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Analysis on the current status of green base station construction in the communications industry





Overview

Can a 5G base station promote green development of mobile communication facilities?

However, a significant reduction of ca. 42.8% can be achieved by optimizing the power structure and base station layout strategy and reducing equipment power consumption. Overall, this study provides a clear approach to assess the environmental impact of the 5G base station and will promote the green development of mobile communication facilities.

Will communication base stations reduce electricity consumption?

Our findings revealed that the nationwide electricity consumption would reduce to 54,101.60 GWh due to the operation of communication base stations (95% CI: 53,492.10–54,725.35 GWh) (Figure 2 C), marking a reduction of 35.23% compared with the original consumption. We also predicted the reduction of pollutant emissions after the upgrade.

How does a communication base station upgrade affect emissions?

(D) Total emissions of major pollutants (CO₂, NO_x, SO₂, and PM 2.5) generated by the electricity consumption of communication base stations before and after the upgrade. Paired bars with the same color represent pre- and post-upgrade comparisons for the same pollutant. Emissions of all pollutants are significantly reduced after the upgrade.

Should China upgrade to low-carbon base stations?

These outcomes demonstrate that upgrading to low-carbon base stations not only ensures economic feasibility but also delivers significant environmental and public health benefits, reinforcing the strategic value of decarbonizing China's communication infrastructure.



Analysis on the current status of green base station construction in ...

Remake Green 5G

Nov 10, 2022 · The Ministry of Industry and Information Technology issued the " Action Plan for Green and Low-Carbon Development of the Information and Communication Industry (2022

...

Low-Carbon Sustainable Development of 5G Base Stations in ...

In order to increase the contribution of the communication industry to mitigate the global greenhouse effect, future efforts must focus on reducing the carbon emissions associated with ...

Low-carbon upgrading to China's communications base stations ...

Nov 21, 2025 · Summary It is important for China's communications industry to reduce its reliance on grid-powered systems to lower base station energy costs and meet national carbon targets. ...

China Mobile - Renewable energy and green base station ...

Aug 7, 2025 · China Mobile added 467,000 5G base stations while achieving a 2% reduction in overall base station energy consumption in 2024.

Carbon Reduction Path Analysis of 5G Base Stations in the

Jun 30, 2022 · However, 5G networks require construction of numerous base stations, leading to greater carbon emissions. Scientifically analyzing the carbon reduction potential of 5G base ...

5G Base Station Construction Market Report: Trends, ...

Mar 13, 2025 · 5G Base Station Construction Market Report: Trends, Forecast and Competitive Analysis to 2031 - The future of the global 5G base station construction market looks ...

Green Communications: A Review of the Current Situation

Mar 8, 2023 · This study presents an overview of sustainable and green cellular base stations (BSs), which account for most of the energy consumed in cellular networks.

Low-Carbon Sustainable Development of 5G Base Stations in ...

May 4, 2024 · Therefore, this chapter aims to provide an overview of green 5G base stations, exploring their construction in China, their environmental impact, and the various factors and ...

Carbon emissions and mitigation potentials of 5G base station ...

Jul 1, 2022 · A significant reduction of emissions can be achieved by 2030 if taking some actions. The emergence of fifth-generation (5G) telecommunication would change modern lives, ...

Toward Green Network: An Expanding of Base Station ...

Aug 4, 2025 · Green network aims to promote the sustainable development of communication



systems, and base station (BS) and cells sleeping has been proven effective in reducing the ...

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