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A house built to resist the elements – and high energy bills

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COVER STORY

First-of-its-kind house in Lawrence County is built to resist the elements – and high energy bills

Story by MARY GRZEBIENIAK

THERE'S A HOUSE IN SLIPPERY ROCK Township capable of withstanding a bitter Alaska winter.

Jerry Fisher's new home on Butler Road would be cozy and warm even if it was in Fairbanks, Alaska, where. according to usclimatedata.com, winter night temperatures range from minus 15 to minus 25 degrees.

Lawrence County winter nights are warm by comparison, averaging 23 degrees.

But Fisher's new house was built to an exceptional standard of weather resistance by its builder, Pete Mathieu, of Hickory Township, who learned a few things about stopping energy leakage when he built a house for his brother, who lives in Fairbanks.

Mathieu is the only builder in this area to have completed an on-site Energy Star home, although there are some manufactured homes locally that have also met the standard.

Energy Star is a voluntary U.S. Environmental Protection Agency standard that exceeds regular building standards for energy efficiency by about 30 percent. To get the rating, Fisher's home had to undergo a process of inspections, testing and verifications to meet the requirements which are further described at www.energystar.gov.

The Fisher home is Mathieu's first Energy Star-certified home in the lower 48 states, but he just completed another one in New Wilmington and is waiting for certification. In addition, the Hickory Township resident is building a home for himself which he hopes to get Energy Star certification.

The 2,000-square-foot, two-story Cape Cod with a basement is heated by a geothermal system that uses an underground closed loop. It is supplemented with electricty for its forced-air heat. The furnace heats the water tank as well.

The home doesn't look much different from an average home, although you might notice that every seam of the furnace ductwork in the basement is sealed with mastic duct sealant instead of foil tape. The mastic sealant is used because it doesn't get dry and crack like tape. Mathieu concedes the appearance of the sealant on the seams isn't very attractive.

In addition, Mathieu used advanced framing techniques, more insulation, no partitions in exterior

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Above, homeowner Jerry Fisher stands outside his house, flanked by contractor Pete Mathieu, right, and Tom Branch of Comfy Homes in Emsworth, Pa. Branch is the energy auditor who certifies construction under the federal Energy Star program guidelines.

At left, Mathieu shows how every seam in the ductwork is sealed. Although the mastic sealing "doesn't look very attractive," it accomplishes the job of eliminating air leaks

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The Cape Cod style home, with second story bedrooms under the roof, makes energy efficiency more difficult to achieve. But contractor Pete Mathieu, left, is used to the challenges after building his brother an energy-efficient home in Alaska. Homeowner Jerry Fisher is at right.

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walls, and two-stud outside corners as some other construction methods to reduce heat loss. Visqueen plastic sheeting is used on all outside walls.

"This house is built like a Tupperware bowl; it's sealed," Mathieu said.

But a house, unlike a Tupperware bowl, needs to breathe or else the inside atmosphere will be too damp and moisture will collect on the walls. A home that is sealted too tightly has nowhere to vent.

"It's unhealthy not to have fresh air circulating," Fisher noted.

So, to achieve a good exchange of air, Mathieu uses a heat recovery ventilator unit that brings in fresh air and exhausts moist and stale air outside.

The rating achieved by using all these measures has Fisher very happy because his home has a Home Energy Rating System score of 53. That means it is 47 percent more efficient than the average home constructed to building-code specifications. The U.S. Department of Energy says a typical new home is rated at 100 under this home energy rating system, which is the industry standard for rating residential energy efficiency.

Fisher keeps the thermostat at 68 or 69 degrees Fahrenheit during the winter and has never had a monthly bill over $70, though he was expecting to pay more than twice that for electricity. In the summer, the same energy efficiency helps keep the house cool. And he expects that because of this, the home will have a better-than-average resale value if he ever decides to sell it.

Although the house uses geothermal heat supplemented by electric, that was Fisher's personal choice, and the Energy Star system allows a variety of heat sources. The heating system was installed by Twin Air Heating and Cooling of New Castle, which also has obtained credentials aligned with the Energy Star program.

Mathieu said he works with every homeowner to give them the house they want. In this case, some of the

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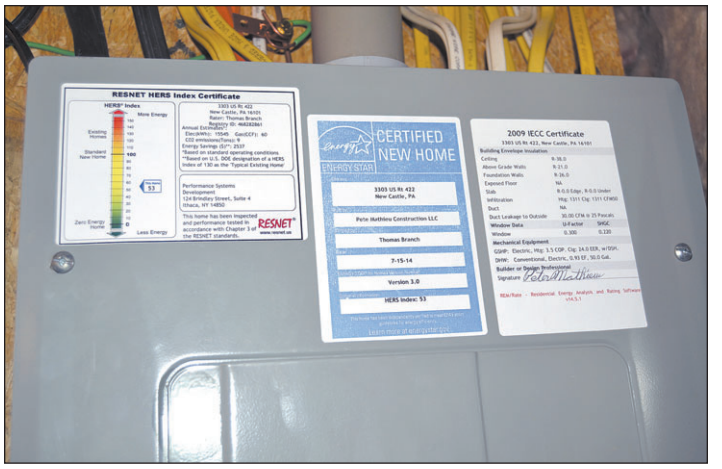
Contractor Pete Mathieu looks over the geothermal heating system. It is only one of several heating options for an Energy Star home, but was a feature that homeowner Jerry Fisher wanted. Geothermal draws heat or coldness from underground using a liquid that is circulated in a closed system of underground pipes.



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These energy certifications attest to the home's energy efficiency and will increase resale value if homeowner Jerry Fisher ever wants to move, contractor Pete Mathieu said.

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Solid foam behind insulation in the basement helps the house to be 47 percent more energy efficient than the average home.

things that Fisher wanted posed a challenge for energy efficiency, such as a stone fireplace on an exterior wall and a wood ceiling. But Mathieu dealt with these one by one, adapting them so as not to compromise the energy efficiency. For example, he put plywood behind the wood ceiling to increase insulation.

What does it cost to build such an energy efficient home? Mathieu said that on average, it costs an extra $3,500 per home, although there is a one-time tax credit available for this type of construction. Mathieu noted that the heating contractor also has to be Energy Star-certified.

After construction is completed, additional inspectors have to be hired to do tests for duct leakage This included independent verification of the energy efficiency through a test where smoke is blown through the ductwork. And the home has to be modeled on computer software to get the HERS rating.

Mathieu said he gives all his customers the option of the Energy Star system but though 86 percent are interested, most "don't want to pay for it."

Mathieu has been a general contractor for 20 years, working mostly in the residential market. He said he attended Slippery Rock University but ended up in construction because as a builder, "I could see something done at the end of the day and have some pride in it."

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