

Pulling water from the heavens

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Inventor John Zakryk built a Florida company around a "fabulous" machine that pulls pure water from thin air.

Quebec-based Dectron Internationale Inc. agreed. In fact, company executives liked the machine so much, they bought the firm and moved manufacturing headquarters to Montreal. Now the small Canadian company has emerged as a frontrunner in the international race to develop the revolutionary new technology -- which is expected to be in high demand not only in parched Third World countries, but also in drought-stricken areas of the First World.

"The world is quickly running out of its water supply," says Keith White, chief executive officer at Vancouver's TTW International Ltd., which owns the worldwide marketing and distribution rights for Dectron's water-from-air units, variously called water-makers, water generators or atmospheric water vapour processors. "With this technology," he says, "we plan to revolutionize the delivery of water to the world."

The units operate like dehumidifiers, except they go one step further: They extract water from the moist air and purify it with carbon block filters and ultraviolet light.

"To the best of our knowledge," says Mr. White, "we're the only ones up and running that have gone through ETL," referring to Edison Testing Laboratories, also known as ETL SEMKO, a Britain-based company that assesses and certifies new products internationally. In its report, ETL found Dectron's machine exceeded international standards for water purity.

"In our own testing, we found purity of our water is so high that the labs come up with zero -- nothing in it -- which makes it very useful even for surgery," says Nick Agopian, vice-president for sales and marketing.

The water at the TTW's Vancouver office is sweet and cold; it tastes even better than most bottled water. An open office window provides the necessary humidity, which a Radio Shack relative-humidity metre registers at 30 per cent.

Mr. White says the ETL water-purity certification and the company's up-and-running assembly lines give Dectron a three- to five-year jump on competitors with alternative water-from-air technologies.

Mr. White and Ray Anderson, president of Dectron, promise a plug-and-play unit that "requires no plumbing, water lines or pipes, just electricity."

The first units of their AquaStar Atmospheric Water Generators came off the assembly line in May, and already countries from Singapore to Egypt are buying Dectron's machines.



CREDIT: Christinne Muschi, The Ottawa Citizen

Nick Agopian, of Dectron Internationale, and the Water Maker M-10. The small Canadian firm is a frontrunner in the race to develop water generators.



CREDIT: Ian Lindsay, The Vancouver Sun

Ray Anderson, president of TTW International in Vancouver, and CEO Keith White have produced a device that pulls clean water from air. 'Contaminated water is the No. 1 cause of death in the world,' says Mr. Anderson, 'and it's all preventable.'

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Only three per cent of the world's water is fresh, and only 0.3 per cent of that fresh water is available for use. Much of that supply is fouled by disease organisms and pollutants.

"Contaminated water is the No. 1 cause of death in the world," says Mr. Anderson, "and it's all preventable."

The technology can also save lives another way, he says: preventing potential water wars between parched countries that share crucial rivers and lakes as climate change and overpopulation push the demand for more fresh water to the breaking point.

"I was trying to get water for the world," explains inventor John Zakryk.

The first time he saw a prototype for a water-generator, Mr. Anderson knew such a invention would be world-changing. While that particular model didn't work, he recalls, "the technology blew me away. It could produce water desperately needed around the world. There it was, sitting right in front of me."

The water-generators are economical, too, Mr. Anderson adds. "Here we can give people a machine so they don't need to bottle water. Our cost is 1.7 cents to two cents U.S. a litre; if you amortize the machine over 10 years and include electricity costs, that's five cents a litre."

And the units can operate in almost any country, he says. "I have no doubt you can take our machine anywhere in the world. As long as it's above 50 degrees (Fahrenheit) and 50-per-cent relative humidity, it will operate at good efficiency." (Ottawa's relative humidity ranges from 72 to 87 per cent in the morning, dropping to between 50 and 74 per cent in afternoon.)

Field testing in Dubai, United Arab Emirates and the Philippines, he says, produced good results.

Mr. Zakryk says portable water-makers should be standard disaster-relief equipment. He saw first-hand just how fast and how desperate water shortages become after a disaster, even in the wealthiest countries. When Hurricane Andrew struck Florida in 1992, he says, "we had a tremendous problem with getting water; in some cases it was selling at \$20 a gallon."

Mounted in tractor-trailers, he says, three or four 2,000-gallon units could supply a day's worth of drinking water to 3,000 or 4,000 people in a disaster zone. (Output is measured in U.S. gallons for all of Dectron's machines).

For relief in remote regions, he designed shockproof military units that can be dropped from a plane: "You bring them down, start them up and you've got instant water."

The military units are clad in metal, says Mr. Anderson, "built to be explosion-proof: You can drop them off the back of a truck and they withstand the force of the blow."

Although the company would not reveal how many of these units has sold to date, it says military departments in the U.S., Israel, Egypt, Malaysia and Singapore are already using them to supply troops and medical units, trucking the machines around or setting them up at permanent installations.

The company also expects great interest from Third World countries where access to clean water is limited even under normal conditions. The Philippine government, for example, has contacted TTW's Keith White to help provide fresh water to 125 villages that cannot be supplied with deep-well drilling. "The government asked us to construct a building around one of our larger units, and to place drink dispensers all around the outside, for each of the villages."

Without such a system in place, people would have to walk three to five kilometres a day to get water.

Residential units are also operating in Singapore, the Philippines, Hong Kong, the Middle East and the

Caribbean Islands, says Mr. Agopian.

China and India have also expressed a strong interest in the technology; businesses in Dubai, United Arab Emirates and in Trinidad, El Salvador, Honduras and Australia are also making inquiries.

Industrial customers for pure water range from soft-drink bottlers to computer chip manufacturers; one of the world's largest vending equipment companies is looking into the possibility of using water-generators in its vending machines.

"I honestly, truly, believe that water is going to become such a (valuable) commodity," says Mr. Agopian. "Ten years ago, who would have believed you are going to pay \$1.10 a bottle for water? People would have thought you were crazy. Now we pay more for water than for gasoline. It's obscene.

"If you really look at the numbers and supply of water, it's scary what is going to happen in the next decade or two, if we continue this way."

Pure water is, of course, in high demand on deep-sea oil-drilling platforms: ExxonMobil is using a 200-gallon unit to supply workers and equipment on a drilling platform in the Gulf of Mexico. Dectron is building a second unit for the world's deepest drilling and production platform, the Hoover Diana, also in the Gulf, which averages 80,000 barrels of oil and 200 million cubic feet of gas daily for Exxon and BP.

Each unit will save Exxon \$1 million U.S. a year by continuously cleaning turbine engine blades, keeping them at 98-per-cent operating efficiency for months, and sharply reducing maintenance shutdowns, which used to be necessary several times a year.

Those units cost \$350,000 apiece, says Mr. Agopian, but "that pays back in 18 weeks."

ExxonMobil has already decided "all its turbine applications must be updated with this technology," says Mr. Agopian, noting that there are "tens of thousands" of oil-drilling platforms around the world, on which water-vapour condensers may one day be standard equipment.

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First off Dectron's assembly line were 1,000 of the 10-gallon units, each roughly the dimensions of a bar fridge, wholesaling at \$1,950 U.S.

The company has sold 150 to Florida homeowners and businesses, says Mr. Anderson.

Now 75-, 200- or 600-gallon units are in production, with a five-gallon model still under development.

"We all want a compact five-gallon residential unit wholesaling for \$300-\$500," explains Mr. Anderson.

The units only produce those quantities under ideal conditions -- approximately 80-per-cent relative humidity at temperatures of 32 degrees Celsius. Drier air can drop water production by 75 per cent, but the units make, store and re-purify water continuously.

Mr. White says Dectron is gearing up to go full-tilt next year, producing 50,000 10-gallon units a month. By the end of 2003, he anticipates sales between \$10 and \$15 million.

He bases his predictions partly on the sheer size of the current worldwide market for bottled purified water, which, according to one estimate, is 89 billion litres yearly, worth \$22 billion.

So far, he says, the company has worked almost in secret to bring the product to market. Even now, in the initial stages of production (engineers are still making adaptations) they don't feel entirely ready.

"It's scary," Mr. Anderson laughs. "When the world finds out, we're not prepared to be overwhelmed" with the expected demand.

Dectron, a NASDAQ-traded company worth \$18 million, has annual sales of \$32 million, in refrigeration, air conditioners, humidifiers and indoor-air purifying equipment. It has seven factories, five in the Montreal area and two in Buffalo, New York.

Mr. Anderson says TTW plans a slow but sure marketing strategy that will focus on governments and international agencies such as the UN and the World Bank. "Water is regulated all over the world by local governments," he explains, "and we have to work with them.

"Saudi Arabia, for example, will allow these units to be brought in duty-free and tax-free. We're looking for that worldwide.

"We really do believe we have the best product in the world," he says.

Mr. Anderson says his favourite request, which he is still working on, came from a charity group building a children's home in Guatemala. The organization, which contacted Dectron three weeks ago, needs "water desperately because bottled water is very expensive," he explains.

"It's great to put a roof over their heads, but they need water.

"I have a bit of a religious background," he adds, quoting James 1:27: 'This is pure and undefiled religion in the sight of our God and Father, to visit orphans and widows in their distress.'

"I have had a life-long goal to support kids in an orphanage," he says. "I think it's really important to take care of people in situations like that.

"I think this is going to enable me to do that, and -- if we succeed -- a lot more."

In the Observer

A special five-page report on the small band of scientists who are designing machines to make water out of thin air -- in amounts that could make the difference between life and death. Story, B1

Ran with fact box "In the Observer", which has been appended to the story.

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