

## ***ABSTRACT***

*The issue of environmental pollution in the form of emissions caused by motorized vehicles in Indonesia has recently become the world's spotlight. Where Indonesia itself became the sixth largest contributor to emissions in the world in 2020 with total CO<sub>2</sub> emissions from motorized vehicles totaling 56788 tons of CO<sub>2</sub>. This triggered the emergence of innovations related to electric vehicles as a solution to overcome these problems. PT Mobil Listrik Indonesia is one of the companies engaged in manufacturing electric motorbikes, Where electric motorbikes with the MOLINDO brand use lithium-ion batteries. Batteries as energy for electric motorbikes are considered as environmentally friendly energy because they do not emit emissions like motorized vehicles. However, the Lithium-Ion (Li-Ion) battery cycle still has an impact on the environment, therefore, it is necessary to analyze the environmental impact of the battery. In this study, using the Life Cycle Assessment (LCA) method and Green Value Stream Mapping (GVSM) tools, it was found that in the Lithium-Ion (Li-Ion) battery life cycle, a total environmental impact of 920 Points (Pt) was obtained. The impact is obtained from the environmental impact on the supplier process of 179 Points (Pt), the production process of 185.5 Points (Pt), the usage process of 550 Points (Pt), and the end of life battery of 5.54 Points (Pt). Based on these environmental impacts, they are grouped into damage categories such as human health, resources, and ecosystem quality. In an effort to reduce environmental impacts and increase the utility of the battery, a proposal is given in the form of reusing the external case of Lithium-Ion (Li-Ion) batteries and reusing the second life of batteries for the quality control process on MOLINDO motorbikes. Where in the proposal that reuse external cases can reduce the total environmental impact to 918.86 Points (Pt), While in the proposed reuse of second life batteries Which aims to maximize battery utility from 53.74 kWh to 68.14 kWh and the resulting environmental impact also increases to 998.04 Points (Pt).*

***Keywords: Life Cycle Assessment (LCA), Green Value Stream Mapping (GVSM), Lithium-Ion (Li-Ion) Battery, Electric Motorcycle***