

Lights on in Ontario

The biggest blackout in North American history made one couple in Southern Ontario feel quietly vindicated. Only months before they had installed the off-grid solar system that kept them connected to the world during the two-day disaster.

A row of solar panels line the roof, providing year-round power to a rural Ontario home.

Glen hikes his home's forested hills ([this page, top](#)). The solar panels and windmill feed into a bank of batteries ([bottom](#)). Situated in rolling countryside an hour outside of Toronto, the modern architecture of this passive-solar house is a stunning counterpoint to the more typical area farms ([opposite page](#)).

It was mid-August 2003, and Glen Hunter was sitting in his home office enjoying a vista of rolling verdant hills and the cooling breeze of his overhead fan. To the south, the land dipped and swayed for miles to meet Lake Ontario; to the north, a grassy incline rose out of granite rock, a wind turbine perched atop like a cherry on a cake. After taking a satisfying sip of iced tea, Glen tapped away on his computer.

It was a day pretty much like any other for Glen. Not so for 50 million other residents of Ontario and upstate New York. On 14 August of that year, the biggest blackout in North American history cut electricity to millions of homes: refrigerators, lights, phones and computers lost power. The world there went black for two days.

Glen and his partner, Joanne Sokolowski, were oblivious. Their home, near Peterborough in Southern Ontario, is powered entirely by sun and wind. Construction on the airy, modern structure had been completed mere months before the blackout hit the province and their off-grid, solar system proved worth its weight in hydro.

"It was sort of surreal," says Glen. "We turned on our television and watched news coverage of the blackout, knowing that the millions it affected were unable to turn on their TVs."

At Glen and Joanne's house, solar panels flank the rooftop like oversized flags, powering batteries that fuel the house's electrical needs. A single wind turbine feeds the same batteries, providing extra wattage. With the sun contributing 1.3 kilowatts of power, and the wind generating 1 kilowatt, the environmentally friendly systems rack up an impressive 2.3 kilowatts of green electricity. With batteries capable of storing 1100 amp hours of power, Glen and Joanne are able to enjoy three days of usage in winter and five days in summer before needing to worry about draining their batteries (A 53-foot-deep well equipped with a special slow-start pump provides water and is easy on the batteries).

"The concept," says the home's architect, Paul Dowsett, "is to let nature do the majority of the work for you." Both Paul and his client, Glen, came to this project with a passion to build something that embraced both a modern aesthetic and a modern (green) sensibility.

In a bit of client-contractor kismet, both Paul and Glen were highly influenced by environmentalist fathers. "Building an environmentally friendly house has been something I've always wanted to do," says Glen. "When I was growing up, my father was constantly talking about Earthships – a '70s form of biotecture. There were all sorts of books and magazines lying around on these →





Gator (a Chesapeake Bay retriever) enjoys the freedom of country life (this page, top). The wind turbine soars over snow-covered hills (bottom). Ceara (a golden retriever) catches some rays on the home's all-glass south side (opposite page).



below-grade houses built right into the sides of hills.”

Paul’s father lived for years in Canada’s remote and rugged far-North, where living in harmony with the land isn’t an option, it’s a requirement. “Recycling and re-using materials was a matter of survival for my dad,” says Paul. “It was natural for me to bring that sort of thinking into my architectural practice. What have we already got working for us? Well, the sun rises and sets in a very predictable pattern.”

Solar panels and wind turbines are two of the most obvious strategies, but the house plays host to a number of other, cleverly green, design tricks that work with, and not against, Mother Nature.

The house was situated on a hilltop facing due south, to gain maximum exposure to the warming rays of the sun—a must in many parts of Canada, where temperatures can be sub-zero for months at a time. The home’s south wall is composed entirely of floor-to-ceiling glass windows (all double-glazed, low-E). After studying solar angles on the Internet, Dowsett erected an overhang geometrically pitched to permit penetration of low winter sun, but to block penetration of the high summer sun.

“It’s amazing how much heat is generated by the sun coming through those windows in the winter,” says Glen. “It can be minus-20-degrees and we’re nice and toasty.”

Being snug as a bug while snow swirls outside is only partly due to the solar gain provided by the home’s bank of windows. The seasonal temperature range in this part of Canada is so drastic—temperatures can soar to as high as +30°C in summer and plummet to -30°C in winter—that thermal insulation is a must. “It plays a critical part in keeping the outside temperature outside and the inside temperature inside,” says Dowsett.

The homeowners stumbled upon an advertisement for straw bale insulation and although Dowsett had never used the material before, he was eager to try. A waste agricultural product, straw that is bound tightly and cut into bales offers highly effective yet relatively inexpensive insulation. “And,” says Dowsett, “it’s dead simple. The learning curve is about five minutes. You pick it up and stack it. It’s like adult Lego.”

Indeed, child’s play was pivotal in the approach to the home’s interior. While not yet born when construction began on the house in 2001, children were definitely in the plan and Glen and Joanne were keen to have a house that could adapt to meet their changing needs as a family. “We specifically asked Paul and our builder to create only a shell,” says Glen.

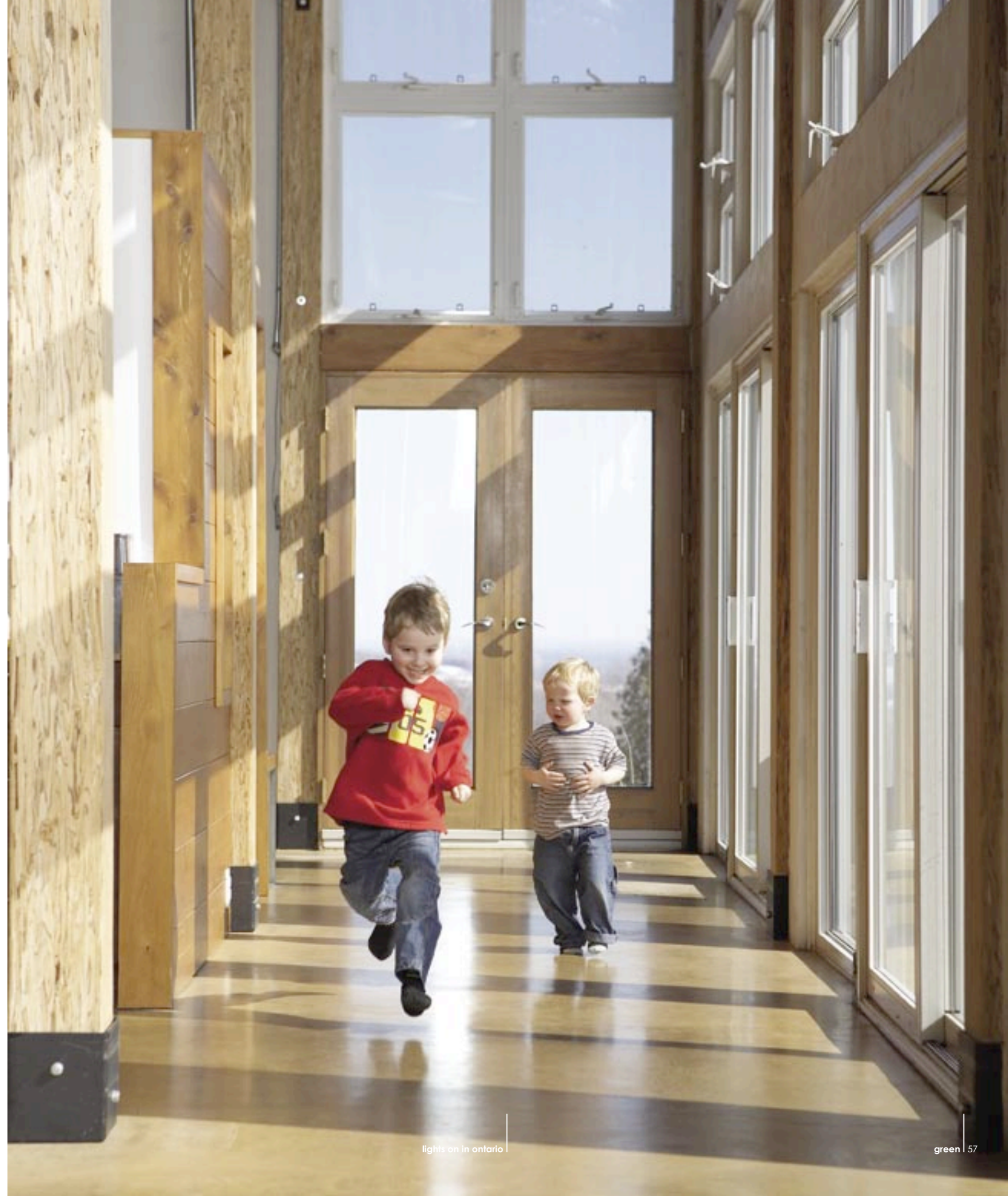
“We wanted to have a blank canvas that could →



be drawn on and shaped as our lives changed.”

In preparation for his progeny, Glen had load-bearing walls built around the bathroom, providing privacy, but also the foundation for a fort that could be easily installed in the cubby just over the bath. All the in-house wiring, phone and Ethernet cords were run outside the walls, disguised behind detachable baseboards. “That way, if we wanted to throw a wall up for a nursery, rerouting the electrical is no trouble,” says Glen.

Glen’s thinking, it turns out, was prophetic. Five months after the couple moved into their hilltop aerie, young Gilbert (now five) was born. Two years later, Declan joined the family. Today, the inside of the open-concept house has a few more walls than it once did, and the spare, modern furnishings have been accessorised with bright plastic blocks and plush, squishy animals. But from the outside, all remains as it was. The solar panels still salute the progress of the sun across the sky, the turbine hums along with the howling wind and the glass windows still watch the trees wave their way down to the water. Just like nature intended it. 🌿



The open-concept kitchen and dining room is light-filled thanks to floor-to-ceiling windows (this page, top). A portion of the original stone farm structure was incorporated into the living room’s modern design (bottom left). The wood wall in the master bedroom is made from Eastern White Cedar milled from trees cut right on the property (bottom right). Gilbert (age four) and Declan (age two) race down a sunny hallway. Radiant heating in the concrete floor ensures their little feet stay toasty (opposite page).

Specs:

Architect
Paul Dowsett Scott Morris Architects
www.scottarch.ca

Solar Electric (PhotoVoltaics)
1.34 kW of solar panels, comprised
of 8 x 85 Watt BP solar panels
4 x 165 Watt Shell solar panels.

Solar Thermal (Hot Water)
Solcan 64-80 DB system
2 panels = 12.6 GJ /year = ~ 3,500
kWh /year or, 80 gallons of hot
water per day.

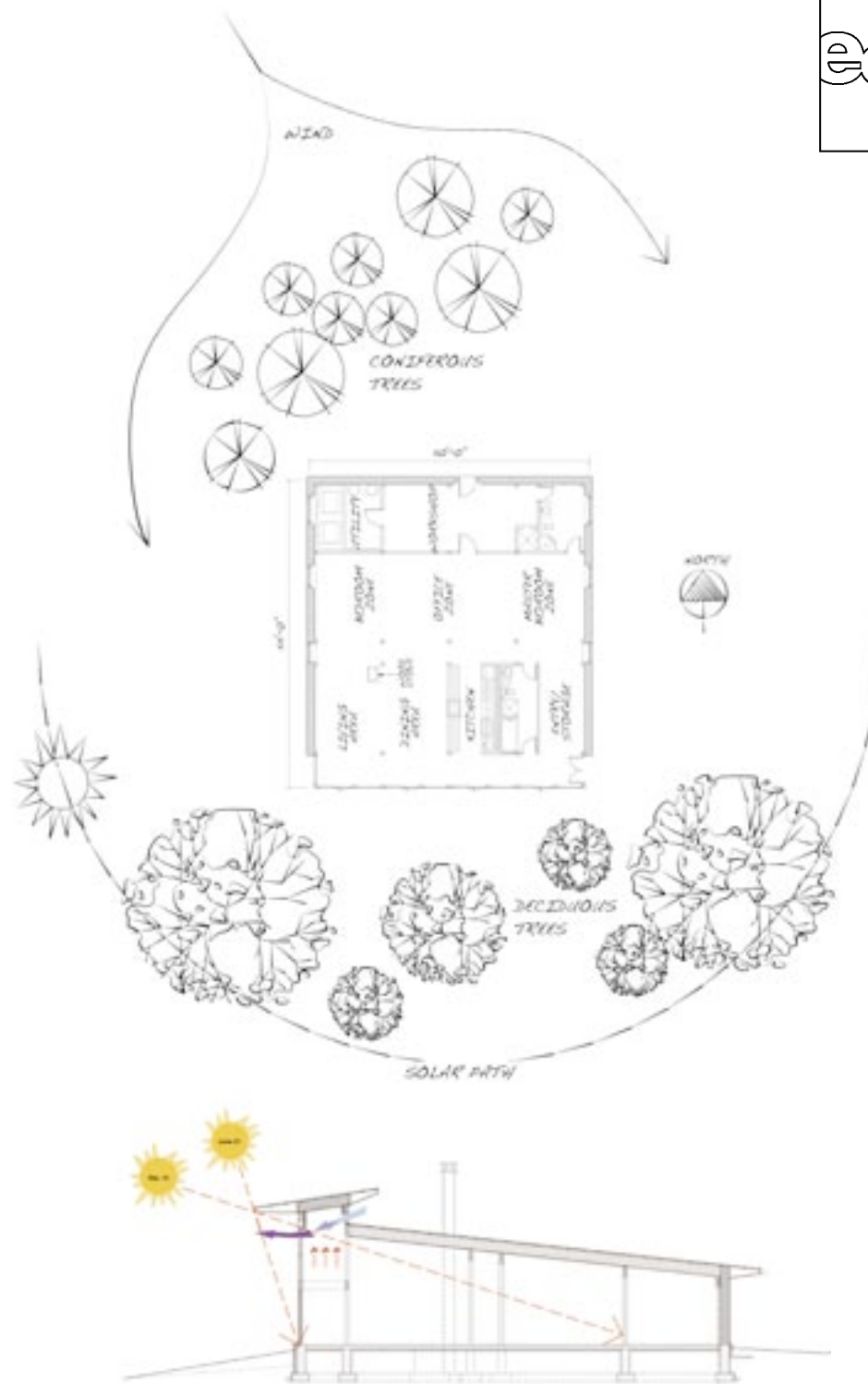
Wind Generator
Southwest Windpower Whisper
H80 1kW generator.

Storage
Surrette deep cycle lead acid
batteries 8 x 6 Volt, wired in series,
for 48 Volts. The battery bank has
1100 Amp/hours of storage or,
5 days of storage in the summer
and 3 days of storage in the winter
(assuming no sun and wind
to recharge).

Charge Controller
Outback MX60

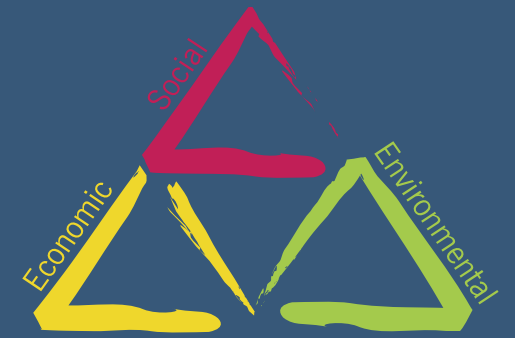


1100 amp hours of electricity
are stored in the batteries (**top,
left**). Solar panels (**middle**). Straw
bale insulation is showcased in a
peekaboo window (**Bottom**). The
stone walls of an old barn act as
garden fencing (**right**).



Long Section Sun angle: Latitude 41°17' N Longitude 17°38' W

eeh



smart & sustainable HOMES



A smart and sustainable home is:
Environmentally Sustainable
reducing waste, water and energy use



Socially Sustainable
safer, more secure and comfortable



Economically Sustainable
cost saving over the life of the home

The Smart and Sustainable Homes program
is a joint initiative between Queensland
Government, local government and
industry partners. The program is providing
communities throughout Queensland with
display homes which incorporate principles
of sustainable design and performance,
using the Smart and Sustainable Homes
Design Objectives as the minimum criteria.

Display homes currently open:
Sustainable Home Caboolture
24-26 Central Lakes Drive, Caboolture
Sustainable Home Doonella Noosa
Cnr Jacksonia Place and Morina Circuit, Lake Doonella
Sustainable Home Toowoomba
308 Ramsay Street, Toowoomba

For more information visit www.sustainable-homes.org.au or www.smarthousing.qld.gov.au