

# Study: Cairo-Durham well-suited for biomass fuel

Energy specialist issues report on wood-chip technology

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Jeff Forward, a Wood Energy Specialist from Richmond Energy Associates, Vermont, presented the results of a preliminary biomass heating analysis for the Cairo-Durham Middle-High School at the Durham Town Hall.

Biomass energy is the combustion of biological materials such as wood chips, pellets, crop residues, animal wastes and firewood for energy types including heat, steam, electricity, and liquid



Photo contributed

The Cairo-Durham analysis is part of a Watershed Agricultural Council project evaluating the feasibility of heating with wood chips.

The studies were part of a Watershed Agricultural Council (WAC) project evaluating

the feasibility of heating with wood chips.

WAC contracted with Forward through a matching

grant from the U.S. Forest Service's Economic Action Program.

Forward, a leader in renewable energy and green building, has helped set up wood-chip heating systems in forest dependent communities from Maine to Oregon.

He has overseen projects in 30 Vermont schools serving 25 percent of the student population and is conducting similar studies in the Adirondack Region for the state Department of Environmental Conservation.

Besides the Cairo-Durham project, WAC selected five other sites for feasibility studies including hospitals and schools in Delaware and

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Ulster counties.

After conducting visits over the winter with Cairo-Durham School District administrators and officials, Forward prepared a report on his findings called "Biomass Heating Opportunities at the Cairo-Durham Middle-High School."

The report suggests the potential for changeover to biomass fuel sources is positive.

Forests cover 75 percent of the Catskills providing a ready source for wood-chip boilers.

Roughly 9.4 million tons (2.1 million tons of chips equals 1 cord) of forest biomass grows yearly in New York of which roughly 1.2 million tons are in the Catskills.

The current NYS regrowth to harvest rate is 3-to-1 and the market for low-value wood helps better trees survive, affording a sustainable source for energy needs.

There are several regional wood products vendors within a 20-mile radius including B&B Forest Products of Cairo.

According to B&B owner Bill Fabian, "We use low-grade wood every day and supplying wood chips is not a problem."

There are two types of wood-chip boilers, both of which are market-ready.

The direct-burn conventional boiler directly converts woodchips to heat.

The two-chamber combustion model first heats the woodchips to the point of producing gas which then produces heat.

Woodchip boilers require roughly a half hour a day for maintenance including ash removal, checking the motors and cleaning the tubes and boiler.

Because schools have year-round maintenance crews, they are well-suited to the technology, Forman said.

The issue of space for

woodchip storage is also compatible with the Cairo-Durham School's extensive grounds.

Twenty-five to 30 tons of wood chips create just a trashcan full of ash which farmers can use to spread on their fields.

Addressing the issue of emissions considerations, Forman said that in the northern climate solar technology is not an alternative.

"The reality is you have to burn something for energy," he said, "and woodchips are less expensive than propane, fuel oil or coal."

While there are "almost no visible emissions and odors associated with modern wood chip and pellet heating systems because of the high efficiency of the burn," pollution control equipment is needed for particulate emissions.

But Forward pointed out the residue produces is less than that of an idling school bus.

"Stack height helps deal with emissions by scattering particles over a wider area," he added, "and the higher the stack, the better."

Forward estimates the Cairo-Durham Middle-High School will spend more than \$100,000 on heating fuel next year.

Woodchips are one-third the cost of fuel oil at \$55 a ton for the former compared with \$85 a gallon for the latter.

A new boiler should last over 30 years, replace 85 percent of the cost of fuel oil and result in a savings of roughly \$2.4 million.

Ironically, Forward said the biggest increase during that time is the projected rise in the 15 percent of the energy budget earmarked for fuel oil.

"Energy improvements provide a return on investment," Forward said, "unlike auditoriums or gym construction."

The impact on the school

budget would go down the first year even with an initial \$1.5 million investment, he said.

Forward estimates the project's capital cost at \$1,613,594 but with 77.4 percent in School Construction Aid the net cost to the district would be \$364,672.

Currently, the school consumes an annual supply of 37,224 gallons of No. 2 fuel oil but that would decrease to 5,584 gallons if it installs a wood-chip boiler.

The Cairo-Durham project would need roughly 500-600 tons of woodchips a year which would be supplied by truck.

Roughly 20 truckloads a year, each carrying 25 tons would deliver the woodchips at the rate of one to two times a week during peak heating season.

With the preliminary analysis completed, the next step is for the Cairo-Durham School district to hire an architectural and engineering company for an estimate of the proposed conversion.

Forward also recommended that District officials tour wood-chip heated schools in Vermont and identify a list of local biomass suppliers including sawmills, chipping contractors and pellet suppliers.

Collin Miller, Wood Products Utilization and Marketing Specialist from the Watershed Agriculture Council said that he will present a report on the woodchip feasibility study at the next Cairo-Durham Board of Education Meeting.

A summary report on all five sites involved in the feasibility investigation will be available soon on the WAC website at [www.nycwatershed.org](http://www.nycwatershed.org).