

Energy-efficient communication sites for broadcast transmission



Article Overview

Energy-efficient broadcast transmission sites combine advanced transmitter technologies, renewable energy sources, and optimized operational strategies to reduce power consumption and environmental impact.

Renewable Energy Integration

One of the most effective approaches to energy-efficient broadcast sites is the use of solar-powered systems. For example, BAI Communications in Australia has implemented solar-powered transmission sites in locations such as Yatpool, Victoria, and Mawson, Western Australia, significantly reducing CO2 emissions and operational energy costs while ensuring reliable service in urban, rural, and remote areas . These systems often operate in conjunction with mains power and backup supplies to maintain uninterrupted transmission.

High-Efficiency Transmitters

Modern broadcast transmitters have dramatically improved energy efficiency compared to older models. Early digital TV transmitters had efficiencies of only 15-18%, wasting most of the input power as heat. Advances such as 50V LDMOS RF devices, Drain Modulation, and Doherty amplifier techniques now allow RF amplifier efficiencies exceeding 50% for TV and up to 72% for FM transmitters . These technologies reduce electricity consumption, lower cooling requirements, and decrease maintenance costs, contributing to both economic and environmental ben...

Article Content

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To explore the potential of SIM, we consider both dirty paper coding (DPC) and linear precoding (LP) and formulate the

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The main environmental impacts of the broadcasting industry are greenhouse gas emissions (GHG), energy use; raw material

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anding of how energy-efficient a communication system can become. Current research papers typically present values on the order

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Energy-Efficient Communication Networks and Systems

This Special Issue aims to open new research ways toward more energy-efficient communication networks and computing systems.

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Energy efficiency is important to wireless and broadcast networks

The research by engineers at the University of Bristol, and published in the IEEE Transactions on Broadcasting, has

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A comprehensive review of energy-efficient design in satellite ...

Strategies for optimizing energy efficiency in transmission protocols, modulation schemes, power management, and

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The communications industry must therefore develop strategies to optimize the energy efficiency of 5G networks,

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By leveraging these energy-efficient communication protocols and techniques, satellite communication systems can achieve higher

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