

Zenn and the art of electric car maintenance

The breakdown of his beloved 1959 French electric car led to Toronto auto maker's 'aha! moment'

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The first thing you notice about a Zenn car is its silence. "You can hear the birds singing driving down an urban street," Ian Clifford, founder of Toronto's Zenn Motor Co., boasted to Rick Mercer, bringing a mock tear to the comedian's eye when he visited the company's assembly plant for a segment of his show last year.

Zenn (for "zero emissions, no noise") is a low-speed electric car, conceived and assembled in Canada. It can go 80 kilometres on one charge, maxing out at 40 km/h, which pretty much limits it to neighbourhood excursions. Some 350 have been sold, mainly to U.S. buyers, as only one Canadian province - Quebec -permits it on its roads. It is, Mr. Clifford admits, a niche technology.

But the 46-year-old entrepreneur has much bigger plans. In 2004, Mr. Clifford signed a licence with Eestor, a Texas battery developer, that gives Zenn exclusive rights to use its technology in small and mid-size cars. Because Eestor's battery promises to propel a car up to 400 kilometres at highway speeds after just a five-minute charge, the deal could have a massive upside: Mr. Clifford envisions "Zennergy" electric propulsion systems powering millions of new and old vehicles. "We want Zennergy drives to be ubiquitous with electric-drive cars," he says. "We want to be the standard."

The downside? If Eestor's technology, still in development, proves unviable, Zenn could join Bricklin and Magna's Torrero in the annals of failed Canadian car brands.

Mr. Clifford is well aware of the gamble, but he's driven as much by ecological passion as business opportunity. In the mid-'90s, frustrated at being unable to buy an electric car in Canada, he bought a 1959 French electric car. "You'd park it and there'd be 20 people around it, staring and asking questions," he recalls.

Then, in 2000, two things happened: Mr. Clifford sold his Internet marketing business, and his beloved car broke down. He called the guy from whom he'd bought it to ask how to get it fixed, and was told, "Look in the Yellow Pages under 'lift trucks.'" As in forklifts. "That was the 'Aha!' moment," Mr. Clifford says. "There are millions of electric cars being driven behind closed doors in warehouses. This is proven, commercialized technology."

In 2002, Mr. Clifford ventured forth on two parallel streams. One was assembling a commercial, low-speed electric vehicle for neighbourhood driving, using the chassis of French Microcars. "I saw it as a low-capital-risk way to get a product to market" while establishing a brand and industry credibility, he says.

The second, more important stream was to develop a long-range, high-speed electric drive system that could power any car. "Consumers will not accept electric vehicles until they do exactly, or close to, what their gas-powered vehicles do," Mr. Clifford says. That means a charging time roughly equivalent to what it takes to fill up at the pump, the ability to operate in any climate, and near price parity.

The challenge turns primarily on battery technology, and the Zenn team investigated numerous options until it came across Eestor, an Austin-based startup whose prototype ceramic "ultracapacitor" promised to provide 10 times the energy of existing batteries at one-tenth the weight.

"It was a completely disruptive, breakthrough technology," Mr. Clifford says. "It replaces petroleum - it has that capacity." But the tech was still untried. To raise development funding, Eestor offered licences covering rights for various applications, from automotive to industrial to military. Zenn paid \$2.5-million for rights covering small to mid-size cars, then in April invested another \$2.5-million in the company.

Why would Eestor sell exclusive rights to an upstart given that partnering with a large auto maker could be much more lucrative? "I get that question all the time," Mr. Clifford says. For starters, auto giants, most of which are working on electric models, were holding out for a proven solution, he says, and Zenn, like Eestor, was a young company passionate about the technology's potential. "We were willing to take the risk when no one else would. Part of it was a leap of faith, part was due to diligence," Mr. Clifford says. "We were like angel investors, in at the ground floor, able to negotiate a strategic agreement which, when they commercialize, will create a massive global opportunity."

Mr. Clifford knows that skeptics would say "if" rather than "when." He stresses that the Eestor deal triggers payments only after Eestor reaches various developmental milestones. So far, Eestor is behind on its timeline. Meanwhile, Mr. Clifford has publicly stated that he expects Zenenergy-powered cars on the market by the end of 2009.

While Mr. Clifford admits that relying on another company for the realization of his entrepreneurial dream is "a little stressful," he's heartened by the fact that Eestor has attracted funding from two major players: venture capital fund Kleiner Perkins Caufield & Byers, and Lockheed Martin, which licensed the technology for military applications.

If the Eestor bet pays off, Mr. Clifford plans to shift Zenn away from low-speed vehicles and focus on supplying electric drivetrains to auto makers. "The last thing we want to be is a car maker," he says. "It's more the Intel-inside model."

And if it doesn't pan out? Mr. Clifford says he has plans B and C, but won't divulge them. But he stresses he won't give up on delivering an electric car - one that doesn't draw a crowd, because it's like every other on the road. Except for its silence.

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The numbers

33

Percentage of new car buyers in California who say they would buy an electric car for their next vehicle

678,108 gallons

Amount of crude oil the New York Power Authority estimates it saved by retrofitting school buses to electric power, providing incentives for electric cars and other initiatives aimed at boosting electric transportation

250,000

Number of electric vehicles expected on the roads in Europe, their biggest market, by 2015

40 km-h

Top speed of a Zenn neighbourhood car

14 km-h

Average speed on Manhattan streets

THE VITALS

KEY DECISIONS

Mr. Clifford opted to focus on building an energy-storage solution rather than an entire car. "It's about the drive, not the car," he says. He also decided a solid-state capacitor had more potential than a chemical battery (such as lead acid or lithium-ion). "I saw clearly to a time when all cars would be electric, and that would require an electrical infrastructure using sustainable power." An Eestor capacitor could be charged in less than five minutes at a charge station; chemical batteries take at least 30 minutes.

THE OVERSIGHT

Launching a new car brand proved more complex than Mr. Clifford anticipated. In hindsight, he might outsource more of the assembly, so that Zenn simply resells a product manufactured elsewhere. As well, setting up a distribution network proved very time-consuming and resource-intensive. "We could have looked at other business models, like master distributors or Internet sales."

THE NEXT STEPS

The next major milestone in Zenn's agreement with Eestor is third-party verification of the chemistry and storage process. If successful, it would trigger further payment from Zenn as set out in the two companies' agreement. Zenn will also continue to introduce its low-speed vehicles to new markets, next focusing on the southern U.S.

THE MARKET

The main buyers of Zenn's low-speed cars have been U.S. municipalities, especially on the West Coast, which use them for metre reading, neighbourhood policing and other functions. But if and when Eestor's technology proves commercially viable, the market could become massive. There are some 55 million new cars sold worldwide every year, and more than 750 billion on the roads - and all of them, Mr. Clifford believes, are potential clients for Zenenergy drivetrains or retrofitting kits.

THE VITALS

Zenn has more than 40 employees, 15 of whom work at the 40,000-square-foot assembly plant in St-Jerome, Que. The company, which trades on the TSX Venture Exchange, has a roughly \$75-million market cap. In 2007, its most recent fiscal year, Zenn lost \$6.9-million on revenues of \$2.3-million.

THE INTRIGUING IDEA

The low-speed vehicle category stems from the lowly golf cart. U.S. Sunbelt residents drove them illegally on the roads, leading federal regulators to create a special vehicle class, requiring seatbelts and better lighting to make them safer. Now, there's a movement to create a medium-speed vehicle class, which would top out at 55 km/h, creating a viable category for an urban commuter vehicle.

WHAT DRIVERS WANT

Performance requirements of drivers interested in electric vehicles

192 km, 1%

160 km, 8%

128 km, 24%

96 km, 25%

64 km, 25%

32 km, 17%

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