Forestry Sciences Building Energy Audit

Interns: Adam Wechsler and Thomas McGrade

Infrared image of the Forestry Sciences Lab windows showing heat loss around window edges.

Built in 1973, the Forestry Sciences Building on Spear Street, now part of the University of Vermont's Rubenstein School of Environment and Natural Resources, is in dire need of energy efficiency upgrades. Once home to the U.S. Forest Service's Burlington unit, the building is now part of the Rubenstein School for use as laboratory space. Forest Service scientists are now housed in the Aiken Center, the home of the Rubenstein School on UVM's main campus.

While the Forestry Sciences Building may have once been considered a modern building, its heating, ventilation, and air conditioning (HVAC) systems, as well as electrical systems are now out of date. By today's standards, the building's energy efficiency could use significant improvement. The Rubenstein School, along with student interns from Gary Hawley's Greening of Rubenstein Internship course, have taken on the task of helping to bring the building up to date.

This process starts with an energy audit. A Level II audit is currently underway; this HVAC-focused audit is being conducted by engineer David Slade of Slade Engineering, a Montpelier-based firm. The completed energy audit will contain a list of possible energy conservation measures (ECMs), evaluated for their cost, how much energy might be saved, and their estimated payback times – the time frames within which the upgrades in question are expected to have paid for themselves in saved electricity or natural gas. This completed energy audit, along with a proposed Level III audit, will be used to formulate a plan for upgrading the building, significantly increasing its efficiency, decreasing the cost associated with keeping it functional, and, we hope, bringing it closer to achieving net zero energy status – the classification given to a building (and its associated systems) that, through renewables, produces as much energy as it uses.

Additionally, the Greening of Rubenstein Interns assigned to this project, senior Adam Wechsler (Environmental Studies major) and first-year Thomas McGrade (Wildlife Biology major), have compiled the Forestry Sciences Building's energy usage data from the past few years. Both electricity and natural gas were considered. While limited data were available, there were enough data points to observe trends. Using these data, they will calculate the size of the solar array that would be needed, in the building's current state, to achieve net zero status. That figure will remain uncertain until David Slade completes his audit and the ECMs have been chosen.

At the conclusion of this project, recommendations will be made to the University of Vermont concerning the upgrades that should be purchased for the building, as well as the estimated price, efficiency improvement, and estimated payback time for the entire project. Once the new energy usage of the building has been calculated, an appropriately-sized solar array may be installed, bringing the Forestry Sciences Building's net energy usage, both natural gas and electricity, to zero.