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Can You Afford Free Heat?

A WHOLE lot of progress is happening in alternative fuels these days, all around this great country of ours. The number of growers who have gone from researching to actually installing biomass boilers keeps rising, and the savings are no doubt significant no matter the fuel used. However substantial these savings have been from burning corn, tires, oat pellets, beans and the like may be, all can agree that they cannot compete with free heat.

"If labor is not considered, we came very close to recuperating the cost of our Heatmor in one year through our propane savings."

– Ben Cecil, Oldham County Nursery

Underground Sunshine

One of the most interesting ideas to bubble to the surface lately has been aquifer heat storage. The diagram below shows how solar energy is being converted into hot water by running it through fine wire (FiWiHex) heat exchangers, and then stored in the ground for heat season. Obviously, your groundwater must be static, not too shallow, etc., but if conditions are right...presto! Free heat.

Feeding The Beast

Ben Cecil, propagation and container production manager at Oldham County Nursery in Crestwood, Ky., has watched as that business installed and used a Heatmor wood-burning boiler last winter. Although he says, "the work it takes to feed the beast is fairly significant," he also estimates that, because they have worked out a good fuel source, they will achieve ROI within three years.

"Our wood is acquired through local arborists," Cecil explains. "They have to pay for dumping their waste in other places, but we allow them to bring it here for nothing. While we have no control over the quality of wood, and the occasional nail, sign or piece of 1910s farming implement in the wood, those instances are few and far between."

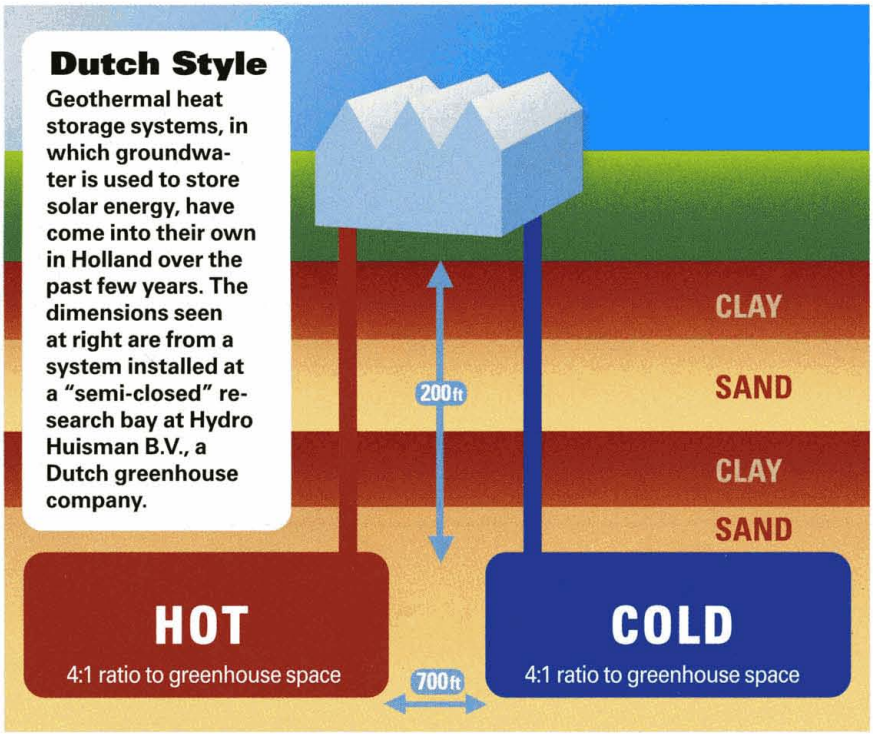
For those a little less likely to crank up the chainsaw, a number of companies are competing to offer the closest thing to an all-natural experience that a greenhouse owner/operator could desire. By providing all the pieces of the puzzle – everything from the storage bin, grinder, disc separator and fuel transfer auger to the combustion unit and emissions control equipment and even the heat storage buffer tank – companies like St. Mary's, Penn.-based Advanced Recycling Equipment are attempting to fill in the gaps for busy growers looking for a hassle-free alternative.

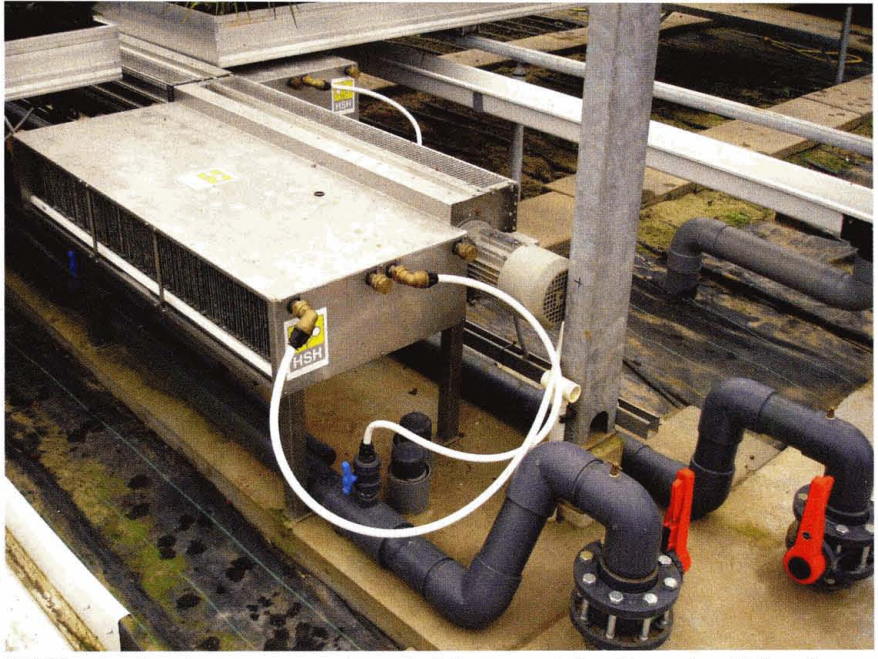
Implementation

Bloomsburg, Penn.-based Dillon

Fuel Cost Comparison (Per Therm)

Edible Beans (/Ton)	$.44
Coal (/Ton)	$.63
Corn (/Ton)	$.64
Oat Pellets (/Ton)	$.68
Wood Pellets (/Ton)	$.74
Natural Gas (/ft3)	$1.20
#2 Oil (/gal.)	$1.38
Waste Wood (/Ton)	**$0**
Solar Heat	**$0**





FiWiHex heat exchangers use extremely thin copper tubes through which water flows and transfers energy. In the summer, the heat of the hot air exchanges with cool water in the tubes, cooling the greenhouse temperature and heating the water for the warm aquifer. The Dutch inventor asserts that FiWiHex can decrease natural gas usage 5 to 10 meters^3 per meter^2 of greenhouse space.

Floral has been in business since 1875, so if anyone was going to be set in its ways, it probably would be fourth-generation owner/operator Rob Dillon. With a recently downsized 100,000 square feet under glass, Dillon grows gerberas, lilies and other cuts, as well as some potted and bedding plants to round out a diverse selection of offerings to its customer base. Because this variety gives the company a competitive advantage as a wholesaler, Rob wanted to keep his greenhouses open. Energy costs, however, were rising to unsustainable levels. This price pressure instigated a search into sustainable energy sources.

"We've done all we could with conservation since the 1970s, but that's not enough anymore, so last winter we decided we either needed to find an alternative or close our greenhouse operation entirely," he recounts. "After we analyzed all the sources and types of fuel, including coal, sawdust pellets, corn and even tires, we decided on wood chips because we could get them from two primary sources – land-clearing companies (sourced at $25 to $30 dollars per ton) and right-of-way clearing companies, who are looking for a place to dispose their wood waste for free." Once he decided on a fuel source and locked it in, Dillon then shopped around for the equipment. He found a company, Advanced Recycling Systems, that not only came highly recommended by other growers, but also was located close enough to Dillon Floral to make repairs quickly should the need arise.

A Little Help

Dillon Floral made the entire process a lot cheaper by spending the time filling out a number of grant applications at the state level, a task that Rob Dillon calls arduous but well worth the hassle.

"We got an Energy Harvest Grant from the state of Pennsylvania for $206,000 which offset the initial equipment investment cost of $750,000. We also were offered low-interest loans from the Department of Economic Development, giving us a blend of financing which helps balance the high capital cost. Our calculations are that we're going to require 2,444 tons of chips per heating season, at a cost of $73,320, but that's only if we have to buy all the fuel. Our actual costs could be significantly less." Dillon is hopeful that he might even be able to get on the free heat bandwagon, noting that he knows of at least one example of a greenhouse currently doing so. "A grower I know in New England who switched to wood hasn't had to buy a pound of chips yet!" **GG**