



## STUDENT SUSTAINABILITY COMMITTEE

### Funding Application – Step II

#### Funding Criteria

##### A. General Rules

1. Students, faculty, and staff are encouraged to submit requests for funding. Student-led projects require a faculty or staff sponsor in order to have funds awarded.
2. Funding can only go to university-affiliated projects from students, faculty, staff, and departments.
3. All SSC projects must make a substantial impact on students. This may be a direct impact or an impact through education and engagement. All SSC funding is 100% from student green fees, so the projects funded by the students must benefit them.
4. SSC encourages innovation and new technologies – creative projects are encouraged to apply.
5. Unless a type of expense is specifically listed below as having restrictions, SSC can generally fund it. The items referenced below should not be taken as comprehensive list.

##### B. Things SSC Can Fund, On A Case-By-Case Basis

1. SSC can fund feasibility studies and design work; however, it must work toward ultimately addressing a sustainability need on campus.
2. SSC can fund staff positions that are related to improving campus sustainability. Strong preference will be given to proposals receiving matching funding from departments and/or plans for maintaining continuity of the position after the end of the initial grant.
3. SSC can fund outreach events with a central theme of sustainability, provided their primary audience is the general campus community.
4. SSC discourages funding requests for food and prizes but will consider proposals on a case by case basis that prove significant reasoning.
5. SSC can fund repairs and improvements to existing building systems as long as it works toward the goal of improving campus sustainability; however, a preference is shown to projects utilizing new or innovative ideas.
6. SSC can provide departments with loans for projects with a distinct payback on a case by case base. Loans will require a separate memorandum of understanding between SSC and departmental leadership pledging to repay the award in full and detailing the payback plan.

##### C. Things SSC Will Not Fund:

1. SSC will not fund projects with a primary end goal of generating revenue for non-University entities.
2. SSC will not fund personal lodging, food, beverage, and other travel expenses.
3. SSC will not fund any travel expenses.
4. SSC will not fund tuition or other forms of personal financial assistance for students beyond standard student employee wages.

**Your Step 2 funding application should include this application, the supplemental budget form, and any letters of support.**

*Please submit this completed application and any relevant supporting documentation to [Sustainability-Committee@Illinois.edu](mailto:Sustainability-Committee@Illinois.edu). The Working Group Chairs will be in contact with you regarding any questions about*

the application. If you have any questions about the application process, please contact the Student Sustainability Committee at [sustainability-committee@illinois.edu](mailto:sustainability-committee@illinois.edu).

## General & Contact Information

**Project Name:** Expansion and increased utilization of biomass heating at the Energy Farm.

**Total Amount Requested from SSC:** \$43,871

**Project Topic Areas:**  Land & Water  Education  Energy  
 Transportation  Food & Waste

**Applicant Name:** Timothy Mies

**Campus Affiliation (Unit/Department or RSO/Organization):** Crop Sciences

**Email Address:** tmies@illinois.edu

### Check one:

- This project is solely my own **OR**  
 This project is proposed on behalf of (name of student org., campus dept., etc.): Crop Sciences / Energy Farm

### Project Team Members

Name	Department	Email
Timothy Mies	Crop Sciences	tmies@illinois.edu
Mark Taylor	Architecture	mstaylor@illinois.edu
Erik Sacks	Crop Sciences	esacks@illinois.edu
Marillia Gomes De Sa Ribeiro	Architecture	marilia2@illinois.edu

### **Student-Led Projects (Mandatory):**

Name of Faculty or Staff Project Advisor:

Advisor's Email Address:

### ***Financial Contact (Must be a full-time University of Illinois staff member)***

Contact Name: Anna Tammen

Unit/Department: Crop Sciences

Email Address: amtammen@illinois.edu

## **Project Information**

*Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.*

### **Please provide a brief background of the project, its goals, and the desired outcomes:**

*You may copy and paste your Step 1 application answer if nothing has changed.*

This project would retrofit drying ovens and associated workspace to utilize renewable energy heat from an existing biomass boiler. The College of ACES is financially supporting the construction of a sample processing room to better utilize the existing drying oven assets at the Energy Farm. The current energy source for drying oven operation is propane. The proximity of the existing biomass boiler to this new workspace would allow an economical means to provide renewable low carbon heat for space heating and oven operation.

The biomass boiler, installed in 2017 and operational now for two heating seasons, has proven its functionality and carbon decreasing benefit. The primary structure heated by the boiler is a greenhouse ( heating season is Oct-April annually, with the majority of hours at night) that has untapped resource to better utilize the off peak idle time. By expanding both the number of months of operation per year and utilizing excess capacity, an increased value and return on initial investment in the boiler can be realized.

The Student Sustainability Committee was one of the primary financial contributors to the initial project which installed the biomass boiler. With support for this application, biomass heat can additionally power the drying ovens and associated workspace to be enclosed. This project will further capitalize on the environmental benefits of the boiler allowing for an immediate decrease in carbon output from the Energy Farm.

### **Where will the project be located? Are special permissions required for this project site?**

*If special permission is required for this location, please explain and submit any relevant letters of support with the application.*

Located at the Energy Farm, directly adjacent to an existing biomass boiler room to minimize installation costs. Support has been granted by the department and college for this project.

### **Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that benefit from this project.**

*Please attach letters of commitment or support at the end of the application.*

College of ACES \$50,000

Department of Crop Sciences : in-kind support through project management, system operation, biomass supplied, and balance of funds necessary to complete the project.

School of Architecture : in-kind support for the construction of the sustainably produced wall insulation panels utilizing plant fibers.

Dudley Smith Initiative : Biomass heating research support : \$4807

Surplus funds from initial boiler installation : \$7840

## **How will this project involve and/or benefit students?**

*This includes both direct and indirect impact.*

- Directly, this new workspace would be used year round by researchers, including undergrad and graduate students, in processing their samples for further analysis. This project will create a comfortable work environment utilizing renewable energy, where previously it was exposed unconditioned space, typically processed during winter months.
- Student groups from multiple colleges across campus visit the Energy Farm each year. The Biomass Boiler is a regular stop for these tours whether they are within the home College of ACES or from multiple other colleges including Engineering and LAS. These interactions always peak interest in the practical application of novel renewable energy.
- Student class projects and individual research projects are always encouraged and supported as they arise.
- During this spring 2019 semester students in Seminar Arch 576 will begin investigating and developing construction details for this project with a view to integrate a mixture of agricultural waste fiber and natural binders as part of the structure walls and insulation materials, further demonstrating sustainability construction techniques.

## **How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?**

Publicity will be distributed through the iSEE communications office in the form of electronic communications to the campus. Field days, class tours, and frequent visitors will also benefit from onsite education and outreach activities either directly through biomass heating presentations or related tours at the Energy Farm. Finally, a web pages with not only specific focus on the biomass boiler and attached heating loads be available, but also a real time web page reporting the energy and carbon benefits realized through the system.

## **Financial Information**

*In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee [website](#). Submission of both documents by the submission deadline is required for consideration of your project.*

## **Have you applied for funding from SSC before? If so, for what project?**

2015 Field to Fuel - Biomass Heating on Campus

2018 Gable Home - Permanent Location

## **If this project is implemented, will you require any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?**

*Please note that SSC provides funding on a case by case basis annually and should not be considered as an ongoing source of funding.*

NO – Income from biomass purchased for replacement of propane will provide for ongoing O&M costs associated with the conversion from propane to low carbon biomass.

**Please include any other obtained sources of funding. Have you applied for funding elsewhere?**

*Please attach any relevant letters of support as needed in a separate document.*

ACES - \$50,000 in support of the enclosing of the room that will be heated by this biomass heat system.  
Dudley Smith Initiative - \$4807 in support of biomass heating systems from biomass  
Surplus from Biomass Boiler System - \$7840

**Environmental, Economic, and Awareness Impacts**

**How will the project improve environmental sustainability at the Urbana-Champaign campus? If applicable, how does this project fit within any of the [Illinois Climate Action Plan \(iCAP\)](#) goals?**

The biomass boiler provides a low carbon heat source (200kw) utilizing biomass fuel harvested from research plots. Miscanthus as the primary feedstock is a perennial grass grown locally on-farm that efficiently utilizes nitrogen with minimal nutrient leaching, while sequestering carbon underground.

Now in its second year of operation, the existing biomass boiler is projected to decrease propane usage from a peak of 10000 gallons per heating season to less than 500 gallons this year. The boiler currently only operates from early October to April. Drying oven operation is a much earlier season though, running from July to February annually. By utilizing excess capacity and expanding the days of operation per year, the boiler would further replace propane with renewable energy. By converting this room and ovens to biomass, propane use will decrease, aiding in realizing the goals of the iCAP for decreasing the campus carbon footprint.

The average annual propane consumed for biomass drying was 5600 gallons which can be reduced to near zero. The estimated carbon decrease would be at least 35 tons of CO2 per year. As we continue to expand the number of users and thus the operating hours per year, the realized CO2 benefit will increase also.

**How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?**

*Some examples include carbon emissions, water conservation, green behavior, and reduced landfill waste.*

Instrumentation will be installed that will allow for an accurate measurement of heat delivered to this room and drying ovens. With this information, we can accurately report how much propane was displaced, along with the carbon offset. Short term impact will be the immediate elimination of propane use from the converted heating loads. Long term benefit will be through outreach events that could lead to new systems installed both on campus and by external entities.

**What are your specific outreach goals? How will this project inspire change at UIUC?**

Tours will continue to be a regular occurrence with the biomass heating system. Tour groups have included in the past student groups (middle school through college), worldwide research and administrators and government officials, and the public.

As practical and successful application of low carbon energy systems replace fossil fuel energy sources, campus officials will be more likely to consider future similar projects. By continuing to support and demonstrate new growth possibilities, our hope is that campus will support the installation more of these systems moving into the future.

**If applicable, how does this project impact environmental injustice or social injustice?**



# STUDENT SUSTAINABILITY COMMITTEE Step II Application

Please submit this completed application and supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact SSC at Sustainability-Committee@illinois.edu.

## GENERAL INFORMATION

Project Title:	Expansion and increased utilization of biomass heating at the Energy Farm.		
Total Amount Requested from SSC:	\$43,871.00	Heating contractor \$39,883 & 10% Contingency on that work.	
Amount Requested as:	Grant	(LOAN or GRANT)	

## SCOPE, SCHEDULE, AND BUDGET VERIFICATION

If the project required you to obtain information from Facilities & Services Planning Division, please include that here and attach any supporting documentation.

### Scope & Schedule

What is the plan for project implementation? Describe the key steps of the project including the start date, target completion date, target date for submitting a final report, and any

Task	Timeframe (# of weeks to completion)	Estimated Completion Date
Project Contracting	10	7/15/2019
Room Constuction	4	8/15/2019
Heating Installation	2	9/1/2019
Project Closeout	2	9/15/2019
System Startup	2	10/1/2019
Final Report		5/1/2020

### Budget

List all budget items for which funding is being requested under the appropriate category in the following table. Include cost and total amount for each item requested. Please be as

Item	Cost Per Item	Quantity	Total Request
<b>Equipment &amp; Construction Costs</b>			
Room Construction	\$50,000.00	1	\$50,000.00
Purchase Order to Heating Contractor	\$40,000.00	1	\$40,000.00
Electrical Contractor	\$10,000.00	1	\$10,000.00
Contingency	\$10,000.00	1	\$10,000.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
Subtotal			\$110,000.00

### Publicity & Communication

			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
Subtotal			\$0.00

### Personnel & Wages

			\$0.00
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			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
		Subtotal	\$0.00

**Project Budget per F&S**

			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
		Subtotal	\$0.00

**General Supplies & Other**

			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
			\$0.00
		Subtotal	\$0.00

**TOTAL BUDGET \$110,000.00**

End of Application





## COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

Department of Crop Sciences  
AW-101 Turner Hall, MC-046  
1102 S. Goodwin Ave.  
Urbana, IL 61801-4730

31 March 2019

### Letter of Support

To whom it may concern,

I strongly support the proposal, 'Expansion and increased utilization of biomass heating at the Energy Farm', made to the Student Sustainability Committee. This project will provide sustainable heat from renewable biomass produced on the UIUC Energy Farm to warm a workroom and drying ovens. The workroom, which will be newly constructed via funding from the College of ACES, and the existing dryers are expected to be heavily used by students (undergraduate workers and graduate students) conducting research at the energy farm. Moreover, we expect high interest from students and the public in touring the biomass boiler (already existing) and the spaces it provides heat to, including an existing greenhouse, and the proposed extension to a new workspace and existing biomass dryers. By demonstrating the effectiveness, sustainability, and savings associated with alternative energy, we will not only help UIUC meet its carbon-reduction goals but we will be providing an important leading example to students and the public.

Sincerely,

A handwritten signature in blue ink that reads 'Erik Sacks'.

Erik Sacks  
Associate Professor of Perennial Grass Breeding

## Mies, Timothy A

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**From:** Bollero, German A  
**Sent:** Thursday, September 6, 2018 11:34 AM  
**To:** Mies, Timothy A; Davis, Adam S; Sacks, Erik J  
**Cc:** Isaac, Nichole Marie; Keyes, Brian J; Wolters, Douglas James  
**Subject:** RE: Energy Farm Updates

Hi Adam,

The Office of Research will support the construction of a “Weighing Room” (my naming) at the Energy Farm. I spoke to Erik Sacks about this over the summer and was waiting for you to be in the Head’s office to move it forward.

I have had conversations with Pat about this project as well. In a nutshell, there is a need for a dry, out of the wind and cold, and relatively spacious weighing room to work with biomass crops. Most of the harvesting happens in winter.

Tim and Erik has identified a place for and cost of this project. The OR will provide up to \$50,000 towards it. I will let Tim explain the details to you.

I am asking Tim to work with Doug on moving this forward.

Regards

GB

Germán Bollero  
Professor and Associate Dean for Research  
College of Agricultural, Consumer and Environmental Sciences  
University of Illinois

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## Mies, Timothy A

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**From:** Long, Stephen P  
**Sent:** Wednesday, March 13, 2019 2:15 PM  
**To:** Mies, Timothy A  
**Cc:** Emerson, Lisa Haeuber  
**Subject:** RE: Dudley Smith Heat and Power in Illinois

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**From:** Bollero, German A <[gbollero@illinois.edu](mailto:gbollero@illinois.edu)>  
**Sent:** Wednesday, March 13, 2019 2:05 PM  
**To:** Long, Stephen P <[slong@illinois.edu](mailto:slong@illinois.edu)>  
**Cc:** Mies, Timothy A <[tmies@illinois.edu](mailto:tmies@illinois.edu)>; Tammen, Anna M <[amtammen@illinois.edu](mailto:amtammen@illinois.edu)>; Isaac, Nichole Marie <[nmisaac@illinois.edu](mailto:nmisaac@illinois.edu)>  
**Subject:** Re: Dudley Smith Heat and Power in Illinois

Steve,  
Thank you for your email. I approve this request.

Regards,

Germán Bollero  
Professor and Associate Dean for Research  
College of Agricultural, Consumer and Environmental Sciences  
University of Illinois

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**From:** Steve Long <[slong@illinois.edu](mailto:slong@illinois.edu)>  
**Date:** Wednesday, March 13, 2019 at 2:03 PM  
**To:** German Bollero <[gbollero@illinois.edu](mailto:gbollero@illinois.edu)>  
**Cc:** Tim Mies <[tmies@illinois.edu](mailto:tmies@illinois.edu)>, "Tammen, Anna M" <[amtammen@illinois.edu](mailto:amtammen@illinois.edu)>  
**Subject:** FW: Dudley Smith Heat and Power in Illinois

Dear Germán, I was awarded a DS some time ago to work on Miscanthus for heat and power. This provided funding for trials on the Dudley Smith and funding to support heat and power use of Miscanthus in Christian County Extension Office and on campus. At the time there were insufficient funds to do this on campus. This has changed with the construction of the system on the Energy Farm. I would like to transfer the remaining funds to Tim Mies control so that these can be applied on campus, to upgrades of the Energy Farm Miscanthus combustion system. The DS funds are, I believe, controlled from your office. So I am seeking your permission for the re-allocation which is entirely consistent with the original proposal awarded from DS. I have copied Anna, who has outlined the remaining funding (below) and Tim Mies.

Best wishes, Steve.