

Solar Ready

A large-volume builder in Ontario is incorporating solar-ready rough-ins in all of the homes it builds.

By Judy Liebner

Doug Tarry knows it's not enough to build homes that are merely energy-efficient – they also have to be aesthetically pleasing.

Achieving that goal has been an all-consuming task for Tarry, who is director of marketing for Doug Tarry Homes, a family-owned building and development company in St. Thomas, Ontario. Since March, all of the company's homes have incorporated a solar-ready rough-in, which will allow buyers to heat their hot water with solar thermal power.

Tarry has been redesigning all of his house plans to accommodate the solar technology, which can be incorporated into almost any home without detracting from its appearance.

“Our number one criterion is that our product has to function well and look good,” Tarry says.

Providing the rough-in for solar hot-water panels is fairly reasonable at a cost of \$350 per home. It allows home buyers, who are coming from as far away as Toronto, to have the solar panels installed immediately, or later at a lower cost than that of retrofitting a home.

Completing the setup costs \$6,700, which homeowners can recoup in about 12 years. At today's fuel rates, Tarry says homeowners with a completed setup will be able to save up to 60 per cent on their hot-water energy bills, compared to homes built to conventional codes in Ontario.

Doug Tarry Homes was recently chosen as the sole builder to participate in a pilot project by Natural Resources Canada (NRCan). The company will build about 80 Solar Ready homes by the time the project is completed in March 2008.

NRCan is providing \$40,000 in funding for the project, which will study solar-ready housing on a large-volume basis and promote the program to builders and new home buyers. Tarry will document the process of adapting his homes to be Solar Ready, which will be crafted into a guideline for other builders to follow. NRCan will also assess the interest level of consumers based on surveys completed by Tarry's clients.

Charles Zaloum, the Solar Ready project manager with NRCan in Ottawa, says this is the first time a builder has piloted the solar-ready concept on a large scale in Canada. NRCan is particularly interested in the challenges Tarry, as a production builder, is experiencing in adapting his designs to the technology.

“We're going to take the lessons learned and we're hoping to package it into a broader program that would involve other big builders,” Zaloum says. “It would also involve integrating these components into existing government housing programs, such as R-2000 or EnerGuide for New Homes.”

Zaloum foresees that solar-powered hot-water heaters will become a standard feature in Canadian homes and that Solar Ready will help develop a domestic market for Canadian-made solar products.

“They export most of their product either to the U.S. or internationally, so it's creating a demand locally, and hopefully reducing the costs and making a product more accessible and more affordable,” Zaloum says.

Tarry, whose homes have won two SAM design awards from the Canadian Home Builders' Association, says combining aesthetics with function is a challenge in a smaller two-storey, open-concept home. A common wall is needed to accommodate the rough-in, which consists of a pair of two-inch conduits that run from the basement mechanical room, where the solar hot water tank is located, to the attic for hook up to the solar panels.

"It's certainly a little harder than we thought," Tarry says. "If I were to give advice to another builder who's looking at doing it, it would be to 'Give yourself some lead time before you launch it.' It's a big project."

Once the system is roughed in, key components are labelled with stickers that direct homeowners to a website where further information will be available. The system can be completed by a qualified contractor, Tarry says.

Each Solar Ready home will come with roof and mechanical room layouts that indicate the locations of future solar panels and the solar-powered hot-water tank.

Doug Tarry Homes, which builds Energy Star-qualified homes exclusively, is using solar-powered hot-water heaters manufactured by EnerWorks, a Dorchester-based solar thermal company.

Solar energy, in the form of heat, is collected by two solar panels mounted on a roof. During sunny periods, the heat is transferred through a flexible pipe from the roof to a heat exchanger and into a home's solar hot-water tank.

A gas water heater or an instant hot-water heater functions as an auxiliary heating source, which is required more in winter when less solar energy is available, says Tim Berry, senior vice-president of marketing and channel development for EnerWorks.

"In the summer, it's almost solely solar power that's creating the hot water. You're getting almost a full day of (sun) exposure at a high angle."

Berry believes the Solar Ready homes will encourage home buyers to take the next step and make the setup operational. "It makes it a lot easier to put the solar system in and less expensive. You're saving about 50 to 60 per cent on your hot-water heating costs," he says.

Tarry recently unveiled two model homes in Cherry Blossom Lane, an adult-lifestyle community of detached two-bedroom bungalows located within the Orchard Park subdivision in St. Thomas. Homes, which start from \$202,000, are inspired by Craftsman architecture and feature a combination of clay brick, James Hardie concrete siding in a board-and-batten style, as well as Arriscraft stone.

The 1,300-square-foot Richmond model is solar-ready, while the 1,500-square-foot Lambert features a completed setup that includes two roof-top solar panels.

The homes in the 20-home enclave also feature sun dormers, which function as passive solar collectors. In the Lambert model, the sun dormer in the kitchen consists of three fixed panes of Energy Star low-e argon-filled glass situated high on an east-facing wall above the range.

"It will naturally light and naturally warm this area in the morning," Tarry says. "The idea with this is to gain a little bit of warmth in the morning to warm the home up, but we didn't want it to keep gaining heat throughout the day."

Tarry also designed his front porches with deep overhangs, which will limit sun gain in summer and reduce homeowners' air-conditioning costs. In the winter, the sun will warm the interior.

In Lake Margaret Estates, which the Tarry family built around a former gravel pit that is now a wildlife sanctuary, homes start from \$250,000.

The two-storey Ivystone model incorporates two south-facing solar panels, a solar hot-water heater and a heat recovery ventilator. The solar hot water tank preheats the domestic water in a boiler in the basement mechanical room. If the water in the solar tank is sufficiently hot, the boiler does not turn on.

The boiler also provides a heat source for an air handler that heats the home using high-velocity ducting. Heating zones throughout the house allow homeowners to thermostatically control the temperature of individual areas.

The model, which Tarry refers to as a “family cottage-style home,” is reminiscent of beach houses in Nantucket and emphasizes outdoor living. A deep covered rear porch incorporates two levels and three distinct casual living areas, while a large balcony off the master bedroom above offers a superb view of the lake.

Deep soffits shield the windows at the front and rear of the home from excessive heat gain in summer. Smaller piano windows set high into the east wall of the home convey light into the adjoining dining and family rooms, but limit heat gain in summer as well as views of neighbours’ homes next door.

Tarry used the same rationale for the smaller, higher windows in the second-floor ensuite bathroom. Most builders install 48- by 48-inch windows in ensuite bathrooms, but they allow too much heat to enter in summer.

“If you’re using shorter windows, then the roof overhangs are going to block the amount of sun, particularly when the sun comes around to the south,” Tarry says.

The solar component complements several “green” features in Tarry’s homes. They include 30-year shingles; R50 blown cellulose insulation in attics, which is denser and more stable than fibreglass, and eliminates cold spots; and a heat recovery ventilator. As an option, Tarry insulates the basement concrete sub-slab, which he believes provides “the best bang for the buck” for improving the energy efficiency of a home.

Tarry has also begun incorporating advanced framing techniques in which he builds 2X6 walls with an insulating value of R-24, well above the current code of R19.

“You’re putting about 23 per cent more insulation into the wall, versus a standard 2X6 wall, by using advanced framing,” he says.

Tarry says incorporating passive solar heating, solar-ready technology, Energy Star, and advanced framing have added up to a steep learning curve for the company – but one that he expects will pay off for buyers.

“It’s a lot to think about in the design of a house, but I really think in the long run that’s where you’ve got to go. That’s what going to help control heat gain in the summer and gain you some heat in the winter – and we’re doing it in a way that looks good,” he says.