



中国传媒大学  
COMMUNICATION UNIVERSITY OF CHINA



Institute for a Community  
with Shared Future  
人类命运共同体研究院



## **The Development of 5G Networks in China:** **Implications for the World**

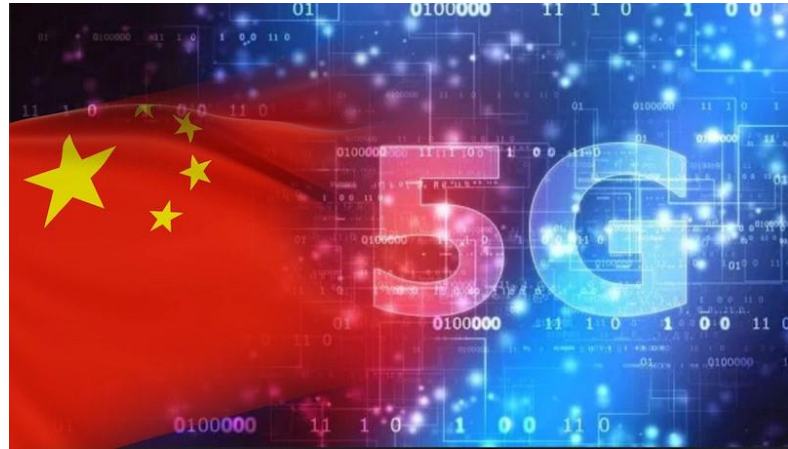


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## Introduction

The fifth generation, or 5G, of wireless cellular technology offers more capacity, more reliable connections, and faster upload and download rates than earlier networks. 5G has the potential to completely change how we use the internet to access information, social networks, and applications because it is far quicker and more dependable than the



already widely used 4G networks. For example, the 5G connectivity is expected to significantly enhance technology that depends on dependable, fast data connections, such as self-driving cars, sophisticated gaming apps, and live streaming media. <sup>1</sup>Data speed increases of up to 10,000 Mbps and a fast reaction time (low latency) of one millisecond or less are features of 5G cellular wireless systems that are crucial for delivering real-time interaction services like self-driving car control. With these characteristics, 5G is going to provide the digital framework for the Internet of Things (IoT), a network of billions of physical gadgets that are connected to the internet globally and that all gather and exchange knowledge.

Even as the nation was seeing a major expansion of 4G networks, China was expanding research and development to prepare for the creation of 5G systems. The IMT-2020 (5G)

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<sup>1</sup> Liu, Qian, Xiaochuan Shi, Xu Wang, and Jia Li. 2017. "5G Development in China: From Policy Strategy to User-Oriented Architecture."



Promotion Group was founded by the central government in 2013 and is based after the IMT-Advanced Promotion Group. Following this, in 2016, the Ministry of Industry and Information Technology (MIIT) formally began testing 5G technology. In June 2019, the ministry granted China Mobile, China Unicom, China Telecom, and China Radio and Television commercial licenses for 5G. Three state-owned mobile operators were granted licenses for 5G spectrum in the mid-band frequency range by the Chinese government in 2018 in anticipation of the commercial rollout of 5G services in 2020. Market leader China Mobile acquired 260 MHz of spectrum in the 2.6 GHz and 4.8 GHz bands, while China Telecom and China Unicom each received 100 MHz in the 3.5 MHz band, generally referred to as the C-band.<sup>2</sup>

As China's 5G market develops further, more connections and greater economic value will result. Because of the rapidity of network installations and the maturing device ecosystem, 5G adoption is expanding more quickly than expected. China now has over 800 million 5G mobile connections. It is projected that by the end of 2024, there will be over 1 billion 5G connections nationwide, and the percentage of 5G connections will have increased from 45% to over 50% this year.

### **China's Leadership in 5G Development**

The Chinese leadership wants to construct a new development that includes the ability to store and analyse a great deal of data using important technologies like cloud computing and artificial intelligence (AI), as well as core facilities for data collection and sharing,

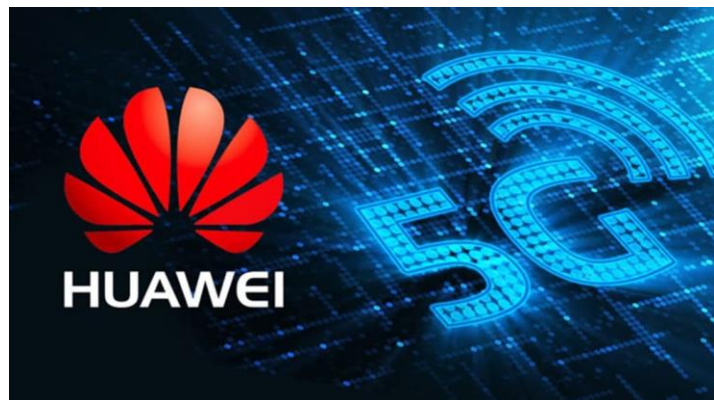
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<sup>2</sup> BARTHOLOMEW, CAROLYN. 2020. "CHINA and 5G."

such as fifth generation (5G) mobile communications networks, which are fast and widely available. The development of advanced technologies, such as 5G, was highlighted in the 13th and 14th Five-Year Plans as a key component of industrial development and economic expansion. The Made in China 2025 campaign established specific objectives for technological leadership, such as achieving self-sufficiency in vital industries like telecommunications. <sup>3</sup>Beneficial regulatory regimes, subsidies for infrastructure development, and financial support for research were all made possible by specific 5G-related legislation. The Chinese government promoted cooperation among academia, private sector leaders, and state-owned firms in order to improve innovation and expedite the deployment of 5G technologies. Public-private partnerships and other activities made sure that the nation's digital infrastructure was built in a coordinated manner. <sup>4</sup>

China promotes nations along the Belt and Road to adopt its national 5G standards.

Chinese firms ZTE, Huawei, and China Mobile are actively working on 5G technology and have stepped up their involvement in international 5G standard-setting organizations.



Leading the way in 5G worldwide, Huawei provides end-to-end solutions ranging from consumer electronics to base stations and core networks. With yearly R&D expenditures

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<sup>3</sup> TekirGökhan. 2020. "Huawei, 5G Network and Digital Geopolitics."

<sup>4</sup> Forge, Simon, and Khuong Vu. 2020. "Forming a 5G Strategy for Developing Countries: A Note for Policy Makers."



above \$20 billion in recent years, the corporation has made significant investments in this area. Modern equipment with improved efficiency, reduced energy usage, and sophisticated cybersecurity features are among its improvements. ZTE is committed to offering scalable and reasonably priced solutions. The business has collaborated with telecom providers around the world, expanding China's impact on 5G infrastructure internationally.<sup>5</sup>

Over 3 million 5G base stations have been installed in China by 2024, making up more than 60% of the global total. Strong network coverage is guaranteed in both urban and rural regions thanks to this vast infrastructure. With nearly complete 5G coverage, major cities like Beijing, Shanghai, and Shenzhen have established themselves as international centres of technological innovation. China has the world's largest 5G user base, with more than 500 million subscribers. This adoption has been sped up by the availability of reasonably priced 5G handsets made by firms like Oppo, Xiaomi, and Huawei. Adoption has been accelerated by the incorporation of 5G technology into commercial, consumer, and public sector applications.<sup>6</sup>

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<sup>5</sup> Hua, Jia, and Rajib Shaw. 2021. "5G and Its Implication to Communication in China."

<sup>6</sup> Jin, Guo, Wang Lei, Zhou Wenji, and Wei Chu. 2022. "Powering Green Digitalization: Evidence from 5 G Network Infrastructure in China."

## Global Implications of China's 5G Leadership

China has a major competitive advantage in international markets thanks to its leadership in 5G, especially in sectors like artificial intelligence, e-commerce, and smart manufacturing. Because of improved efficiency and innovation, many nations that use Chinese 5G technology see quicker economic growth in industries like transportation, healthcare, and agriculture. China's international



commerce policy heavily relies on exporting 5G technology, especially through its Belt and Road Initiative (BRI). The leadership of China in 5G signifies a dramatic change in the US and Europe's historical dominance in global technology.<sup>7</sup>

China is able to increase its influence in areas like Africa, Asia, and Latin America by using the development of 5G as a soft power tool. The U.S.-China technology competition has been more intense with the development of China's 5G networks. Trade restrictions, restrictions against Chinese firms like Huawei, and Western countries' attempts to create substitutes for Chinese 5G technology are all results of this competition. Initiatives like Open RAN and alliances like the Quad (the United States, Japan, India, and Australia) are being marketed as alternatives to China's dominance in 5G.

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<sup>7</sup> Lee, Chuan-Kai, and Limeng Yu. 2022. "A Multi-Level Perspective on 5G Transition: The China Case."



## Conclusion

China has become a global leader in telecommunications due to its quick development of 5G technology, which is changing the digital landscape globally. Significant local and international economic, scientific, and geopolitical implications have resulted from the nation's strategic concentration on 5G. China has raised the standard for 5G development by utilizing government assistance, encouraging innovation through partnerships with private sector huge companies like Huawei and ZTE, and building a strong infrastructure. In addition to promoting economic growth internally, this has had a revolutionary effect on businesses across the globe, ranging from e-commerce and artificial intelligence to smart manufacturing and healthcare. China's worldwide power is being further enhanced by the quick deployment of Chinese 5G technology in emerging countries, particularly through the Belt and Road Initiative. China is already establishing itself as a leader in 6G, the next stage of global connectivity, while it continues to lead in 5G rollout and adoption.



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