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— SPECIAL REPORT —

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**WHO WILL BEAR  
THE BANNER OF THE  
5G REVOLUTION?**

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The telecommunications industry has found itself on the verge of change stemming from the introduction of the 5G network. This simultaneously provides a range of never-before-seen opportunities and poses a threat to security, morphing into an issue that has ignited political rows around the world. States are becoming increasingly strained over divergent stances on whether Chinese telecoms companies should be involved in building the 5G wireless network.



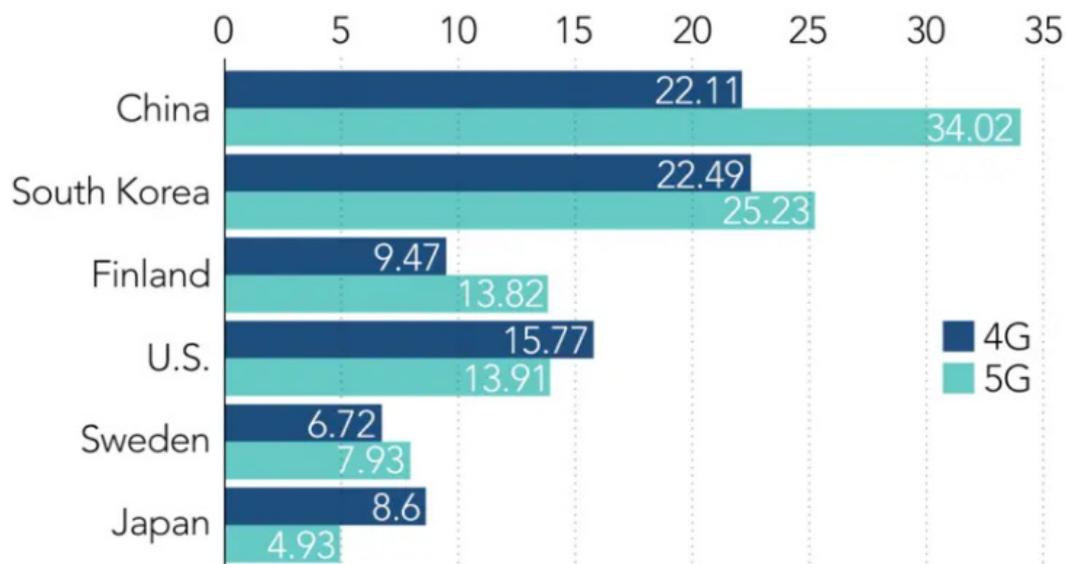
2018 CHINA MOBILE GLOBAL PARTNER CONFERENCE  
SOURCE: CHINA DAILY

## What is 5G technology?

The fifth-generation (5G) wireless network technology is poised to offer faster data downloads while putting in place a digital transformation strategy that so far has not covered many areas of human activity. The cutting-edge technology could serve up to one million connected devices per square meter. The 5G technology is likely to alter user behavior,

paving the way for transferring much larger files, connecting to better-quality streaming while enabling better communication with their fellow users. This vanguard technology will open new opportunities for business, transport, and city infrastructure, providing for greater automation and the rollout of advanced information systems. This vision that many

## Where 4G and 5G patent holders come from (in percent)



SOURCE: NIKKEI ASIAN REVIEW

policymakers dubbed somewhat alluring is well illustrated by the example of an autonomous car transporting a patient for surgery, the latter carried out by a medical robot being operated remotely by an eminent surgeon based somewhere on the other part of the world. Nevertheless, any conspiracy theories spreading health scares about the 5G mobile network should be ignored, given that back in 2009, the World Health Organization (WHO) issued an official statement on the health effect of electromagnetic radiation<sup>1</sup>. Although placing a 5G transmitter every ten homes will boost electrosmog, this has no proven impact on human health or behavior. The 5G wireless technology is set to follow suit of its predecessors, or 4G, LTE, and LTE-Advanced networks, eventually ousting earlier generations. The European Commission has adopted a plan with the objective to start launching 5G services in at least one city in every Member State by 2020, followed by coverage of all major urban areas and biggest terrestrial transport

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paths by 2025. Poland also plans to develop the 5G network. The Office of Electronic Communication, the country's telecoms regulatory authority, says that as many as four Polish cities may welcome the fifth-generation network infrastructure next year. In Poland, first pilot trials have been launched by some telecoms operators, including Exatel, Ericsson, Nokia, Orange, T-Mobile, and Play<sup>2</sup>.

[1] <https://www.who.int/peh-emf/about/WhatisEMF/en/>

[2] <http://wgospodarce.pl/informacje/68355-kiedy-kommercyjna-siec-5g-w-polsce>

## A global 5G game

The telecoms market currently sees a narrow group of entities capable of ensuring fifth-generation wireless services. China holds the lead in the number of 5G patents held worldwide, accounting for as much as 34.02 percent of them, followed by South Korea (25.23 percent), Finland (13.82 percent), the United States (13.91 percent), Sweden (7.93 percent), and Japan (4.93 percent)<sup>3</sup>. Among top actors are Scandinavia's Ericsson and Nokia, Huawei of China, South Korea's LG and Samsung, U.S. telecoms Verizon and AT&T, as well as an American telecommunications equipment company Qualcomm. Notably, U.S. suppliers recorded a gradual decline in importance to the benefit of China, first observed in the early days of this century when the U.S. telecoms industry lost steam to the advantage of the Middle Kingdom. It is noteworthy that Chinese tech vendors have contributed significantly to the 4G rollout across Europe, chiefly in Germany and the United Kingdom. It can therefore be concluded that they will continue the 5G expansion by using a foot-in-the-door technique. The Americans, for their part, will attempt to catch up on the backlog while bringing their competitors to a halt, mainly through a set of political actions that – quite importantly – might eventually prove justified if fears over adverse outcomes of cooperation with China on U.S. and allies' security seem credible. Telecoms giants from both sides of the Pacific may find it challenging to see the emerging, albeit silent competition from Scandinavian firms: Finland's Nokia and Ericsson of Sweden. As it might turn out, they could forge cooperation with South Korea's Samsung in their endeavor to deploy a 5G

network in Japan. Nokia said that it had inked 48 global fifth-generation commercial contracts<sup>4</sup>. And new alliances are being formed: Samsung teamed up with U.S.-based Qualcomm to develop advanced 5G modems<sup>5</sup>. The partnership between broadly understood Western telecoms firms might be established for purely business purposes. But it is only the involvement of Chinese companies that gives political momentum to the sector in a move that prompts security analysts to keep a close watch on Beijing-based telecoms giants' further steps. This is relevant due to the effect the fifth-generation communications network may exert on both security and social development.

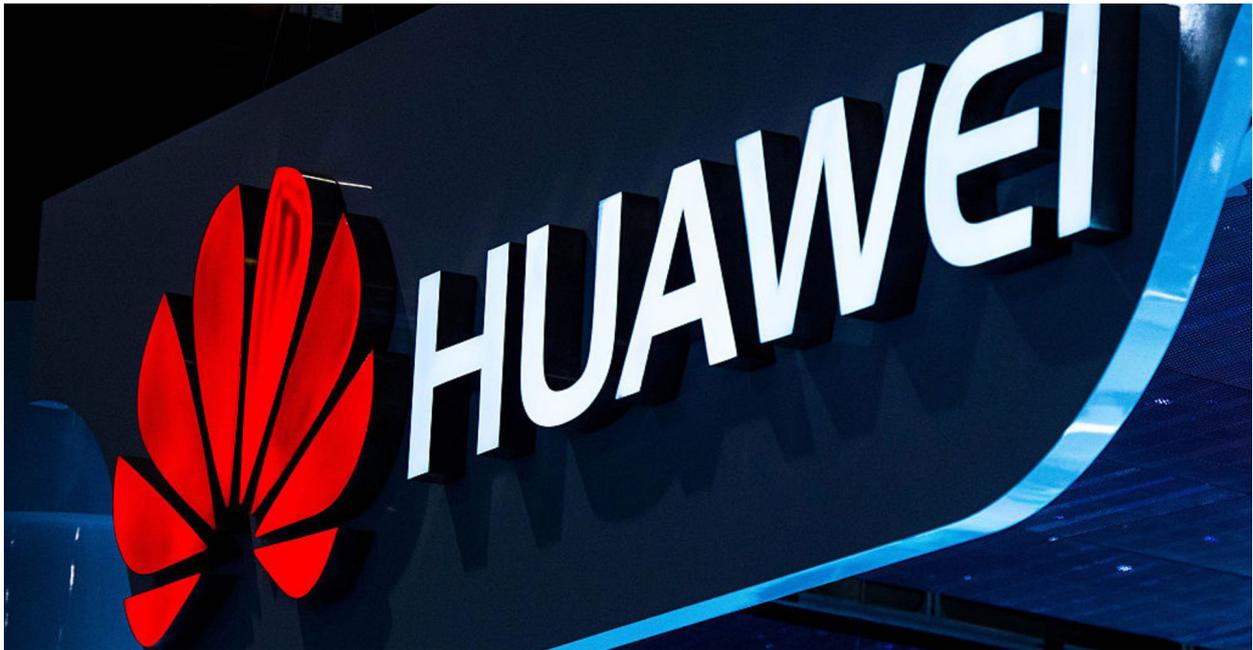
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[3] <https://asia.nikkei.com/Spotlight/5G-networks/China-in-pole-position-for-5G-era-with-a-third-of-key-patents>

[4] <https://www.telko.in/ericsson-i-nokia-zbuduja-siec-5g-dla-japonskiego-kddi>

[5] <https://www.reuters.com/article/us-qualcomm-5g/qualcomm-samsung-axis-brings-5g-to-the-masses-as-huawei-struggles-idUSKCN1VR1HT>



SOURCE: VISTACRAFT / FLICKR

## A new security reality

Due to its profound impact on human life, the 5G technology has aroused a surge of interest for the security sector that saw in the newest-generation network both fresh opportunities for development and threats to citizens and state secrets. Security experts say that once used to steal data or take control of digitally managed infrastructure, the 5G network could permit hostile entities to accomplish malicious goals. In this way, state actors will obtain data on the functioning of whole social groups whose representatives send real-time information on their behavior patterns, everyday choices, and even groceries in the fridge. As for non-state actors, they can derange intelligent transportation systems, exchange unreliable expiry dates on certain food products or contaminate water bodies. The 5G technology thus turns out to open up a new ground that until then had been reserved for foreign intelligence services and technology-related organizations. Therefore the fifth-generation

communications network should grow in a thoughtful and orderly manner, with national security watchdogs being in charge. Western representatives of the security industry frequently voice concerns over the deployment of China-made technology that might carry solutions enabling Beijing to use 5G networks to fulfill its political aims while running a possible risk to national security.

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## What's behind China-made equipment

Across the world, as well as in Europe and Poland, the debate on the 5G technology heated up after disclosing first reports on Chinese vendors allegedly utilizing the network to collect intelligence data for the Beijing government. In February 2018, FBI Director Chris Wray cautioned against buying Huawei and ZTE phones, while in May, the U.S. Pentagon banned the sale of devices from these two on U.S. military bases.

In June, the U.S. Congress called out Google - the market leader in email services, also in charge of the world's biggest search engine - over its ties with Huawei, while a leaked report showed the latter's special permissions from Facebook, the world's leading social networking website. In July 2018, Australia effectively excluded Huawei from public procurement for 5G infrastructure in the country. In October 2018, reports said that China's Huawei might have stolen technology solutions from a U.S.-based startup, CNEX Labs. In December 2019, Meng Wanzhou, Huawei's chief financial officer (CFO), was arrested in Canada and charged with industrial espionage. Still in the same month, Japan said no to China-made equipment for a 5G rollout across the country. In January 2019, President of the United States Donald Trump was reported to consider issuing an executive order banning Huawei and ZTE gear from U.S. communications networks. Also in the same period, Poland detained an employee of Huawei and a scholar at the Military University of Technology on spying allegations. In late January 2019, the United States unveiled 23 indictments against the Chinese telecom giant, accusing it of trade theft and fraud. In February, the FBI raided

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Huawei labs. The United Kingdom announced the decision to further cooperate with the Chinese equipment maker, yet saying that additional security measures need to be taken into account. Also, Poland said it would not obstruct commercial pursuits of any company. In March 2019, Huawei called for international cybersecurity security that would protect against abuse. In April this year, the CIA accused Huawei of receiving funding from Chinese security services. Though Vodafone discovered hidden spying mechanisms added to Huawei phones, the United Kingdom allowed the Chinese tech company to bid for the country's mobile network. The heated dispute over the Chinese firm's participation led to the sacking of Defense Secretary Gavin Williamson in May this year. Still in the same month, U.S. President Donald Trump issued an executive order seeing Huawei as a source of threat to national security. In June, Russia greenlighted Huawei to develop a fifth-generation communications network in the country, and two months later, in August, the U.S. Department of Commerce allowed American companies to do business with the



2019, TRUMP AND XI DURING THE G20 SUMMIT IN OSAKA.  
SOURCE: WIKIMEDIA COMMONS

Chinese telecom giant. In September, Huawei dropped a lawsuit against the U.S. government after the latter returned telecom equipment seized back in 2017, yet upholds the suit filed following Donald Trump's decree on banning Chinese technology. Though in October, Google refused to resume technological cooperation with Huawei, President Trump was reportedly ready to readmit trading Chinese gear in the United States. The discussion on China's participation in the 5G revolution sweeping through Western countries is underway and causes high excitement, especially given how the events have unfolded so far<sup>6</sup>. Interestingly, the potential participation of U.S. and Scandinavian firms seems to stir up far less powerful emotions. Poland is considering inking a deal with Sweden's Ericsson, and it has already signed an agreement with

**Poland is considering inking a deal with Sweden's Ericsson, and it has already signed an agreement with the United States that obliged it to cooperate only with trusted and reliable 5G equipment suppliers. The accord was intended to serve as a model and warning for European nations that take into account getting technology from „unreliable” sources, which are by default Chinese.**

[6] <https://www.cnet.com/news/huawei-ban-full-timeline-struggling-without-google-support-trump-ban-mate-30-threat-china/>

the United States that obliged it to cooperate only with trusted and reliable 5G equipment suppliers<sup>7</sup>. Poland's Prime Minister Mateusz Morawiecki and U.S. Vice-President Mike Pence signed a relevant accord on the matter, a document intended to serve as a model and

warning for European nations that take into account getting technology from „unreliable” sources, which are by default Chinese. Despite this, Poland has not officially ruled out its cooperation with any telecoms company.

## 5G: a tool for influence?

There are at least two reasons behind a lively debate over China's participation in the 5G rollout, the first of which is seemingly more trivial and somewhat simplistic. The U.S.-Chinese mounting political and economic rivalry makes these two involved in some economic spats like a trade war. The current 5G drama may be just a splinter of the competition between Washington and Beijing. In this light, any U.S. intelligence actions taken to turn Washington's allies against Chinese vendors appears to be an attempt to narrow down the Middle Kingdom's influence in the U.S.-dominated Western world. Such an interpretation would deem acceptable if it were not for the fact that the Americans allowed for China's encroachment into their backyard, and its lasting objection toward Huawei likely may seem part of Washington's talks with Beijing to achieve an explicit goal of Trump administration's foreign policy, which is a new trade deal with China. Viewing the row over Chinese telecom firms and 5G as a geopolitical dispute seems unjustified when compared to publicly available data on actual security doubts around China-made fifth-generation communications gear. Chinese law on national intelligence requires privately held companies, of which Huawei and ZTE are examples, to cooperate unconditionally with Chinese intelligence

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agencies. And the very concept of „a private company” has a different flavor than it has in the West. Local companies are subject - either directly or indirectly - to a system of Chinese Communist Party control and cannot operate outside Beijing's political umbrella. And even those entities listed on the stock exchanges de facto represent the Chinese regime abroad. In its numerous analyzes, prominent research centers like Avast Threat Labs or Kryptowire disclosed a set of vulnerabilities in Huawei and ZTE software allowing uncontrollable data flow to China<sup>8</sup>. On October 9, 2019, the European Commission released a report Report on the EU coordinated risk assessment on cybersecurity in Fifth Generation networks,

[7] <http://wyborcza.pl/7,156282,25147755,jest-polsko-amerykanska-umowa-w-sprawie-5g-czy-zablokujemy.html?disableRedirects=true>

[8] <https://www.cyberscoop.com/android-malware-china-huawei-zte-kryptowire-blu-products/>



INSTALLING VODAFONE'S 5G INFRASTRUCTURE IN GERMANY  
SOURCE: WIKIMEDIA COMMONS

implying that state-run or state-backed companies might pose the greatest possible threat in the 5G area and urging the Member States to launch risk assessment procedures before installing any network-related equipment<sup>9</sup>. Telecoms market analysts say that these are China-based companies that<sup>10</sup> could not be named openly for political reasons. Such restrictions make even the world's most optimistic governments forge 5G cooperation with China only under upon proper security guarantees.

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[9] [https://europa.eu/rapid/press-release\\_IP-19-6049\\_en.htm](https://europa.eu/rapid/press-release_IP-19-6049_en.htm)

[10] <https://biznesalert.pl/unia-europejska-%E2%80%8B%E2%80%8Bostrzega-przed-korzystaniem-z-sieci-5g-od-huawei/>

## A 5G game goes on

All in all, 5G technology has given rise to tempting prospects for both economy and social development. Its rollout is likely to lead to the proliferation of the fifth-generation network devices all over the world. There are many companies on the market being capable of providing the technology needed to advance 5G services across Europe, albeit under the recommendations of the European Commission. Nonetheless, any government must listen to the arguments put forward by security analysts who caution against some vendors. This should by no means exclude that an open tender will be held for 5G buildout, with a set of requirements being put in place, where the best technology will prevail, allowing the fifth-generation revolution to roll out securely. Therefore it is plausible to conceive the following two extreme solutions.

What would be seen as dramatically disadvantageous for China-made technologies that have already come under harsh criticism from the West could be sanctions similar to those that U.S. President Donald Trump wanted to impose on Huawei. Once in force, these punitive measures would ban the use of the Chinese telecoms' gear in Western countries, also those holding close ties to the countries of the „Five Eyes” intelligence alliance: the United States, Australia, Canada, New Zealand, and the United Kingdom. The question is yet whether the EU Member States would follow suit as these show a somewhat ambivalent stance, an example of which is Germany that expresses concerns over security matters while not excluding China's participation in the

fifth-generation revolution. Under the best-case scenario for China, its telecoms companies will be given the go-ahead to build the 5G infrastructure in the West, albeit after fulfilling a series of formal security restrictions. It is possible to imagine that China's cooperation with mainland Europe will manifest the latter's independence of the United States, as was the case with how Austrian and German diplomacy interpreted the involvement in the construction of the Nord Stream 2 gas pipeline. Back then, Berlin and Vienna scoffed at the U.S. attempts to dissuade them from pursuing the much-debated energy project with Russia through a firm diplomatic response<sup>11</sup>. Though the discussion on the 5G technology has taken on outsized political significance, any potential

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**Therefore it is plausible to conceive the following two extreme solutions. First, the United States might impose sanctions banning the use of China-made tech equipment for the 5G buildout in Western countries. Secondly, Chinese firms could be allowed to build the 5G infrastructure after fulfilling a series of formal security restrictions.**

[11] <https://www.euronews.com/2019/01/13/us-threatens-sanctions-on-german-firms-building-nord-stream-2-gas-pipeline>

decision on including companies into the newest-generation buildout should not be taken without prior insight into objective concerns raised by the security sector. If any equipment contains spyware, it should be removed from the country's 5G infrastructure or at least from its use in strategic fields. ■

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The report was prepared in cooperation with the BiznesAlert.pl portal.

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