Impact of uncertainty on microgrids

Uncertainty is a critical aspect of energy management in microgrids, especially due to the variability of renewable energy sources and dynamic load behaviors such as E-Bike charging demand.

In response to this growing uncertainty, microgrids are gaining attention as a practical way to strengthen energy security and improve grid flexibility. At its core, a microgrid is a localized energy ...

In this paper, the impact of uncertainties in loads, renewable generation, market price signals, and event occurrence time on the feasible islanding and survivability of microgrids is analyzed.

These configurations will be used to compare the impact of parametric uncertainty with epistemic uncertainty arising from model simplifications, thereby providing insights into their broader ...

This work serves as a building block for building effective control algorithms for electrical microgrids in the context of uncertainty. These approaches are crucial in addressing real-world energy ...

This paper presents a framework for uncertainty management and treatment, an essential step toward achieving a robust microgrid design. The microgrid is first designed using a deterministic techno ...

Ensuring reliable operation of active microgrids with critical loads, such as emergency infrastructure or energy-sensitive industries, under uncertain conditions such as unplanned grid ...

In this paper, we compare the effectiveness of a two-stage control strategy for the energy management system (EMS) of a grid-connected microgrid under uncertain solar irradiance and load ...

Distribution networks are increasingly exposed to threats such as extreme weather, aging infrastructure, and cyber risks-resulting in more frequent contingencies and outages, a trend likely to persist.

A comprehensive review of uncertainties in power systems, covering modeling, impact, and mitigation, is essential to understand and manage the challenges faced by the electric grid.

Web: https://www.falconengineering.co.za