To find out if a biomass heating system works smoothly or not, ask the people who really run it—day by day.

At National Life Group in Vermont, those people include Ansel Quintin, HVAC team leader. Late last year, when the Fortune 1000 company installed a new, twin-boiler woodchip system to provide primary heat for its 500,000 square-foot headquarters—one of Vermont’s largest office buildings—the daily operation and problem-solving was turned over to Quintin and his team.

They were, to be honest, a little worried.

“Because it was something new and they’d never operated it before, most of the guys said, ‘This is going to be bad,’” Quintin recalls. “It seemed like a lot of work. But you know what? That thing is awesome. We can’t say enough about it, the way it operates. Very smooth.”

After the first winter with biomass heat and hot water, the executive in charge of the project is just as pleased—and he’s got data to back that up.

“It’s been quite a success,” reports Tim Shea, National Life’s second vice president of purchasing and contracting. “We started the system in the latter part of December [2010]. We’ve got a 7 million Btu boiler and a 5 million Btu boiler, and we also put in an electrostatic precipitator (ESP) emission control. With the system up and running, we exceeded our initial projections.”

The installation of two different-sized biomass boilers allows for greater flexibility to run the system more efficiently with the seasonal changes in heat demand. “We had expected to meet about 90 percent of our thermal-output needs from our biomass system,” Shea says. “But from the time it was up and running, we were up over 98 percent.”

With its previous, oil-fueled heating system, which it now uses as backup, National Life was consuming about 210,000 gallons of No. 4 heating oil per year. During the winter of 2010-11—though it didn’t fire up the new biomass equipment until December—the company used 2,792 tons of woodchips, averting an estimated 180,000 gallons of oil.

“This computes to over $400,000 in fuel savings from December 2010 to June 2011 for National Life Group,” Shea reports.

The company vented its state-of-the-art ESP exhaust-filtration system through an existing incinerator stack that had been capped for a number of years, reducing the overall cost of the $2 million project. “We also put in an ash-collection silo that collects the ash from the combustor and the ESP,” Shea says. While many other similar-sized systems use mechanical filtration, National Life’s is one of the first in the Northeast to employ a far more effective ESP.

The ESP removes, on average, about 98 percent of fine particles from the system’s exhaust—and “there’s no manual ash removal,” says Shea. “It’s all done through a Grizzly vacuum system.” The silo will need to be emptied about twice a year, the company expects. Its ash will be sent to a local farm, where it will be commingled with manure and spread on fields.

“There is no waste,” notes Shea.
‘That Thing Took the Load’

Although biomass already heats scores of commercial facilities around Vermont, including more than 40 schools, National Life was one of the state’s first commercial facilities to adopt the technology. The company used local contractors as much as possible in the installation process, and it sources its fuel from a woodchip provider about 30 miles away.

“I had thought we would have to manage the chip bin and call for deliveries, but they did all that for us,” Shea says. “So that was a pleasant surprise. There were no issues with the chip delivery system.”

Nor were there problems with the fuel itself, reports Ansel Quintin. “The chips we got were super-clean. No plug-ups. Fed in fine.

“We were worried about when it got really cold out, that we’d be running the oil burners,” he says. “But that thing took the load, and it ran right through. We used way less fuel oil than we thought we would.”

A 2009 BERC feasibility study had projected that fuel cost savings would repay the biomass system’s capital costs in six and a half years. But in practice, with the rise in oil prices, the system is now on track to pay for itself in four years.

“We’re more than happy,” Shea says. “Six years is not bad; four years is incredible. We’re looking at getting 30 years out of those boilers. That’s not a bad investment.”

‘People, Profit, and Planet’

In deciding to move toward biomass heat, Shea says National Life saw three priorities: people, profit, and planet. “Economically, the system could reduce our operating costs. As for the planet, we looked at the total costs of what it takes to extract the oil, process and transport the oil, and the emissions associated with the oil, versus using a local, renewable fuel that replenishes itself within 50 years.

“These trees grow back naturally in Vermont—and the trees we’re using are not replacing something that was going to be a fine piece of furniture,” Shea adds. “Also, the emissions aspect is something we want to be mindful of, so we went with the highest technology available. And the thing just runs! I’m sure there’s a lot of technology inside of it; but from our perspective, the ESP has its controller and it just does its job.

“The people side is just talking about the story of Vermont,” he adds—“a local investment, with contractors who did the work out of area communities, plus a local fuel supply. Also the investment in the local community of reducing our emissions. We’re not emitting black smoke, people are not getting soot on their lawns. This system takes into account all those aspects.”

For Ansel Quintin and his HVAC team, the report is even simpler. Team members take turns being on call for winter weekends, in case the heating system needs attention. When the oil burners were the main suppliers of heat, they often required weekend maintenance. Not so with the biomass system.

“We thought, ‘Oh no, we’re going to be in here every day,’” Quintin says. “But I’ll tell you, you talk to any of our guys, and they’ll give you the same story. We’ve got nothing but positives to say about it.”

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