



THE DEVELOPMENT SIMPLE RENEWABLE
ENERGY SYSTEM

By

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the requirement for the award of the degree of
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DEPARTMENT OF PHYSICAL SCIENCES
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FAKULTI SAINS DAN TEKNOLOGI
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PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:.....

THE DEVELOPMENT OF SIMPLE RENEWABLE ENERGY
SYSTEM

oleh MUHAMAD RAZIF OTMAN.....,no. matrik: UK11918

telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah SARJANA MUDA SAINS GUNAAN (FIS., ELEK. & INST.) Fakulti Sains dan Teknologi, UMT.

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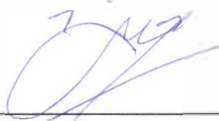


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DECLARATION

I hereby declare that this project report entitle The Development of Simple Renewable Energy System is the result of my own research except as cited in the references.

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ABSTRACT

Renewable energy is one of the energy sources that can overcome global energy crisis problem. The renewable energy sources consist of sun, wind, tides, waves, geothermal, biomass and a biogas. PEMFC is one of the renewable energy source using biogas. It involved an electrochemical reaction between hydrogen and oxygen gases to produce electricity. Many researches had been conducted to make PEMFC as a source of the future energy. For this study, the development of the renewable energy system using PEMFC is mainly focused. The renewable energy system consists of renewable energy source, the power conditioner and the load. The renewable energy source used in this study was PEMFC. The power conditioner used was the inverter to converted Direct current (DC) into Alternate current (AC). The load can be any devices that used an AC current. The development of the system starts from the experimental stage using a PEMFC kit. Then it proceeds into simulation stage using Proteus software and the Breadboarding stage. The result of this study produce an AC wave form that can be used to operate an AC type devices, these will make a PEMFC as another source of energy and thus reduce the dependency of energy demands in this world.

ABSTRAK

Tenaga yang boleh diperbaharui adalah salah satu daripada sumber tenaga yang dapat mengatasi krisis tenaga global. Tenaga yang boleh diperbaharui terdiri daripada matahari, angin, ombak, geoterma, biojisim dan biogas. PEMFC adalah salah satu sumber tenaga yang boleh diperbaharui yang menggunakan biogas. Ia melibatkan tindak balas elektrokimia diantara gas hidrogen dan gas oksigen untuk menghasilkan tenaga elektrik. Kajian tentang PEMFC ini telah banyak dijalankan untuk menjadikan ia sebagai salah satu sumber tenaga untuk masa hadapan. Untuk kajian ini, fokus kajian adalah untuk menghasilkan sistem tenaga yang diperbarui. Sistem tenaga yang diperbaharui terdiri daripada sumber tenaga diperbarui, *power conditioner* dan beban. Sumber tenaga diperbaharui yang digunakan dalam kajian ini adalah PEMFC. *Power conditioner* yang digunakan adalah *Inverter* untuk menukarkan arus terus, DC kepada arus ulang-alik, AC. Beban pula adalah sebarang jenis alat yang menggunakan arus AC untuk beroperasi. Proses penghasilan sistem ini bermula dengan peringkat ujikaji menggunakan kit PEMFC, kemudian diteruskan kepada peringkat simulasi menggunakan perisian *Proteus*, dan peringkat *breadboarding*. Hasil daripada kajian ini akan menghasilkan bentuk gelombang yang boleh digunakan untuk mengoperasikan peralatan yang menggunakan arus ulang alik, AC. Ini akan menjadikan PEMFC sebagai salah satu daripada sumber tenaga elektrik dan mengurangkan kebergantungan kepada sumber sedia ada.