

Biomass Expansion Project Information Sheet

Design Engineer - Rist Frost Shumway,
Laconia NH

Design Architect - ARC/Architectural
Resources Cambridge, Cambridge, MA

General Contractor – Pizzagalli Construction
Company, Portland ME

Biomass Boiler Systems - Chiptec Wood
Energy Systems, Williston VT



Project Schedule and Costs

- The biomass expansion to the Central Heating Plant was approved by the Trustees in October 2010.
- Construction began in fall 2010 with the relocation of site utilities and earthwork.
- The College first made steam in the new plant in the fall of 2011, with steam production for normal operations starting in early 2012.
- The total project cost is \$11.25 million; total construction cost is approximately \$9.3 million.
- Estimates of oil and wood biomass prices suggest the facility will pay for itself in six to 10 years.
- In August 2010, Colby was awarded a grant from Efficiency Maine in the amount of \$750,000 as part of RFP#201004668, Competitive Grants for Large Greenhouse Gas Reduction Projects.

Project Scope

- The building footprint for the addition is approximately 8,100 GSF with a total building area of approximately 15,800 GSF.
- The project will install 2 – 400 boiler horsepower fire tube boilers fed by close coupled gasification units. Gasification was chosen over the traditional stoker type boilers to (a) provide a better turn down ratio to meet Colby's variable loads and more efficient operations in the summer, and (b) reduce emissions.
- The college will continue to cogenerate electricity in the plant, generating up to 600 kw per hour during the heating season and more than a million kwh annually.
- The college expects up to 4 trucks per day during the coldest part of the year and will be able to hold up to three peak days of biomass storage in the below grade chip storage bin.

Fuel Use and Environmental Impacts

- Current steam plant operations use approximately 1.1 million gallons of No. 6 (low sulfur) fuel oil annually.
- New plant will use approximately 22,000 tons of wood chips annually and reduce oil use by roughly 90%.
- The biomass fuel is expected to consist largely of wood waste that does not have a higher value for other uses, such as tree tops, tree branches, and smaller trees from thinning operations. Wood is anticipated to be sourced within a 50 mile radius of the campus. All wood will be harvested under the guidelines of the Sustainable Forestry Initiative, Forest Stewardship Council, or via a Master Logger with a certified harvest plan.
- There are several methodologies for calculating emissions reductions. Upon completion, it is expected that this project will result in a reduction of more than 9500 tons of carbon annually with a potential reduction in excess of 13,500 tons of carbon annually.
- Cyclonic dust collectors in the flue gas ducting and an electrostatic precipitator (ESP) will be installed as part of the process to remove particulates from emissions.
- All ash generated will be used beneficially as either field dressing or as an additive for composting operations. We expect to generate 200-300 tons of wood ash per year.



The project is expected to achieve LEED Silver rating with the potential of achieving LEED Gold.