Spring 2016 Campus Sustainability Grant Proposal

Solar Kiln

Project Leader: Maria Urban
Co-participants: Joe Orefice

Requested Amount: $4,750

Project Summary

Goals: The goal of the solar dry kiln proposal is to provide a tool for students to utilize to complete the wood production process at the Dillon sawmill on Paul Smith's College Campus. The solar dry kiln kit and lumber for construction will be purchased, once it is approved, and is planned to be built in the summer of 2016. It will be constructed by a group of students, alumni, faculty and staff.

Project Justification and Relevance: A solar dry kiln will not only benefit the education of Paul Smith's College students, it will also allow for the schools resources to be put to use.

By providing a solar dry kiln to be used as a part of the wood production process, it will permit students to actively learn how to properly dry sawn timber. It will be the last necessary tool that the schools saw mill needs in order to have a saw mill representative of what students will possibly be working in once completing their education at Paul Smith's College. Classes such as Forest Production Processes and Wood Properties and Production Processes will utilize the solar dry kiln as a part of their class experience.

The solar dry kiln will also be key in using more of the school's resources. With properly dried lumber, it can be utilized for projects on campus that are conducted by students, faculty, staff and alumni. Lumber that is allowed to air-dry will warp and check therefore being inadequate for building projects unlike when dried in a solar dry kiln, a controlled environment.

Another benefit of using a solar dry kiln is that there is no electricity used therefore no costs of utilization and a sustainable way to dry wood! This will keep this project from needing to produce its own source of income or having to request more money in the future. Once it is built, it will be running on solar and man power. It will be a great example for the student body and community as a sustainable tool that they will enhance their education.

The processing of the school's resources by students will give greater value to the production process and the use of the lumber for projects on campus. It will also create a "full circle" effect by using the resources managed and processed by the students for projects that the campus community will benefit from.

Methods: Joe Orefice will be the main faculty contact for this project. He will be contacting Curtis Lumber in Ray Brook and Wood-Mizer to purchase the lumber and solar dry kiln kit.

The kiln will be built in the summer of 2016 by students, alumni, faculty and staff in the same vicinity as the sawmill. A concrete pad already exists in this location that will be used to build the solar dry kiln on to. The kiln will be used by students in the Forest Productions Processes and Wood Properties and Production Processes classes. It will be maintained by those students and associated faculty in the same way that the saw mill is currently being maintained.

Project Budget and Timeline

Budget Table:

Sustainability Fund Budget- Solar Dry Kiln	
Product	Cost
Lumber & Hardware	3064.91
Solar Dry Kiln Kit	1595.00
Shipping & Handling	66.65
Total	4726.56

Budget Justification: The solar kiln kit from Wood-Mizer includes blueprints, specialty hardware, assembly instructions, circulation fans and a list of materials required for building. The list of materials required for building was given to us from a Wood-Mizer employee in order to be able to have a quote completed for the lumber prices.

Timeline: The kiln and lumber will be purchased with adequate time prior to the start date of construction following the approval of the proposal. The kiln will be built as soon as the colleges insurance company approves the construction by students, alumni, faculty and staff. A proposal will be sent to the insurance company once the approval of the solar kiln as been approved. Immediately following the approval of the sustainability proposal and insurance proposal, a building permit will be obtained by the Town of Brighton and the supplies will be ordered during that time as well. Those that are interested in participating in the construction of the solar kiln will be given adequate notification before the supplies arrive as of when construction will begin in order to plan. The kiln will be built within the next year given that the insurance company approves the construction by the fore mentioned people.

Supporting Documentation

Currently, a letter of approval from Space Allocation is in the process of being obtained. Meetings are only held when necessary, which was unknown to us until recently, so an adequate amount of time was not given to the committee by us. Also, the grounds committee only meets the first of every month, also unknown to us until recently, so we are unable to present our proposal to them until March 1st in order to receive a letter of approval. In an email chain with Randall Swanson, head of Campus Grounds Committee, it was said that they would most likely have little objection towards the proposal.

Included are four letters of support from Robert Brhel, David Simmons, Joseph Orefice and Daniel Kelting. Additionally, the construction narrative that will allow students, faculty, staff and alumni to participate in the construction of the kiln follows.

Proposed Solar Dry Kiln

Dear Sustainability Members,

It has been brought to my attention that the need for a solar dry kiln is in the funding stage. I have read the proposal and am in complete support of this project. Currently Paul Smith's College mills lumber frequently but has no way to properly dry the sawed boards, thus leaving the valuable boards—especially hardwoods—to irregularly air dry which, as stated in the proposal, twist and warp and check rendering them useless for anything other than firewood. That is a waste of time, energy, and the student's prior hard work. Also as stated in the proposal, students should be allowed to follow the chain of custody from full logs to usable boards, and even as far as using said boards to create pieces for themselves or family or legacy pieces for the college. Understanding the complete process through a hands-on approach is an extremely valuable experience, both academically and practically.
I see this project as a huge plus for Paul Smith's College as it will further the education of students, offer an insight into the wood production process for those interested in pursuing a career in that field, and it will also be prosperous for the college itself by allowing us to once again open up affordable lumber to the community through annual and/or bi-annual sales as has been the practice in the past.
I am also familiar with the proposed site and wholly believe the existing concrete pad would be adequate for the location and size for the solar dry kiln.
As the resident PSC woodworker, instructor of the Studio Art: Woodworking class, and the advisor to the Woodworking club, I would very much like to be kept abreast of developments and also to be included in the construction phase.

Thank you for your consideration,

David Simmons

Adjunct Faculty: NRME CALA

Advisor: Woodworking Club

Construction & Maintenance Manager, John Dillon Park

518-312-3618 (cell)

518-327-3951 (home)

February 20, 2016
To: Campus Sustainability Grant Committee

Attention: Kate Glenn & committee members

I am writing in support of Maria Urban's request for funding from the Paul Smith's sustainability grant monies for the construction of a solar dry kiln.
A solar dry kiln would be an asset to the Forest Production and Process class (FOR 206) that I teach during the summer session. This class would be enhanced with the addition of the principles and/or theories of drying wood products via a solar kiln along with the practical experience it brings. This addition will "close the gap" in terms of the lumber production cycle. Now we can demonstrate the cycle from standing on the stump to the finished raw product, ready to be made into a multitude of products. The students will also receive added value when they see (or use) the boards that they produced being utilized by the woodworking club and class. This additional experience would be an added skill that students would be able to use on their resume as they look for future employment opportunities.
As the primary caretaker of the saw mill on the Paul Smith's campus, the addition of the solar kiln would still be efficient in the cost of running the saw mill as it wouldn't add undue time or work to the upkeep of the area.
I would see this as a win-win for both students and the College.

Sincerely,

Robert M. Brhel

Joseph Orefice
School of Forestry and Natural Resources
Paul Smith's College

February 22, 2016

Paul Smith's College Sustainability Fund

Sustainability Council,

I am writing to provide support for the solar dry kiln proposal to the campus sustainability fund. This project has multiple benefits to both our community and our place as environmental leaders. To provide a bit of background: kilns are utilized for two main purposes; one is to dry lumber for storage and final use, and the other is to kill potential forest pathogens. Both of these results utilize heat to create value added to wood products. At Paul Smith's College we currently have the skeleton of an older, oil powered kiln, which the proposed solar kiln will replace. This transition is similar to replacing an old 4x4 Suburban with a Prius. Much like the solar kiln, a Prius is not only more environmentally friendly, it is also more user friendly.

By adopting this proposal the sustainability fund will help Paul Smith's College set the example that solar power holds a place in the forest products industry. We will have the opportunity to showcase this technology to regional professionals in addition to the many students who go through our academic programs. We will also be able to demonstrate to our students and community how to properly heat-treat firewood in compliance with New York State's firewood transport regulations. Kiln drying firewood kills invasive alien insects that pose risks to forest health, such as emerald ash borer. This is just one more sustainable aspect to a solar kiln.

One challenge we currently face at the campus sawmill is that we are not able to properly dry hardwood lumber. We have an incredible resource of hardwood logs from our forest, but after we saw these into boards their use becomes limited due to defects from air drying. Currently all of our lumber is air dried, causing much to be wasted due to warping. Lumber requires a controlled environment to dry properly, and this solar kiln is designed for just that. The ability to produce dry high quality, local lumber for campus and community projects is a true asset, especially as we will not have to rely on fossil fuels.

I am excited to have a solar kiln on campus and I see it becoming a key resource in the Wood Properties and Production Processes course and the Forest Production course. Lastly, I think the spirit of the solar kiln project fits well with sustainability fund and Paul Smith's College traditions: it will be built by our community with wood products, thus joining the list of student build campus resources. I look forward to overseeing this project with our students.

Sincerely,

Joseph Orefice
Assistant Professor
Forestry Program Director

February 25, 2016

Maria Urban
Ecological Forest Management, B.S
Forest Operations, B.S
Junior Class President

Dear Maria,

I strongly support your proposal requesting Campus Sustainability funds to build a solar dry kiln. I was impressed by your proposal, it was well written, thoughtful, and strongly supported by my faculty and staff colleagues. I agree with points made by my colleagues, that this kiln will be a great asset and resource to support teaching and learning within our natural resources curricula. As such, as Dean of the School of Natural Resources Management & Ecology, I pledge my full support toward maintaining this wonderful new resource so it will enjoy many years of use by our students. Should you need any further comments from me, I would be happy to provide.

Sincerely,

Dan Kelting

Daniel Kelting
Dean, School of Natural Resources Management & Ecology

Solar Dry Kiln Construction Narrative

February 21, 2016

Project Description

The construction and use of a solar dry kiln on the Paul Smith's College campus will benefit many in our campus community. It will provide a full circle effect in the use of the resources on the 14,000 acres owned by the college. Students, faculty, staff, and alumni will utilize the sawn dried timber in a number of various projects across the campus. It will also enhance the hands-on learning experience in multiply courses related to the forest products industry as well as the wood working club. Specifically, this dry kiln will encourage experiential education in drying hardwood lumber, moisture content dynamics in wood, and mitigation of invasive insects in firewood.

The solar dry kiln will be built in the same vicinity as the Dillon saw mill. Currently the skeleton of a large, oil-fired dry kiln is located on the site. This old kiln has not been operated since 2007, is in complete disrepair, and many critical components have been removed by the college. This kiln was neither energy efficient or sustainable, and in its current condition is not worth fixing. This kiln needed to be filled to capacity to operate, and classes rarely sawed enough lumber to fill it. The solar dry kiln, proposed here, is smaller, holding 3,000 board feet, and of the appropriate size for the amount of hardwood lumber sawn in forestry courses. New York State requires any firewood traveling over 50 miles to be kiln treated (to kill insect pests), and this kiln is efficient enough to demonstrate that process to forestry students. The solar dry kiln will be a resource of the forestry department and managed by that department. In line with PSC tradition and spirit, this kiln will be constructed from a kit by students, faculty, and staff as a service project.

Timeframe

Planning stages - February 2016
Order of new kiln plans and supplies – April 2016
Removal of old kiln by forestry department – Summer 2016
Construction of new solar dry kiln— September and October 2016

Project Supervision

Faculty and staff will oversee the construction of the solar dry kiln. Students will not be allowed to work on the project unsupervised. Power tools will only be utilized by students under supervision of faculty/staff.

Tool Utilization

Tools for this project will be provided by the forestry department and/or borrowed from faculty/staff. Tools will be stored in the forestry tool room when not in use. When power tools are in use, faculty/staff supervision will be present.

Construction Details

The first stage of this project will be to remove the current, old kiln. This will be the administrative and financial responsibility of the forestry department, the current program responsible for it. It is likely that this kiln will be sold for parts. A concrete slab will remain after the removal of the old kiln and this is where the new solar dry kiln will be built. Construction will not begin until demolition of the old kiln is completed by the forestry department.

The first stage of construction will be to set the wooden foundation for the solar dry kiln. The second stage will be to construct the frame, followed by the roof of the solar dry kiln. All of these steps are engineered in the construction plans for the kiln. Specific construction plans will be received upon purchase of the kiln kit, and these instructions will be followed. Lumber for the kiln will be purchased separately, and some may be milled in the campus sawmill.

Follow Through

Joe Orefice, David Simmons, and Maria Urban will oversee the construction and recruitment of volunteers for the solar dry kiln. David Simmons has connections with alumni, current students, faculty and staff that have extensive skills in carpentry work that would be more than willing to help with this construction process. As soon as one step is approved, the next step in our process will immediately take place. For example, once the sustainability proposal is approved and space allocation as approved we will apply for a building permit immediately. Once the building permit is obtained we will begin recruiting volunteers and ordering the supplies.