

# BEND COMPANY'S BATTERY RECYCLING POWERS NEW OREGON LEGACY

BY KATHY SHINN  
OREGON DEPARTMENT OF ENERGY

Recent news reports on the recall of nearly six million laptop batteries makes us aware of the tremendous number of rechargeable batteries we use to power our laptops, not to mention cell phones, digital cameras, camcorders and numerous electronic gadgets. The lithium-ion battery is a consumer favorite due to its light weight and longer life, plus it doesn't suffer from the "memory effect" that requires draining the battery completely before recharging.

But where do the millions of defective and exhausted lithium-ion batteries end up? An industry-sponsored recycling effort collects about one-fourth of spent laptop batteries. The rest mostly end up in landfills or overseas, where methods used to extract materials present health and environmental risks. Most lithium-ion recycling in the U.S. involves incinerating batteries, but the process allows ex-



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Steve Sloop, chemist and owner of OnTo Technology, runs tests to refine his clean chemical process for recycling lithium-ion batteries at his pilot plant in Bend. Sloop recently received a patent on the unique process.

tracting only a few reusable materials. Compare that with a 99 percent recycling rate in the U.S. for lead-acid vehicle batteries, where the infrastructure is in place to collect, process and market retrieved materials. Although the components of lithium-ion batteries contain fewer toxic materials than some other types of batteries, they do pose risks and add to the waste stream.

## A NEED, A NICHE AND A BUSINESS OPPORTUNITY

To address the problem, Steve Sloop founded a forward-looking enterprise, OnTo Technology, in Bend in 2004. With a doctorate in chemistry from Oregon State University and battery research experience at the Lawrence Berkeley National Laboratory, he set out to develop an environmentally friendly technology that would extract valuable materials and reduce the number of lithium-ion batteries going to landfills and incinerators.

Sloop's company qualified for a loan from the Oregon Department of Energy's state Energy Loan Program. The loan allowed him to move from the research-and-development scale to a scale large enough to test the process at a production level. The low-interest, fixed-rate loan helped pay for the fabrication and purchase of equipment, including testing equipment to refine his process.

"A battery recall two years ago provided more than enough batteries to test the technology," said Sloop.

His newly patented process uses "green" chemical methods, generally regarded as safe with little or no environmental impact. Nearly 100 percent of the battery compo-



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OnTo Technology's unique process can recycle nearly 100 percent of the materials, including the case, in a battery package. It typically takes less energy to manufacture new batteries and other products from reclaimed materials.

nents are recycled. He sees a growing market for the reclaimed metals and other materials – and it typically takes far less energy to manufacture batteries and other marketable products from reclaimed, rather than new, materials. Sloop's unique process extracts copper, cobalt, graphite and electrode powders. He also recycles polypropylene, one of the most recyclable plastics. He has a recycle stream for all of the recovered materials and is exploring additional products and

applications.

## NEXT STEPS, FUTURE MARKETS

Sloop's next step is to expand his pilot plant into a large-scale facility. Besides recycling consumer electronics batteries, he has an eye on exhausted batteries from hybrid vehicles. He's working with the U.S. Council on Automotive Research to develop the infrastructure needed to enable recycling and recovery of the growing number of hybrid batteries.

"There hasn't been a lot of motivation to recycle lithium-ion batteries, but that's changing," said Sloop. "For one thing, public perception of companies is enhanced when they handle waste responsibly, and the recovery process is safe."

One of the challenges he faces is market acceptance of recycled materials. However, Sloop said he has not only developed a safe process, the materials are definitely high quality. He follows federal Environmental Protection Agency standards for recycled materials.

OnTo Technology has joined the growing list of companies developing new clean routes to recycling high-tech scrap.

"I think the patented process I've developed for lithium-ion batteries can become an Oregon legacy," said Sloop. ■