

# A Different Shade of Green

Some lesser known renewable energy options may be viable.

By Peter Warburton and Dr. Tammy Davis

What pops into your mind when you think about renewable energy technology? For many people, it's likely a solar array topping a sun-drenched roof in California or possibly a fleet of wind turbines spinning away on the flats of Kansas.

These are both very visible examples of green technology. And many schools — whether to meet public commitments or promote environmental stewardship — have turned to solar and wind to help offset energy consumption from traditional sources, lower utility costs and reduce greenhouse gas emissions.

But what are your options if your district only receives the necessary levels of solar radiation a few dozen days out of the year or if you rarely see the school-yard flag waving in the breeze? The initial reaction may be to rule out renewable energy altogether. Worse yet, you could invest in a technology that's going to have limited power generation and economic payback.

However, there are several other lesser known renewable energy options that could be viable, both environmentally and economically. And in our Pembroke and Winnisquam School Districts in New Hampshire, we were able to leverage one of these alternatives as part of broader building retrofit programs expected to reduce carbon dioxide emissions from non-renewable fuel sources and drive more than \$3.7 million in combined energy savings over the next 15 years.

The centerpiece of both programs, implemented by Honeywell, is the installation of a central biomass plant that uses renewable wood chips to provide hot water for heating buildings. The abundance of local fuel was a significant factor in our selection, as each district's system will use nearly 1,000 tons of wood chips each year sourced from local suppliers.

At Pembroke, the biomass-fueled plant will heat Pembroke Academy and Three Rivers Middle School, the district's two largest facilities. Additional upgrades include HVAC controls across

all buildings in the district, and replacement of some windows at Pembroke Hill School. At Winnisquam, the biomass plant will serve the heating needs of the Regional High School and Middle School. The plant will also include classroom space so the district can incorporate renewable energy lessons into its vocational programs. Additional improvements include replacing boilers; upgrading temperature controls, fuel-oil heaters and steam traps to improve HVAC efficiency; replacing outdated lighting with more efficient fixtures; and sealing

buildings to reduce heat loss.

Switching two schools in each district to a carbon-neutral fuel source is expected to have a significant environmental impact, cutting fuel-oil consumption by more than 64,000 gallons and natural gas use by 120,000 therms. This will lead to a combined annual reduction of almost 720 tons

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of carbon dioxide emissions. According to figures from the U.S. Environmental Protection Agency, this is equivalent to removing 125 cars from the road.

All of the improvements are financed through the energy and operational savings the upgrades produce, which are guaranteed through 15-year performance contracts. In both districts, we were also able to receive state school building aid and funding through the Qualified School Construction Bond (QSCB) program, part of the American Recovery and Reinvestment Act (ARRA) that provides a low-interest loan for qualified renovation projects. The programs will not require up-front capital or additional money from our district budgets as a result.

No matter how much we wish, New Hampshire will never be synonymous with endless summer or wind-swept plains. But as we discovered, there are many options beyond solar and wind to help address greenhouse gas emissions and improve the bottom line. The key is finding the right technology based on your district's unique needs and location. ■

>> Peter Warburton is the superintendent of Pembroke School District in Pembroke, N.H. Dr. Tammy Davis is the superintendent of Winnisquam Regional School District in Tilton, N.H.