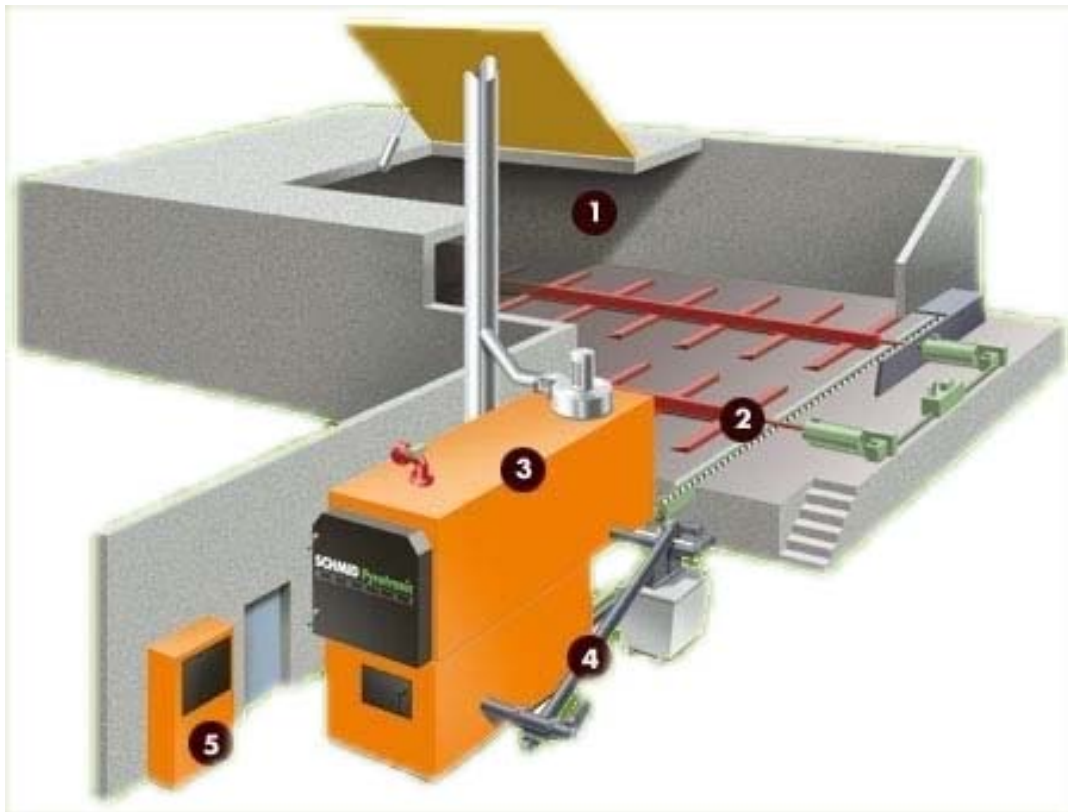
**Silo located above boiler room**



**Inclined swept floor bunker**



**Non-inclined, swept floor bunker**



**Walking floor bunker**

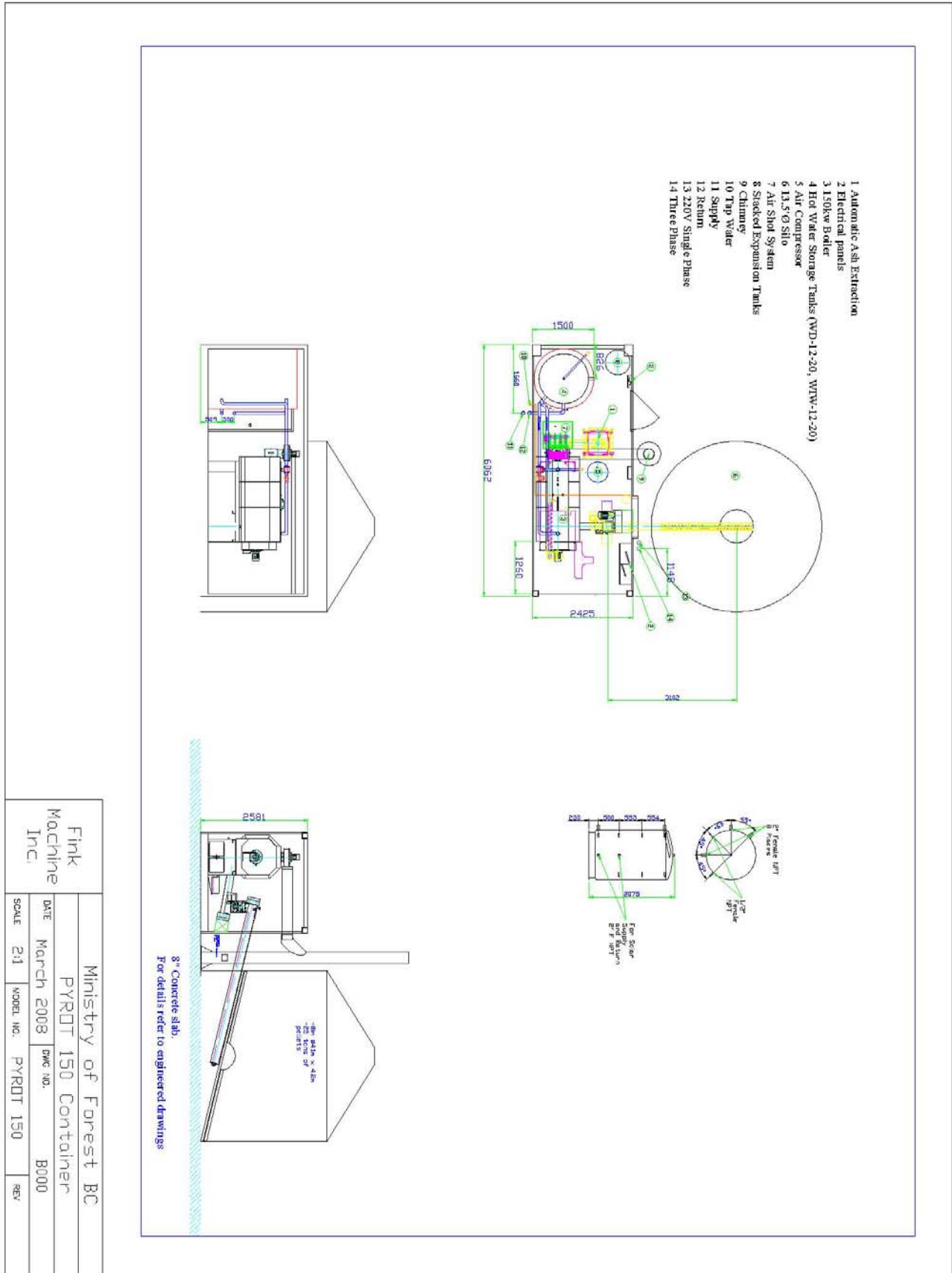
## Appendix B: Sample Boiler Project Estimate (for reference only)

Wood Boiler Cost Budget (for reference only as an example, not for actual costing of a system)

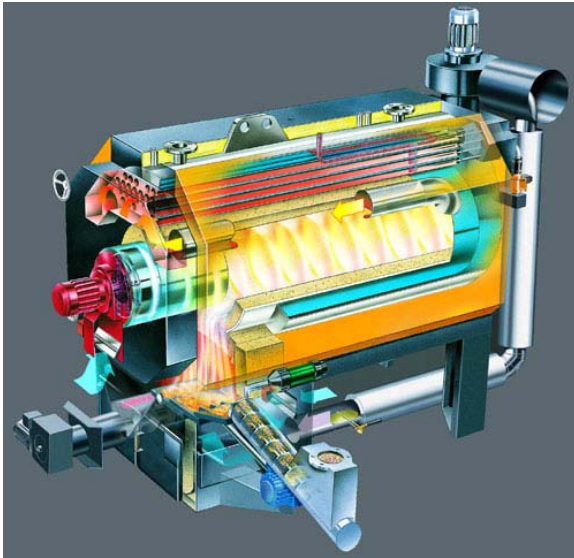
### **2 Million BTU/hr Wood chip boiler in free standing boiler house**

Wood storage bin & all conveying		\$30,000
Wood chip boiler		\$100,000
Boiler controls		Included
Stack		Included
Fire suppression system		Included
Multi-cyclone fly ash precipitator		Included
Automatic tube cleaner & automatic ash removal		Included
Baghouse or electrostatic precipitator		not required
HW storage tank		\$10,000
HW supply pump & expansion tank		\$5,000
	<b>Equipment Subtotal</b>	<b>\$145,000</b>
Engineering	10%	\$14,500
Project Management	5%	\$7,250
Freight	5%	\$7,250
	<b>Miscellaneous Cost Subtotal</b>	<b>\$29,000</b>
HW heating unit heaters for multiple locations		\$10,000
HW and boiler mechanical installation labor		\$30,000
Electrical installation labor		\$10,000
Domestic water and sewer to building		\$15,000
	<b>Installation &amp; HW Piping Subtotal</b>	<b>\$65,000</b>
	\$/sq ft	
Boiler building (600 sq ft at given cost per sq ft)	\$40	\$30,000
	<b>Boiler Building Subtotal</b>	<b>\$30,000</b>
	<b>Project Subtotal</b>	<b>\$269,000</b>
General Contractor Fees	10%	\$26,900
Contingency	20%	\$53,800
	<b>Total Project Estimate</b>	<b>\$349,700</b>

# Appendix C: Sample Boiler Layout (500,000 BTU/hr Containerized)



## Appendix D: Sample Automated Wood Chip Boiler and Accessories



- Feeder module with barrier control
- Moving grate
- Primary air control valve
- Flue gas recirculation control valve
- Ignition blower
- Deasher
- Secondary air control valve with rotation blower
- Rotation combustion chamber
- Boiler heat exchanger
- Safety heat exchanger
- Pneumatic pipe cleaning system
- Induced draft fan

### **PYROT Rotary combustion**

The new dimension in combustion technology. Continuous gasification is carried out on the moving grate with minimal primary air. The combustible gases rise into the rotary combustion chamber and are mixed with secondary air that had been diffused by the rotation blower and given spin impulse. This guarantees a perfect mixture of secondary air with the combustible gases. It brings about a new era in the combustion technology of wood fuels, making it equivalent in quality to gas combustion.

### **High efficiency**

The perfect combustion lowers the emissions of CO and NOx to below that of modern oil heating systems. Unlike oil and gas, wood is CO2-neutral and renewable. Used with our modulating output controllers, burner efficiency of more than 90% is achievable.



**Flue gas de-duster**



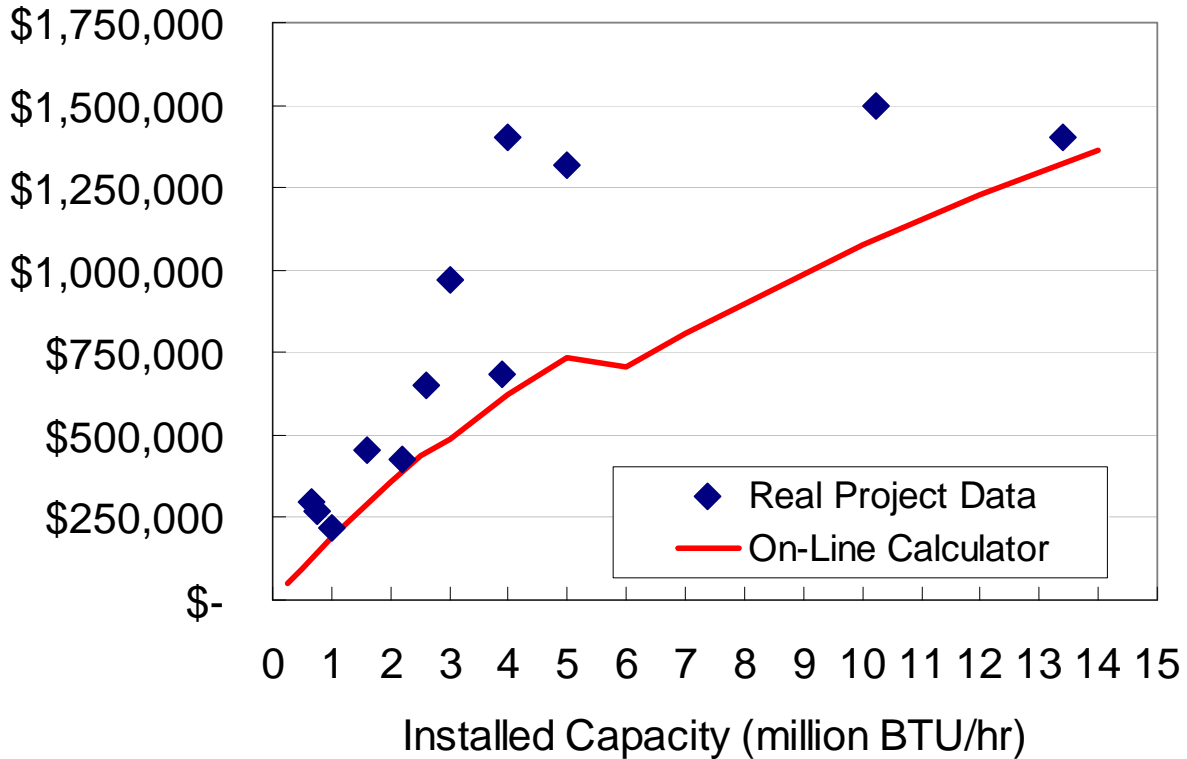
**Automatic ash removal system & bin**



**Automatic tube cleaning system**

## Appendix E: Estimated Boiler System Budgets per Installed Capacity

### Total Installed Project Cost per Million BTU/hr of Installed Capacity



Year	State	Size (MMBTU/hr)	Size (kW <sub>th</sub> )	Installed Cost	Manufacturer	Cost per MMBTU/hr
2007	MT	0.65	191	\$ 300,000	Decton	\$ 461,538
2006	OR	0.75	220	\$ 269,000	KOB	\$ 358,667
2007	ND	1.0	293	\$ 220,000	King Coal	\$ 220,000
2005	MT	1.6	469	\$ 455,000	Chiptec	\$ 284,375
2007	MT	2.2	645	\$ 425,000	Solagen	\$ 193,182
2004	MT	2.6	762	\$ 650,000	Messersmith	\$ 250,000
2003	MT	3.0	879	\$ 970,000	Messersmith	\$ 323,333
2004	MT	3.9	1,143	\$ 684,000	Messersmith	\$ 175,385
2007	AL	4.0	1,172	\$ 1,400,000	Chiptec	\$ 350,000
2007	MT	5.0	1,465	\$ 1,320,000	Messersmith	\$ 264,000
2002	MA	8.0	2,345	\$ 4,340,000	Messersmith	\$ 542,500
2008	MI	10.2	3,000	\$ 1,500,000	Vynke	\$ 146,499
2007	MT	13.4	3,927	\$ 1,400,000	Chiptec	\$ 104,478
2007	SC	72.0	21,102	\$ 16,000,000	Nextera	\$ 222,222
2007	MT	6.0	1,758	\$ 525,000	PES-Solagen	\$ 87,500

Reference: "Exploring Woody Biomass Retrofit Opportunities in Michigan Boiler Operations", CTA Architects and Engineers, funded by Southeast Michigan RC&D Council, (2007)

## Wood Energy Calculator

### Contact Information

E-mail

County

### Facility Type

- Office/Retail
- Detention
- Education
- Healthcare
- Industry
- Power Production
- Residential
- Not Applicable

### Boiler Size

Combined Input of Boilers Currently in Your Facility

 (in BTUs)

### Current Fuel Type

- Coal
- Electrical
- Fuel Oil
- Natural Gas
- Propane

[Continue](#)

## Calculator Continued

### Fuel Information

Price of Current Fuel

(\$ per gallon)

Annual Use of Current Fuel

(in gallons)

Projected Price of Wood Fuel

148  (\$ per green ton)

### Financing

Projected Interest Rate

5  (%)

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# Michigan Wood Energy Report

**Estimated Total Project Cost: \$97,500.00**

**Simple Payback: 7.6 years**

Project Financing Information	
Percent Financed	100%
Amount Financed	\$97,500.00
Amount of Grants	\$0.00
Interest Rate	5%
Term	10 Years
Annual Finance Cost - Principal and Interest	\$12,627.00

Annual Project Costs					
Cash Flow Descriptions	Unit Costs	Fuel Source Proportion	Annual Fuel Quantities	Fuel Units	Year 1 Costs
<b>Estimated Existing Annual Costs</b>					
Existing Fuel (fuel oil)	\$2.75		10,000.00	gallon	\$27,500.00
<b>Estimated Proposed Wood-Fired System Annual Costs</b>					
Wood Fuel (pellets)	\$148.00	95%	86	ton	\$12,728.00
Existing Fuel	\$2.75	5%	500.00	gallon	\$1,375.00
Additional Operation and Maintenance Costs					\$500.00
<b>Total Proposed Annual Costs</b>					<b>\$14,603.00</b>
<b>Annual Cost Savings</b>					
					<b>\$12,897.00</b>
<b>Annual Finance Cost - Principal and Interest</b>					<b>\$12,627.00</b>
<b>Net Annual Cash Flow</b>					<b>\$270.00</b>

## Your Current Information

This is the information you submitted via the calculator:

- E-mail: test@sample.org
- County: Alcona
- Facility type: Office/Retail
- Combined boiler size: 500,000.00 btu
- Current fuel type: Fuel Oil
- Current fuel price: \$2.75
- Annual use of current fuel: 10,000.00 gallons
- Projected wood fuel cost: \$148.00 / ton pellets
- Projected interest rate: 5%

## Assumptions

Some standard values were used to make this calculation. These figures are likely to be suitable for your project; however, a site with different values may have a less reliable report. The following assumptions were used:

- Amount of grants: \$0.00
- Term of financing: 10 years
- Wood fuel type = chips for systems > 3,000,000.00 btu
- Wood fuel type = pellets for systems <= 3,000,000.00 btu
- Proportion of wood fuel use in new system: 95%
- Proportion of existing fuel use in new system: 5%

*[Note: Wood boiler sizes are assumed to be half of the size of existing boilers to maximize efficiency. This size is optimal for meeting the needs of 90-95% of a typical heat load. Existing fossil fuel boilers, which are generally oversized, can still be used to meet infrequent peak load conditions.]*

The information provided by the Wood Energy Calculator is a preliminary assessment and should not be used to develop actual project plans. Projected costs and savings are only estimates; no guarantee of actual expenses or benefits is implied.



**US Forest Service Wood Education and Resource Center  
Wood Energy Technical Assistance Program**

**Wood Energy Project Data Collection**

<b>Facility Information:</b>		
Facility name and mailing address  <input type="checkbox"/> Public or <input type="checkbox"/> Private	Size of heated space in square feet:	
	Year of construction:	
	Years of major renovation(s)	
	First renovation:	
	Second renovation:	
Contact person for questions regarding this form:  Name: Title: Phone : Fax : E-mail address: Date form was completed:	Type of facility (check one) <input type="checkbox"/> School <input type="checkbox"/> College/University <input type="checkbox"/> Hospital <input type="checkbox"/> Prison <input type="checkbox"/> Other	No. of students or occupants
If the facility has multiple buildings, list each building below, give its size in square feet and state whether it is heated from a central boiler plant		
<b>Name of building</b>	<b>Size in square feet</b>	<b>Central boiler?</b>
Ex. Franklin elementary school	25,000	yes
<i>An opportune time for adding a boiler is when a facility is undergoing an expansion or major renovation. Do you have any plans for expansion or major renovation in the foreseeable future? If so please describe below.</i>		
<b>Heating System</b>		
How is heat delivered to rooms? (check all that are applicable) <input type="checkbox"/> Hot water <input type="checkbox"/> Steam <input type="checkbox"/> Ducted air <input type="checkbox"/> Electric resistance <input type="checkbox"/> One heating plant in one location? <input type="checkbox"/> Different heating plants in multiple locations? <input type="checkbox"/> Individual, room by room heating systems?	How is heat generated? <input type="checkbox"/> Hot water boiler <input type="checkbox"/> Steam boiler <input type="checkbox"/> Hot air furnace <input type="checkbox"/> Electric baseboard <input type="checkbox"/> Electric duct coils <input type="checkbox"/> Rooftop packaged units <input type="checkbox"/> Heat pumps	

<b>Heating equipment</b>		
List each piece of heating equipment separately below. Include size in boiler horse power or BTU, state what fuel it uses, i.e. Natural Gas, #2 fuel oil, heavy oil, LPG, Coal, other and when it was installed.		
<i>Size</i>	<i>Type of Heater</i>	<i>Fuel Type and year installed</i>
<i>Ex. 3.5 MBtu or 200 BHP</i>	<i>Hot water boiler</i>	<i>#2 fuel oil, installed in 1998</i>
If buried steam lines or hot water lines are used to connect multiple buildings to a central boiler plant, what condition are the lines? Circle one: <b>Poor Fair Good Excellent</b>		
<b>Other information</b>		
Describe your fuel storage for each heating fuel storage tank		
<i>Tank Capacity</i>	<i>Date installed</i>	<i>Fuel Type</i>
<i>Ex. 10,000 gallon buried</i>	<i>1953</i>	<i>#2 fuel oil</i>
Is your domestic hot water heated from a central boiler? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Has your facility recently undergone an energy audit? If so when?		

**Required Attachments**

1. If the facility has multiple heating plants in separate locations, please provide a rough sketch on a separate page of the community or campus and locate each heating system on the sketch. Feel free to use a pre-printed community or campus map or building floor plan if one is available. Provide size of heating plant in boiler horse power or Btu for each system and state what fuel is used for each system. Place on map location of any storage tanks used for heating fuels and their size.
2. Please provide at least two full years of heating fuel records with volumes of fuel used **for each heating plant**. For example if some buildings are heated from a central boiler plant using natural gas and others have stand-alone fuel oil boilers, list each separately with volumes for each. If your domestic hot water is not provided by a central boiler, list each account separately and identify which fuel is used for which equipment. Often it is easiest to get this information from your fuel dealer as a printout of fuel deliveries.
3. Please provide at least two years of electric bills for all buildings on site.
4. Please provide a copy of your latest fuel bill and electric bill for all accounts on site that includes account number and cost of fuel.

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**Mail or fax completed application form and attachments to:**

**USFS WERC Wood Energy Technical Assistance  
 c/o Yellow Wood Associates, Inc.  
 228 North Main Street  
 St. Albans, VT 05478  
 Fax 802-524-6643  
 Phone 802-524-6141**