
ENERGY CASE STUDY

40 East Street, Bristol



Located at the Northeast corner of East Main and Mountain Street in Bristol, this home was built about 1850, the rear section was added in 2000 and the “ell” between the house and barn was added in 2013.

**Richard and Gail Butz’
1850 Bristol home
located on East Street.**

Status in 2012:

Richard and Gail Butz bought the house in 2012 and began to ascertain what needed to be done to make it more energy efficient and comfortable. The 2000 addition was well insulated and had up-to-date windows. The old section also had cellulose insulation blown in, but the windows were original, loose and hard to operate. The aluminum storm windows also were loose and hard to operate.

Attic insulation over the old section was very old cellulose, about 6” deep and moisture built up in the attic in the winter, creating mold on the rafters.

The heating system consisted of a single oil furnace configured to drive steam radiators in the old section and hot water base board in the newer one. Domestic hot water was supplied by the furnace.

Improvements 2012-2018

- Installed solar panels.
- Installed a small wood stove.
- Installed a hybrid hot water heater, disconnecting domestic hot water from the furnace.
- Contracted for an energy audit with Building Energy of Williston to determine why moisture was building up in the attic in winter. The report also identified areas where insulation was needed, causing significant heat loss.
- The attic was sealed with foam around the edges and insulation was added to R-50.
- The basement crawl space under the newer section was sealed and foamed.
- The basement perimeter was foam insulated.
- Vents and a window were installed in the attic.
- Six replacement windows were installed to replace inefficient ones, about five more remain to be replaced.
- Installed a mini-split heat pump

Evaluation:

- The insulation and sealing costs were partially reimbursed by Efficiency Vermont, and the moisture problem in the attic was resolved.
- The wood stove (one cord last winter) and the heat pump enabled us to stop using the oil furnace six to seven months of the year. This was also facilitated by installing the hybrid hot water heater so we didn't have to run the furnace year- round just to heat water. And the heat pump and wood stove reduced the need to use the oil furnace even when it was turned on.



Solar panel inverter system.

Cost Savings:

It is difficult to quantify exactly the \$ savings because of wildly erratic seasonal variations from year-to-year. But, oil use declined by more than 50% last year, and the solar panels largely offset the increased use of electricity and the monthly financing of the solar panels and heat pump. (We used financing plans from Sun Common and Green Mountain Power that enabled us to install the panels and heat pump at no upfront cost. Another advantage to this arrangement is that the suppliers maintain the units.)

Comfort:

- The house is tighter and less drafty, the floors on the first floor are warmer and the wood stove and heat pump provide “warming spots’ in the winter.
- The heat pump also provides air conditioning and dehumidification in hot weather, a real relief this summer.
- The hybrid hot water heater dehumidifies the basement.

“Equally important to us is the reduction in fossil fuel use and emissions because of the solar panels and because Vermont’s electrical energy comes largely from renewable sources. It’s our responsibility to future generations.”

-RICHARD BUTZ

