Development of Energy Storage System for Roadway Geneerating Machinery

廖晨翔、蔡耀文

E-mail: 360076@mail.dyu.edu.tw

ABSTRACT

In recent years, the rapid development of technology makes the human demand for energy is increasing, resulting in the rapid consumption of the global oil inventories, also we will face three major issues in the future: energy, climate and ecological imbalance caused by the food crisis. There for, save energy, reduce pollution and develop alternative energy sources has become essential. It also attaches great importance to the world organization for renewable energy research. For renewable energy research, we focus on solar, hydro, wind and biomass energy. For sustainable development, we should actively develop diversified renewable energy, according to statistics, there are 800 million vehicles a day in a variety of highway, if we can use some kind of highway power installations, with the appropriate energy storage system design, is expected to be able to develop another effective and innovative green renewable energy. The development of Chinese green energy company based on roads generating device, the energy measurement platform for the design of power devices and energy storage system developed. Measurement platform can get the energy generated by the vehicle passes through the power installations, energy storage system of the device generators of electricity stored in the battery, the power required to supply street lights. Generating device of this road is set in a road, through traffic on this road device, to convert kinetic energy into electrical energy, this energy is an intermittent supply, causing the generator to produce electrical energy for a change in sexual power, power generation device is set in a road, through traffic device convert kinetic energy into electrical energy, this energy is an intermittent supply, causing the generator to produce electrical energy for a change in sexual power, so must be based on this feature whole new set of energy storage system. The key technology of this system is based on the current condition of the battery charging different, individual characteristics of the battery in the battery pack, will inevitably lead to a power imbalance, causing part of the battery from overcharging or excessive discharge, and even shorten the life of the battery, resulting in overall decreased system reliability, it is to design a special charge distribution unit, modular initiative to balance the charge control method to improve system performance. This article will use the microcomputer as the core of the control and operation, at any time adjust the rate of conduction of the power switching elements based on the condition of the battery to achieve the purpose of energy storage and energy balance of the battery pack. Finally, by experiments and tests of the actual road, the actual verification of the effectiveness of highway energy storage system developed in this paper.

Keywords : renewable energy、road generating system、green energy technology、battery energy storage system

Table of Contents

REFERENCES

[1] “2011台灣電力公司永續報告書”，台灣電力公司，民國100年。

[2] “道路綠動能發電裝置”，宇春綠能源科技股份有限公司，民國102年。 http://www.youtube.com/watch?v=_v7za8V-cHU

[3] 歐陽杰，“磷酸鋰鐵電池之分散式充電系統研製與驗證”，大葉大學機械與自動化工程學系碩士班碩士論文，民國99年。

[4] “可再生能源”，維基百科。

http://zh.wikipedia.org/wiki/%E5%8F%AF%E5%86%8D%E7%94%9F%E8%83%BD%E6%BA%90 [5] Imelda V. Abano “ Renewable energy's role 'underestimated' ” Science and Development Network,13 March 2009.
http://www.scidev.net/en/news/renewable-energy-s-role-underestimated-.html [6] 馮垛生，“ 太陽能發電原理與應用 ”，五南出版社，民國98年。
[7] 黃柏翔、劉怡成，“ 太陽能發電系統 ”，明志科技大學電機工程系，民國98年。
[8] “ 風力發電在雲林 ”，雲林縣政府，民國97年。 http://reading.yunlin.gov.tw/index-2.asp?sid=5&id=28&page=1 [9] “ 二極體 ”，維基百科。 http://zh.wikipedia.org/wiki/%E4%BA%8C%E6%A5%B5%E9%AB%94 [10] “ 光耦合器Photo coupler簡介 ”，億光電子工業股份有限公司。 www.dianyuan.com/bbs/u/53/1498541179891317.pdf [11] M. Loreto, and M. Francesc, "Appropriate Charge Control of the Storage Capacitor in a Piezoelectric Energy Harvesting Device for Discontinuous Load Operation",2009.