



SolarTech Power Solutions

**China's first generation of
communication base stations
powered by 125kWh**



Overview

How much electricity does a communication base station consume in China?

Based on the actual number of base stations in each province of China in 2021, we calculated the national electricity consumption of communication base stations (methodology detailed in Note S4), which amounted to 83,525.81 GWh (95% confidence interval [CI]: 81,212.38–85,825.86 GWh) for the year (Figures 2 A and 2C).

How much electricity does a communication base station use a year?

In 2021, the annual electricity consumption from communication base stations was 83,525.81 GWh, and it is estimated to rise to 458,495.18 GWh by 2030 (average across three scenarios), with an increase of 448.93% compared with 2021.

Why do Chinese communication companies rely on a power grid?

This is primarily due to the reliance of these base stations on the power grid, which derives over 70% of its energy from coal.^{19,20} Compounded by the Chinese government's stringent low-carbon policies, which mandate environmental responsibility across all industries,²¹ communication companies face considerable policy pressure.

Can China's communications industry reduce reliance on grid-powered systems?

While focused on China, the model and findings can serve as a blueprint for countries worldwide facing similar energy and infrastructure challenges in the age of digital expansion. 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.

Should China upgrade its communication systems?

Our analysis indicates that the low-carbon upgrade of China's communication

systems is a critical strategy for alleviating both cost pressures and carbon policy constraints. The upgrade also delivers additional environmental and public health benefits.

Why are China's leading communications companies incorporating energy storage batteries and photovoltaic power?

In addition, China's leading communications companies are progressively incorporating energy storage batteries and photovoltaic power generation to offset the mounting cost pressures stemming from the continued expansion of energy usage. The relative importance attached to this issue depends on the sense of urgency.

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