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Real Estate Edge

Geothermal energy delivering big savings

Ground-source heating attracts interest despite initial costs

By James Bow
Business Edge

For Eric Lange, geothermal heating and cooling was like finding buried treasure.

In only two months last year, his company, Lange Transportation and Storage Ltd. found \$12,000 in energy savings beneath his company's 70,000-sq.-ft. Mississauga warehouse after installing such a system.

Lange Transportation and Storage moves heavy and expensive equipment on demand. It specializes in delivering and setting up tradeshow displays across the country, but it also delivers "high-value" products including CAT scan and lotto machines, securely and to critical deadlines.

The company, located just west of Toronto and employing 50 full-time staff, needed more space, so it purchased the warehouse last July.

Almost immediately, Lange realized he had a problem.

"I opened my first electrical bill, and it was for \$3,800," says Lange. "We hadn't even moved in. We hadn't even turned on the air conditioning. All we had were the lights on for the painters."

Lange contacted Selectpower, a hydroelectric company owned by the City of Guelph, to do an energy audit. It confirmed his fears.

"We had a glutton for energy use," says Lange. "The air conditioning was old; the windows weren't insulating enough. A lot of things needed to be replaced. Fortunately, we had a few months before we had to move in, so I decided to renovate the building to make it more energy efficient.

"In September, I hired Selectpower to oversee the project," he adds. "In total, we spent \$600,000 on the renovations.

"The changes included double-glazed windows and rubber liners on the loading docks to reduce heat loss, but the big item was the geothermal heating and cooling system. GeoSmart Energy of Cam-



Photo courtesy of Lange Transportation and Storage
Refitting the Lange Transportation and Storage warehouse for geothermal power required the use of two drilling rigs.

bridge engineered it and Main Air Systems was the mechanical contractor."

When Guelph Hydro phased out its Selectpower operations in October, GeoSmart took over the oversight role for the project.

The geothermal installation was active in November.

Geothermal energy conjures up images of homes heated by volcanic hot springs in Iceland or Japan, but the system Lange installed, referred to as ground-

source heating and cooling, works most places on the planet.

A hundred metres below the surface, the Earth's temperature is a constant 13°C, regardless of the conditions on the surface. This is a good source of heat in winter and an effective heat sink in summer.

Pipes drilled down to this layer are filled with water or another heat-conductive fluid, which transfers heat between the Earth and the surface using

pumps, fans and heat exchangers.

Geothermal systems can even be found in oil- and gas-rich Alberta.

Bill Temple, a former partner with Keen Engineering, which is now a part of the engineering and architectural firm Stantec Inc., has experience with geothermal heating and cooling, having overseen three commercial systems in major projects across the province.

"Ground source works best if your building requires both heating and cooling," says Temple, "so you take heat out of the ground during winter and reverse that cycle in the summer. An imbalanced system can deplete the heat sink."

Established in 1954, Stantec employs 6,900 workers in more than 80 offices across North America, and has designed a number of buildings that meet LEED (leadership in energy and environmental design) standards.

Not all of Stantec's sustainable projects use geothermal power, but it is part of the company's repertoire when it comes to designing new energy-efficient buildings or rehabilitating old ones.

"LEED is the accepted standard for sustainable and energy-efficient buildings in North America," says Temple. "It's been adopted by the federal government, the government of Alberta, Calgary, Vancouver and others. They mandate that their buildings at a minimum meet the LEED Silver standard as relates to energy efficiency.

"The Alberta Municipalities Association headquarters, in Edmonton, was the first LEED project in Alberta," he adds. "Ground source kept things warm in winter and cool in summer for this 8,000-sq.-ft. administrative building."

Two other projects followed in the province, including the Yellowhead County Administration building in Edson, two hours west of Edmonton, and the Boreal Centre for Birds in Slave Lake, three hours north of Edmonton, the latter of which received a sustainable design award from the Consulting Engineers for Alberta.

"It was almost completely off the grid," says Temple. "No sewer line, water line or gas line. With the exception of electricity, it had no utility connections. We find that, in the buildings that we've designed using ground source, we can

achieve 60-per-cent energy savings over the model national energy code for buildings."

He acknowledges the irony of heating buildings geothermally in Alberta when gas is traditional, plentiful and nearby, but interest is growing.

"Using ground source for heat requires a supplemental heat source," says Temple. "This requires electricity. In this part of the world, electricity is more expensive than gas, but that gap is closing. The closer your gas costs come to electricity, the more appealing ground source is."

Geothermal power is not for every building, says Temple. The initial capital costs are an obstacle.

"If you were to compare ground source to a traditional heat/cool system using pure construction capital costs, you wouldn't decide on ground-source system. You have to look at the life cycle and the cost of energy over a number of years."

It also costs less to install a system as a building is being built.

The challenge of retrofitting Lange's 30-year-old warehouse made for an even more expensive project, but Lange is pleased with the results. "We expect a payback after 8 1/2 years based on today's energy costs," he says.

One of the challenges in retrofitting geothermal technology was finding space, says Lange.

"Twenty-eight holes had to be drilled, each six inches in diameter and 10 feet apart. Our property is three acres, but the building uses much of that. Then we realized one of the driveways needed to be repaved anyway. It was over 300 feet long and 24 feet wide, a perfect space to drill the bore field."

Because geothermal heating and cooling is still rare, some construction companies, lending agencies and governments aren't prepared for it, although that worked out in Lange's favour.

"We went to Mississauga City Hall and asked them about permits, and they looked at us like deer caught in the headlights," says Lange. "Even though we wanted to drill 360 feet down in the earth 28 times, we didn't need a permit. Other than checking that there was no electrical or gas pipelines below us, we were free to go."

Air carrier rising above turbulent takeoff

Porter Airlines looks to strengths in business model, management

By David Hatton
Business Edge

After less than six months of flights, Canada's newest regional airline has a number of things going against it: Protesters showed up to picket the first day of operations; it has limited potential for growth at its tiny island airport; and the industry is known for a long list of companies that have failed.

But a strong business model and solid management team should put Toronto-based Porter Airlines and its parent company, Regional Airlines Holdings Inc. (REGCO), on a clear flight path to success, according to experts.

"We have no shortage of aviation entrepreneurs in this country who have tried to start their own airline and failed," says industry consultant Rick Erickson, managing director of R.P. Erickson and Associates in Calgary. "We make excellent aircraft and have well-trained pilots and flight crews. But past attempts have been historically either underfinanced, not enough expertise or both."

"I'm bullish on Porter's chances because they have all that covered."

REGCO announced just over a year ago it would begin flying passengers out of the Toronto City Centre Airport, located southeast of the downtown financial district.

It posed a distinct advantage over Pearson International Airport in nearby Mississauga, which was known for difficult accessibility, lengthy delays and high prices.

"(A downtown businessperson) can go from the office to sitting in the actual aircraft in about 35 minutes," said Erickson. "This poses a distinct advantage for the niche they are targeting, which is the business traveller."

Soon after that first announcement, Porter had more surprises up its sleeve.

It had negotiated an agreement with the Toronto Port Authority to severely restrict Air Canada's Jazz division, Porter's main competitor, from using the airport terminal. Porter had an overwhelming majority of the available time "slots" at the departure gates, blocking Jazz from using them for its passengers.

Air Canada launched several unsuccessful court appeals. The most recent one was turned down last month by a judge who rebuked the airline for "wasting the court's time" with what she saw as a frivolous appeal with no new information presented.

Some industry analysts questioned a raccoon being unveiled as Porter's new company mascot.

The animal is also known for being crafty and devious in going through residential garbage cans, which seemed too close to WestJet's recent court battle with Air Canada.

WestJet admitted to hiring people to go through an executive's curbside trash container for competitive information.

The fledgling carrier also released brief details of one of the highest levels of equity financing in the airline industry: \$125 million.



Brennan O'Connor, Business Edge

Porter Airlines CEO Robert Deluce (with flight attendant Katherine Chassi) targets business flyers.

Investors included Edgestone Capital Partners and Borealis Infrastructure, the investment arm of the giant Ontario Municipal Employees' Retirement System (OMERS).

"These guys obviously impressed a lot of the right people with their business plan. It's certainly not easy to get that kind of investment," said Erickson.

Porter began flights on schedule late last October, using 10 of the 70-seat Q400 turboprops built just north of Toronto.

With leather seats arranged in a 2-2 configuration, the aircraft has about two to three inches more legroom than its standard counterparts and no middle seats.

It was positioning itself as a more comfortable alternative to other carriers. Wireless Internet access was available in the bright new passenger waiting area.

During flights, amenities such as soft drinks, coffee, light meals and snacks were available to passengers at no charge.

Erickson said there was little chance of major players such as Air Canada giving away amenities to woo business travellers. They are successful right now with incremental discounts for passengers who give up an inflight meal or frequent flyer points.

Robert Deluce, Porter's president and CEO, brushed off the additional cost during an interview. "There's going to be an extra cost to providing these things, sure. But I sincerely believe that business passengers are tired of being nickel-and-dimed to death," he said. "We have to be different."

Deluce said his team decided early on that controlling a majority of the time slots at the airport departure gates had to be a key part of its strategy. "We needed the island airport and the timing was just right."

For Deluce, using the island airport put him back on familiar territory.

He got his pilot's licence there in the mid-'60s before moving on to run Canada 3000 from 1988 to 1995. His oldest brother, William, is a past president of Air Ontario.

"This (Porter) is an idea we've been working on since the late '90s and early 2000," said Deluce.

He had been making the rounds with investors at about the same time as two passenger jets were crashed into New York's World Trade Centre, sending a chill through the airline industry.

Then, as they were finalizing their deal, Jetsgo stranded thousands of passengers around the world when it declared bankruptcy overnight in 2005 and CanJet announced it was no longer going to be a passenger carrier in 2006.

But Deluce said the investors

were not fazed. "They recognized we had an excellent business plan and the expertise to pull it off. It was difficult; arranging any kind of financing like that is difficult. They realized it was a strong business plan put forward by some good people," he said, recalling the boardroom discussions.

Porter had used its connections as much as possible during the negotiations. After all, REGCO was partly owned by Larry Tannenbaum, chairman of Maple Leaf Sports and Entertainment, who is well established in Toronto's Bay Street financial district.

Deluce had earlier managed to convince Donald Carty, a former executive with American Airlines Inc., to join Porter as chairman. "Don Carty is like the godfather of the airline industry," joked analyst Erickson. "Getting him on your team with a new airline is a big advantage."

During the early negotiations, Deluce talked to Fred Lazar, an associate professor of economics at Toronto's York University and Schulich School of Business, to get some of Lazar's opinions.

"Air Canada and Jazz could easily have undercut us on price at Pearson. The island airport was an important piece," Lazar recalled in an interview. "Air Canada had been frustrating the Port Authority for years because they were winding down their operations at the island airport. The Port Authority knew there was potential at that airport, but Air Canada had decided it didn't want two bases of operations in Toronto."

"By the time Air Canada realized what was happening it was too late."

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Business considerations drove move

The installation process did generate comments, however.

"We had two huge rigs in the area for two months," says Lange. "Our neighbours asked us if we were drilling for oil."

Lange claims he is not an environmentalist, even though he drives a hybrid. His decision to retrofit his warehouse was motivated purely by business sense.

"I opened my gas bill for November and it asked for \$5,631.96," says Lange. "I disputed the charge and the gas company told me it was based on the history of the building and I could get a new bill based on actual usage."

"Reading the meter, I discovered that no gas had been consumed that month. The gas

company thought this was impossible, but then I explained the system we'd installed."

The gas company confirmed the readings, removed the meter and capped the system. A full credit for the November bill appeared in the December bill which, had it been based on history, would have been for an additional \$6,416.93.

"When you see savings of over \$12,000 in two months, you realize that a smart businessperson and an environmentalist can be one in the same," says Lange.

Web Watch:

www.langeshow.com

www.geosmartenergy.com

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