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Battery revolt

Local company
creating new
style of energy
for consumer
applications

By **HEIDI GAISER**
Flathead Business Journal

A new generation of low-cost, lightweight and safe batteries for energy storage, cell-phones and possibly vehicles is taking shape in the Flathead Valley.

The scientists at ZAF Energy Systems, located on U.S. 2 south of Columbia Falls, are taking a sustainable, widely available material — zinc — and creating air-breathing battery cells that require only a small amount of oxygen to feed the discharge reaction.

Led by Chief Technical Officer and CEO Ron Brost, ZAF has come up with



RANDOLPH KOSTED, development supervisor, works in the ZAF Energy Systems laboratory located on U.S. 2 between Columbia Falls and Kalispell. (Brenda Ahearn/Flathead Business Journal)

a battery material that is lighter and more economical than standard lithium ion batteries.

“You can store more energy per unit weight,” Brost said. “A good lithium cell has 200 watt hours per kilogram; we can store 400 watt hours per kilogram. It’s a fraction of the cost and the weight. Lithium is half of our energy density.”

The zinc air batteries also are nonflammable, so unlike traditional lithium batteries, there are no worries

about pressure or overheating. Zinc is also recyclable and plentiful as a natural resource.

“Montana alone has huge reserves of zinc,” Brost said. “There will never be a zinc war. It’s cheap, easy to mine and there is lots of it. It’s an excellent element for storing energy.”

If the zinc-air combination sounds familiar, the company has its roots in a Columbia Falls company that until recently went by the name Zinc

Air Inc., although Zinc Air recently changed its name to ViZn Energy Systems. (The Zn in ViZn reflects zinc, the foundation of the company’s chemistry.)

ViZn Energy works on a much larger scale than ZAF, having developed a safe, clean, reliable and cost effective grid storage battery.

“We’re a spinoff of Zinc Air, but we have a different technology and a

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RON BROST displays one of the jelly roll 32650 cells and the materials that are rolled up inside it.

BATTERY (continued from page 1)

different customer base," Brost said. "They make grid-sized batteries and we are consumer-size batteries."

The new company became a formal entity in February 2011, although ZAF and ViZn still share some employees and board members.

ZAF has been keeping quiet about its work until the company could secure its intellectual properties and delve deeper into the patent process. The company has applied for four patents, and has one granted at this point.

Brost and his wife, Kristine both worked at Zinc Air before forming ZAF. Ron, with 25 years of battery experience working on electric car programs at Ford, GM and CODA Automotive, started at Zinc Air in 2010 as Chief Technical Officer. Kristine, the chief legal officer at ZAF, worked as a laboratory manager at Zinc Air.

There are six full-time and six part-time employees at ZAF, with three interns working there during the summer. There are a number of nationally known scientists acting as consultants on the advisory board, and so far, the company is supported by investor funding, with no government money in the project and no debt.

ZAF is a development company and won't make the zinc air batteries for mass production, but will allow others to use the technology.

"We'll focus on the brainwork and the development," Brost said.

The first product to be released

FOR MORE INFORMATION:

www.zafsys.com

by ZAF will be a home-energy storage unit with 1,000 D-sized cells. The rechargeable unit, which will cost about \$10,000, will be the size of a small refrigerator. It will be certified for residential, commercial and medical backup energy storage needs, with a 48-kilowatt capacity, enough to meet the average two-day needs of the average household. It can be coupled with renewable energy sources to extend its performance.

ZAF also is designing a flat, flexible battery for personal electronic devices such as cell phones. The 1-millimeter wide battery could pave the way for cell phones and other personal devices to be much thinner and more flexible than the current rigidly structured, 3-millimeter size allows.

"Beyond personal electronics, we hope to get into the electric vehicle market," Kristine Brost said.

Lithium batteries are heavy and expensive and don't provide more than a few hundred miles of travel on a charge.

"What is needed is a light battery that is safe and inexpensive," Ron Brost said. "Zinc air has the potential to provide low weight and low cost," Ron Brost said.



KRISTINE AND RON Brost of ZAF Energy Systems display a module that holds 80 of the company's 32650 batteries. It takes 24 modules to fill one of the ES48 Energy Storage Systems, which can power a normal home for 48 hours.

'MONTANA ALONE has huge reserves of zinc. There will never be a zinc war. It's cheap, easy to mine and there is lots of it. It's an excellent element for storing energy.'

♦ *Ron Brost, Chief Technical Officer
ZAF Energy Systems*

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