

PFI member refuses to be held hostage by oil prices

by Patrick Burke

Practical Farmers of Iowa farmer member Francis Thicke is reducing his dependence on oil with a variety of on-farm energy alternatives. Could some of his energy-saving methods work for your farm?

“We are held hostage by oil,” says PFI farmer Francis Thicke. “Without cheap oil, we could not farm the way we do today. The problem is that we’re at the end of the cheap oil era.”

Thicke and his wife, Susan, own Radiance Dairy, a 450-acre, 80-cow dairy near Fairfield. They are working to reduce their fossil fuel dependence by implementing a variety of on-farm energy solutions. In collaboration with PFI, Thicke is tracking his energy usage, cost, and CO₂ emissions and using that data to improve the farm’s energy efficiency.

While some of the energy-saving systems in place at Radiance Dairy required a significant initial cash investment, others were simple and inexpensive. For example, Thicke considers grazing his cows to be an important part of energy self-sufficiency. As opposed to conventional confinement operations, where feed might be purchased and hauled to the farm, and manure is hauled from the confinement to the pasture, Thicke’s cows harvest their own feed and fertilize their own paddocks. “And they enjoy their work,” he says. In turn, the farm is less dependent on oil and feed prices.

To provide water to the cows, Thicke employs a solar-photovoltaic-powered pump that transfers water from a pond into a 4,000-gallon storage tank. From the storage tank, water is gravity-fed underground to the drinking barrels in each of the farm’s 60 paddocks. As long as there is water in the storage tank, the barrels automatically replenish themselves.

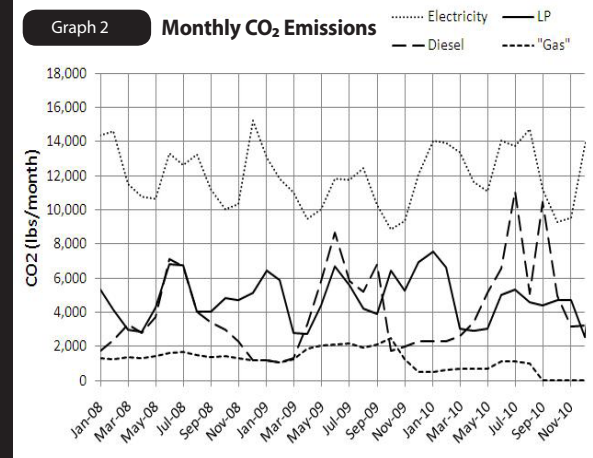
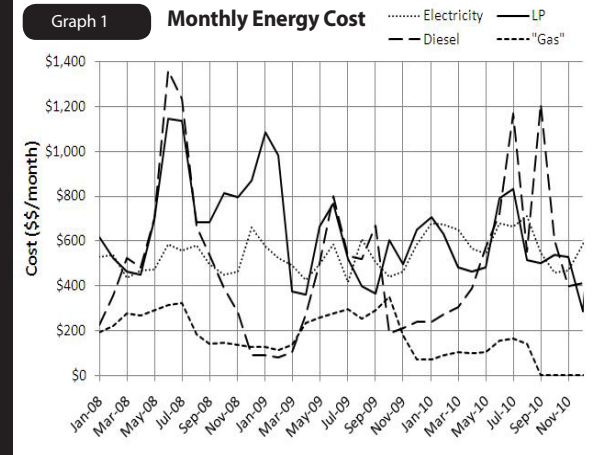
Thicke puts solar power to work in other areas of his farm as well. Four solar-thermal panels are used to preheat water before it enters a traditional hot water heater, where it is then heated up to 170 degrees F. In July,

this system can preheat the water up to 130 degrees F so the water heater needs to use very little liquefied petroleum gas (LPG) to finish heating the water. The solar-thermal system, installed in the summer of 2010, should result in a measurable reduction in Radiance Dairy’s LPG use.

To save on heating and cooling costs, Thicke has installed a geothermal heat pump, which works by cycling water from a nearby pond to the house and back. In the summer, the cool pond water soaks up heat from the house. In winter, the pond water is relatively warm compared to the outside air temperature so the furnace has to use less energy to heat the house to a comfortable temperature.

Thicke’s biggest energy project to date will involve the installation of a wind turbine later this year. The turbine was purchased in part with funds from a USDA REAP (Rural Energy for America) grant, and should produce most of the electricity the farm uses. Because electricity from the grid is generated by burning fossil fuels, the clean energy generated by the wind turbine should greatly reduce Radiance Dairy’s CO₂ emissions as well as its electricity bill.

While not all of these ideas are appropriate or feasible for everyone, they are good examples of what is possible for motivated farmers. With a little ingenuity, no farmer needs to be “held hostage by oil.”



Francis’ Energy Use graph (not shown) mirrors closely graph 1 above, Monthly Energy Cost. Notice the cost spike in the summer of 2008—experts say we will be seeing more spikes like this one.

In graph 2, Monthly CO₂ Emissions, notice how electricity provides a substantial portion of Francis’ carbon dioxide emissions. Adding a properly designed wind turbine, which Francis will do this summer, could potentially reduce his energy bill and CO₂ emissions by 28% and 54% respectively.

The data provided here will serve as a baseline as PFI continues to analyze Francis’ energy use, specifically the reduction of LP as a result of the solar-thermal water heating system that Francis has recently added, and PFI will continue to quantify the combined effect of the solar-thermal water heating system and the coming wind turbine.

If you would like your farm’s energy use analyzed, please contact Rich Schuler at rich@practicalfarmers.org