Microgrid Management Platform Technology

We have developed the Microgrid Planner platform (Reich and Frye 2024) to address DOD needs and to bridge the gap between the microgrid planning methods implemented in existing software and methods developed by the scientific research community that remain unavailable to practitioners. Our goal is to facilitate increased development of nonproprietary ...

Solutions for Microgrid Management are all-inclusive technology plans and setups intended to effectively manage and maximise microgrid operations. Small-scale energy systems, known as microgrids, may function both separately and in tandem with the larger power grid. Integrated renewable energy sources, energy storage, and sophisticated control systems ...

We design the Microgrid, which is made up of renewable solar generators and wind sources, Li-ion battery storage system, backup electrical grids, and AC/DC loads, taking into account all of the ...

The authors in (Gui and MacGill, 2018) use a low-cost IoT-based innovative communication platform to implement an optimal energy management technique for microgrid systems. The suggested system"s energy monitoring and control architecture is built on a cloud-based Remote Monitoring Unit (RMU) that communicates via a Message Queuing Telemetry ...

This paper presents an energy trading platform based on the permissioned blockchain for managing renewable energy microgrids.To accomplish low-cost and efficient renewable energy trading, a series of automated trading processes is designed for the trading platform, including the token trading mechanism and account management ...

By aiding in the design, operation management, and maintenance of microgrids, these methods offer a potent tool for managing the massive historical data and real-time data stream in a proficient ...

XENDEE is the world"s most awarded Microgrid Decision Support Platform for certifying the resilience and bankability of distributed energy systems. ... The Most Comprehensive DER Design & Operation Platform. Model and control 25+ DER technologies and 14 distinct value streams (e.g. electric vehicle charging and demand charge reduction ...

Pros and Cons of Using Blockchain Technology in Microgrids. Blockchain technology can support the microgrid in several ways. However, many people still hold certain concerns about blockchain networks. This technology requires high scalability, secure blockchain platform components, and significant investment in infrastructure and development.

In this paper, we describe a solution that has been developed to create an intelligent software platform for the optimal management of energy trade (specifically a P2P trade) in microgrids. Furthermore, the choice of a solution based on the architecture of two-level hierarchical systems using the restrictions and recommendations of the control center is ...

The U.S. Department of Energy defines a microgrid as a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. 1 Microgrids ...

A microgrid, regarded as one of the cornerstones of the future smart grid, uses distributed generations and information technology to create a widely distributed automated ...

An integrated platform enabling the management of all types of distributed energy assets An end-to-end and flexible solution to manage complex energy systems Using our energy management system, monitor, predict, aggregate, optimize, ...

A microgrid is a local electrical grid with defined electrical boundaries, acting as a single and controllable entity. [1] It is able to operate in grid-connected and in island mode. [2] [3] A "stand-alone microgrid" or "isolated microgrid" only operates off-the-grid and cannot be connected to a wider electric power system. [4]Very small microgrids are called nanogrids.

This article comprehensively reviews strategies for optimal microgrid planning, focusing on integrating renewable energy sources. The study explores heuristic, mathematical, and hybrid methods for microgrid sizing and optimization-based energy management approaches, addressing the need for detailed energy planning and seamless integration between these ...

Compared to other management platforms, one of the primary innovations of the proposed system is application of the control algorithms employed in the system; this uses machine learning techniques to predict the energy demand and supply, and adjust the microgrid"s operation accordingly.

The grid integration of microgrids and the selection of energy management systems (EMS) based on robustness and energy efficiency in terms of generation, storage, and distribution are becoming more challenging with rising electrical power demand. The problems regarding exploring renewable energy resources with efficient and durable energy storage ...

a Microgrid Platform, a new microgrid EMS, and develop its prototype implementation running on top of a Linux distribution. This section also describes two algorithms that the MP runs

Systematic research and development programs [10], [11] began with the Consortium for Electric Reliability Technology Solutions (CERTS) effort in the United States [12] and the MICROGRIDS project in Europe

[13].Formed in 1999 [14], CERTS has been recognized as the origin of the modern grid-connected microgrid concept [15] envisioned a microgrid that ...

Aspen Technology Inc, a global leader in industrial software, has introduced the AspenTech Microgrid Management System(TM) (MMS), a solution for customers with heavy electrical power requirements in mining and other ...

Development of an Integrated Platform for Hardware-in-the-Loop Evaluation of Microgrids Prior to Site Commissioning, Applied Energy (2021) Remote Hardware-in-the-Loop Approach for Microgrid Controller Evaluation, 2020 Clemson University Power Systems Conference (2020)

Microgrid management systems in particular aid in the obsession with renewable energy resources, the continued development of energy storage expertise, and progress of cloud computing technology. In order to analyse this massive amount of data, it is necessary to apply more powerful computer analytical techniques in microgrid, which pave the ...

This paper presents a unified energy management system (EMS) paradigm with protection and control mechanisms, reactive power compensation, and frequency regulation for AC/DC microgrids.

2. Platform Overview Microgrid Planner is a software platform for developing analytical modeling tools. Its current modeling capabili-ties are built around a core simulation method that operates a microgrid over a specified time horizon with the goal of meeting all electrical load demands.

NREL tested the microgrid management system on a microgrid test platform at its Energy Systems Integration Facility. The platform included a microgrid switch, PV inverter, wind power inverter, diesel generator, controllable loads, metering, and a grid simulator to emulate the point of common coupling.

As a pioneer in energy management and optimization, ABB is a trusted partner in the evolving global energy ecosystem. ABB"s Smart Power solutions are leading energy innovation and transition to new ways of managing the energy, starting from commercial and industrial sites aiming to unlock new economic opportunities, up to utilities and service providers striving to ...