Green Alert

September - October 2023, Vol.10 Issue 4

The focus of Environmental Information, Awareness, Capacity Building & Livelihood Programme (EIACP) scheme is to disseminate environmental information to decision makers, policy planners, scientists and researchers across the world.

CERC-EIACP, Programme Centre - Resource Partner to MoEF&CC works on the thematic mandate of 'Environment Literacy - Eco-labelling & Eco-friendly Products'. This bi-monthly e-bulletin features latest of Environment, developments and innovations.

Eco-Product

Battery Waste Management Rules, 2022

On 24th August, 2022, the Ministry of Environment, Forest and Climate change of India published New Rules on Battery Waste Management for ensuring environmentally safe management of batteries. The new rules lays emphasis on Extended Producer Responsibility (EPR) which covers all types of batteries like Electric Vehicle batteries, portable batteries, automotive batteries and industrial batteries. To meet the EPR obligations, producers may engage themselves or authorize any other entity for collection, recycling or refurbishment of waste batteries and it prohibits disposal in landfills and incineration. This will bring in new technologies and investment in recycling and refurbishment industry and create new business opportunities. Environmental compensation will be imposed for non-fulfilment of Extended Producer Responsibility targets, responsibilities and obligations set out in the rules. The funds collected under environmental compensation shall be utilized in collection and refurbishing or recycling of uncollected and non-recycled waste batteries.

Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1854433

Green Issue

Importance and Environmental effects of Lithium-ion Batteries

Batteries

Batteries are classified by the chemical compounds used in its preparation. The most common ones are lithium-, lead-, and nickel-based systems. The Lithium based batteries are the most widely used ones. According to a study, around 37% batteries are made using Lithium-ions. Laptops, mobile phones, cameras, etc. are the largest applications of lithium-ion batteries (from now on addressed as LIBs). Because of its high energy density, high specific energy and longer cycle life. Apart from this, LIBs have slow self-discharge rate and wide range of operating temperatures. One of the important element in these batteries is cobalt, which is used in making the cathode structure of the lithium-ion battery.

The Nobel Prize in 2019 for the subject of chemistry was awarded to Dr. John B. Goodenough, Dr. M. Stanley Whittingham and Dr. Akira Yoshino for their contributions to development of the lithium-ion battery.

In 1991, a leading Japanese company first started selling the first LIBs.

Electric vehicles and global policies

After three decades of commercialization of LIBs, the usage of these batteries has acquired a new potential. It is now powering our vehicles like Cars, Motorcycle, and Auto-rickshaws etc. With the advancements in actions for sustainable planet and future, the global auto-industry is observing a tremendous transformation. According to International Energy agency's annual Global EV outlook 2023 report, the global auto industry is undergoing a sea change, with implications for the energy sector, as electrification is set to avoid the need for 5 million barrels of oil a day by 2030. EV is being seen as a significant alternative to fossil fuels, which is quite visible from large-scale governmental initiatives across the globe. For instance, Indian government approved phase-2 of FAME (Faster Adoption and Manufacturing of hybrid and electric vehicles) scheme in 2019. This scheme with the outlay of ₹10,000 crore is a three year subsidy program for a range of EVs including buses, cars and two-wheelers. The US and EU also have strong policies in action for promoting the use of EVs.

Raw material for LIBs

The demand for lithium is expected to reach at 1.5 million tonnes of lithium carbonate equivalent* by 2025. India's first and only lithium reserves with around 5.9 million tonnes have been discovered in Reasi district of Jammu and Kashmir in February this year. Later on, Lithium reserve have been traced in Rajasthan. This is going to help India to reduce its lithium import and become self-sufficient.

It is important to know that 53% of the world's lithium ore reserves are located in the "Lithium triangle" which encompasses North-western Argentina, Chile and Southern Bolivia. When combined with Peru, which happens to be neighbor of Bolivia, makes 67% of world's Lithium reserve.

Democratic republic of Congo (DRC) produces an estimated of 70% of the world's cobalt. The country has more than half of the world's cobalt reserve.

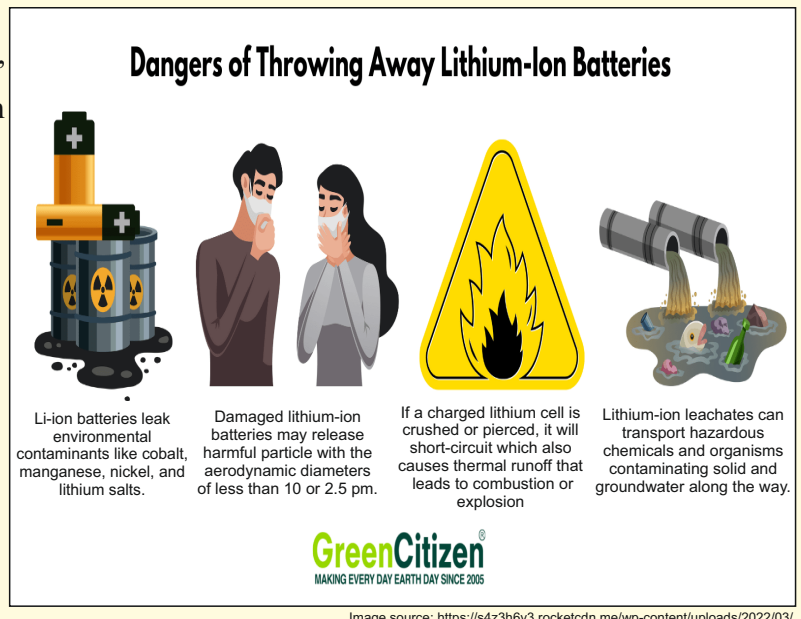

Image source: https://s4z3h6y3.rocketcdn.me/wp-content/uploads/2022/03/Dangers-of-Throwing-Away-Lithium-Ion-Batteries.png

The Dark side of LIBs

Lithium mining is responsible for 1.3+ million tonnes of carbon emission annually, i.e. per every tonne of mined lithium, almost 15 tonnes of CO_2 is released in air, which is significantly less than fossil fuels. For mining a ton of Lithium, up to 2 million liters of water is required in one of the most common lithium mining method, called lithium brine extraction. This had led to water-related conflicts in different communities in North of Chile.

Some metal contents in EV batteries are highly damaging even in small quantities. Since a large majority of them are disposed of in landfills, leaks of environmental contaminants are quite frequent.

Mining companies have been extracting billions of dollars of lithium from the Atacama region in Chile, but the indigenous people of the region are left poor, and struggle to pay for sewage systems, drinking water and heat for schools.

Cobalt mining in the DRC is having significant impact on the workers and the environment of the country. Millions of trees has been axed to make space for cobalt mines. Thousands of poor Congolese people have no other option but to work in the cobalt mines with little to no protection against toxic cobalt dust.

While lithium and cobalt mining has environmental and social impacts, it is crucial for development of clean energy and sustainable society up to some extent. Mining must be approached with care and consideration for the environment and local communities. Efforts for sustainable and responsible mining practices and to address the concerns of marginalized communities should be made.

Alternatives to LIBs

According to a review, Sodium-ion batteries will soon be lessening the burden on heavily lithium dependent EV ecosystem. However current sodium-ion batteries are not as capable as lithium-ion batteries as they have lower energy density, but it comes at a low cost.

*Lithium carbonate equivalent ("LCE") a term used in the lithium industry for the first commonly traded Lithium intermediate in the value chain

Source: https://rb.gy/769oj, https://rb.gy/phr4h, https://rb.gy/ue70q, https://bit.ly/44GwBPF, https://bit.ly/3Z3N5Ak, https://bit.ly/3Z3nQOx, https://wapo.st/45Fb0Zk, https://bit.ly/45IaV7k, https://bit.ly/3PpL0vl

Eco-Tips

Used batteries can pose health risks and cause serious or fatal injuries, therefore discard it properly.
Store batteries safely to reduce the risk of fires or explosions, away from metal, like coins or keys, and out of your pockets, purses and bags.

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