

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Allerton Park and Retreat Center

515 Old Timber Road
Monticello, IL 61856



September 26, 2008

Ms. Stephanie Bogle
Student Sustainability Committee

University of Illinois

Re: Help Your Campus Be More Sustainable—Allerton Park and Retreat Center
Green Allerton --Alternative Energy/ Conservation Project

Dear Stephanie,

On behalf of the University's Allerton Park and Retreat Center, I appreciate the opportunity to submit a grant proposal to the Student Sustainability Committee in the amount of \$25,500. The 'Green Allerton--Alternative Energy/ Conservation Project' is a continuation of the Park's efforts to address its stated mission:

- To develop programs for research and education that focus on a comprehensive understanding of nature, landscape and sustainable systems.
- To employ balanced, integrated management techniques that preserve Allerton's natural and cultural reserves
- To be good stewards of a natural setting where visitors gain a better understanding of their relationship to nature

The Green Allerton initiative focuses on operational sustainability issues at the Park, including:

- Recycling efforts
- Energy conservation initiatives
- Reduction of Fossil fuel use
- Water conservation initiatives
- Park grounds energy efficient operations
- Facility maintenance and conservation
- Purchasing
- Waste stream management

Goal and Objectives

This project's goal is to bring together University faculty, Park staff and a student scholar to discover and implement a sustainable solution for the reduction of the extraordinary energy consumption of several park buildings. The objective of the project is to research, recommend and install a new alternative fuel heating system in these structures, which utilizes both the Park's human ingenuity and renewable natural resources. Specifically, we would use the grant funding toward the purchase of a new alternative heating system. The quality and success of this project depends on the generous support of the Student Sustainability Committee who share our mission of a

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sustainable campus and park. As with all Green Allerton project, they are demonstrable examples of energy conservation that educate visitor (students and the surrounding community members).

Extraordinary Energy Consumption

In 1946, Robert Allerton gave his east central Illinois estate to the University of Illinois. Several buildings from this period that are under consideration in this project are the Environmental Education center (formerly the ice house), the woodshop and the car shop. Currently they are heated by individual inefficient forced air natural gas units. In the past year the natural gas rates have dramatically increased. Each of these spaces provides vital services to the Park. However, the increase cost to heating these structures may necessitate the limited use of them. The park administration believes that an alternative method of heating these buildings can be found and employed for continued full use of the facilities.

The Park has installed a wood burning furnace that heats two greenhouses during the months of January through April. These facilities were heated by individual forced air heating units. The cost of fuel has decreased by one third.

Budget

The proposed budget for the entire project can be found on the Attachment 1. This grant proposal is requesting over 70% of the cost of this project. The park will make up the remaining 27%. As with all university units we are searching for additional potential funding sources. The project is dependent on the funding from the Student Sustainability Committee grant.

Methodology and Rationale

In order to obtain baseline data for each of these buildings, the project would begin with a structure conditions survey and energy audit. This information would be analyzed using current LEED standards and the latest energy saving research studies. In particular, industry formulas would be applied to ascertain the heat loss for each structure. The analysis would include a comparison of economic impacts of different alternative heating systems over time. This would be crucial to its implementation at the Park since the whole reason for looking into a change in the heating system was precipitated by extraordinary fuel costs. Finally, this phase would determine what, if any of the existing heating system elements could be re-used.

Two other components of the methodology would include the development of an energy conservation plan including weather-proofing, thermostat regulation, insulation upgrade, etc and research into what renewable natural resources that are produced at the Park would be appropriate for use in the alternative heating system. The later would be key to the sustainability aspect of the project.

Project Products

Documentation List:

1. Existing building drawings and site condition survey
2. Each building Energy Audit
3. Analysis of findings: Energy loss, economic cost benefit, renewable Park natural resources, energy conservation measures, etc.
4. Project specifications based on appropriate LEED standards and research studies
5. Recommendations for appropriate alternative fuel heating system
6. Final report to grantor of project completion

Proposed Project Timeline:

Nov 1, 2008 – January 30, 2009	Begin project: Site condition survey and energy audit; building drawings
February 29, 2009	Analysis of survey and audit findings; research on appropriate LEED standards and research of alternative fuel heating systems studies
March 31, 2009	Recommendations for heating system; develop specifications and drawings for system
June 30, 2009	Installation of heating system; final report to grantor

Energy, Environmental, Social and Economic Impact:

This project would result in an alternative energy system that would save the park greater than 45% on the heating bills for the specified structures for the heating season. This has been experience in the existing wood burning furnace that is currently installed and used at the Diversified Farm at the Park. See Attachment 2 for insert from energy report completed on the Diversified Farm

Environmental Impact

Positive environmental effects will primarily include the saving of natural gas resources. In addition, the use of renewable energy source of downed timber with in the 1500 acres of the park is also a positive benefit of this project. Negative environmental effects could be the disturbance of habitat is certain parts of the park by removing downed timber. The Park staff will have a plan in cooperation with the Park naturalist on removal of this timber as to minimize the effect of removal.

Social Impact

The positive social impact would be in the education of the public (visitor and students) of the project system and the potential use in their homes and/or communities. This would also be an opportunity for student and/or service groups to volunteer to assist park employees with preparing and handling the wood for the furnaces. Any negative social impact would be negligible.

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Economic Impact

The positive economic impact would be the creation of a job in maintaining the furnaces at the park. Any negative effects would be negligible.

Outreach and Education

Allerton Park and Retreat Center, although not physically on the University campus has made strident efforts to included students in the various aspects of the planning, design and operations of the Park. The Scholar program works with the Departments of Architecture, Landscape Architecture and Natural Resources and Environmental Sciences. Each summer the Park employees 3-5 interns in various operations of the part including: horticulture, design and park maintenance.

The origin of this project will be with the assistance of the Architecture scholar that works 20 hours at the park per week. The actual installation of the system will be conducted in the summer of 2009 in which the summer interns will be involved in the project as well as the construction of storage structure.

As with all the Green Allerton Project, information on the project, installation and operation will be made available on the Allerton Park and Retreat Center website, quarterly newsletter and features in local and university media. Similarly, these projects are also available to the public and especially university classes for study and tours. In the past, we have had classes from the Department of Architecture and Landscape Architecture tour the various energy efficient facilities that are on site and include suggestions for additional designs. It is hoped that information on this project would be highlighted in the University's energy efficiency program, B.L.U.E. Program.

Finally, Allerton Park and Retreat Center has over 150,000 visitors annually. It is important to note to these folks that we are part of the University. It is equally important to demonstrate that the University and the staff of the Park are aware of their roles as educators and innovators in natural areas conservation awareness and energy conservation, not only on campus but to all the units.

Should have a further questions or require additional information, please do not hesitate to contact me at 217-333-3287 x 204 or by email: bschleic@illinois.edu or Jim Gortner, Associate Director 217-333-3287 x 111 or by email: gortner@illinois.edu.

Sincerely,

Barbara A. Schleicher
Grant Writer and Landscape Designer

Attachments

University of Illinois-- Allerton Park
 Green Allerton--Alternative Energy and Conservation

Attachment 1--Project Budget

Phase 1.	Site condition survey, energy audit and building drawings (Graduate student time and supervisor meetings)	\$1,520
Phase 2.	Analysis of findings, report development and presentation (Graduate student time and supervisor meetings)	1,520
Phase 3.	Recommendations, project specifications and drawings for system 1,469 (Graduate student time and supervisor meetings)	1,520
Phase 4	Heating system installation-- materials estimate	25,500 3,000
	Wooden Storage Structure Park labor estimate	2,500
Phase 5	Reporting to grantor (Grant write preparation and presentation)	550
	Total	\$36,110

This amount does not include the cost of heating line work.

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Attachment 2.

Table 10.3.1: Wood-burning retrofit

	WOOD BOILER										
	ELEC		GAS		WOOD						
	Kwh	PRICE (+10%)	THERMS	PRICE (+10%)	CORDS	FUEL (+10%)	LABOR (+5%)	PRICE	TOTAL PRICE	SAVING vs. CURRENT	
2005	10145	\$1,155	7625	\$9,325	0			\$0	\$10,480		
2006	25362.5	\$3,176	3050	\$4,103	200	\$600	\$6,960	\$7,560	\$14,839	\$8,217	-
2007	25362.5	\$3,494	3050	\$4,513	200	\$660	\$7,308	\$7,968	\$15,975	\$17,603	-
2008	25362.5	\$3,843	3050	\$4,965	200	\$726	\$7,673	\$8,399	\$17,207	\$28,294	*
2009	25362.5	\$4,228	3050	\$5,461	200	\$799	\$8,057	\$8,856	\$18,544	\$40,437	**
2010	25362.5	\$4,650	3050	\$6,007	200	\$878	\$8,460	\$9,338	\$19,996	\$54,197	**
2011	25362.5	\$5,115	3050	\$6,608	200	\$966	\$8,883	\$9,849	\$21,573	\$69,757	**
2012	25362.5	\$5,627	3050	\$7,269	200	\$1,063	\$9,327	\$10,390	\$23,286	\$87,316	**
2013	25362.5	\$6,190	3050	\$7,996	200	\$1,169	\$9,793	\$10,963	\$25,148	\$107,098	**
2014	25362.5	\$6,809	3050	\$8,795	200	\$1,286	\$10,283	\$11,569	\$27,173	\$129,347	**
2015	25362.5	\$7,489	3050	\$9,675	200	\$1,415	\$10,797	\$12,212	\$29,376	\$154,336	**
2016	25362.5	\$8,238	3050	\$10,642	200	\$1,556	\$11,337	\$12,893	\$31,774	\$182,364	**
2017	25362.5	\$9,062	3050	\$11,706	200	\$1,712	\$11,904	\$13,616	\$34,384	\$213,761	**
2018	25362.5	\$9,968	3050	\$12,877	200	\$1,883	\$12,499	\$14,382	\$37,228	\$248,893	**
2019	25362.5	\$10,965	3050	\$14,165	200	\$2,071	\$13,124	\$15,195	\$40,325	\$288,163	**
2020	25362.5	\$12,062	3050	\$15,581	200	\$2,278	\$13,780	\$16,059	\$43,702	\$332,016	**
2021	25362.5	\$13,268	3050	\$17,139	200	\$2,506	\$14,469	\$16,976	\$47,383	\$380,944	**
2022	25362.5	\$14,595	3050	\$18,853	200	\$2,757	\$15,193	\$17,950	\$51,398	\$435,488	**
2023	25362.5	\$16,054	3050	\$20,738	200	\$3,033	\$15,952	\$18,985	\$55,778	\$496,246	**
2024	25362.5	\$17,660	3050	\$22,812	200	\$3,336	\$16,750	\$20,086	\$60,558	\$563,877	**
2025	25362.5	\$19,426	3050	\$25,094	200	\$3,670	\$17,588	\$21,257	\$65,776	\$639,109	**
2026	25362.5	\$21,368	3050	\$27,603	200	\$4,036	\$18,467	\$22,503	\$71,475	\$722,744	**
	*	SINGLE WOOD BURNING BOILER PAYS FOR ITSELF									
	**	DUEL WOOD BURNING BOILERS PAY FOR THEMSELVES									

Source:Energy *Evaluation and Recommendations. Allerton Park Diversified Farm Greenhouses.* Ben Loeffler (Architecture Scholar) June 22, 2006