

## **ABSTRACT**

*The development of electric car in Indonesia nowadays has went on so fast. however it still has problem due to electric car's capability of cruising that limited until it reaches location to recharge the battery. Hence, it is highly needed for the availability of technology in order to elevate the battery life. One of technologies that can increase the battery life is by recovering the wasted energy when braking occurred or in this case the technology has made in Hybrid Electric Car (HEV).*

*Besides obtaining the power source from the battery, power input in Hybrid Electric Vehicle system can also be gained from electric motor when the regenerative braking occurred. To obtain the performance with optimal result, charging and discharging current in the battery are controlled by bidirectional converter based on PI control (Proportional-Integral). Bidirectional converter function as the regulator of power flow while motoring and the regenerative braking are occurred. PI control (Proportional-Integral) function is to control the motor's speed so that the precise of motor's speed can be obtained with desired velocity. By controlling motor's speed, it is expected to obtain the power restoration optimally.*

*The goal of this research is to make a bidirectional converter that operates effectively in regenerative braking system for gaining the power restoration optimally.*

*Keyword: Bidirectional Coverter, PI Control (Proportional-Integral), Regenerative Braking System*