

**OPTIMAL SIZING AND OPERATIONAL STRATEGY OF HYBRID
RENEWABLE ENERGY SYSTEM USING HOMER**

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ABSTRACT

Nowadays, in order for the world to have a healthier environment, people has started to consider the green power technology. The wind energy and solar energy system are chosen in designing a hybrid renewable power system as they give minor impact on the environment. In addition, by maximizing the use of the renewable energy, the diesel generator in the system could also be reduced. Therefore, this paper will discuss on the optimization of the renewable energy hybrid system based on the component sizing and the operational strategy. The optimization software used is the Hybrid Optimization Model for Electric Renewable (HOMER).The sensitivity analysis is also performed to optimize the system in different combinations of renewable energy by using this software.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Lately, human activities have given bad effects to the ecosystem and also the society. Scientists have proven that the act of releasing the greenhouse gases to the atmosphere has contributed to global warming. In addition, the materialistic lifestyle and industrialization have also caused toward the environmental pollution. Hence, in order to overcome these problems, the renewable energy should be used as it holds the key to a healthy global environment. The major environmental problems like water pollution, ambient air quality (Carbon Dioxide, Nitrogen and Sulfur Dioxide gas emission), acid rain and global warming could also be solved due to the effect of renewable energy utilization.

In Malaysia, energy policies and regulations are being enacted in order to stop the environmental problems as these policies are important in helping to achieve the goal of having sustainable development in Malaysia. The Malaysian government strategy is to maximize the use of indigenous energy resource and minimize the negative environmental impact. The energy efficiency and renewable energy under the Eighth Malaysian Plan (2001-2005) and the Ninth Malaysia Plan (2006-2010) are focused on targeting for renewable energy to be significant contributor and for better utilization of energy resources. An emphasis to further reduce the dependency on petroleum has also led to extra effort in integrating alternative source of energy [1].