



Photo: More than **30 stakeholders** from various sectors including government agencies, NGOs, international development organizations, financial institutions, and academics attended the workshop 'Unified Policies and Healthier Journeys' to collaborate on solutions.

PRESS RELEASE

Formalize Electric Three-Wheeler Sector: Regulating for Growth, Preventing Lead Pollution, and Unlocking Green Investment

Stakeholders' Policy Suggestions in an E-Mobility Workshop

Dhaka, Bangladesh, April 5, 2024 - Electric three-wheelers - **EZ bikes, mishuks, and e-rickshaws** are now the primary mode of transport for millions in Bangladesh, with **3 to 4 million vehicles** serving **112 million people** every day. This growing **sector, valued at US\$ 871 million**, is important for its role in reducing fossil fuel dependency, creating local jobs, and enhancing connectivity through affordable electric mobility.

Surprisingly, despite the **electric three-wheeler** industry's immense size and market value, the **sector is not officially recognized by the Bangladesh Road Transport Authority (BRTA) and National Electric Vehicle (EV) Policy**. As a result, it operates informally, escaping regulatory

oversight. This has led to a proliferation of **low-quality lead-acid batteries for electric three-wheelers, informal recycling practices** posing environmental risks, substantial **tax revenue losses**, and **heightened energy consumption**, all exacerbating climate change and pollution.

Studies on blood lead levels show that Bangladesh is the fourth highest impacted by lead pollution globally. Approximately 60% of children are suffering from lead poisoning. This toxic heavy metal poses severe health risks, particularly to children, resulting in detrimental effects such as brain damage in younger children, cardiovascular disease among adults, and increased incidence of terminated pregnancies in women.

Addressing these challenges head-on, **Pure Earth Bangladesh** and the **United Nations Conference on Trade and Development (UNCTAD)** organized a workshop titled 'Unified Policies and Healthier Journeys' on April 3, 2024, at the Holiday Inn Hotel in Dhaka, to share insights from research into potential solutions. **The 3-hour long workshop was led by esteemed facilitators** Amrita Kundu from Georgetown University, Washington DC; Prof. Erica Plambeck from Stanford University; and Dr. Atiq Zaman from Curtin University, Australia. They bring years of dedicated research experience in business models, innovation, and policy reforms within the electric vehicle industry.

The event gathered **over 30 stakeholders** from various sectors including government agencies, NGOs, international development organizations, financial institutions, and academics to collaborate on solutions.

The workshop resulted in **8-point policy recommendations** that include:

1. Formalizing the electric three-wheeler sector, through its formal regulatory recognition;
2. Implementation of a battery tagging system for manufacturing quality assurance
3. Tracking and traceability technology for battery, monitoring, and enforcement of end-of-life management;
4. The establishment of a national registry of operators for accountability;
5. Formal recycling protocol for used lead-acid batteries;
6. Providing incentives for local adoption, and, reducing import tariffs for quality-assured lithium batteries
7. Financial inclusion in the e-mobility sector; and
8. Combat electricity pilferage by using smart meters, and data tracking options.

The electric three-wheeler sector intersects with various policy areas, including waste management, environmental health, trade, energy, taxation, and labor. However, it currently operates outside the country's legal framework and e-waste regulations. **Md. Atik Ullah, Assistant Director of Bangladesh Standards and Testing Institution (BSTI)** stressed that formal recognition of three-wheelers by the Bangladesh Road Transport Authority (BRTA) is crucial for quality monitoring and regulation. This step would allow BSTI to oversee both vehicles and batteries, facilitating registration and battery management tracking.

While household batteries are covered by the national hazardous e-waste policy, used lead-acid batteries (ULABs) from electric three-wheeler transportation are not included. Despite the ULAB industry falling under multiple regulatory bodies, there is a lack of harmonization among ministries. The legalization of electric three-wheelers is still undecided, with various authorities, including the

Ministry of Home Affairs, Ministry of Road Transport and Bridges, Ministry of Environment, Forest and Climate Change, and Ministry of Industries, yet to determine jurisdiction. **Mohammad Solaiman, Deputy Secretary of the Planning Commission** highlighted the issue and stressed the importance of integration among ministries.

A set of EZ Bike **lead-acid batteries costs over 72,000 Tk (or US\$650)** but lasts only **8 to 11 months**. This short life causes a high recycling rate and increased lead pollution. Improving battery longevity can mitigate lead poisoning. **Doubling the lifespan** of lead-acid batteries from **1 year to 2 years reduces recycling frequency, halving lead and energy emissions**.

Low-quality batteries need frequent charging, leading to wasted electricity and heat generation. Charging electric three-wheelers consumes a substantial portion of **Bangladesh's electricity**, estimated at **over 5% of total consumption**, exacerbating strain on the grid and contributing to climate change. Again, despite electric vehicles (EVs) commonly using household power lines for charging, **nighttime pilferage remains a concern**. The Bangladesh Rural Electrification Board (BREB) faces challenges in accurately tracking charging sites, so implementing smart meters and data tracking can enhance the collection and reduce electricity theft.

Both the vehicles and this battery segment are informal and unregulated, resulting in large tax losses for the government. Considering that only **30% of the Used Lead Acid Battery (ULAB) recycling is formal**, the **tax revenue loss for the government reaches US\$91 million** per year.

Najneen Perveen, Deputy Secretary of the Ministry of Environment, Forest, and Climate Change, emphasized the need for a national database encompassing recyclers, importers, exporters, and users. This database would streamline tracking and monitoring efforts for regulators.

Many informal battery recyclers have upgraded to motorized factories and claim these facilities as formal. Although they have secured environmental clearance certificates, they still operate outside proper recycling standards, polluting the environment and resulting in high levels of human exposure. Protocols for identifying and certifying the most environmentally responsible battery recycling facilities should be developed, ensuring they **recover over 95% of lead** from batteries; equivalently, **emitting less than 5% of the lead** into the environment.

Dr. Mahfuzar Rahman, Country Director, Pure Earth Bangladesh said, *“Pure Earth has identified and assessed over 300 toxic sites, particularly abandoned ULAB recycling sites, which pose significant environmental and health risks to local communities. With population growth, rising demand, and increased connectivity and electrification, the situation of lead pollution could escalate if left unchecked. A multi-sectoral approach is needed to bring impactful solutions.”*

Henrique Pacini, Economic Affairs Officer, United Nations Conference on Trade and Development (UNCTAD) said, *“Now is the moment to adopt regulatory solutions to improve how this sector operates. Else, we risk seeing polluting practices linked to informal battery recycling expanding into other developing countries, as all face a pressing need to accelerate clean mobility. The legal formalization of the sector, coupled with lower import tariffs for higher quality and less polluting batteries, can help promote responsible manufacturers and recyclers, reducing pollution.”*

Introducing **high-quality lithium (Li) batteries** offers several advantages, including **five times the lifespan** and no lead poisoning, along with a **30% reduction in electricity consumption**. Reducing the current high import tax on Li can support the development of the local Li battery assembling industry. Financing facilities are essential to promote the adoption of these batteries, providing options such as loans, leases, and swaps for manufacturers and end users alike.

Bidyut K. Saha, the Senior Investment Officer of The Asian Development Bank (ADB) expressed that the ADB views transportation as a key investment area. Formalization and registration of electric three-wheelers as well as the quality and safety of the batteries are essential to unlock green investment potential. He expressed support for providing the necessary assistance to develop these systems to drive progress in the sector.

The participants recommended that all batteries in the market must have a tag, this can be done by implementing tracing technology and establishing a national database of cell importers, battery assemblers, and electric vehicles. Data from the tag confirms payment of a fixed fee/tax per battery. The tag can be tracked using readily available technology. Enforcement at stands would scan batteries and vehicles to ensure they are registered.

The workshop facilitators **Amrita Kundu from Georgetown University, Washington DC, and Prof. Erica Plambeck from Stanford University** said, *"It was clear from the workshop that there is a lot of interest from national and international investors in the massive e-mobility sector in Bangladesh. Formalization and registration of electric three-wheelers and quality and safety assurance of the batteries are primary bottlenecks at the moment. The formalization will also unveil more tax revenues and less energy consumption for the Government."*

The workshop concluded with a call from **Chair Md. Solaiman Haider, Director of the Department of Environment**, for a joint dialogue between government and private sectors to reform policies. User awareness is also crucial for identifying noncompliant batteries and vehicles. Participants highlighted the need for continued discussion and awareness during this transitional phase.

Several Senior officers of different institutions attended the workshop including the Deputy Secretary of the Ministry of Environment, Forest and Climate Change, Director of the Department of Environment, Deputy Commissioner of Taxes of the National Board of Revenue (NBR), Director of SREDA, Senior Officer of IDCOL, Director of IESD, BUET; Senior General Manager of SAJIDA Foundation, Director of BSTI, Director-Advanced Energy Technology of USAID-BADGE, Director-Training of BREB, Senior Manager of BRAC Bank PLC, Health Officer of UNICEF, Additional Secretary of IWM, Assistant Director of Shakti Foundation. Senior Investment Officer of ADB, Executive Director of BYEI, and many more.

This event, under the **Sustainable Manufacturing and Environmental Pollution (SMEP) project**, is supported by the United Kingdom's Foreign, Commonwealth, and Development Office (FCDO) and UNCTAD, and organized in collaboration with Georgetown University, Washington D.C., and Stanford University, California, U.S.A.

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NOTES TO EDITORS

- Impact of Lead Poisoning in Bangladesh:** A study, published in the Lancet Planetary Health journal in September 2023, titled “Global health burden and cost of lead exposure in children and adults: a health impact and economic modeling analysis,” has brought to light the devastating consequences of lead pollution. Conducted by two World Bank specialists, Bjorn Larsen and Ernesto Sánchez-Triana. Lead poisoning affects 36 million children in Bangladesh with an average blood lead level of 6.8 µg/dL, leading to a loss of 20 million IQ points and around 140,000 adult cardiac deaths. These health impacts cost 6 to 9% of the country’s GDP in 2019. Lead sources include aluminum cookware, ceramic foodware, paint, toys, informal lead-acid battery recycling, etc.

Pure Earth Bangladesh has implemented the first few cleanups of severely lead-contaminated communities polluted by informal battery recycling (Kathgora, Mizrapur, and Khulna), but there are hundreds more, and the number of sites continues to grow. Systemic solutions are urgently needed to stop this cycle of lead pollution, and this workshop is a hopeful step in this direction.
- Factsheet:** Rapid E-Mobility Transition, Lead Poisoning, and Market and Policy Innovation Opportunities can be accessed [here](#).
- Report,** “*Unified Policies, Healthier Journeys: Addressing the Used-Lead-Acid Battery Challenge in Bangladesh,*” is available [here](#).
- Workshop Schedule** can be accessed [here](#)

Annex 1:

The 8-point policy recommendations derived from the workshop are:

Three-wheeler vehicles and their batteries are vital for a country's growth and need support. To maximize their potential, formalization and technological advancements are recommended. Given the significant toxicity and quantity of materials in batteries, strict regulations are necessary, especially with the introduction of Lithium batteries, to ensure quality and safety from the beginning.

1. Formalizing Electric Three-Wheeler Sector: All Electric Three-Wheeler vehicles and batteries must be registered, and the sector must be formalized. This will unveil more tax revenues, private sector investments, technological advancements, improved battery durability, and energy efficiency.

2. Implementing Battery Tagging System: All batteries in the market must have a tag that confirms payment of a fixed fee/tax per battery. Relief from VAT for manufacturers who pay the fixed fee/tax. Informal manufacturers currently evade VAT, so ensuring that every battery bears a fixed fee/tax will level the competitive playing field.

3. Tracking Technology for Effective Enforcement: The tag can be tracked using readily available technology. Enforcement at stands to scan batteries and vehicles to ensure they are registered. Heavy penalties for noncompliance. Reward passengers for detecting and reporting non-compliant batteries and vehicles.

4. Establishing a National Registry for Accountability: A national registry with information on the vehicles and batteries can be created. The tag and national registry can contain manufacturer information, manufacturing date, sale date, and date at which the battery reaches a qualified formal recycling facility. This also provides information on the durability of the batteries and recognizes manufacturers that recycle their batteries responsibly.

5. Developing Formal Recycling Protocol and Providing Incentives: Protocols for identifying and certifying the most environmentally responsible recycling facilities should be developed, ensuring that they achieve world-class best practice of recovery of over 95% of the lead in the batteries they recycle (equivalently, emitting less than 5% of the lead into the environment) and monitoring of the number of batteries that they recycle with those best practices. Those select, best recyclers must be rewarded for their responsible practices, to ensure that they out-compete cheap, irresponsible recyclers who currently release 30% or more of the lead in batteries to the environment. Incentives can be extended towards reducing the cost of collecting and holding inventory on used batteries for these selected best recyclers.

6. Reducing Import Tax for Quality Assured Lithium Batteries: The high import tax on Li impedes a local Li battery assembling industry. Consider reducing the import tax on qualified Li cells for selected responsible battery assemblers that ensure quality and safety and pay appropriate VAT. We need to prevent the import of unsafe, unqualified Li cells and batteries. Using readily available technology, the cells can be tracked and registered at the point of import, assembly, sale, end of life, and refurbishment/ resale as is being implemented in India and other countries with strong Extended Producer Responsibility.

7. Facilitating Financial Inclusion in the E-Mobility Sector: Microfinance, large banks, and development banks are eager to enter this e-mobility market to provide microfinance loans to end users and operating lease financing for manufacturers towards long-term lease and swap models. The informality of the sector and the lack of quality standards and assurance remain a barrier to large capital investments that need to be addressed.

8. Combatting Electricity Pilferage: Tackling electricity pilferage is important to create a market for energy-efficient batteries. Using smart meters, data tracking, etc. can be avenues for increasing collection.

Annex 2: Assumptions for the numbers in the press release

1. Number of people transported: The average number of trips made by an EZ Bike is 9 during peak hours and 5 during off-peak hours (from our survey data of 140 drivers). Assuming an average of 4 passengers per trip and assuming 2 million EZ Bikes, the total number of passengers in a day = $14 \times 4 \times 2,000,000 = 112$ million

2. Size of the EZ Bike battery market: From above, 6.7 million EZ Bike batteries are replaced every year and each battery costs around \$130, so the total annual market size = $\$130 \times 6,700,000$ or \$ 871 million
3. Electricity consumption: For a typical EZ Bike with a 60V battery system with 140 Amp-Hr energy capacity, the amount of electricity required for use with a full charge is 8.4 kWh. Energy efficiency is 70% in the highest quality lead-acid batteries in the country. The total amount of electricity consumed annually by one vehicle is $(8.4/0.7) \times 365$ kWh = 4.38 MWh. Very conservatively assuming 1 million vehicles in Bangladesh, the amount of electricity required to charge these vehicles is 4.38 TWh/year. The total electricity consumed in Bangladesh in 2020 was 82.5 TWh (<https://www.iea.org/countries/bangladesh>)
4. Assuming that only 30% of the ULABs recycling market is formal and pays 15% taxes, a 70% informality level results in tax revenue loss* for the government in the range of = $0.7 \times 0.15 \times 871$ million = USD 91 million or 915 crores BDT.

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DISCLAIMER

SMEP Project is implemented by Pure Earth, and working in close collaboration with Georgetown University, has been awarded a grant by the UK Government through UK International Development to develop practical solutions for lead acid battery recycling in Bangladesh. The grant has been provided through the Sustainable Manufacturing and Environmental Pollution (SMEP) Programme. The SMEP Programme is funded by the UK Foreign, Commonwealth and Development Office (FCDO) and is implemented in partnership with the United Nations Conference on Trade and Development (UNCTAD). The grant has been awarded from February 2023 to February 2025.

The UK Government funds this research and pilot activity through UK International Development; however, the views expressed do not necessarily reflect the UK Government's official policies.