



BUHLE POWER

# Mobile communication green base station survey





## Overview

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Since base stations consume the maximum portion of the total energy in current cellular systems, we explore important renewable energy techniques for green base stations. We will provide a comprehensive survey on how to generate renewable energy, such as solar, wind and fuel cells, for green base stations in 5G green cellular networks. Are green cellular base stations sustainable?

This study presents an overview of sustainable and green cellular base stations (BSs), which account for most of the energy consumed in cellular networks. We review the architecture of the BS and the power consumption model, and then summarize the trends in green cellular network research over the past decade.

Can cellular BSS operators establish a green cellular network?

Case Studies for Enabling Green Cellular BSs operators establish a green cellular network. This section presents existing studies on cellular BSs and proposes directions for future research. 4.3.1. South Korea particularly its LTE cellular network, which offers data-oriented services. The LTE cellular network.

Are cellular network operators moving towards green cellular BS?

Figure 10 reveals that many cellular network operators in the world have still not shifted toward green cellular BS. Most of these operators are located in developing countries with limited electricity supply and unreliable electric grids. The financial issues in these countries must be investigated further. 4.5.

How many green cellular BSs are there?

GSMA predicted that the number of green BSs would increase to 389,800 by 2020 [ 8 ], which reflects the growing awareness of cellular network operators about the significant economic and ecological influence of their networks in the coming years. Figure 10. Worldwide deployment of green cellular BSs [



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### [Research on future 6G green wireless networks](#)

Apr 1, 2025 · In mobile communication networks, base stations are the largest consumers of energy. According to GSMA's 2021 study of 31 networks, base station energy consumption ...

### [Energy-Efficient Base-Stations Sleep-Mode Techniques in Green ...](#)

Apr 1, 2015 · In this survey, we first present facts and figures that highlight the importance of green mobile networking and then review existing green cellular networking research with

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### [A Survey on Green Mobile Networking: From The ...](#)

Feb 15, 2021 · In this survey, we mainly focus on energy efficient techniques in base stations and mobile terminals as they constitute the major sources of energy consumption in wireless ...

### [Green and Sustainable Cellular Base Stations: An](#)

Apr 25, 2017 · This study presents an overview of sustainable and green cellular base stations (BSs), which account for most of the energy consumed in cellular networks.



### [Resource management in cellular base stations powered by ...](#)

Jun 15, 2018 · This paper aims to consolidate the work carried out in making base station (BS) green and energy efficient by integrating renewable energy sources (RES). Clean and green ...

### [Energy Efficient Cellular Network Base Station: A Survey](#)

Dec 20, 2019 · Concept of Green communication is emerged from negative impact of wireless communication on the environment. Green communication through green networking can be

...



### [Energy performance of off-grid green cellular base stations](#)

Aug 1, 2024 · However, the design of a green mobile network requires the dimensioning of the energy harvesting and storage systems through the estimation of the network's energy ...



## Energy-Efficient Base Stations Sleep Mode Techniques in ...

May 4, 2020 · In this survey, we first present facts and figures that highlight the importance of green mobile networking, and then review existing green cellular networking research with

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## A Survey on Green 5G Cellular Networks

Oct 1, 2022 · Since base stations consume the maximum portion of the total energy in current cellular systems, we explore important renewable energy techniques for green base stations, ...

## Green Cellular Networks: A Survey, Some Research Issues and Challenges

Aug 27, 2011 · Since base stations consume a maximum portion of the total energy used in a cellular system, we will first provide a comprehensive survey on techniques to obtain energy ...



## Green Cellular Networks: A Survey, Some Research ...

Nov 30, 2024 · sion of mobile networks to deploying vast quantities of base stations. Based on provide coverage to the global population relies on ...



## [Enabling Green cellular networks: A survey and outlook](#)

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## [Green UAV communications for 6G: A survey](#)

Prolonging the lifetime and developing green UAV communication with low power consumption becomes a critical challenge. In this article, a comprehensive survey on green UAV ...



## [Renewable energy powered sustainable 5G network ...](#)

Feb 1, 2021 · Moreover, this survey study presents a comprehensive review of the approaches and solutions proposed in the literature for sustainable mobile networks and RE base stations ...



## [A Survey on Energy Efficient Cellular Mobile Communication](#)

May 24, 2021 · The base station switching is based on a Game-theoretic model where cost function provides an incentive to mobile network operator (MNO) to serve its own traffic as well ...

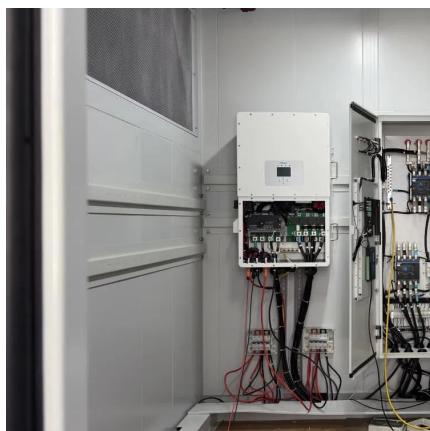


## Energy-efficiency schemes for base stations in 5G ...

Jul 27, 2023 · Abstract In today's 5G era, the energy efficiency (EE) of cellular base stations is crucial for sustainable communication.

Recognizing this, Mobile Network Operators are

...



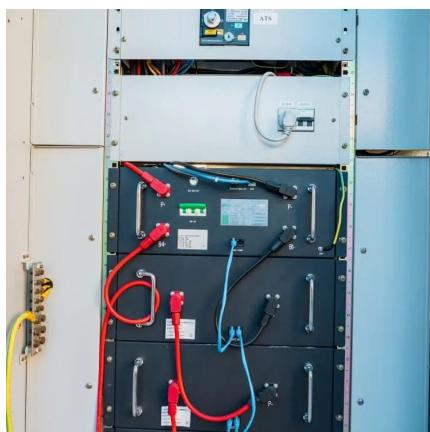
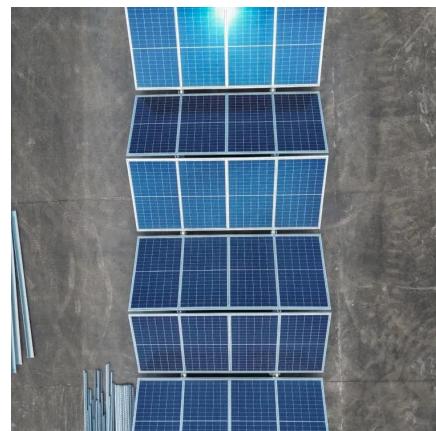
## A survey on green communication and security challenges in ...

Oct 15, 2017 · To meet these demands, a conforming increase in the count of base stations has been witnessed (Green Power for Mobile, GSMA, Green Power for Mobile Bi-Annual Report,

...

## Energy Efficiency Techniques in 5G/6G Networks: Green Communication

Feb 26, 2024 · The focus is on smaller cell infrastructure and the need for optimization in terms of connection, communication, and power. The solutions include reconfiguring flow paths, ...



## Green and Sustainable Cellular Base Stations: ...

Apr 25, 2017 · This study presents an overview of sustainable and green cellular base stations (BSs), which account for most of the energy ...



## [Green and Sustainable Cellular Base Stations: An Overview ...](#)

Apr 25, 2017 · Energy efficiency and renewable energy are the main pillars of sustainability and environmental compatibility. This study presents an overview of sustainable and green cellular ...



## [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.

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