


Chapter 11


Optimization of Hybrid Renewable Energy Systems for Sustainable Townships With Net Zero Emission Solution

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ABSTRACT

Green buildings, distinguished by their commitment to reducing environmental impact, are transcending traditional energy efficiency norms to prioritize the overall health of occupants. Special emphasis is placed on innovative design principles,

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cutting-edge materials and smart technologies that not only contribute to energy savings but also cultivate indoor spaces conducive to occupant health and productivity. This research aims to provide valuable insights into the interconnected benefits of green buildings, wherein energy efficiency and occupant health are seen not as disparate objectives but as mutually reinforcing elements of sustainable and harmonious living and working environments. In the proposed system PV produces 82,916 kWh of energy per year, the generic 3 kW of wind turbine produces 1,008 kWh of energy per year and the purchase from grid is 95,485 kWh of energy per year, providing a total of 93,887 kWh of energy per year.

INTRODUCTION

List of abbreviations

AM	Asset Management
BCCL	Bharat Coking Coal Limited
BDA	Big Data Analytics
BRICS	Brazil, Russia, India, China, South Africa
CE	Circular Economy
CS-ARDL	Cross-Sectional Autoregressive Distributed Lag
ES	Environmental Strategy
Fron24	Fronius Symo 24.0-3-M with Generic PV
GFN	Global Footprint Network
GHG	Greenhouse Gas
GHI	Global horizontal irradiance
GRG	Green Revolution in Genetics
HRES	Hybrid Renewable Energy System
IEQ	Indoor Environmental Quality
LEED	Leadership in Energy and Environmental Design
NZE	Net Zero Energy
NZEB	Nearly Zero Energy Building
NRs	Natural Resources
NRDC	Natural Resources Defence Council
PH 245	Generic 245kWh Pumped Hydro
SCE	Southern California Edison

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