

Criteria of Optimization Theoretical and Experimental of a Renewable Energy System with Hydrogen Storage

R. Barbosa¹, V. Sánchez¹, B. Escobar², J. Hernández¹, H. Toral¹, A. Allanes¹, D. Cámara¹

¹Universidad de Quintana Roo, Boulevard Bahía s/n, Chetumal, Q. Roo, México, 77019.

^{*}Tel: +529831566032; e-mail: romelix1@gmail.com

²Instituto Tecnológico de Cancún, Av. Kábah Km. 3, Cancún, Q. Roo, México, 77500.

ABSTRACT

In this paper a computational tool to assist in the sizing and automatic control of a hybrid renewable system with energy storage in the form of hydrogen is presented. The tool is based on an algorithm programmed in language C++. The philosophy of the algorithm consists to analyze the effectiveness and efficiency of the system according to operating conditions planned and actual experimental data. An energy balance based in analytical models of each component is used for previously dimension the installation of the hybrid system. Afterwards when a real requirement is generated in the hybrid system, an optimization strategy is implemented with the same philosophy and previously applied mathematical models

Keywords: computational tool; fuel cells; hydrogen

