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Need for Life Cycle Impact Evaluation for the Electric Vehicles sector

Electric Vehicle (EV)s with Lithium Ion battery are at best a work-in-progress innovation. We must understand long term impact of EVs on jobs, pollution levels, imports, and economic growth.

With India's EV space warming up, GTRI recommends life cycle impact evaluation of the EV sector. GTRI has identified 13 issues related to interests of consumers, industry, and the government for such an evaluation.

A-Consumers

High Price: Are EVs more expensive than regular cars? Battery accounts for half the cost of an EV. The value of an EV becomes half in 6 years as the battery becomes unusable and needs replacement. This offsets any savings due to lower maintenance costs.

Fitness for a long journey: With recharge needed every few hundred KMs, are EVs suited for a long trip? Also, EV recharge takes hours. EVs can only serve as a second car or city cars.

Performance under extreme weather: Will EVs work well under extreme weather conditions? Batteries work best in the 15-40 degrees Celsius range. Half of India has a temperature below or above this range for more than six months every year.

Incentives: How long will the Central and state government incentives be available to the consumer? The Chinese government has planned to phase out its subsidies on EVs.

B-Government

Increase in power demand: EV charging at home will increase home electricity bills by 6-20 times. Increased demand for electricity means new investment in grids and more pollution as most power is generated from fossil fuels. Also, many charging stations use diesel-based generators.

Less fit for public transport: Large, heavy batteries increase the weight of the vehicle and cause more road wear and tear. Also, during road accidents, EV

batteries may explode, causing damage in a wide area. More studies are needed in this area.

Increased dependence on China: About 70 percent of materials used to manufacture EVs in India are imported from China and a few other countries. EVs will increase India's dependence on China for raw materials, mineral processing, and battery production.

China has bought the largest lithium mines in Australia and South America. It processes more than 60 percent of the Lithium produced globally. It also processes 65 percent of cobalt and 93 percent of Manganese. China makes three out of four batteries produced globally. Over 100 Chinese battery units make 60 percent of the cathodes and 80 percent of the anodes used in Lithium Ion cells.

No reduction in pollution: EVs result in the release of pollutants during battery making, disposal, and EV charging.

I-Battery making: A typical 500 Kg lithium car battery uses 12 kg of Lithium, 15 kg of cobalt, 30 kg of nickel, 44 kg of copper, and 50 kg of graphite. It also uses about 200 kg of steel, aluminium, and plastics. Mining extraction, transport, and processing of these materials release pollutants and CO₂, leading to air and water pollution.

II-Battery disposal: The battery's life is 6-7 years; after which it needs to be recycled. Recycling is complex as the battery contains many toxic materials that are challenging to dispose of. Firms promoting EVs talk about Zero Tail-pipe Emissions but are silent on mining and disposal costs.

III-Battery charging: EVs will only increase pollution as the batteries are charged from coal-generated electricity. India generates 60% of electricity from fossil fuels like coal and petroleum. Of this, coal accounts for 50%. Electric cars only make sense when most power comes from renewable energy.

EV not a Global phenomenon: The Push for EVs comes from Europe, which is introducing Carbon Border Adjustment mechanism to protect their polluting industry and disrupt global trade.

At the UN's Climate Change Conference in 2021, commonly referred to as COP26, held in Glasgow, Scotland, in October-November 2021, six automobile manufacturers, which included General Motors, Ford, Mercedes-Benz, and Volvo, and 30 countries agreed to phase out the sales of new petrol and diesel vehicles by 2040 worldwide. But there were notable dissenters too. Toyota, Volkswagen, and Nissan-Renault did not join the pledge. The US, China, and

Japan were also absent. Not everyone is sure of the timeline for consigning all petrol and diesel vehicles to the scrapyards.

C-Industry

Disruption of Auto Component sector: EVs will disrupt India's auto-component industry with 700 organized and 10,000 unorganized manufacturers. The reason is simple. A traditional petrol/diesel car uses an engine, wheel, and axle transmission system made of over 2000 moving parts. But an EV does not have an engine or transmission system. Instead, it has a battery, motor, and controller, and hence EV drive train has about 20 moving parts. Currently, most revenue of the auto component sector comes from engine parts and transmission components. Since EVs do not have these parts, the Auto Component sector will be massively downsized. Downsizing will hit the unorganized sectors most as they do not have money to invest in R&D.

Disruption of garages/ servicing sectors: EVs will end the existence of lakhs of shops/ garages selling spare parts, changing oil, and servicing vehicles. These are spread across the highways everywhere in India.

Inadequate availability of Lithium: EVs use Lithium-Ion batteries. Over 82 percent of lithium reserves are in Chile, Australia, Argentina, and China.

Lithium reserves will be exhausted at the current mining rate in less than three decades. All the lithium available in the mines may produce EVs that replace less than 20 percent of petrol and diesel cars.

The lithium resources discovered in the Reasi District of Jammu & Kashmir fall into the category of inferred resources, which means it will take years of hard work before we can say the reserves are fit enough for lithium extraction. Processing of lithium also requires great expertise and most countries send the lithium mineral for processing to China.

Research for an alternative to Lithium Ion batteries suggests a possible breakthrough in the early next decade. It would be a game-changer if new batteries could make energy green and cheaper than fossil fuels. Till then, let EVs evolve on their own.

Standardisation needs: There is no standardization in the charging port for Electric scooters. Each firm issues its charging port model. Unless the charging ports are standardized, each maker has to set up separate charging infra across the country.

An evaluation of the above issues will help everyone with stakes in the sector with fact based decision making and dispel myth.

The brief is prepared by Ajay Srivastava with inputs from **Mr Abul Kamar**, Senior Research Analyst at IFPRI, and **Dr Kishor Jadhav**, Senior Research Fellow at Ministry of Commerce and Industry

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GTRI aims to create high-quality and jargon-free outputs for governments and industry on issues related to trade, technology and investment from the perspective of development and poverty reduction.

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Feedback

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