



# RECELL CENTER PIONEERS PIVOTAL BATTERY RECYCLING R&D

## THE CHALLENGE

Lithium-ion batteries are the literal engines of our technological future, powering everything from portable electronics, such as smartphones and laptops, to hybrid and electric vehicles, to stationary energy storage. Recycling technologies to manage these batteries at end-of-life currently exist, but there is great opportunity to improve the cost effectiveness of these operations before the real wave of these enter the recycling infrastructure.

The processes being used today enable the recovery of low-value metal salts capable of being used to make new batteries. Improving the economics of battery recycling will help incentivize those with batteries to bring them in for recycling instead of throwing them out. This will help increase collection rates and lower raw material costs so future batteries are even more affordable.

An enormous opportunity looms on the horizon: Researchers project that

in less than a decade, two million tons of lithium-ion batteries will be available for recycling each year.

## THE INNOVATION

Researchers at the Argonne National Laboratory-led ReCell Center, the U.S. Department of Energy's (DOE) first advanced battery recycling research and development center, are designing innovative recycling technologies to make lithium-ion battery recycling more cost-effective. They're using less energy-intensive processing methods and capturing more valuable forms of materials for "direct recycling"—the recovery, regeneration, and reuse of battery components directly without breaking down the chemical structure.

ReCell—which is supported by DOE's Vehicle Technologies Office—is based at Argonne, but the center is a collaboration between the lab, the National Renewable Energy Laboratory, Oak Ridge National Laboratory, Michigan Technological University, the University of California at San Diego, and Worcester Polytechnic Institute.

## THE IMPACT

ReCell's work is helping:

- Reduce the cost to recycle lithium-ion batteries
- Spur the growth of a profitable recycling market for spent lithium-ion batteries
- Drive down the cost of electric vehicle batteries for both producers and consumers
- Enable the U.S. to compete in the global battery recycling industry
- Strengthen the energy independence of the U.S. by increasing the use of domestic sources of recycled battery materials and reducing reliance on foreign sources

## CONTACT

**Jeff Spangenberg**  
 ReCell Center Director  
 Phone: 630-252-5543  
 Email: [jspangenberg@anl.gov](mailto:jspangenberg@anl.gov)  
[www.recellcenter.org](http://www.recellcenter.org)