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CASE STUDIES SERIES

NRG WIND SYSTEMS, HINESBURG, VERMONT, UNITED STATES

At a Super-Efficient Industrial Site, Pellet Boilers Are the Choice

Business Wood Pellet Heating System

Heating Capacity (output): Two 43 kW (150,000 Btu/hr) boilers

Annual Pellet Fuel Use: 25 tons

Year Installed: 2007

Thermal Output: Hot water

When David and Jan Blittersdorf, owners of NRG Wind Systems in Hinesburg, Vermont, were planning their business's new manufacturing and office facility—a building that would use one-fifth to one-third as much energy as typical facilities of comparable size—they pondered how best to heat it.

“Being in Vermont, and having grown up burning wood, I really liked the idea of pellets,” David Blittersdorf recalls. “Very clean-burning, dry, buy all your fuel at once.”

For their 46,000-square-foot facility, which opened in 2004 and manufactures wind testing equipment, NRG installed two Danish-made TARM boilers, each with 150,000 Btu capacity.

“The idea of the building is that it's not metered,” Blittersdorf says. “The emphasis is to be super-efficient, and then to do everything with renewables—with wind, solar, and pellets.”

NRG's total heating bill for the winter of 2007-08: \$5,905.

“Bulk pellets cost us about \$190 per ton last year, and we used 25 tons, or \$4,750,” Blittersdorf explains. The pellet fuel is made from various wood by-products of lumber milling and other wood processing. “This year we are paying about \$210/ton. Delivery from Jaffrey, New Hampshire is expensive. We need a local supplier!”

NRG uses a propane boiler for backup heat “that's just this little teeny thing next to the wood boilers,” Blittersdorf says. “We run it in the shoulder seasons, when we start heating, in October-November and in April.”



NRG also fuels its backup electric generator with propane, and spent \$1,155 for propane during the winter.

So Blittersdorf figures total heating fuel costs at \$4,750 plus \$1,155, or \$5,905.

“I'm a big proponent of multiple boilers instead of one huge one, because then you can stage things and work at maximum efficiency,” he says.

NRG Systems gets 53 percent of its electricity from solar photovoltaics and a wind generator, with 78.5 kW of solar voltaics on its roof, awnings, and a movable tracker. A 10 kW wind turbine is mounted on a 100-foot tower on a hill behind the building. Six solar hot-water collectors and a 240-gallon storage tank meet some of the company's hot water needs.

The architects who designed NRG's building won Vermont's top architectural award for the project, the 2004 Honor Award for Excellence from the Vermont Chapter of the American Institute of Architects.

“So few industrial buildings reach this level of sophistication,” said the award citation.

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Pictured on front: NRG Wind Systems headquarters. Right: Behind the headquarters building, NRG's 30-ton pellet silo is filled once a year, off season. "It's really nice to be able to buy your fuel in the summertime, and have your year's supply," (NRG owner) Blittersdorf says.

'It's Completely Controlled'

"The nice thing about the pellet system is, it's completely controlled," Blittersdorf says. "Very low maintenance, and very low amounts of ash. We burn 25 tons of fuel, but we only get a couple hundred pounds of ash. We clean the ash out a couple of times a week. We just use it on the garden—it's clean.

"I also like the super high efficiency. These boilers are 90 percent efficient, with very low pollution levels. And with the wood pellets, we're almost 100 percent renewable."

The heating system uses radiant floor technology, with almost 10 miles of radiant piping for both heating and cooling. A two-thirds-acre pond in front of NRG is used for cooling, heat pumping, storm water collection, and recreation.

Behind the headquarters building, NRG's 30-ton pellet silo is filled once a year, off season. "It's really nice to be able to buy your fuel in the summertime, and have your year's supply," Blittersdorf says. "I don't like deliveries in the winter."

Overall, the pellet system is working so well for NRG that it is installing two new pellet boilers in the 31,000-square-foot addition it is currently building.

"With the increase in our business," Blittersdorf says, "we've almost tripled our people since we opened three years ago."



For more information on this and other biomass energy projects, contact:

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