

Design and Automation of a Hybrid System for Generating Electric Power

24 Jul 2017

Cliff Mosiori and John Maera

Abstract

A novel system for generating electric power using a combined wind and solar energy is discussed and proposed for real implementation. It combines a compressed system for air transmission, storage, and a large solar reservoir integrated air heating collector. It employed a CAD/CAA tool which will help designers determine the optimal hybrid wind-solar power system for either autonomous applications. Linear programming techniques were used to the load requirements in a reliable manner. The design takes into account environmental factors both in the design and its operation phases. The essential subsystems include coupled to air compressors to wind turbines, high pressure large diameter pipeline, solar collectors, and a turbo-expander driven generator. This hybrid power generation system will be useful in electric systems with very large wind and solar energy potential areas. This hybrid wind-solar system is expected to be a more economical than independent construction of wind and solar plants.

A controller that monitors the operation of the autonomous systems was designed from each of the system components and the environmental credit of the system.

Keywords: Hybrid Power Generation System, Wind Turbines, Wind-Solar System