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Solar Pioneers Point the Way to a Sustainable Future

In many ways, Don Happner's acreage north of Nipawin is reminiscent of the pioneer homesteads carved out of the Saskatchewan wilderness 100 years ago. A pile of firewood sits near the kitchen door, a cook stove glows warm in the kitchen, the cellar is lined with preserves, and a pair of snowshoes is propped by the porch door. But the bank of solar panels and the wind turbine whirring in the breeze indicate that Happner and his partner Dawn Schumilas—early adopters of the latest solar and wind energy technologies—are pioneering a more sustainable way of life.

The road comes to an abrupt halt in Happner's yard and little more than forest stands between his land and the Arctic Circle. But a remote location suits Happner and Schumilas, who enjoy the opportunity isolation provides to concentrate on their major interests, music and an appreciation of their natural surroundings. Originally from northern Alberta, the couple researched land values and environmental conditions before finding land near Nipawin. When they realized it would cost \$25,000 or more to connect their home to the provincial power grid, they decided to harness the sun and wind to produce electricity.

At less than one third of the cost of connecting to the electrical grid, the couple were able to purchase solar panels, a wind turbine and deep cycle storage batteries to supply most of their electrical needs. Since their home is entirely heated with wood, they have achieved near self-reliance in energy. This has allowed them to eliminate monthly energy bills, making it easier to live comfortably while devoting time to their musical careers.

Their neighbours Scott Edwards and Roseanne Kirkpatrick are also tapping into the sun and wind to power up their remote acreage. Their impressive owner-built log house relies on passive solar gain from large south windows and an efficient radiant, in-floor heating system using natural gas as an energy source. Electricity is supplied from an array of 12, 64-watt solar panels and a 500-watt wind charger. The total cost of their power system was considerably less than the cost of hooking up to the electrical grid, and of course there are no monthly power bills.

Both couples typify an emerging trend toward the use of solar and wind power in remote locations. In most cases, people who have turned to alternative power are also committed to protecting the environment, and few technologies are more environmentally benign than wind or solar. In Canada, residential energy use produces about 30% of the greenhouse gases that cause climate change. Installing solar and wind systems eliminates greenhouse emissions, helping Canada meet its international commitments to prevent global warming.

Don Happner's power supply comes from four 64-watt solar panels and a 400-watt wind turbine. Energy is stored in eight, 6-volt, deep-cycle golf cart batteries, which make it possible to use power even when it is not sunny or windy. A 1500-watt inverter changes the DC power stored in batteries to the AC power commonly used for lighting and appliances. All the system components were supplied by Kelln Solar of Lumsden SK, which also provided technical advise and support.

Solar and wind power allows Happner and Schumilas to operate lights, a TV/VCR, a sound system, small kitchen appliances, and small tools like electric drills. With home power systems it is still important to conserve energy, so compact florescent bulbs and other energy saving applications are used throughout the house. This is especially true in winter, when bright sunlight is limited to four hours per day and the demand for lighting is high during the long nights. On the other hand, summertime allows for more liberal use of energy and it is then possible to use appliances such as a microwave oven and toaster, which draw a lot of power.

In mid-winter, it is often necessary to supplement the power supply by operating a gas generator to recharge the batteries. The generator is also needed to operate tools like a circular saw, which require more power than a solar/wind system of this size can supply. Happner and Schumilas also use a propane refrigerator, since an electrical fridge would require most of their current system capacity on a continuous basis. Happner feels that his wind turbine could produce more power if it were on a much higher tower.

Scott Edwards and Roseanne Kirkpatrick have installed a considerably larger system, which allows them to operate appliances like a refrigerator. The couple makes every effort to conserve energy and reduce waste and resource use, including the use of highly efficient lighting units, an energy efficient refrigerator, quadruple-pane windows and a composting toilet. Clothes are washed in a front-loading, low water-use machine and dried on the line. Televisions and computers are plugged into power bars that can be turned off to prevent energy losses from "phantom" loads.

A gasoline generator is still required to boost power during the winter, but the extension of the wind charger tower to 70 feet and the addition of some additional solar panels may eliminate or reduce the need to use it.

In cases where a farm or acreage is already on the electrical grid, a home power system can be designed to tie into it, drawing external power during extended cloudy or calm periods or for heavy uses such as welding. In some jurisdictions, the power utility allows home users to feed excess energy back into the grid so that the electricity meter run backwards. This eliminates the need for expensive batteries to store power while keeping electrical costs low. All grid tie-ins must be approved by utilities and use CSA-approved equipment.

"Early users of solar and wind are paving the way for the eventual widespread application of sustainable energy systems," says leading Saskatchewan solar consultant Ken Kelln. "People in Saskatchewan will eventually be able to produce most of their own power at a reasonable cost while significantly lowering their impact on the environment. Alternate energy pioneers like Edwards and Happner are working out the kinks, helping us design highly efficient, effective and affordable home power systems."

Information on home-scale solar and wind energy systems for Saskatchewan is available from Kelln Solar, Box 94, Lumsden SK S0G 3C0. Call 1-888-731-8882 toll free or visit the web site at www.kellnsolar.com

Happner System Description

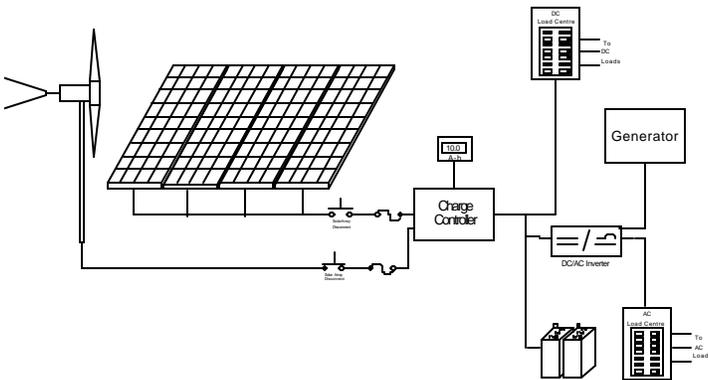


Don Happner and Dawn Schumilas live on an acreage north of Nipawin which is about 2 km beyond the end of the electrical grid. They have reduced their electrical needs to a few energy efficient compact fluorescent lights, a TV/VCR, a sound system, some small kitchen appliances, and few small tools. They heat their home with wood, and use a propane powered refrigerator to keep the electrical demands low. In the summer, when more solar electricity is available, they use a microwave oven and toaster. They also make use of a gas generator to recharge their batteries when required, and to operate larger power tools.

Happner System Components Table

Qty	Description
1	Air-X 400 W Wind Generator
4	US-64 Uni-Solar 64 W Shatterproof Solar Module
1	ASC MARK/20-12 12 V, 20 A Charge Controller with Digital Meter
1	Trace DR1512 1.5 kW Inverter with 70A Battery Charger
8	T105 Trojan 6 V, 220 Ah Deep Cycle Battery
2	DC Disconnect

System Schematic



Edwards System Description



Scott Edwards and Roseanne Kirkpatrick live in a log home heated by passive solar energy and an in-floor radiant heating system fuelled by natural gas. They are not connected to the electrical grid, however, and rely on their solar/wind generation system for electricity for an energy efficient refrigerator, circulating pump for their heating system, front loading clothes washer, televisions, computers, and high efficiency lights – most of the conveniences that grid-connected home owners enjoy. A gasoline generator is required to boost the batteries during the short winter days.

Edwards System Components Table

Qty	Description
1	Air-X 400 W Wind Generator
12	US-64 Uni-Solar 64 W Shatterproof Solar Module
2	Trace C40 Charge Controller with Digital Meter
1	Trace PP-SW4024 Power Panel
4	Surrette 6 V, 1025 Ah Heavy Duty Deep Cycle Battery
2	DC Disconnect
	Cables and Connectors

System Schematic

