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A Micro-Distributed ESS-Based Smart LED Streetlight System for Intelligent Demand Management of the Micro-grid.

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Highlights

- This system is sufficient for providing alternative power in power blackout situations in a micro-grid using intelligent power peaks and demand resource management.
- These functions include power demand management, power stabilization, alternative power, and energy conservation.
- The LED system has advantages from the viewpoint of energy efficiency and service by providing distributed power sources and LED lighting services at the same time.
- In the future, this system can provide intelligent energy IoT services in cities for sustainability.
- In addition, this system can extend the core service technology in various fields such as the power demand management business and so on.

Abstract

Currently, many researchers worldwide are focusing on creating a novel service model by integrating IoT (Internet of Things) technologies with ICT (Information and Communications Technologies) to increase energy efficiency by reducing power consumption and greenhouse gas emissions. This paper examines the problems related to the current integrated ESS (Energy Storage System) in a smart-grid: high installation costs and low management efficiency. To solve these problems, this paper studies the development of a micro-distributed ESS in an intelligent LED (Light Emitting Diode) streetlight system, and its low-cost installation and high management efficiency in a micro-grid. Through the application of this system, the initial installation costs can be reduced by using micro-distributed ESS and IoT-based intelligent energy management, facilitating power monitoring of the streetlights and energy efficient demand resource management in the micro-grid. This provides a more intelligent and efficient environment, such as in a smart-city.

Keywords—Micro-distributed-ESS, Micro-grid, Smart-grid, IoT (Internet of Things), Smart-LED streetlamp system

1. Introduction

Currently, many researchers worldwide are focusing on creating a novel service model that integrates IoT (Internet of Things) technologies with ICT (Information and Communications Technologies) for

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