

Which Environmental Pollutants are Produced by Lithium Batteries?



FUEL FOR THOUGHT
 (/news/fuel-for-thought/13)

Mar 02 2023

As the world becomes increasingly electrified, batteries have become a ubiquitous source of power for everything from cars to cell phones. While batteries may be seen as a greener alternative to fossil fuels, their production and disposal can still have negative environmental impacts. In particular, the mining and processing of materials used in batteries, such as lithium and cobalt, can be highly polluting.

Water Pollution

Lithium (<http://www.petro-online.com/article/safety/15/gfg-gas-detection-uk-ltd/risks-and-side-effectsbr-theunderestimated-dangers-of-lithium-ion-batteries/2395>) batteries are a key component of many electric vehicles and are widely used in other applications, such as grid-scale energy storage. However, the extraction of lithium can be very water-intensive, requiring up to 500,000 gallons of water per metric ton of lithium. In addition, toxic chemicals can leak into water supplies, causing harm to both wildlife and human communities. In South America's Lithium Triangle, which covers parts of Argentina, Bolivia, and Chile, mining activities consume up to 65% of the region's water, impacting local farmers and communities.

Air Pollution

The production of lithium batteries also causes air contamination and harms the soil. In Australia's Salar de Hombre Muerto, residents believe that lithium operations have contaminated streams used for crop irrigation and human and livestock consumption. In Chile, mining operations have resulted in mountains of discarded salt and canals filled with contaminated water. Recycling lithium-ion batteries can also be problematic, with only a small percentage being recycled and unwanted batteries often ending up in landfills, where **metals** (<http://www.labmateonline.com/article/laboratory-products/3/carbolite-gero-ltd/the-use-of-furnaces-in-recycling-preciousmetals/2788>) and other toxic materials can leak into the environment. Indeed, there's the pollutants produced by improper disposal of lithium-ion batteries.

Heavy Metals

Lithium-ion batteries contain heavy metals such as **lead** (<http://www.envirotech-online.com/article/health-and-safety/10/skc/cdcniosh-develops-safety-management-tool-for-recognition-evaluation-and-control-oflead/216>), **mercury** (<http://www.envirotech-online.com/article/environmental-laboratory/7/buttonwoodmarketing-services/pmercury->

[challenges-in-a-changing-worldp/2856](#)), and [cadmium \(http://www.envirotechonline.com/article/environmental-laboratory/7/thermo-sher-scientific-clinical-diagnostics/automated-nitrate-ion-assay-method-using-vanadium-as-reductant-correlation-to-cadmium-and-hydrazine-reductant-methods-in-sea-natural-and-waste-waters/1346\)](http://www.envirotechonline.com/article/environmental-laboratory/7/thermo-sher-scientific-clinical-diagnostics/automated-nitrate-ion-assay-method-using-vanadium-as-reductant-correlation-to-cadmium-and-hydrazine-reductant-methods-in-sea-natural-and-waste-waters/1346), which can leach into the soil and water if not disposed of properly. Heavy metals are known to be toxic to humans and wildlife, and exposure to these pollutants can cause serious health problems such as kidney damage, respiratory issues, and even cancer. When these batteries end up in landfills, the heavy metals can seep into the ground and contaminate nearby water sources, making them unsafe for human and animal consumption.

Lithium

As the name suggests, lithium-ion batteries contain a significant amount of lithium. When these batteries are not disposed of properly, lithium can enter the environment and contaminate the soil and water. While lithium is not considered a toxic substance, it can still have harmful effects on the environment. High levels of lithium in water sources can impact aquatic life, leading to the death of fish and other aquatic creatures. In addition, excessive amounts of lithium in soil can disrupt the balance of nutrients, making it difficult for plants to grow.

Carbon Dioxide

The production of lithium-ion batteries, as well as the energy required to charge them, produces carbon dioxide emissions. However, when these batteries are not disposed of properly, they can continue to release carbon dioxide into the environment. When lithium-ion batteries end up in landfills, they can release carbon dioxide as they decompose. This can contribute to climate change and have long-term effects on the environment.

Hydrofluoric Acid

Another harmful pollutant that can be produced by poorly disposed lithium-ion batteries is hydrofluoric acid. This acid is used in the manufacturing process of lithium-ion batteries, and if not disposed of properly, it can leach into the environment and cause serious harm. Hydrofluoric acid is corrosive and can cause severe burns and lung damage if inhaled. In addition, this acid can also be harmful to plants and wildlife, leading to long-term damage to the ecosystem.

The increasing demand for batteries is also contributing to the depletion of natural resources, as the production, transportation, and distribution of batteries consumes significant amounts of resources. In addition, batteries can emit pollutants into the atmosphere, contributing to climate change and photochemical smog pollution. Improper disposal of batteries can also result in the release of toxic substances into the environment.

While there are efforts underway to make batteries more recyclable and reduce their environmental impact, much work remains to be done. The public can play a role by properly disposing of batteries and supporting companies that prioritize sustainable battery production and disposal.

As the world seeks to transition to a cleaner and more sustainable energy system, it is important to consider the full environmental impact of the technologies we rely on. Batteries have the potential to be a significant source of pollution, but with careful management, they can also be a valuable tool in the fight against climate change.