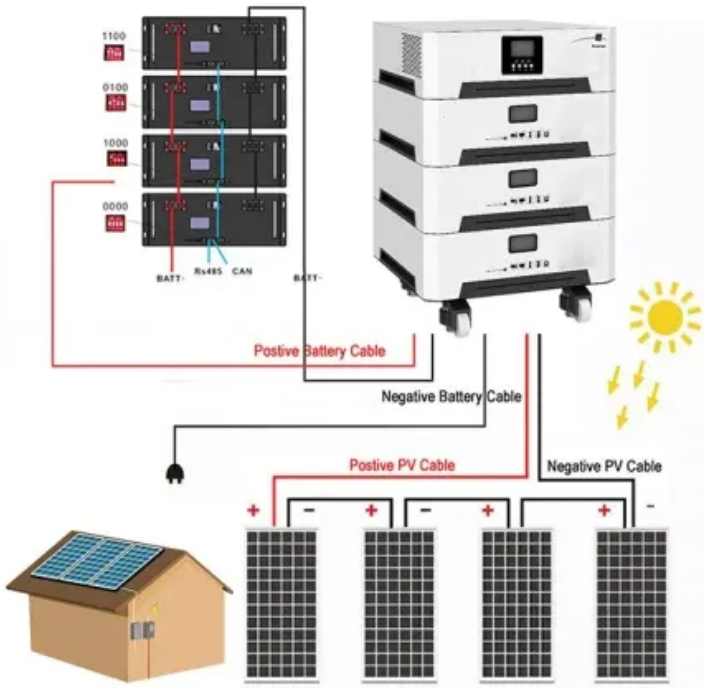
SolarHybrid Solutions

Niue Telecom 5G Base Station AI Energy Saving Project



Overview

What is 5G NR & how does it work?

The 5G new radio (NR) standard allows more components to switch off or go to sleep when the base station is in idle mode and requires far fewer transmissions of always-on signalling transmissions. Equipment deep sleep, a basic function that is introduced in the initial stage of the 5G deployment, can be applied to maximize energy saving efficiency.

What is the energy consumption of a 5G network?

The energy consumption of 5G networks is one of the pressing concerns in green communications. Recent research is focused towards energy saving techniques of base stations (BSs). BSs are one of the most power consuming elements of a 5G network. It is important to model their energy consumption for analyzing overall energy efficiency of a network.

Does a 5G base station need a sleep strategy?

Abstract: For time and space constraints, 5G base stations will have more serious energy consumption problems in some time periods, so it needs corresponding sleep strategies to reduce energy consumption.

How artificial intelligence (AI) technology will improve 5G network operation?

Artificial intelligence (AI) technology has natural advantages in solving high computational data analysis, cross domain feature mining, dynamic strategy generation and so on, which will give new mode and ability of network operation and maintenance in 5G.

Can network energy saving technologies mitigate 5G energy consumption?

This Technical Report explores how network energy saving technologies, such as carrier shutdown, channel shutdown, symbol shutdown etc., that have emerged since the 4G era, can be leveraged to mitigate 5G energy consumption.

What is 5G MIMO & how does it work?

The 5G standard introduces massive MIMO technology. In low base station service load scenarios, such as idle hours at night and non-capacity cell scenarios, it can be considered to turn off the transmission power of some RF channels to achieve energy-saving effect.

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[Renewable energy powered sustainable 5G network ...]

This survey specifically covers a variety of energy efficiency techniques, the utilization of renewable energy sources, interaction with the smart grid (SG), and the ...

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[A technical look at 5G energy consumption and performance]

Find out how 5G New Radio energy saving features can enable operators to build denser networks, meet performance demands and ensure low 5G energy consumption.

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[The energy use implications of 5G: Reviewing whole network ...]

Smart Energy Saving of 5G Base Station: based on AI and other emerging technologies to forecast and optimize the management of 5G wireless network energy ...

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[Intelligent Energy Saving Solution of 5G Base Station ...]

This article identifies energy-saving potential of the fifth generation (5G) Radio Access Network, and describes main energy-saving principles and ...

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AI-based energy consumption modeling of 5G base stations: an ...

This paper demonstrates the energy consumption modeling of a BS considering its energy-saving sleep modes. We design a Deep Neural Network (DNN) based energy ...

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Intelligent Energy Saving Solution of 5G Base Station Based on

This article identifies energy-saving potential of the fifth generation (5G) Radio Access Network, and describes main energy-saving principles and technologies.

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Base stations of the future: using AI and renewables to create ...

To achieve this, the project has identified various ways in which newer connected technologies can improve base stations' energy consumption.

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[Application of AI technology 5G base station]

When the symbol shut down function is turned on, when there is no user data transmission in the downlink symbol, the base station equipment can achieve the purpose of energy saving by ...

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These tools and metrics are designed to help AI actors develop and use trustworthy AI systems and applications that respect human rights and are fair, transparent, ...

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[Evaluation of the power-saving effect of 5G base station based on AI]

The research and application of energy-saving technology for 5G wireless networks are significant for the emission-reduction work of Communication Operators. The ...

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[Analysis of Intelligent Energy Saving Strategy of 4G/5G Network ...]

With the large-scale deployment of 5G network of communication operators, there are more and more 5G devices, and the power consumption of mobile network surges. This ...

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[5G greener Telco - Phase II - TM Forum]

This AI-based LTE energy-saving project is jointly developed by China Telecom, AsiaInfo, NetScout, and DataSpark. It is expected to establish an intelligent ...

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[Base stations of the future: using AI and renewables ...]

To achieve this, the project has identified various ways in which newer connected technologies can improve base stations' energy consumption.

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[Energy Saving Technology of 5G Base Station Based on Internet ...]

For time and space constraints, 5G base stations will have more serious energy consumption problems in some time periods, so it needs corresponding sleep strategies to ...

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[Power Consumption Modeling of 5G Multi-Carrier Base ...]

In this paper, we present a power consumption model for 5G AAUs based on artificial neural networks. We demonstrate that this model achieves good estimation performance, and it is ...

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[AI-based energy consumption modeling of 5G base stations: an energy](#)

This paper demonstrates the energy consumption modeling of a BS considering its energy-saving sleep modes. We design a Deep Neural Network (DNN) based energy ...

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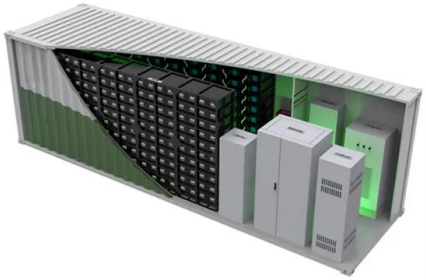

[Evaluation of the power-saving effect of 5G base station based ...](#)

In this paper, a framework is developed to study the impact of different power model assumptions on energy saving in a 5G separation architecture comprising high power ...

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[Final draft of deliverable D.WG3-02-Smart Energy Saving of ...](#)

Smart energy saving of 5G base stations: Based on AI and other emerging technologies to forecast and optimize the management of 5G wireless network energy consumption

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[Research on energy saving technology of 5G base station based on AI](#)

The prospect of 5G base station energy-saving technology combined with AI technology is explored. The development direction of AI energy-saving technology has been deeply studied.

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[Modelling the 5G Energy Consumption using Real-world Data: Energy]

This paper proposes a novel 5G base stations energy consumption modelling method by learning from a real-world dataset used in the ITU 5G Base Station Energy Consumption Modelling ...

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[Intelligent Energy Saving Solution of 5G Base Station Based on]

This paper introduces the basic energy-saving technology of 5G base station, and puts forward the intelligent energy-saving solutions based on artificial intell

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[Energy Management of Base Station in 5G and B5G: Revisited]

The popularity of 5G enabled services are gaining momentum across the globe. It is not only about the high data rate offered by the 5G but also its capability to accommodate myriad of ...

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[AI-based energy consumption modeling of 5G base stations: an energy]

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In this paper, a framework is developed to study the impact of different power model assumptions on energy saving in a 5G separation architecture comprising high power ...

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[Enabling Energy Efficiency in 5G Network]

Energy consumption is a main part of network operational expense (OPEX), and base stations work as the main energy consumption equipment in the radio access network (RAN). In order ...

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