What is waste colonialism of electric vehicle batteries?

Spent electric vehicle (EV) batteries from high-income countries risk being dumped or exported to countries in the global South ill-equipped to handle this toxic waste, which is a form of environmental racism and waste colonialism. This places the burden of toxic battery waste on the environment, communities and informal waste sector in the Global South.

EVs are mainly produced and consumed in the US, Europe, China, Japan and South Korea, with the EU, Japan, and the US constituting the three largest second-hand vehicle exporters. Between 2017 and 2020, the EU, Japan, and South Korea exported a combined total of 760,000 EVs. From 2017 to 2020, the export of used EVs from the EU increased by 82 percent. As the used EV market expands globally, some countries in the Global South, including Egypt and Bhutan, have promoted the import of used EVs to affordably decarbonize their vehicle fleets. However, researchers estimate that the waste lithium-ion batteries (LIBs) derived from the EV boom could amount to 0.8 million metric tons by 2027. Others estimate that 0.33 to 4 million metric tons of LIBs from EVs are expected to reach the end of their useful life between 2015 and 2040. In the near future, recovery strategies will likely be prioritized over landfill given the valuable materials in LIBs.

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4. Ibid.
5. Ibid.
7. Ibid.
Major loopholes for shipping waste overseas: lack of regulation

Under the Basel Convention:

- The Basel Convention restricts the transfrontier shipment of hazardous waste from developed to less developed countries, though some is allowed with prior informed consent, complicated by further loopholes and poor enforcement. However, the Convention specifically allows export for reuse and repair. Unfortunately, many products such as consumer electronics and electric vehicles are not designed for repair, and this results in dangerous, wasteful and highly polluting salvage and recycling operations.

- Commodities with worth can be shipped overseas. If no protocol exists for ensuring that a product is repairable, then the dumping of irreparable waste will occur. Few Global North countries have restrictions on the export of used vehicles while many countries in the Global South have limited or no regulations or standards regarding the import of used vehicles.

  ◦ Thus, cars that would otherwise fail safety, fuel economy and emissions standards in the U.S. or Europe are currently dominating the roads in countries that rely on imported vehicles.

- On the other hand, batteries that reach their end-of-life outside of African countries must be fully remanufactured up to module level and tested for functionality before being imported into African countries.

- EV batteries are considered hazardous waste and their transboundary movements are therefore restricted. However, this can be side-stepped if the products are identified as reusable.
Under the EU Battery Regulation:

- While the regulation calls for recycled content standards and
digital labeling, it lacks an explicit treatment of second-hand
vehicle exports. Though manufacturers are subject to collection
targets for end-of-life (EOL) batteries, there is no discussion of
batteries exported as part of a second-hand vehicle or other
product. While the EU has banned the export of EOL vehicles,
they can still be misclassified as used vehicles instead and end
up being exported.

Under EOL policies for second-hand vehicles in Global South
countries:

- As mentioned earlier, many countries in the Global South (incl.
Cameroon, Kenya, Nigeria, Egypt, India, Malaysia, Mexico, and
South Africa) lack an EOL vehicle management policy.

- In 2021, the UN Environment Programme conducted a review of
regulations overseeing the import of second-hand vehicles
across 146 countries. The findings revealed that approximately
45 percent of these countries had either weak or very weak
regulations, while 42 percent had good or very good regulations
in place.

- Without a solid EOL vehicle management policy in place, the
most common route is to treat and to dispose of them informally,
which ends up causing air and soil pollution. In countries like
Mongolia, dismantlers often replace the faulty battery cells
without adhering to the automotive original equipment
manufacturer’s (OEM) procedures and under hazardous work
conditions.14

13 Ibid.
14 Ibid.
Challenges of dumped toxic waste

Barriers to Repair

Technical challenges

- EV batteries are not designed for repair. Some design and vehicle assembly choices (e.g. cell-to-pack or cell-to-chassis design) made by OEMs make repair and disassembly particularly challenging. As a result, technicians have difficulty repairing EV batteries and auto mechanics require additional training to work on high-voltage equipment. Constant, rapid technological updates also complicate political ability to establish long-term regulations.

- OEMs also typically restrict repair of their products by using software locks and proprietary spare parts in addition to requiring independent shops and customers to use specialized tools to make repairs on their own.

High costs

- Repairing an EV battery can cost up to $10,000 or more, with long wait times for spare parts. Manufacturers may also require customers to use OEM brand dealers and repair services which are typically more expensive.

Failure to adopt right to repair laws

- Massachusetts is one of the few states to adopt automotive “Right to Repair” laws that require automakers selling cars in the state to build an “open data platform” that would allow owners and independent repair shops to access the information they need to diagnose and repair cars. Unfortunately, similar right to repair laws have not been more broadly adopted by other states, the US federal government, or as international standards. Moreover, in some cases, copyright law renders repairs illegal.

Lack of replacement parts for older EV models

- The lack of access to replacement batteries or battery components poses a challenge for older EVs in Global South countries. While the supply of replacement LIBs is typically limited globally due to high demand for batteries in new vehicles, this issue is exacerbated in the Global South where new EV models might not even be available for sale. In countries like Sri Lanka, which embraced second-hand EVs early on, this situation has led to some EVs being converted into internal combustion engine vehicles (ICEVs).

These barriers disproportionately burden communities in the Global South who have fostered their local aftermarket repair industries to create important sources of employment, income and waste management.
Challenges of dumped toxic waste

Risk to Health & Environment

If the product cannot be repaired, then the product becomes hazardous waste and contributes to waste colonialism as there is no capacity to safely dispose of the waste. This therefore raises health risks and environmental justice issues, particularly in the Global South, which has historically been overburdened by waste colonialism.\(^\text{20}\)

LIBs are sensitive to heat and pressure, which creates fire and explosion hazards, and contain toxic and rare materials.\(^\text{21}\) When such materials leach into the soil, they can pollute groundwater,\(^\text{22}\) inhibit plant growth,\(^\text{23}\) and cause cancers and diseases.\(^\text{24}\)

In many Global South countries, batteries are likely to be illegally recycled due to the costly fees for proper methods.\(^\text{25}\) Given the expense, people may stash batteries until costs permit them to recycle their batteries or repurpose them for second-life applications, such as at-home energy generation.\(^\text{26}\) Illegal methods endanger workers and the environment.\(^\text{27}\)

Used electric vehicle exports can cause public health hazards in the receiving country.

\(^\text{20}\) Global Alliance for Incinerator Alternative. (2024)


\(^\text{25}\) (Prates et al., 2023)


FIGURE: concerns on waste colonialism

Safety risks for waste pickers

Fire and explosion risks

Lack of regulation and repairability data

© First and third photos are from an e-waste dumpsite in Agbogbloshie-Accra, Ghana
Potential solutions

- Regulate the export of second-hand EVs by implementing stringent inspections. Only EV batteries that meet minimum battery condition standards should be exported to countries that have the capacity to safely repair and replace battery components.28

- Support countries in the Global South to establish regional recycling hubs aiming to collaboratively achieve economies of scale.

- Design EVs to allow for reuse, safe recycling, and minimal disposal through proper labeling of components and materials used and standardization of structure and design for disassembly, which can be enabled by thoughtfully-designed extended producer responsibility (EPR) schemes.

- Increase the availability of information on battery condition and movement and accessible resources on repair and repurposing in line with the right to repair.

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See GAIA’s Battery Info Sheet Series at: www.no-burn.org/batteries.