

# Lithium batteries and other electronic waste create challenges for Nebraska recyclers and regulators

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*Behind the American Recycling warehouse, pallets of plastic pieces are stacked and prepared to be recycled. Photo courtesy by Emma Krab/NNS*

By Emma Krab, Iman Farid, Shreyoshi Ghosh and Olivia Taylor

In a warehouse in southeast Lincoln, on a morning in November American Recycling is busy at work.

Among piles of materials and cardboard bins, a worker loads pallets of plastic onto a forklift and carries them behind the warehouse, where stacks of pallets form a wall of waste. However, these pallets don't contain the typical recycling mix of plastic bags or old food containers.

Instead, the forklift hauls a pallet of plastic computer frames and cell phone pieces to the back. American Recycling recycles electronic waste, or e-waste.



*A forklift driver safely relocating the goods at American Recycling warehouse. Photo courtesy by Emma Krab/NNS*



“We market to schools, businesses and hospitals all throughout the country and we see if they have any e-waste to recycle,” Chad Gorgen said. Gorgen is the chief marketing officer at American Recycling.

The center takes in industrial electronic waste, which is generated by companies in higher numbers. American Recycling also accepts e-waste from the public, including the cell phones and computers.

*Chad Gorgen works in his office at American Recycling. Photo courtesy by Emma Krab/NNS*

Yet, compared to other types of recycling, e-waste is relatively unheard of — and relatively neglected by the public. According to the United Nations, only 17.4% of the **world's e-waste** is recycled, and total volume of worldwide e-waste has increased by 21% in just five years.



The mystery of e-waste in Nebraska is tied to the state's Department of Environment and Energy, also known as DEE. According to Erik Waiss, the department's environmental assistance coordinator, the regulations around e-waste aren't as simple as other materials.

"We don't have any hard rules for electronic waste in Nebraska," Waiss says. "By that regard, we just fall under the basic solid waste rules, the basic hazardous waste rules.

E-waste breaks down into two categories in the state. On one hand, industrial hazardous waste, which is usually in bigger amounts and contains more toxic materials, is regulated by DEE. Companies that produce industrial e-waste are required to recycle it at centers like American Recycling.

On the other hand, e-waste produced by the public, like cell phones and computers, is categorized as household hazardous waste. These waste may contain hazardous materials, but can still be dumped with the trash under regulations. According to Waiss, this can be a problem.

"A lot of stuff like cell phones, computers and whatnot have these lithium ion batteries now," Waiss said. "If those are not properly managed and properly recycled, we're constantly getting landfill fires

all the time.”

*A collection of old monitors from American Recycling warehouse. Photo courtesy by Emma Krab/NNS*



Lithium batteries are in a variety of today’s products, from cell phones to electric cars, and their popularity is only increasing. In June, the U.S. Department of Energy **announced a new policy** to scale up manufacturing for lithium batteries.

Still, the increased production of lithium batteries comes with risks. As Weiss explained, this includes an increase in landfill fires. According to Jake Schmitt, an undergraduate student and researcher at the University of Nebraska-Lincoln, the process of combustion in lithium batteries is called thermal runaway.

“Basically what happens is the heat the battery is producing becomes more than the battery is able to give off,” Schmitt said.

In thermal runaway, the lithium batteries get hotter and hotter until they combust. It’s a difficult process to predict. According to Schmitt, it’s also a hard one to stop, often setting off a chain reaction.

Fortunately, lithium batteries are stable in use, which means cell phones won’t catch fire in the back pocket of its unsuspecting owner. However, stressors are everywhere in a landfill, leading to the constant fires Weiss mentioned. Just how many fires is a difficult question to answer.

According to the Nebraska State Fire Marshal, the answer is none. As their records show, not a single landfill fire has been investigated in the last five years. Available records at DEE tell a different story. One 2020 report from a landfill in Colfax County shows 2-3 lithium battery fires per year.

At G&P Landfill in Milford, Nebraska, officer manager Jessica Bodfield describes the fires as a more common occurrence.

"A lot of times, if the compactor hits that spike on it, it'll pop and smolder and stuff like that," Bodfield said.

Across the Missouri River in Iowa, lithium battery fires are also an issue. Christa Latch, the education coordinator for the Landfill of North Iowa, even **spoke with reporters** earlier this year about the issue. She tells a similar story to Bodfield's.

"Cell phones, a tablet, iPad type tablets, laptops," Latch says. "What happens is when items like these that have lithium ion batteries in them get run over by our compactor, the little bit of stored energy left in those lithium ion batteries has the potential to spark and basically it generates fire."

In Nebraska, landfill fire numbers vary greatly. According to DEE waste compliance supervisor Jeffery Edwards, this is because state landfills don't need to report fire unless they halt operations. Because of this, landfill fires may happen often, but relatively few fires end up in DEE records.



Edwards also said that landfills fires are one of a few hazards that are associated with e-waste. In addition to pollution, Edwards particularly noted the presence of leachate, which is the liquid produced by solid waste, and said that sustainable options like recycling are the best ways to manage risks.

*According to Bodfield, compactors like this one from the Milford landfill often trigger landfill fires. Photo courtesy of Jordan Opp/NNS*

"Ultimately," Edwards said, "it keeps the materials out of the landfill – so less toxic materials that could potentially be leached into the waste mass."

Keeping materials out of landfills is especially important in Nebraska, where more than 80% of waste heads to the landfills. According to Karla Weldon, superintendent for solid waste

*A portrait of Jeffery Edwards at the Nebraska Department of Environmental and Energy. Photo courtesy by Iman*

Farid/NNS operations at the Lincoln Department of Transportation and Utilities, e-waste plays a significant role in it.

“There is an increase in the waste arriving at the landfills because there is definitely a documented increase in the use of electronic devices,” Weldon says.

Fortunately, more sustainable options exist, including the hectic, busy warehouse that is home to American Recycling. More than just lithium batteries, companies like American Recycling take in all e-waste that falls through the cracks of household hazardous waste.

According to Gorgen, it can be a difficult task to take on, especially with a lack of regulations. The last **attempt to regulate e-waste** was rejected by then-governor Dave Heineman nearly a decade ago. Since then, the power to recycle e-waste is in the hands of Nebraska residents. For those looking to start recycling their e-waste, Gorgen says the solution — ironically enough — starts at the phone.

*A picture of the warehouse at American Recycling. Photo courtesy by Emma Krab/NNS*

“I would have them call the local landfill to see how they need to recycle their electronics,” Gorgen says. “Call us too, sure we will be able to help you.”



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