

Photo by Kimberly McKinzie



Superintendent Jean-Claude Brizard has generated both praise and ire with his plans for Rochester schools. Profile starts on page 10.

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Nanotech firm builds future on Kodak research

By **MARY STONE**

With nanotechnology-based additives that Cerion Energy Inc. develops, tests and produces here, the firm is looking to revolutionize the way fuel is used by improving its efficiency, decreasing gas emissions and lowering soot emissions.

The 33-person Cerion is repurposing Eastman Kodak Co. technology, reusing Kodak real estate at Eastman Business Park and rehiring a dozen former Kodak Ph.D.s.

Since its start in 2007, Cerion has been resurrecting science that Kodak pioneered to produce film and applying it to new areas including energy and medicine.

Cerion uses a process called aqueous

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Innovative judge to leave bankruptcy bench

Ninfo to retire after two decades on the bench in Rochester

By **WILL ASTOR**

After two decades on the bench, Bankruptcy Judge John Ninfo II plans to retire early, stepping down six years into his second 14-year term.

Ninfo informed the 2nd U.S. Circuit Court of Appeals of his intention several weeks ago, setting Dec. 31 as his final day on the bench. A successor has not yet been named. Bankruptcy judges are appointed by majority vote of the appellate judges for each circuit, and court officials plan to form a committee to select a candidate.

As a judge, Ninfo is known for carefully explaining rulings and running a

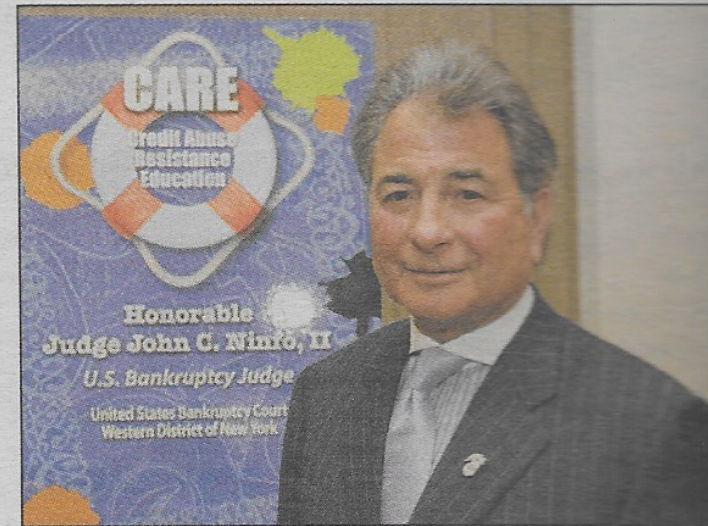


Photo by Kim

Ninfo plans to continue involvement with his Credit Abuse Assistance Education program.

tight, efficient ship. When he took over the local court, he took steps to move cases quickly through the busy court, and he has consistently showed equal respect

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Matt Kwiatkowski
Math Teacher,
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CERION

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precipitation to make nanoparticles for new applications. Treatment of diesel fuel is its first major commercial use.

That application first attracted investment from Braemar Energy Ventures, an venture capital firm in New York City. But Cerion's founders soon realized that interest was too limited in scope, so they sought a more patient investor, one keen to develop Cerion's larger potential.

In 2009, Constellation Brands Inc. chairman Richard Sands bought out Braemar in the first of a series of investments in Cerion amounting to multiple millions of dollars.

Sands heads the board of directors at Cerion, which now has two locations: a 12,500-square-foot office on Blossom Road and a 20,000-square-foot manufacturing facility at Eastman Business Park.

By the end of next year, Cerion will have expanded its manufacturing space to 200,000 square feet and its work force to 100, officials said.

The firm has approximately 20 investors, with equity/debt of some \$10 million invested so far. The company logged less than \$100,000 in revenue in the fourth quarter. It is aiming for \$25 million in revenues in 2011, based on orders in hand or promised.

Sands said he had been tracking Cerion's progress through its CEO. Once he saw the potential impact of Cerion's technology, Sands said, it was too economically compelling to pass up. Customers too, he said, will see that with the company's first commercial product.

First product

The product, GO_2 , when added to die-

sel fuel, can increase fuel efficiency by 8 percent to 13 percent, decrease greenhouse gas emissions by 10 percent to 20 percent and decrease emissions of unburned soot by up to 40 percent, officials claim.

It is a nanotech-based combustion catalyst, Cerion officials explain. It helps fuel burn more thoroughly and cleanly by shuttling and rebalancing oxygen between fuel-rich and starved areas in the chamber. As a result, more mechanical energy is extracted from the fuel by the engine.

GO_2 is diluted, one gallon to every 4,000 gallons of diesel fuel. The price Cerion charges for it, said Mick Stadler, chairman and CEO, depends on the contract.

Right now, the price for GO_2 is based on savings per gallon; Cerion splits those savings with the customer. For instance, if diesel fuel sells for \$2.50 and the product procures an average saving of 8 percent, Cerion and the customer would each make a dime per gallon.

The company can make enough of the product to treat 400 million gallons of diesel fuel per month.

"That's far short of what we need to do if everybody adopts the product, but for a startup company that's a great capacity," Stadler said. "We've been able to really leverage that expertise and the facilities that Kodak is no longer using to our benefit.

"Because of this, we've had to raise a lot less capital than we would have if we were located, for instance, downstate, where we didn't have the Kodak facility."

Based on the company's initial success, it has secured a handful of clients.

The customer base "is less than 10 at this point, but we've got in our sales pipeline probably 31 or 32 additional potential us-

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ers who have been looking at or testing the product,” Stadler said. “Our pipeline of active potential customers is quite large. It’s over \$400 million of potential sales to us if all 31 of those clients decide to adopt the product. We’re talking to some very, very large users.”

To narrow its focus in the broad diesel market, Cerion chose to target the off-road sectors such as marine, rail, construction and mining operators. In the United States, these generally larger-scale users buy approximately 65 billion gallons of diesel fuel annually and represent 40 percent of the total diesel market, Stadler said.

The on-road sector, which includes trucking, he explained, is more fragmented and thus more difficult to reach—at least for a small company. That does not mean, however, that Cerion will not target it later.

Scott Radosta, owner of Omni Marine Service in Harvey, La., is a Cerion customer.

After using a variety of other diesel fuel additives, Radosta said, he was unimpressed. None showed any significant reduction in fuel consumption, he said.

After testing GO₂ and recording a 9 percent drop in fuel consumption last year, the company is using Cerion’s product across its fleet of workboats as well as the vessels it rents. The product also reduced soot and engine maintenance.

“We just recently signed a new U.S. Army Corps of Engineers contract that will run for four years, building levees. GO₂ will be in every gallon of diesel used for the entire project, including boats and all other construction equipment,” he said. “When the job is at full operation, 25 (gallons) of GO₂ will be used per month.”

One of Cerion’s main challenges, Stadler said, is the bad reputation that additives tend to have with diesel users. Additives either clean the engine or add lubricity to make it run better, and they rarely improve efficiency substantially.

Cerion’s product, he underscored, is a catalyst. It makes more oxygen available where it is needed in the combustion chamber.

“What we’ve done is we’ve repurposed (Kodak’s) expertise, not to make film but to make cerium dioxide very, very consistently, down at 2.5 nanometers, which for a variety of reasons is the sweet spot. It’s where you need to be to optimize this kind of technology.”

Mining hidden tech

For Stadler, optimizing neglected or hidden technologies is something of a science in itself, and one he got into with his wife before arriving in Rochester.

Stadler ran a venture capital fund in Nashville for Vanderbilt University. In the process, he got to know colleagues at Stanford University who were using a form of social networking analysis.

social networking analysis.

“One of the problems I identified was developing a green energy solution based on material sciences,” Stadler said. “It wasn’t rocket science to say, ‘Geez, if you can find something that you can add to hydrocarbon-based fuels that made them more efficient and reduced pollution, you might have something of value.’”

One of the scientists who stood out, Stadler said, was Ken Reed, who would become Cerion’s co-founder.

To start, Stadler and Reed, vice president and chief technology officer, ran some experiments at Venture Creations. Together with graduate students they developed a business plan. By 2007, Stadler and Reed were ready to form Cerion with their own launch capital, and they moved from the RIT incubator to Blossom Road. Soon, they had three investment offers, including Braemar’s.



Cerion has been resurrecting science Kodak pioneered in new areas including energy and medicine.

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One of his motivations in coming to

CERION

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At the time, Reed was convinced there were multiple applications for the technology. The company just needed the time to identify and explore them.

Sands comes on board

In that way, Sands is a prince of an investor, Stadler said.

Sands calls himself a patient investor, which he said is important in developing a technology. He met Stadler playing golf five years ago at the Country Club of Rochester. Over time, he followed the testing and development of Cerion's diesel fuel additive.

"Mick introduced me to Ken Reed, and we started talking about the technology they had," Sands said. "I began to understand that this platform was truly transformational in that it could be applied across a lot of different applications, in such a way that it can really change how we use energy and the environmental impact of the energy we use—even to the point that this technology probably has the potential of making hydrogen cost-effective as a fuel source. That is the Holy Grail in the clean-tech energy world. It's a very, very powerful technology."

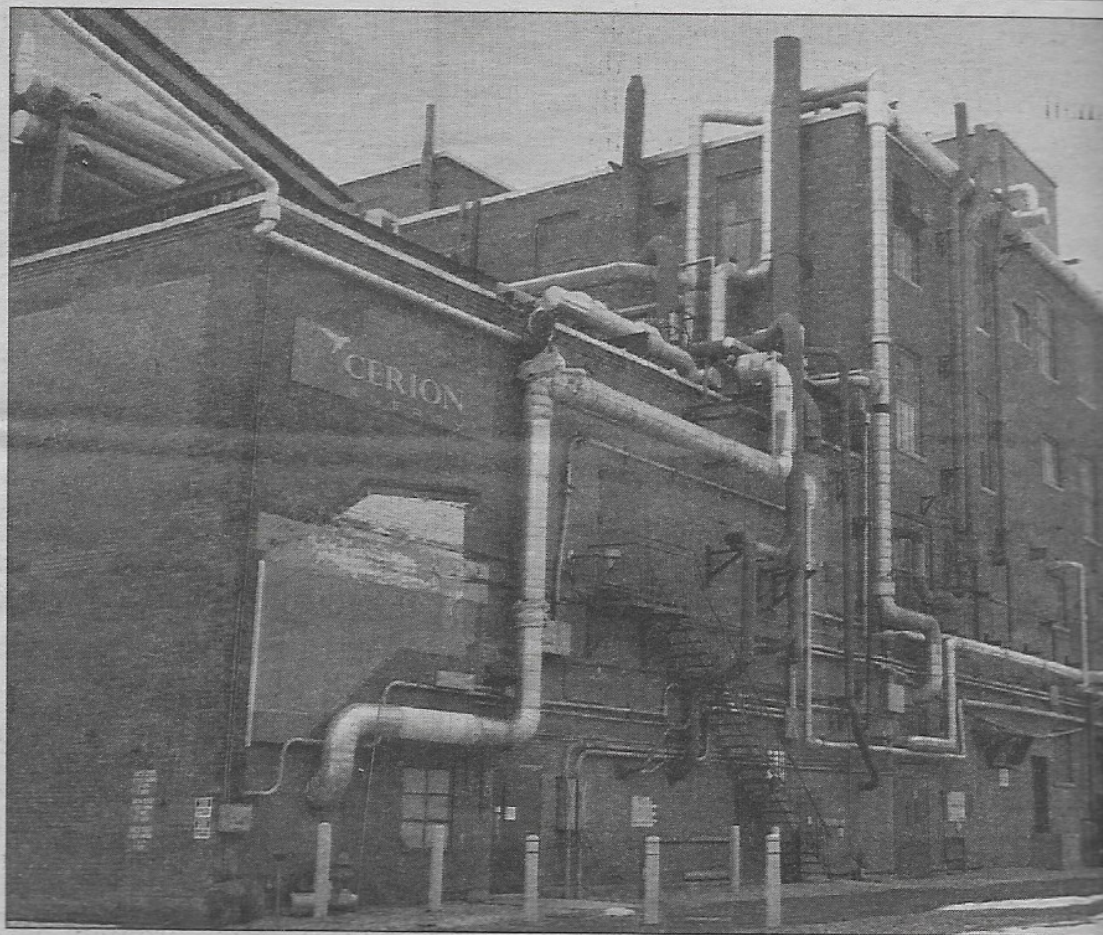
The company is probably two to three years away from having catalysts available to produce hydrogen from a variety of hydrogen sources, he said.

The current applications Cerion has in mind are more than impressive, Sands said.

"They are very, very powerful in terms of how many dollars and cents they can save the energy consumer or the user of other catalysts, which are typically precious metals like platinum or very expensive rare earth components," Sands said. "It's an amazing technology platform in that sense."

The company has a lot of options when it comes to commercializing applications. Cerion, Sands said, has to find the best approach to each market. But that does not necessarily mean it requires a lot more work.

"Each application of the technology is so transforma-



By the end of next year, Cerion will have expanded its manufacturing space at East Main Street and its work force to 100, officials said.

tional and economically compelling that once you prove the commercial viability and get the ball rolling, it doesn't take a huge selling effort. It does take picking the right partners," Sands said.

On the research end, the company has been working to explore applications to fuel cells and lithium batteries. With U.S. universities, Cerion has been delving further into areas such as medicine.

Cerium dioxide is one of the safe nanomaterials, Stadler said.

"It has been used to treat glaucoma and cancers in the body because it is one of the stronger free-radical scavengers. It's an antioxidant," Stadler explained.

"A group from Cerion is working on cerium dioxide in a fuel cell. They are getting results that are very encouraging because they saw the ability to make it more cost-effective."

They soon saw the potential of forming anything and everything. They formed a joint venture with a local university.

"Nine months ago, we were encouraging data in the market," Stadler said, "not just as a fuel, but using the s

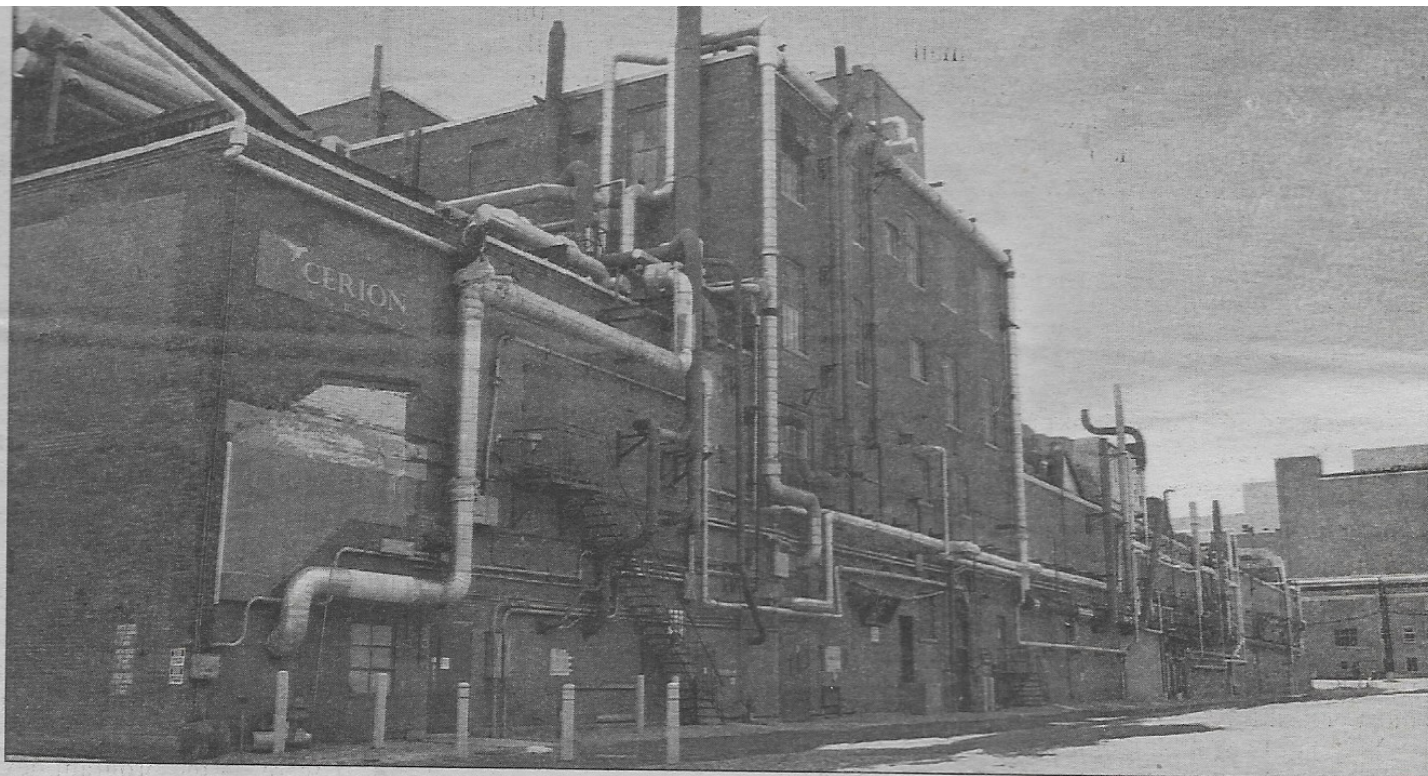


Photo courtesy of Cerion Energy Inc.

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"A group from Clarkson and Dartmouth had been using cerium dioxide in animal models to look at ailments and getting results that were very encouraging. They came to us because they saw the uniformity of our product and our ability to make it more biologically acceptable," he said.

They soon saw that Cerion's materials were outperforming anything else they had tested. They have since formed a joint venture.

"Nine months ago we started looking at some very encouraging data in the treatment of MS, ALS and stroke," Stadler said, "not using the same thing we put in diesel fuel, but using the same platform that we can manipulate."

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