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Companies, People, Ideas

Repeat Pretender

Jonathan Fahey, 11.24.03

Why do companies keep giving money to Stan Ovshinsky, the inventor who can create anything but profits?

For Energy Conversion Devices, a small materials firm in Rochester Hills, Mich., 2003 is a year with a remarkably familiar ring to it. There have been large losses, the defection of a large corporate investor and promises of major developments and profits around the corner. ECD may deserve a place in the *Guinness Book of World Records*: It lost money in 36 out of the 40 years it has been a publicly traded company.

The puppetmaster of this long-running farce is Stanford Ovshinsky, the 81-year-old inventor who claims to have most of the world's big problems already wrapped up. "Our company is invaluable. We have the answers to the economy and to the environmental situation," he says with an utterly sincere expression. Then he pauses: "Not to sound grandiose about it."

In November Ovshinsky dropped another doozy: He told an audience in Japan that he has made possible a cognitive computer, one that can mimic the human brain by busting through the limitations of conventional computing's binary system. He says he has discovered the material that can do it.

ECD is not all hot air. It has honest-to-God revenues, $65 million last year. Still, it managed to lose $36 million. Isn't it time to be making money and paying dividends?

The company's revenue comes from joint ventures, licensing, research-and-development contracts and manufacturing. ECD and its partners make large nickel-metal-hydride batteries for hybrid cars and trucks and photovoltaic thin films for solar electrical generation. Still in development: hydrogen storage and computer-memory products.

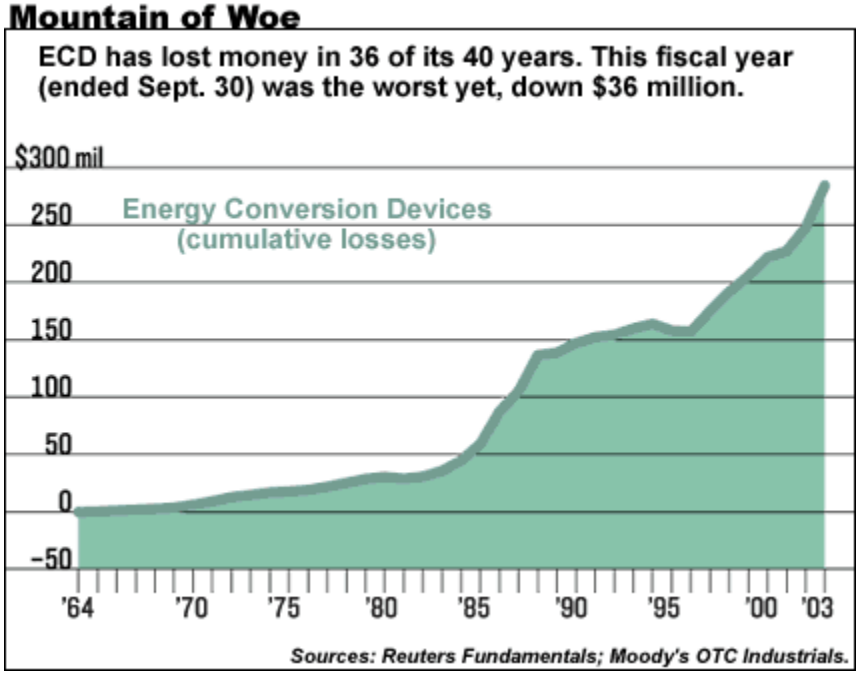
But even when Ovshinsky creates something useful, he has no leverage to earn much from it. His company gets a royalty on about two-thirds of the roughly 1.3 billion consumer nickel-metal-hydride batteries that are produced every year for things like cell phones. But he was so starved for cash when he licensed it in the early 1980s that he negotiated upfront payments of $1 million to $5 million, and a half-percentage-point royalty on the production cost of the consumer batteries, which now sell below $1.

"He's been close to losing the company his whole life," admits ECD Chairman Robert Stempel, the former head of General Motors. "But it's called survival, and it's a powerful instinct. Stan has had the ability to keep the business alive by finding partners."

These partners are, typically, large companies that subsidize the research and development of his inventions. But, almost inevitably, the partners bail out. The latest defector was Bekaert, the $2.5 billion Belgian wire and materials company, and it left ECD close to running out of cash. ECD delayed filing its 10-K last month because its accountants were concerned the cash wouldn't make it through the year.

Bekaert spent $96million building a thin-film photovoltaic factory in Auburn Hills, Mich. for a joint venture called Uni-Solar Ovonic, but the Belgian company retreated in May. "We would have needed huge additional financial resources," says Bekaert spokesperson Françoise Vanthemsche. "We would have had to invest for years and years before we could have hoped for a return, and we can't work like that." Ovshinsky declared the technology ready for commercialization in 1978. Now he says it will be profitable by 2005.

Mountain of Woe



True, partners bail out for many reasons: a change in corporate focus, post-merger belt-tightening, whatever. But after a while you begin to wonder what's going on. What Bekaert did in 2003 is the same thing that happened in 1967 with International Telephone & Telegraph in 1978 with 3M and in 1981 with Arco. Also in 1985 with American Natural Resources, and in 1986 with Standard Oil of Ohio and in 2000 with General Motors. And again in 2000, with Canon. They pulled out of agreements with Ovshinsky after investing in technology that he declared was nearly ready, only to be left with lighter pockets and little in the way of profitable products.

"He should be given the Nobel Prize for raising money," says money manager William Manning, who invested $29 million in ECD on behalf of clients in 1986. After Ovshinsky allegedly violated their agreement, Manning sued and eventually received control of ECD's X-ray-mirror and flat-panel display technology, which he later sold off.

Ovshinsky's is a story you want to believe in. With only a high school and trade school education, he parlayed a pair of early inventions into seed money for a company based upon a single idea:that amorphous and disordered materials could be better and cheaper than structured, crystalline ones to create and store energy and information. The ultimate amorphous switch, figured Ovshinsky, was the human brain, with about 100 trillion neural connections operating free-form to handle most tasks elegantly.

With his wife, Iris Ovshinsky--a current ECD director--he started ECD in 1960 and took the company public in 1964. The two make a disarmingly charming pair--stooped and white-haired, but impossibly energetic and cheerful. They order for each other at lunch. In Stan Ovshinsky's office, which is filled with memorabilia from his career, they act like a set of overly proud grandparents. The two can hardly sit still, they are so eager to show off old devices, framed media coverage and black-and-white pictures of them in front of blackboard calculations--moldering mementos of seemingly great science.

Ovshinsky and Iris have held on to the company through a separate class of supervoting shares. The couple own 7% of the company but control 41% of the voting rights. Texaco owns 20% of the common shares but must vote with Ovshinsky. The Ovshinkys' combined annual pay is $700,000 (Stan gets a little more than half) and their stake in the company is worth $16 million. The ECD market valuation of $242 million seems rich for a moneyloser with $100 million in shareholder equity, but Ovshinsky argues that much of ECD's considerable worth--namely, its intellectual property and stakes in joint ventures--can't be found on its balance sheet.

Early on Ovshinsky drew the pattern that he doggedly follows today. He creates joint ventures with large companies in which they put up money and he puts up his ideas. He charges the joint venture for research and development, engineering, machine-building and other services. When the partner backs out, he holds on tenaciously to the technology rights, and shops them to another partner.

His first splash came in 1968, when he announced that he had succeeded in making a switch out of amorphous

silicon that relied on a principle he called Ovonics--named, of course, after himself. The switch's conductivity could be changed by manipulating the levels of electrical current. Ovshinsky said the switch would compete with silicon crystalline transistors, and in the space of a day ECD stock shot from $57 to $150. The transistor never made much money and the company's stock never returned to those heights, but Ovshinsky did manage to get the word Ovonics(and his name) into the dictionary.

The company limped along in the early 1970s, pursuing things like rewritable microfilm with 3M. He was quoted in FORBES in 1978 after 3M had placed a $7 million order: "We're finally moving to become a profit-oriented company." But 3M rejected the final prototypes and demanded its development money back.

The energy crisis turned into a fund-raising opportunity for Ovshinsky. There were all those oil producers with an embarrassment of profits and a desperate need to look as if all they cared about was finding alternative energy sources. Ovshinsky and his scientists had found a way to use thin films of amorphous silicon to turn the sun's energy into electrical power. Between 1976 and 2003 Ovshinsky convinced a series of five companies to put up $290 million to develop the material. ECD now has, it says, a factory with the capacity to produce enough film to turn out 30 megawatts of generating power per year. Ovshinsky is trolling for another partner to replace Bekaert. He and Chairman Stempel claim the plant will be profitable at two-thirds capacity and enjoy margins over 30% at full capacity.

The company's research into batteries took a similar path through several companies, ending with ChevronTexaco, which has committed to spend $282 million developing batteries and hydrogen storage systems through two joint ventures. Ovshinsky's firm didn't put in a dime but owns half of the joint venture and will get half of any profits.

The battery venture, called Texaco Ovonic Battery Systems, built a plant in Springboro, Ohio with the capacity to produce enough nickel-metal-hydride batteries to fill 60,000 hybrid automobiles a year. But before that can happen, Detroit must decide to sell hybrids, and they must choose Texaco Ovonic to supply them. (The batteries in the hybrid Toyota Prius are supplied by Matsushita, which ECD is suing for patent infringement.)

The hydrogen-storage business is a distant dream. If autos are someday powered by hydrogen, Ovshinsky thinks the hydrogen should be stored not as a gas under high pressure, but as a solid hydride. It is an idea auto companies are looking at closely, but they say the material needs to store 2.5 times to 3.5 times more hydrogen than it does now before it can be seriously considered.

ChevronTexaco declined to comment about its ventures with ECD.James Metzger, ECD's chief operating officer since 2002, was Texaco's chief technical officer when the oil firm decided to invest in ECD. "We were not looking at ECD as a financial entity or as a company," Metzger says. "We were simply looking at the technology and whether it will someday be beneficial to Texaco." Metzger is confident he can stabilize ECD's finances.

In 1999 former Micron executive Tyler Lowry formed a joint venture with ECD called Ovonyx to make memory that, like flash, doesn't lose data when it loses power. Intel invested an undisclosed amount a year later, but prospects dimmed considerably when flash, which is relatively expensive, became much less so as its density went up. Why would Lowry decide to put his money and good name into a project with a company that can't seem to come through? "The devices are fascinating," he says.

Ovshinsky is completely heedless of the trail of woe behind him, speaking in ciphers when pressed to defend his track record. "Value and profitability are the measurements you make, because otherwise you aren't really successful," he says. Yet he considers ECD a smashing success. "We've been able to win our way in energy, in rewritable DVDs. Everything we make becomes so common that you don't even know that it is our stuff."

Like the powerful nickel-metal-hydride battery in the Toyota Prius that he drives to work every day, the one with the license plate OVONIC. Ovshinsky proudly takes credit for the car, claiming he invented the "enabling technology" that helps power the gas-electric hybrid. Could be, but it doesn't earn him a cent.

Tables

The Buck Never Stops Here

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Stan Ovshinsky has convinced a long string of big partners to help him turn his inventions into products, despite a dismal track record. Here are a few.

1963-1967

IT&T

After trying to make **GLASS TRANSISTORS** that could outperform crystalline silicon ones, IT&T backs away. The technology never takes off.

1976-1981

United Nuclear

United Nuclear spends $500,000 to develop **PHOTOVOLTAICS,** but sues when ECD shops technology to Arco.

1978

3M

After giving ECD $850,000 and a $7 million order for **REWRITABLE MICROFILM,** 3M rejects the final prototypes and demands its money back.

1979-1981

Arco

Atlantic Richfield puts up $28.3 million to develop **BATTERIES AND PHOTOVOLTAICS** but bows out before either can be commercialized.

1981-1986

Standard Oil

Standard Oil of Ohio keeps the **PHOTOVOLTAIC** research going with $86.2 million, but backs out and takes $12 million in ECD stock.

1982-1985

ANR

When American Natural Resources backs out of a **BATTERIES** venture, ECD buys back technology for $8 million and continues development.

1990-2000

Canon

Canon spends $79.2 million on **PHOTOVOLTAIC** development and builds the venture a pilot factory that makes thin-film, flexible solar panels, but gives way to Bekaert in 2000.

1994-2000

GM

GM puts $70 million into nickel-metal-hydride **BATTERIES** for electric vehicles and hybrids. Batteries are used in GM's EV-1 electric car, but GM sells its interest to Texaco.

2000-2003

Bekaert

The Belgian wire company picks up **PHOTOVOLTAICS,** spending $96 million on a large-scale factory before backing out. ECD is looking for another partner.

1999-Present

Intel

The chipmaker and former Micron executive Tyler Lowry are spending an undisclosed amount on **PHASE-CHANGE COMPUTER MEMORY** to compete with flash.

2000-2003

ChevronTexaco

Texaco buys 20% of ECD and starts three joint ventures. It commits $40 million to a **FUEL CELL** venture, but sells out to ECD for $1.

2000-Present

Chevron-Texaco

Texaco commits a total of $282 million to two joint ventures that are producing **BATTERIES** and developing **HYDROGEN STORAGE** systems.