Chapter 11
Evaluation of the Political, Economic, Social, Technical, Legal, and Environmental Perspectives of Second Life Electric Vehicle Batteries in India

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ABSTRACT

Enhanced promotion of green mobility through different government policies as an outcome of the initiatives to counter climate change has resulted in a wide acceptance of electric vehicles (EVs) throughout the world. A similar reflection can be seen in the Indian automotive market, which indicates the adherence of the Indian government to the actions adopted to effectively counter the climate change. The sale of EVs in India has seen an increase of 141% in 2022 from the preceding year. It is expected to further increase the sale of EVs in the Indian market. EV batteries generally have a life span of 5-6 years, and these batteries will serve their desired purpose in this time. Post the first life of the batteries, they are generally employed for the second life applications like the use in renewable energy systems. Thus,

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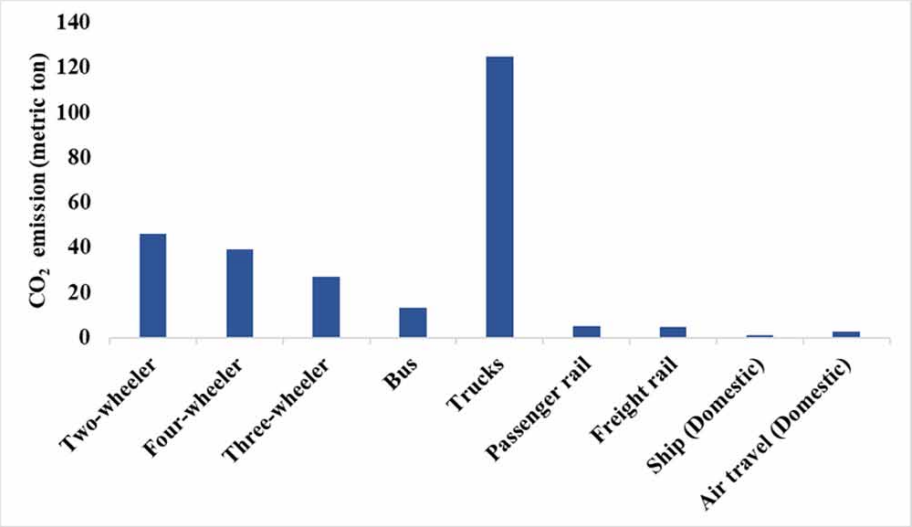
an evaluation of the potential employability of these second-life EV batteries (SLEVBs) is essential to understand the cost-effective and environmentally friendly applications. In this chapter, the PESTLE analysis of the SLEVBs from the Indian context is detailed.

1. INTRODUCTION

The automobile sector is one of the most polluting sectors in the world and the tailpipe emissions from conventional vehicles account for around 75% of all carbon emissions in the mobility sector (Timo Moller, 2022). The transportation sector caters to 24% of CO_2 emissions exclusively by combustion of fossil fuels, and road transport contributes 75% of this share globally (IEA, 2022). The transport sector holds the share of 14% energy related direct CO_2 emissions in India and the same is regarded as the fastest-growing emission sector in the country. Fig. 1 portrays the vehicle type-based carbon emissions by the transport sector in India (Puneet Kamboj, 2022). Electric mobility has been recommended as an effective alternative to issues of environmental pollution and climate change caused by conventional fuel-based vehicles, thus ensuring clean and sustainable development.

Figure 1. Carbon emissions by the transport sector in India in 2020



The EV market has undergone substantial growth in recent times. In 2016, EV sales globally reached approximately 478 thousand. However, by 2022, the number of EV sales had surpassed 5.2 million, leading to a 49% increase in the average annual market growth (CAGR 2016-2022) (Statista, 2022). In April 2023, electric cars including SUVs achieved their second-highest monthly sales, with a total of 5,147 units sold. Notably, EV sales in India during April 2023, experienced a remarkable 41% increase compared to the previous year, reaching 109,283 units. This data, obtained from the Vahan website as on April 30, 2023, marks the seventh consecutive month in which the sales of EVs in India have surpassed the 1 lakh unit milestone (Dalvi, 2023).