



CHRIS SCHWARZ, THE JOURNAL

Gordon Howell has engineered a Riverdale duplex in which each unit can be heated in winter by the power used by four toasters.

# 'Net-zero-energy' home a first in city

## Riverdale house will generate as much electricity as it uses in heating

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A duplex that will capture as much energy as it consumes is rising in Riverdale, with solar collectors on the roof and thick insulation under the basement floor.

This will be the first "net-zero-energy" house in Edmonton, and among the first in Canada, says Gordon Howell of Howell-Mayhew Engineering — a project partner with Habitat Studio and Workshop.

"We start by making it as efficient as possible," Howell says. "A standard house has walls with insulation rating of R20, or R12 in older homes. We have R56."

The ceiling is rated R100, and the base-

ment floor is R30.

The house has high-performance windows and tight construction to minimize air leaks and drafts. All appliances are "off-the-shelf but ultra-efficient," Howell says.

With good insulation, heat from light bulbs, appliances, computers and even the occupants helps to warm the house.

"In poorly insulated homes, that heat quickly rushes outside," Howell says. "In an ultra-efficient home, the heat goes slowly to the outside."

The house receives 30 per cent of needed heat as solar radiation through the south-facing front windows.

Most of the remaining heat comes from 20 square metres of roof-mounted solar collectors, where water is heated before circulating through the house.

On the coldest days, the house also will

be heated electrically.

"In the middle of winter, when it's minus 32 degrees outside, we can heat the house with four toasters," Howell says. Rather than actual toasters, each unit will use electric space heaters drawing about 6,500 watts.

Electricity will be generated by 30 square metres of solar modules, or photovoltaic cells, also mounted on the roof.

"Any excess electricity goes into the grid for credit," Howell says.

During the summer, he expects a surplus to flow into the grid — and be balanced by current flowing from the grid to the house in winter.

"The grid is like a battery bank," Howell says. "On an annual basis, the amount we send to the grid and the amount we pull from it will be equal."

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# Energy-efficiency investment should pay for itself over five to 12 years

## HOUSE

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The duplex is being built with help from Canada Mortgage and Housing Corp., which held a national design-build competition that drew 72 expressions of interest. Twelve projects were selected, including one in Calgary, two in Red Deer, and the Howell/Habitat building in Edmonton.

CMHC provided \$60,000, mostly for

public consultation, performance monitoring and report writing.

Prices for the two duplex units, each of 1,800 square feet, have not been set. Howell thinks they will be in the \$600,000 range.

"These are the first net-zero-energy homes to be built in Canada," he says. "New systems cost more."

The energy-efficiency investment will pay for itself in five to 12 years, Howell believes. The solar heating may require

a 25-year payback and the photovoltaic solar modules could take 50 years.

"The benefits are far more than financial," Howell says. "It will be warm, draft-free, comfortable and prestigious."

"We already have half a dozen people interested in buying."

Beyond this duplex, "we expect these net-zero-energy homes to be the tip of the iceberg as the public becomes interested and asks builders to build

more," Howell says.

He expects the units to be sold in September. One will be turned over to the buyer in January while the other will be a demonstration site for six months.

Howell will discuss net-zero-energy housing Monday, June 4, 7 p.m., at Telus World of Science, 11211 142nd St., in an event organized by CMHC and the Solar Energy Society of Canada.

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