

ZENN and the Art of the Electric Car

The race to build the car of the future is on, and Ian Clifford, founder of a fringe company called ZENN Motor, is betting everything on a revolutionary new battery. If it works, he could be the next Henry Ford **By Alex Hutchinson**



Go car go: the new CityZENN will have a top speed of 125 kilometers per hour, a range of 400 kilometers and a recharge time of less than five minutes

Image credit: Amedeo de Palma

Even before the market chaos of the past six months, it was obvious that change was coming to the auto industry. SUVs were out, compacts were in, and hybrids were selling like hotcakes. Yielding to unprecedented consumer demand, manufacturers revived an old idea: the electric vehicle. This mythical car of the future has had more false starts than any other innovation in the history of the automobile—the most famous being GM’s EV1, the inspiration behind the hit documentary *Who Killed the Electric Car?* Released in 1996, the EV1 became something of a cult enviro-hit, but was discontinued four years later, spawning conspiracy theories about the influence of big oil. Now, virtually every major company is promising either a plug-in hybrid (like GM’s Chevy Volt) or a fully electric car (Nissan’s Nuvu), and the first mass-market versions are optimistically slated to arrive in 2010. In the race to develop a successful gas-free automobile, first prize will be a dominant share of what the veteran industry analyst Dennis DesRosiers calls “one of the fastest-growing, highest-potential markets the auto sector has ever seen.”

The challenge for manufacturers is energy storage. Gas tanks are a surprisingly efficient way of carrying energy. Even cutting-edge lithium-ion batteries, which most carmakers are depending on for their proposed electric cars, provide about 20 times less energy per

pound than gas. The huge battery packs required for a car of even average performance don't leave much room for a back seat. The high cost of creating an energy-efficient battery explains why the Tesla Roadster, a sports car developed in Silicon Valley and already on the market, costs \$109,000 (U.S.). A battery that can provide adequate range, speed and price all in one is the car industry's Holy Grail, and at this point, no company has found one.

ZENN Motor Company, a small carmaker headquartered in Don Mills with a factory in Saint-Jérôme, just North of Montreal, has a serious chance of being the first to complete the quest. ZENN, an acronym that stands for "zero emissions, no noise," was founded by a Toronto entrepreneur named Ian Clifford back in 2001—a year after GM killed its EV1, and at a time when most companies were raking in outsized profits from outsized SUVs. That gave ZENN a head start over its rivals, and in 2006, it released an electric "low-speed vehicle," a plug-in that can reach speeds of up to 40 kilometres per hour. But that was just a stepping stone toward the real goal: a fully functional, highway-approved car, fuelled by a revolutionary "ultra-capacitor" that replaces—and eclipses—the traditional battery. The so-called CityZENN will have a top speed of 125 kilometres per hour, a range of 400 kilometres on a single charge, and a phenomenal recharge time of less than five minutes. The estimated ticket price: \$30,000.

At least, that's the plan. EESstor, the well-connected but secretive Texas company that's building the ultra-capacitor for ZENN, initially promised delivery in 2007, then 2008. Now it's scheduled for late 2009, but time is running out. If ZENN doesn't deliver a practical electric car soon, one of the other contenders will. The stakes are substantial: one analyst estimates that a working ultra-capacitor could bring ZENN \$2 billion in annual revenue by 2013, making the 46-year-old Clifford an auto-industry legend. If it doesn't happen, however, Clifford will likely be remembered in a much less glorified way—as the guy who crusaded to make modified golf carts legal on our streets. The reason you've never heard of ZENN is that its cars can't legally be driven in Toronto. The company has been stuck in a bureaucratic quagmire since it launched. According to Transport Canada, ZENN meets all of the safety criteria required of low-speed vehicles, or LSVs—which usually resemble souped-up golf carts. ZENN cars are not your typical LSV: they're fully enclosed, and feature many of the same safety features as standard passenger cars. But ultimately, it's up to each province to decide which vehicles are allowed on its roads, and Ontario has been slow to recognize the LSV class.

ZENN's battle for approval has made the company a minor cause célèbre. The cars are already legal in 46 states and, as of this year, in Quebec and some parts of B.C. Ontario's indecision has sparked outrage in newspapers and recently prompted Barry Taylor, a radio host on 102.1 The Edge, to urge listeners to bombard provincial transportation minister Jim Bradley with phone calls and e-mails demanding an explanation.

In late October, Clifford took me for a cruise along the pothole-ridden streets of Saint-Jérôme. He has the laid-back air of a yoga instructor; nothing in his demeanour suggests someone who's in a mad sprint against the auto giants. You have to be easygoing to drive

his LSV. It functions just like an ordinary car until the government-mandated regulator kicks in at 40 kilometres per hour, at which point the vehicle simply stops accelerating, leaving your right foot slightly disoriented. There are other minor differences—a silent motor, the absence of power steering—but for the most part, it drives like any other car.

In 2004, Clifford secured a two-year exemption that allowed him to drive his low-speed electric prototype around Toronto. At the time, he was living in the Annex, working downtown, and taking night classes at York. He made out just fine. The average speed in the downtown core, he points out, is less than 20 kilometres per hour. “You can rarely get up to 50 on Bloor or Yonge,” he says. “Just try it.”



Some assembly required: Ian Clifford at ZENN’s production facility in Saint-Jérôme, Quebec Image credit: Ryan Remiorz/AP

Outside our regulation-beset borders, there are investors who follow ZENN’s fortunes with eagle-eyed devotion. Many of them couldn’t care less about provincial approvals, and wouldn’t blink if the LSV was suddenly declared illegal around the world. They’re interested in EEStor’s ultra-capacitor, which is the crucial innovation. Clifford locked up the automotive rights to it for \$2.5 million back in 2004 and followed up in 2007 with another \$2.5-million investment in exchange for a 3.8 per cent stake in EEStor. Since EEStor is otherwise privately held, the most direct way for investors to bet on the company is to buy ZENN stock on the TSX Venture Exchange.

After details of EEStor’s research began to circulate in 2006, Massimo Fiore, a Montreal-based analyst with investment company Versant Partners, was one of the first to quiz Clifford on what the deal could mean for ZENN. “I said, ‘OK, let’s assume the ultra-capacitor works, what do you have?’ ” he recalls.

“I have exclusivity for four-wheel passenger vehicles,” Clifford replied.

“Well, that’s quite interesting. Where does it apply?”

“Worldwide.”

“How long is this going to last?”

“It’s perpetual.”

And that, Fiore says, is when he started paying attention.

EEStor’s claims have generated endless debate in newspapers and magazines, and on-line, including such dedicated blogs as TheEEStory.com, which is devoted to chasing down rumours related to the company’s research and has an active discussion board. There’s plenty of skepticism, but EEStor has also received a couple of key endorsements that make Clifford’s 2004 deal look prescient. In 2005, Kleiner Perkins Caufield & Byers (the vaunted Silicon Valley venture capital firm that was an early backer of Google and Amazon, and is now partner to Al Gore) backed the company with a reported \$3-million investment. Then, in 2008, Lockheed Martin announced that it had licensed the still-hypothetical ultra-capacitor for use in military applications.

These external validations have heightened expectations for ZENN, whose stock jumped by 22 per cent the day the Lockheed deal was announced. But they don’t provide any guarantees. “I don’t use words like ‘imminent’ anymore,” says Clifford. Under the terms of his deal with EEStor, he is permitted to see the progress at the production facility in Texas, but is bound by a non-disclosure agreement. His body language betrays excitement when he discusses it. “I can’t talk about it,” he says, “but I can certainly bubble.”

Clifford’s epiphany came in the late ’90s, when he was running a successful Internet marketing company called DigIT Interactive. Stuck in downtown traffic in his SUV, he started thinking about the electric vehicles that companies like GM were leasing in California. He wanted to get one, but discovered they couldn’t be obtained in Toronto. Eventually, he found a 40-year-old electric car called the Henney Kilowatt for sale in Connecticut; it was a converted Renault Dauphine powered by an electric motor built by the Eureka-Williams vacuum company. When it promptly broke down, Clifford looked in the Yellow Pages under “forklifts” to find a repair person familiar with electric vehicles, which is how he met a versatile technician named Probyn Gayle.

In Gayle’s know-how, Clifford saw an opportunity to fill the market gap the big car companies were ignoring—and, if nothing else, compel them to make electric vehicles more easily available. “He wanted to sell electric vehicles, and I wanted to build them,” Gayle recalls. So the two men, along with Marek Warunkiewicz, one of the co-founders

of DigIT Interactive, formed a company that would buy old Dauphines, convert them to electric, and peddle them to the masses.

Early on, ZENN's success would rely less on engineering than on brand building and timing—two of Clifford's strong suits. Before he launched his dot-com, he was a commercial photographer, one of the first in Canada to work in digital imaging. He founded his Internet company in 1995, when most of us were still trying to find the "@" on our keyboards, and sold it in March 2000—the month the Nasdaq hit its all-time peak. With electric cars, he was once again ahead of the curve.

Over the next few years, the trio managed to acquire 40 old Dauphines. "There was a lot of excitement," Gayle recalls. "But there were times when I didn't sleep for 50 hours to get stuff done for an investor meeting." The payoff came at the Canadian International AutoShow in 2001, where they had to reprint their initial run of 5,000 brochures three times to meet demand. They also fielded a thousand requests for test drives. In the end, they'd sold 15 cars, though they only managed to fill half the orders. The company—still consisting of just the three principals—had to expand. "We realized it was totally unsustainable," Clifford says. "This isn't a cottage industry."

The partners moved away from the Dauphine and focused instead on developing a vehicle using new car bodies manufactured by the French company Microcar. (These are the vehicles currently being produced in Saint-Jérôme.) The decision paid an important dividend: at a point when few other companies were seriously pursuing electric cars, ZENN stood out to EESstor as the best option for a partnership—it already had a strong brand.

All the goodwill surrounding ZENN is turning into expectations with a tangible payoff. Clifford, now CEO (Gayle and Warunkiewicz are no longer with the company), tries to strike a balance between cheerleading and managing expectations. When a trio of investment bankers—two from Boston and one from Toronto—flew to Montreal this fall to tour the factory and discuss financing options, Clifford was understated about what the future might hold. If the ultra-capacitor comes through, he said, the real value would not be in competing directly with giants like Toyota and GM, but from selling the EESstor-powered drive systems to them. "We're talking about massive industries," he said, "and I'm a little guy in Toronto." The model he invokes is Intel, whose chips power 75 per cent of the world's computers.

He can afford to be sanguine. His initial objective was simply to goad the big car companies into making electric cars, and whether ZENN succeeds or not, that goal will have been achieved. Although he's an entrepreneur, Clifford's primary motivation isn't money. And this may turn out to be his biggest asset; it's why he and his partners were willing to launch an electric vehicle company when everybody else was pulling out. Finally, eight years later, he's about to find out whether slow and steady can still win the race.