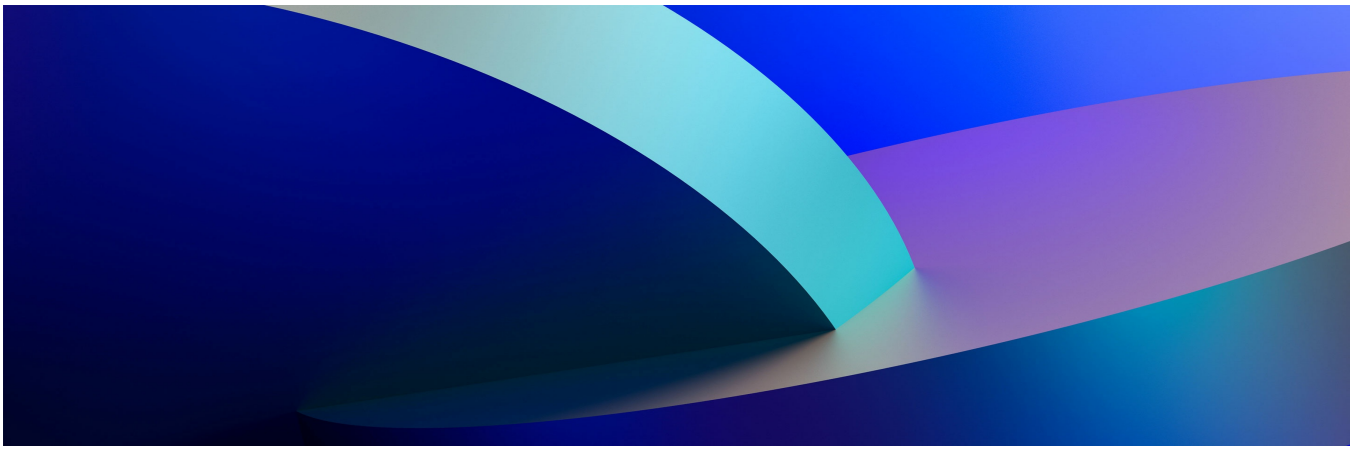

5G regulation and law in Germany

1. What is the state of 5G deployment in your country, and specifically of the deployment of standalone (SA) 5G networks?

Vodafone GmbH was the first to launch 5G in 2019, followed by Telekom Deutschland GmbH, Telefónica Germany GmbH & Co. OHG and 1&1 Mobilfunk.

According to surveys by the Federal Network Agency (BNetzA), 105.4 million SIM profiles were actively in use at the end of 2023. SIM profiles for machine-to-machine (M2M) data communication are not included in this figure. Statistically, this means that there are about 1.2 SIM profiles for each inhabitant. Only those SIM profiles that have been used for communication or for which a bill has been issued in the last three months are included in the count of actively used SIM profiles.

Distribution of SIM profiles among network operators and service providers/MVNOs remained constant at the end of 2023 compared to the previous year. Network operators, including their subsidiaries and group-owned service providers and distribution partnerships, accounted for 77% of SIM profiles (81.0 million) and service providers/MVNOs for 23% (24.5 million). By contrast, there was another change of two percentage points in the types of contracts from SIM profiles with prepaid tariffs to SIM profiles with postpaid tariffs. This means that 71% (75.0 million) of the SIM profiles at the end of 2023 were postpaid contracts and 29% (30.5 million) were prepaid contracts. The number of SIM profiles used for M2M amount to 62.8 million at the end of 2023, an increase of around eight % compared to the previous year (58.3 million).

In the 5G networks in Germany, 88.2 million of the actively used SIM profiles were in use at the end of 2023. The number of mobile subscriptions rose by more than 18% year-on-year. Of these, 19.7 million end customers use 5G non-Standalone (NSA). This means that the connection is established via a 4G/5G access network and the traffic is processed via a 4G core network.

When it comes to expanding mobile networks, radio base stations are most important. According to information network operators provided to BNetzA, the number of these interfaces between wireless and wired networks is expected to increase by around six% year-on-year to 214,677 by the end of 2023, mainly due to the expansion of 5G networks. The number of LTE base stations in operation increased by three % to 87,905. The number of 5G base stations rose by 18% from 41,945 at the end of 2022 to 49,571 at the end of 2023. (source: BNetzA’s annual report 2023, pages 21 et seq. and 26).

5G SA is available in all four 5G networks in Germany.

2. What is being done to ensure that a wide range of operators and industrial companies, from small to large, have access to frequencies?

Since 2019, the German Federal Network Agency allocated frequencies in the 3.7 to 3.8 GHz for local 5G purposes based on individual applications and later also in 26 GHz bands. Those so-called “campus networks” are local, property-related networks for realizing internal company telecommunications. They can be implemented in both frequency ranges. 5G technology offers new possibilities, especially for moving applications such as autonomous driving. The frequencies are also accessible to stadiums, airports and other special premises. There is no obligation for nationwide spectrum holders to enter into a national roaming agreement with local 5G network operators.

3. What public tenders have awarded spectrum licences?

The 5G spectrum auction (2 GHz and 3.6 GHz) started on 19 March 2019 and ended on 12 June 2019 after 52 days and 497 rounds of bidding. The bidders paid more than EUR 6.5bn (USD 6.83bn) in total, and 420 MHz of spectrum was awarded.

3.1 What were the criteria for awarding each of the tenders?

BNetzA published the award criteria prior to the tender. According to the 2019 5G award conditions and auction rules:

- Eligibility to participate was not restricted.
- Each company could only be admitted once. This also applied to approvals within consortia.
- Applicants were entitled to claim an individual minimum requirement for frequencies in accordance with their respective business models in the licence application (so-called essential minimum equipment). If an essential minimum requirement was claimed and the frequency requirement was undercut during the auction by an active bidder, that bidder would be excluded from the entire auction procedure. If an essential minimum configuration was claimed, it had to be described accordingly in the frequency usage plan.
- In the notice of admission, BNetzA specified the respective bidding rights as well as the essential minimum equipment granted. This specification of the essential minimum equipment was binding for the auction.
- Every applicant had to demonstrate reliability, expertise and performance to operate a public telecommunications network and describe how it would ensure efficient and interference-free frequency usage and how it would fulfill coverage obligations.

3.2 What are the conditions of the spectrum licence?

The spectrum has been allocated for the period until 31 December 2040. The conditions of the spectrum licences contain several coverage obligations:

Coverage of population and minimum quantity of base stations (by the end of 2022):

- Coverage of population
- At least 98% of households in each federal state must have at least 100 Mbit/s (downlink per antenna sector)
- Minimum number of base stations
- 1,000 5G base stations and
- 500 base stations with at least 100 Mbit/s in white spots to be put into operation.

Coverage requirements for transport routes: Coverage of other mobile network operators will be taken

into account.

By the end of 2022:

- All federal motorways (approximately 18,000km) with a minimum speed of 100 Mbit/s and a maximum speed of 10 milliseconds (ms) latency,
- Federal roads (with specific connecting functions; approximately 5,350km) with at least 100 Mbit/s and at most 10 ms latency,
- Railways with more than 2,000 passengers per day (approximately 21,000km) with a minimum of 100 Mbit/s, and

By the end of 2024:

- All other federal highways (approximately 32,700km) with a minimum speed of 100 Mbit/s and a maximum speed of 10 ms latency
- All national and state roads (approximately 80,000km) with at least 50 Mbit/s
- TSeaports and the core inland waterway network (approximately 4,500km) with at least 50 Mbit/s and
- all other railways (approximately 20,000km) with at least 50 Mbit/s.

NNewcomer Drillisch Netz AG (1&1) is subject to different coverage conditions:

- At least 25% of households by the end of 2023, and
- At least 50% of households by the end of 2025.

In the end of 2024, the Federal Network Agency published its intention that the frequency usage rights that expire at the end of 2025 (frequencies in the 800 MHz, 1,800 MHz and 2,600 MHz ranges) are to be extended by five years. The aim is to align the terms of these usage rights with usage rights that expire later. In addition, market developments can be included in a later procedure. A larger allocation framework offers companies more opportunities to gain access to frequency spectrum. The extension of the usage rights is to be accompanied by requirements for the further expansion of mobile networks. In addition, the Federal Network Agency intends to attach provisions to promote competition when it extends the usage rights. The public hearing took place on 9 January 2025. The corresponding decision is to be made in the next few months.

3.3 What is the price and how is it calculated?

These are the prices paid during the public 5G award process in 2019.

Drillisch Netz AG	2 GHz: 2 x 10 MHz 3,6 GHz: 50 MHz	EUR 334,997,000 (USD 352m) EUR 735,190,000 (USD772.5m) total: EUR 1,070,187,000 (USD 1.124m)
Telefónica Germany GmbH & Co. OHG	2 GHz: 2 x 10 MHz 3,6 GHz: 70 MHz	EUR 381,104,000 (USD 400.5m) EUR 1,043,728,000 (USD .092m) total: EUR 1,424,832,000 (USD 1.5m)
Telekom Deutschland GmbH	2 GHz: 2 x 20 MHz 3,6 GHz: 90 MHz	EUR 851,520,000 (USD 895m) EUR 1,323,423,000 (USD 1.39m) total: EUR 2,174,943,000 (USD 2.29bn)
Vodafone GmbH	2 GHz: 2 x 20 MHz 3,6 GHz: 90 MHz	EUR 806,501,000 (USD 847,000) EUR 1,073,188,000 (USD 1.12bn) total: EUR 1,879,689,000 (USD 1.97bn)

3.4 Have there been any issues with the implementation of the 5G projects. Have there been any decisions regarding non-compliance with 5G concessionobligations?

On 26 August 2024, the Cologne Administrative Court ruled on the BNetzA Presidential Chamber decision of 26 November 2018 on allocation and auction rules for the auction held in 2019 of the frequencies in the 2 GHz and 3.6 GHz ranges, which are particularly suitable for 5G mobile communications, that the allocation rules of the Presidential Chamber decision were unlawful. BNetzA was ordered to issue a new decision (1 K 1281/22 (formerly 9 K 8489/18) and 1 K 8531/18).

The plaintiffs in this case are complying with this requirement to negotiate. In its judgment of 3 July 2019, the Cologne Administrative Court had initially dismissed the one service provider’s action as inadmissible (case reference: 9 K 8489/18). In its judgement of 21 October 2021 (case reference: 6 C 8.20), the Federal Administrative Court partially set aside the decision and referred it back to the Cologne Administrative Court. In this regard, the Federal Administrative Court stated that it should be clarified whether there was any cause for concern regarding bias with regard to the Presidential Chamber, whether there had been any infringement of BNetzA’s independence as the national regulatory authority, as guaranteed under EU law, and whether the Presidential Chamber's deliberations had been flawed from the point of view of a de facto prior determination. There are indications that the Federal Ministry of Transport and Digital Infrastructure (BMVI) had tried to exert considerable influence, in particular on the definition of the coverage obligations. Further clarification of the facts was needed in this regard. In particular, it had to be clarified how the Presidential Chamber had reacted to the political pressure.

On 14 May 2018, the BNetz APresidential Chamber ordered an allocation procedure for the frequencies mentioned and decided that this should be carried out as an auction procedure (BK1-17/001, Parts I and II). On 26 November 2018, the Presidential Chamber issued the challenged decision on the procurement and auction rules (BK1-17/001, Part III and IV) in the present proceedings. These allocation rules in the decision of the Presidential Chamber of 26 November 2018 include, among other things, the frequency usage provisions for the subsequent assignment holders. These include, for example, specific coverage obligations for households and traffic routes, as well as a service provider regulation. This obliges the subsequent assignment holders to negotiate with service providers without their own network infrastructure on shared use of radio capacities.

The service providers bringing the action here consider this requirement to negotiate to be insufficient. They already applied for a so-called service provider obligation in the proceedings before the Presidential Chamber. They pursued these applications with their actions brought in December 2018. They based their actions on serious procedural and balancing errors in the decision of the Presidential Chamber. In particular, the proceedings had been unlawfully influenced by BMV) under the direction of then Federal Minister Scheuer. This was apparent from the administrative proceedings of BMVI, the Federal Ministry for Economic Affairs and Climate Protection and the Federal Chancellery, which the plaintiffs had obtained after successful administrative court proceedings before the Berlin Administrative Court based on the Freedom of Information Act (source: Cologne Administrative Court press release dated 27 August 2024 - https://www.vg-koeln.nrw.de/behoerde/presse/Pressemitteilungen/17_27082024/index.php(on available in the German language).

4. Is there a long-term spectrum plan or announcements for future tenders?

Yes. BNetzA regularly publishes strategy and position papers for future tenders. At the end of 2022, the Federal Network Agency published a position paper on the provision of frequencies in the 800 MHz, 1,800 MHz and 2,600 MHz ranges for the expansion of digital infrastructures.

5. If 5G specific rules are drafted, what do they say?

Besides the award rules for nationwide 5G spectrum, published on 26 November 2018, and the rules for local 5G frequencies, no 5G specific rules have been drafted.

6. Are 5G network sharing or spectrum sharing agreements in place? Is there any focused 5G network or spectrum sharing regulation?

In August 2024, Vodafone and 1&1 launched a national mobile communications roaming partnership in. The two network operators had already reached a binding preliminary agreement the previous year to work together from the summer of 2024. From 29 August 2024, new 1&1 customers will also be able to use the Vodafone mobile network with their smartphones.

Until now, 1&1 customers' smartphones logged ointo the Telefónica Germany network. Due to restrictions imposed in connection with the merger of Telefónica Germany and E-Plus, Telefónica Germany had to cede a certain network capacity to competitor 1&1 (at that time Drillisch). This transfer had to be converted into a national roaming agreement when 1&1 entered the market as a network operator, which the companies concluded in 2021. The national roaming agreement between Telefónica Germany and 1&1 will remain in place until mid-2025.

7. What are or will be the rules for granting competitors access to new 5G networks once they are deployed?

5G mobile network operators must negotiate among themselves when it comes to sharing existing nationwide networks.

The 2019 award rules for nationwide 5G spectrum do not contain a so-called service provider obligation. That means that 5G mobile network operators are not obliged to sign access agreements with service providers unless ordered to do so by the Federal Network Agency.

8. What comments have been made regarding 5G cybersecurity and possible use of Chinese technology, including regulation?

On 11 July 2024, the Federal Ministry of the Interior announced that it had conducted individual negotiations with mobile network operators Deutsche Telekom, Vodafone and Telefónica on behalf of the Federal Government and concluded a public law contract with these mobile network operators regarding their mobile network operations in Germany. Pursuant to the Federal Ministry press release, ”the contracts obligate the mobile network operators to stop using all critical components made by Huawei and ZTE in their 5G core networks by the end of 2026. The operators are also required to replace the critical functions of Huawei’s and ZTE’s 5G network management systems in 5G mobile network access and transport networks with technical solutions of other manufacturers by the end of 2029” (see: https://www.bmi.bund.de/SharedDocs/pressemitteilungen/EN/2024/07/5g-en.html).

9. Is there any project regarding 6G in your jurisdiction?

No.

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