

An e-waste ‘garbage trap’

Experts weigh in on emerging PHL’s shift from gas-powered to electric-powered vehicles

By [JONATHAN L. MAYUGA](#)
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A traditional fossil fuel-dependent tricycle shares the road with its battery-powered counterpart on Boracay island.

MANG Rudy was busy one early morning this week fixing a busted taillight of his three-wheeled electric-powered tricycle (e-trike).

Maintaining his e-trike is essential for the retired electrician. He relies on the light transport equipment in going to the market as a service vehicle and bringing his grandchildren from home to the gate of their village and back.



An electric tricycle, or e-trike, touted as a greener alternative to traditional tricycles, ferries passengers on Taft Avenue in Manila.

Electric-powered vehicles (EVs) are slowly but surely gaining use and popularity in the Philippines against the backdrop of an aggressive drive by green groups for an environment-friendly mode of transport to help reduce the country's carbon footprint and fight climate change.

They are easy to maintain and, most of all, do not consume costly fuel, says Mang Rudy, no matter if most, if not all, of the replacement parts of the unit in case of a breakdown are imported.

“Battery charging takes only six hours. It’s enough to bring me to the market and back,” he said in Filipino.

He would have spent at least P120 every time he goes to the market and back commuting, as drivers of passenger tricycles—his preferred mode of transport amid threats of Covid-19—have been overcharging passengers.

For Mang Rudy, his e-trike is also environment-friendly and it is not as noisy as a car or a conventional motorcycle, which means less annoying noise pollution.

The EV revolution that is catching most developed countries across the globe, however, is barely being felt in the Philippines. Still considered as a nascent transport industry in the country, the EV fever in the Philippines is mostly on e-trikes. Electric-powered cars or trucks are still widely considered as novelty items.

The transition to EVs from motor vehicles powered by internal combustion engines is faced with huge challenges, though. The lack of infrastructure, for one, limits the commercial appeal and mobility of EVs.

But there's a bigger factor that is not yet included in the equation.

Rudy said his e-trike's battery unit is expiring anytime soon. This means he should be ready to shell out at least P1,500 to acquire a brand-new lithium-ion battery to supply power to his vehicle.

"Battery life is three years, the vendor told me. But some I know complained that their battery is no longer useful after two years. I don't know how long mine will last," he said.

Reshaping the battery value chain

Finland-based Akkurate Oy, a provider of agile battery consulting and engineering services, said that for a long time, batteries have been making peoples' lives easier. The problem is that people are using these in an unsustainable way.

This can become an even bigger problem in the near future with the automotive industry gearing up for a full switch to electricity transport.

New and ambitious climate objectives, hence, require a reshaping of the entire battery value chain.

Citing industry analysts' prediction, not less than 2 million tons per year of EV batteries are reaching the end of their life in 2030, Akkurate said.

Akkurate added that throwing all these means a "colossal" amount of waste, while a large portion can easily be repurposed. The batteries that fail to make the cut may have to undergo recycling process because many valuable raw materials can be reused for new batteries.

"Recycling is the key to reducing the environmental impacts of battery use throughout the life cycle," Akkurate pointed out.

'Battery passport'

The European Battery Alliance (EBA) is creating its own competitive and sustainable battery cell manufacturing value chain, proposing a so-called "Battery Passport."

The initiative will bring together leading stakeholders across the entire battery value chain and enable resource efficiency across the battery life cycle.

Manufacturers that reach a certain transparency and traceability threshold will be allowed to carry a seal of quality. And from July 1, 2024, “only rechargeable industrial and electric vehicle batteries for which a carbon footprint declaration has been established can be placed on the market.”

Meanwhile, European member states are also proposing their own measures.

A Finnish working group proposes in its National Battery Strategy 2025 seven objectives: growth and renewal of the battery and electrification cluster; growth of investments; promotion of competitiveness; increased international awareness of the strategy, responsibility; definition of key roles in the sector’s new value chains; and promotion of circular economy and digital solutions.

Diagnose tech by Akkurate

Akkurate believes that its Diagnose Technology is one of these digital solutions. It is specifically developed to support a better battery value chain and accelerate sustainable and low-carbon economic growth.

“Its diagnostics provide facts on battery health and performance, allowing companies to plan maintenance or replacement well in advance, and yet preventing potential safety issues. Features like centralized surveillance, better battery performance, lifetime prediction, support in possible quality issues, improved safety and help with recycling and repurposing, all contribute to a holistic battery life cycle management,” it said.

Via e-mail, Lauri Pulkkinen, one of the cofounders of Akkurate, said disposing of the e-waste from lithium-ion batteries is difficult, given the sheer volume of batteries that will reach end-of-life.

Learn and adapt

THE Philippines, Pulkkinen believes, must learn and adapt to the challenge if it is to embrace the transition from fossil fuel-dependent motor vehicles to environment-friendly EVs.

Asked if the Philippines can learn and adapt to the challenge, he said: “Yes, I think that is a global challenge: that everybody needs to adapt and learn.”

To be better prepared to prevent the problem of e-waste from electric vehicles, all stakeholders and companies in the battery value chain—from raw materials to cell production, battery usage to recycling—need to start collaborating to make batteries sustainable, he said.

“As we did in Finland, our government launched a national battery strategy that also supports common European climate and sustainable targets,” Pulkkinen said.

Pulkkinen said huge volumes of end-of-life EV batteries could be either recycled to collect and reuse valuable materials of lithium-ion batteries or use them in second-life applications—for example, stationary energy storages that could be used to store renewable energy or support EV charging or other possible new business models.

Diagnose Technology, he said, could be utilized as a software platform for holistic battery life cycle management.

Comprehensive plan, study needed

Greenpeace Philippines campaigner for Energy Transition Khevin Yu said there's a need to study the impact of EVs. He said while the shift to EV appears to be enticing at face value, the transition in the public transport sector, such as from Pinoy jeepney to e-jeepney and tricycles to e-trikes may pose a problem in the future.

Because of that, he said, there's a need for more study on its potential impact.

“There should be a comprehensive plan about this from the Department of Transportation,” he said.

Yu added e-waste from discarded batteries of EVs is also something to worry about.

“One of the concerns in the use of EVs is congestion. The e-wastes from EVs are also a cause of concern because we still don't have a recycling facility for these types of battery,” Yu pointed out.

Systems thinking

Renato Redentor Constantino, executive director of the Institute for Climate and Sustainable Cities, said while e-waste is certainly a critical issue, it is not the main issue in addressing the transportation problem.

“We need to tackle transport as a systems issue, which requires systems thinking,” he said.

“If one merely replaces private cars with electric vehicles, even if done 100 percent, we will address only the needs of the tiny minority. Currently only 12 percent of Metro Manila households own their own cars. This means we need electric public transport, for sure, but maybe we need even more of other means of mobility,” he added.

According to Constantino, there's a need to promote active transportation as regular, mainstream options instead of alternatives.

“This means focusing on support for bicycle commuting and pedestrian-centric urban planning and development. Less energy used, less waste, more efficient means to move people, instead of our decades-long fixation towards moving cars,” he said.

A welcome move but...

GERRY Arances, executive director of the Center for Energy, Ecology and Development, said the sustainable transition in the transport sector and the entry of EVs is a good indication towards a more sustainable transport system.

However, he said, first off, there's a need to prioritize the development of sustainable mass transport system as a primary mode of transportation in the country to not just address sustainability in the sector, but also equity issues, since the majority of the riding public is in the working-class strata of society.

“Secondly, we need to develop policies revolving around the maintenance and disposal, among many others, of EV batteries, to ensure that by pursuing sustainability in this sector we do not create new sustainability problems, especially in the disposal or recycling of waste materials from these batteries, including batteries for solar rooftop PV (photovoltaic) systems which is now expanding as well,” he said.

The huge challenge

EV batteries are expected to add to the already huge amount of e-waste being produced by the Philippines.

The Global Environment Report showed that the country generated approximately 3.9 kilograms of e-waste per capita last year. Also in 2019, the Philippines generated a total of 32,664.41 metric tons of waste from electrical and electric equipment (WEEE) based on a report by the Environmental Management Bureau (EMB).

Proper disposal of e-waste remains a huge challenge as these hazardous materials end up in open dumps and landfill facilities, even as the national policy and regulatory framework for the management of electronic waste or e-waste have long been in place.

Proper disposal of e-waste begins with proper waste segregation and the implementation of the so-called 3Rs, which means reduce, reuse and recycle.

The Philippines, apparently, is not effective in reducing its e-waste or in reusing them. Worse, there is still no recycling facility in the Philippines, as far as lithium-ion battery use is concerned.

National policy

THE EMB under the Department of Environment and Natural Resources (DENR) said that as early as 1990, the Philippines already had a national and regulatory framework on e-waste management with the enactment of Republic Act 6969, or the Toxic Substances and Hazardous and Nuclear Waste Control Act.

The law seeks to regulate the importation, manufacture, processing, handling, storage, transportation, sale, distribution, use, treatment and disposal of toxic chemicals and hazardous wastes that pose risks to human health and the environment.

Two years after the law was enacted, the implementing rules and regulations were issued under DENR Administrative Order 1992-29.

However, like Republic Act 9003, or the Ecological Solid Waste Management Act of 2000, RA 6969 remains poorly implemented. E-waste are often sold as junk and end up in junk shops where they are dismembered to salvage parts before being discarded as ordinary waste.

DENR Undersecretary for Planning, Policy and Foreign-Assisted Projects Jonas R. Leones said there's an ongoing initiative by the EMB in partnership with the United Nations Industrial Development Organization.

A facility in Caloocan City, he said, is now buying e-waste, but these are mostly from electrical appliances and electronic equipment.

"We buy from the recyclers TV and computers and other e-waste, but these do not include lithium-ion batteries from EVs," he said. He admitted that the e-waste from lithium batteries, or similar batteries used in EVs, are not yet on the radar of the DENR.

EPR

WHILE the Philippines has no facility for recycling lithium-ion batteries yet, Leones said that as a policy, the DENR is now pushing for EPR or extended producer responsibility, which would most likely cover EV batteries.

"We have a principle for EPR or extended producer responsibility, which is part of a circular economy we are pushing in the DENR. Under the principle of EPR, manufacturers or producers will take back their waste," Leones explained.

Asked to weigh in on the issue, Crispian Lao, vice chairman of the National Solid Waste Management Commission (NSWMC), said the technology worldwide to viably treat and recycle EV batteries is not on the scale yet, and while the local battery recycling sector (Philippine recyclers) is exploring it, there are no concrete plans in the near future just yet.

He cited a need to develop infrastructure for the batteries of EVs, including waste recycling, and agrees with Leones that one way of addressing the challenge posed by e-waste from the batteries of e-vehicles entering the Philippines in the future, with its limited capacity to deal with e-waste, is the application of EPR.

"I know that the DENR is pushing for extended producer responsibility where the manufacturer or producer has a recovery program for their waste," said Lao, a private-sector representative for recycling in the NSWMC.

Meanwhile, he thinks that government agencies like the Department of Energy, which is aggressively promoting EV, together with the DOTr and the DENR, should also look at the potential problem of EV batteries before going all-out for EVs.

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