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Solar boost to new net-zero home

Second design advances concept

Edmonton's second net-zero energy home has sprouted innovative solar awnings as the design of these progressive buildings continues to evolve.

A net-zero energy home produces at least as much energy as it consumes.

The first home of this type in the city was a duplex completed last year in Riverdale by Peter Amerongen.

Amerongen, who owns Habitat Studio and Workshop, is now at work on his second project in Mill Creek. The free-standing home sits on a narrow lot that runs north to south. At first, Amerongen says he didn't think it had the solar potential to be a net-zero home because its orientation limited the surface area for a solar-power setup.

But homeowner Conrad Nobert was tenacious about maximizing the solar potential of the home, Amerongen says. He was willing to try some extreme tactics to get there.

"The biggest difference between our home and the first net-zero home is that ours uses way more passive solar energy, which basically means we have huge south windows and we're going to have these concrete floors to act as heat batteries," Nobert says.

The sun will shine through the windows onto concrete floors on the main and second floors. It will heat up, absorb the heat during the day. Then during the

evening and night, the floors will release the heat into the 2,200square-foot home. Nobert expects the floors could be chilly sometimes, but he and his wife and two small children are willing to wear slippers.

They're also willing to have a prototype solar awning tested on their \$500,000 home. The awning, which can be handcranked out almost horizontally or up the building wall, will blend the ideas of blocking too much sun in the summer and maximizing solar power all year long.

"In the winter, they're aiming at the low winter sun, making them more efficient," Amerongen says.

"And in the summer, when they're blocking out that unwanted heat, they're aiming at the high summer sun, generating that much more electricity. So we're getting about 16 per cent more electrical output from the same area of photovoltaic panel by using them as this awning."

The design came from a University of Alberta mechanical engineering class.

Altogether, this home's design has advanced from the first net-zero home in Riverdale. The cost to get the Mill Creek house to net zero is about \$60,000 to \$70,000, Amerongen says. It's about two-thirds of the incremental cost of the Riverdale house. A big chunk of the difference is the dramatically simpler solar-thermal system in the latest house.

For Nobert and his family, it was all about reducing their energy use and becoming self-sufficient.

"The first thing I want to do is make myself and my family more energy secure," he said.

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