SolarInnovate Energy Solutions

Communication base station power generation can be done with variable frequency generators

Overview

A significant number of 5G base stations (gNBs) and their backup energy storage systems (BESSs) are redundantly configured, possessing surplus capacity during non-peak traffic hours. Moreover, traffic lo.

Are cellular base stations a flexible resource for power system frequency regulation?

Abstract: Cellular Base Stations (BSs) are equipped with backup batteries. These batteries have some spare capacity over time while maintaining the power supply reliability, so they are potential flexible resources for power systems. This letter exhibits the insight to explore the BS dispatch potential towards power system frequency regulation.

Can BS be used for power system frequency regulation?

This letter exhibits the insight to explore the BS dispatch potential towards power system frequency regulation. For each BS, the feasible dispatch boundaries of participating in frequency regulation are estimated. Then a framework is proposed to coordinate BSs to provide frequency support.

Can gnbs be incorporated into secondary frequency control procedure?

In this paper, a comprehensive strategy is proposed to safely incorporate gNBs and their BESSs (called “gNB systems”) into the secondary frequency control procedure. Initially, an aggregated model is developed using a state space method to capture the state of a cluster of heterogeneous gNB systems (gNBs-cluster).

Can gnbs provide flexibility for power system frequency control?

The substantial quantity, rapid growth rate, and high energy consumption of gNBs establish their potential to provide flexibility for power system frequency control. Specifically, utilizing gNBs as a demand-side flexibility resource has three main advantages: the mature technology, the significant available capacity, and economic benefits:.

Why do we need a 5G base station?

The limited penetration capability of millimeter waves necessitates the deployment of significantly more 5G base stations (the next generation Node B, gNB) than their 4G counterparts to ensure network coverage . Notably, the power consumption of a gNB is very high, up to 3–4 times of the power consumption of a 4G base stations (BSs).

How to improve power system frequency performance?

For each BS, the feasible dispatch boundaries of participating in frequency regulation are estimated. Then a framework is proposed to coordinate BSs to provide frequency support. By incorporating massive distributed BSs, the power system frequency performances can be improved.

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