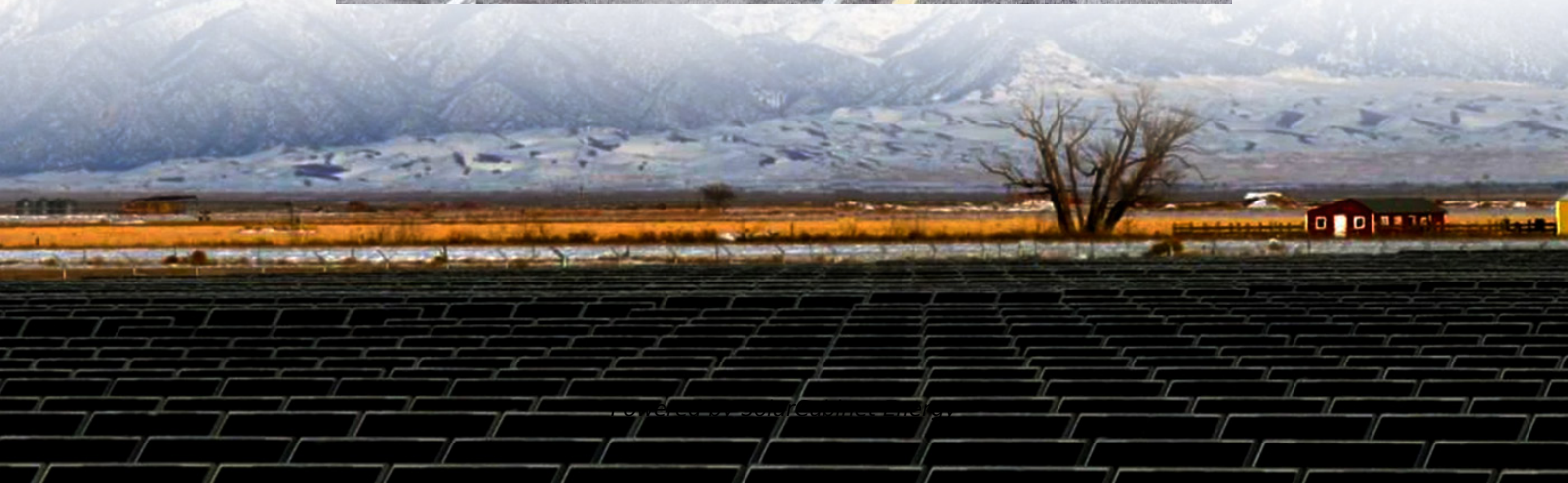
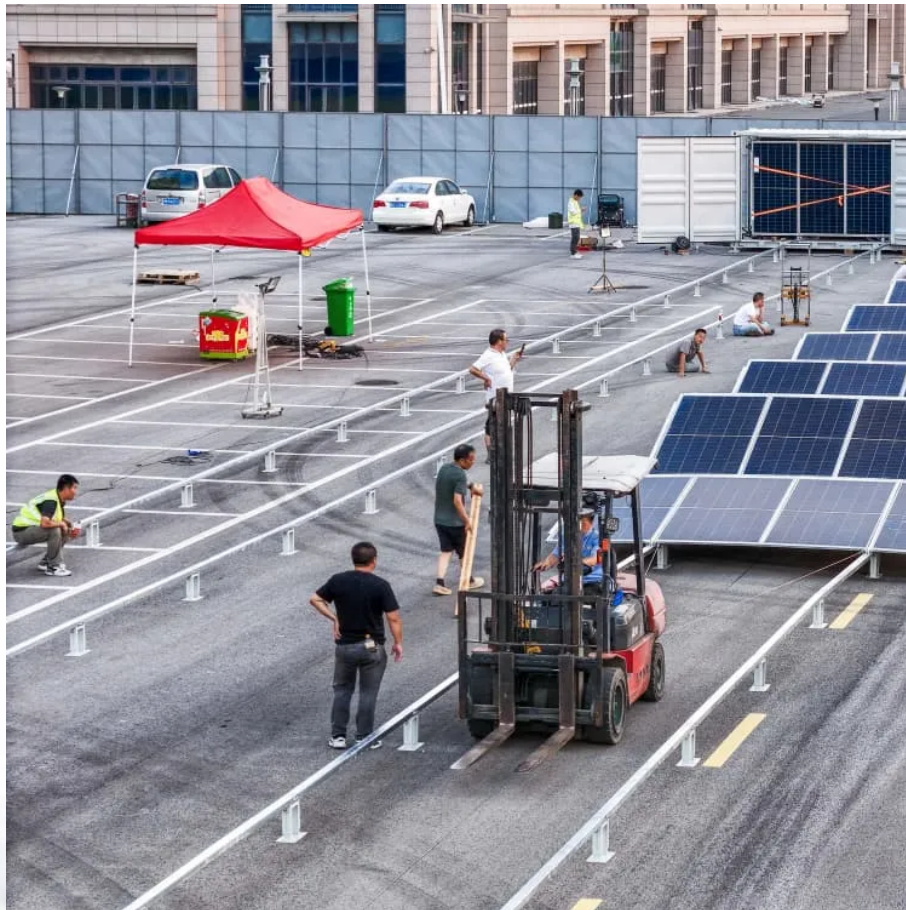


Global distributed power generation of China s communication base stations





Overview

How much electricity does China use per base station?

For China, based on a single base station power's energy consumption of 11.5 KWh (Huawei, 2019), we estimate that the electricity consumed by its 5G network by 2030 will be 6.04×10^5 GW for 6 million base stations, the equivalents of 8.4 % of China's national total power generation in 2019, respectively.

Do 5G communication base stations have multi-objective cooperative optimization?

This paper develops a method to consider the multi-objective cooperative optimization operation of 5G communication base stations and Active Distribution Network (ADN) and constructs a description model for the operational flexibility of 5G communication base stations.

How much CO₂ will China's 5G network produce?

Under the model predicted 5G base stations, China's 5G network could yield 0.15–0.29 GtCO₂ /yr emissions subject to the nation's BDDL from 40 to 80 % by 2030. Both 5G base stations and CO₂ emissions are significantly lower than the previous estimates.

What is the equipment composition of a 5G communication base station?

Figure 1 illustrates the equipment composition of a typical 5G communication base station, which mainly consists of 2 aspects: a communication unit and a power supply unit.

Does China have a 5G network?

Given that China currently has the largest 5G network in the world (~1.53 million base stations by the end of 2021, Table S1) and that base station number was projected by up to 6–8 million by 2030 (CCID Consulting, 2020), concerns are being expressed regarding 5G mobile networks' environmental



effects and sustainability.

Do 5G communication base stations engage in demand response?

In the above model, by encouraging 5G communication base stations to engage in Demand Response (DR), the Renewable Energy Sources (RES), and 5G communication base stations in ADN are concurrently scheduled, and the uncertainty of RES and communication load is described by using interval optimization method.



Global distributed power generation of China s communication base

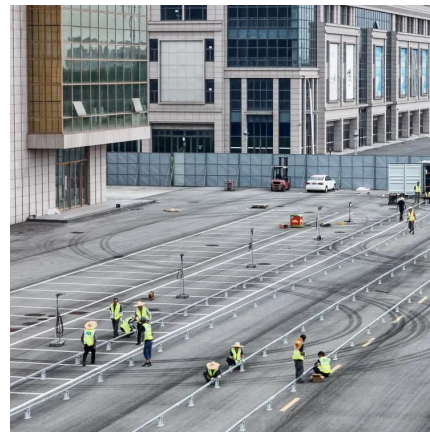


[Optimal Dispatch of Multiple Photovoltaic Integrated 5G Base Stations](#)

Simulation results show that the proposed two-stage optimal dispatch method can effectively encourage multiple 5G BSs to participate in DR and achieve the win-win effect of ...

[Communication base station-solar power supply solution system](#)

Once a power outage occurs, a distributed photovoltaic power generation system is used to ensure that the base station is still efficient and stable. Whether in terms of practicality, ...



The carbon footprint response to projected base stations of China's ...

We collected 5G base station numbers in 2020 and 2021 in 31 provinces and province-level municipalities (PLM), the period with the rapid growth of the 5G base stations in ...

[Low-carbon upgrading to China's communications base ...](#)

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. This study examines ...



[Multi-objective interval planning for 5G base station virtual ...](#)

As an emerging load, 5G base stations belong to typical distributed resources [7]. The in-depth development of flexi-bility resources for 5G base stations, including their internal energy ...

[The business model of 5G base station energy storage ...](#)

1 Introduction 5G communication base stations have high requirements on the reliability of power supply of the distribution network. During planning and construction, 5G base stations are ...



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