Chapter 12
Renewable Energy–Based Charging Solutions for Incorporation of Electric Rickshaws Into Electrical Grid Supply Network

Dharmbir Prasad
https://orcid.org/0000-0002-9010-9717
Asansol Engineering College, India

Rudra Pratap Singh
https://orcid.org/0000-0001-7352-855X
Asansol Engineering College, India

Sneha Mahata
Asansol Engineering College, India

Sourbh Kumar
Asansol Engineering College, India

Sudhangshu Chakraborty
Asansol Engineering College, India

ABSTRACT

For the past few years, urban areas have been grappling with increasing pollution and traffic congestion. The adoption of electric rickshaws presents a promising solution for sustainable and clean urban mobility. However, integrating these

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e-rickshaws into the electrical grid successfully necessitates careful planning and the installation of renewable energy alternatives. Various challenges are faced by the conventional grid systems in accommodating the charging needs of growing fleet of e-rickshaws; and this problem is faced by most of the states in India. Cases of power theft for charging e-rickshaws have become quite common. And thus, to overcome this problem, charging stations can be made separately for e-rickshaws by using renewable energy sources. This chapter deals with the setting up of a plant using renewable energy in a place called 'Seoraberia,' Howrah, West Bengal, by using biogas and PV as the main source of renewable energy.

INTRODUCTION

List of Abbreviations

AAEA	All Assam Engineer's Association
ABB	Asea Brown Boveri
BEV	Batter Electric Vehicle
CAGR	Compound Annual Growth Rate
CHIL	Controller Hardware in the Loop
CSs	Charging Stations
CSCS	Charging Station Control Strategy
DNI	Direct Normal Irradiation
DSTATCOM	Distribution Static Compensator
EV	Electric Vehicle
EVCS	Electric Vehicle Charging Station
EVPL	Electric Vehicle Parking Lot
EVSE	Electric Vehicle Supply Equipment
FADA	Federation of Automobile Dealers Associations
FAME	Faster Adoption and Manufacturing of Hybrid & Electric Vehicles in India-II
FCEV	Fuel Cell Electric Vehicles
GHI	Global Horizontal Irradiance
GCPV	Grid Connected Photo-Voltaic
GWO	Grey Wolf Optimizer method
HRES	Hybrid Renewable Energy System
HV	Hybrid Vehicle

continued on following page