

Connectivity for a European Gigabit Society - Brochure

This brochure gives the current state of play of connectivity in the EU and the vision for the next decade. It gives statistics on broadband coverage, a short overview on telecom markets, presents broadband financing programmes and projects, describes the telecom rules and the steps towards 5G.



EU 2025 Connectivity objectives

The EU set ambitious connectivity objectives for 2025:

- 100 Mbps networks reaching all European households by 2025, with the possibility to upgrade those networks to reach much higher speeds
- Gigabit connectivity connecting all main socio-economic drivers - such as schools, universities, research centers, transport hubs, hospitals, public administrations, and enterprises relying on digital technologies - should have access to gigabit connectivity
- Uninterrupted 5G coverage should be available in all urban areas and all major terrestrial transport paths to connect people and objects
- Access to mobile data connectivity everywhere, in all places where people live, work, travel and gather.

Advanced connectivity means faster data-sharing:

Download 20 Mbps 2025-Fibre to the home networks: 0.4 Gbps

CT scan

14 minutes

40 seconds

Virtual reality game

34 minutes

102 seconds

Top smartphone storage

3.6 hours

11 minutes

4K movie

11 hours

33 minutes

Medium-sized corporate server restore

28 days

33 hours

Human genome

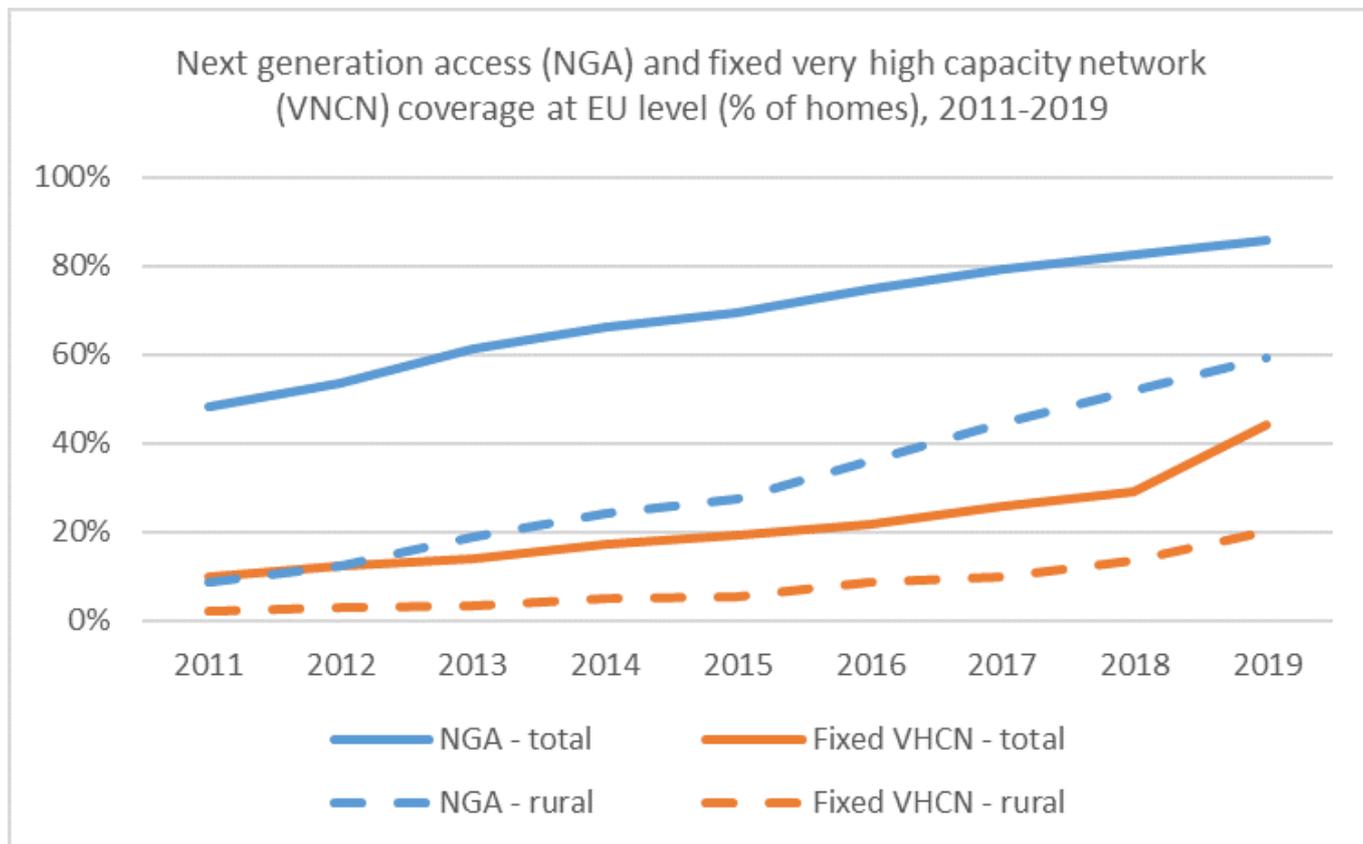
33 days

39 hours

State of Play

A lot of work on connectivity is still ahead. In 2019, in the EU:

- 99% of households were covered by at least one 4G mobile operator in Europe
- All EU households had access to broadband and 86% of EU households to a fast broadband connection of at least 30 Mbps.
- More than half of the European households were not covered with very high capacity networks (44% of the households in July 2019), and the coverage with FTTP was even lower than 34%.
- There were important differences between EU Member States, as well as between urban and rural areas.
- In rural areas:
 - 4G coverage went up from 38% in 2014 to 98% in 2019
 - Only 59% of households had access to a fast broadband connection of at least 30 Mbps.
 - Coverage of households with very high capacity networks reached only 20% of the households, while a poor 18% of the households were covered by FTTP.



Telecom markets

European telecom markets are mature and ensure high levels of competition. While operator revenues have remained stable over the most recent years, the quality and coverage of networks has continued to increase. Prices of at least 100 Mbps bundles (fixed broadband, fixed voice and television) decreased by 35% between 2014 and 2019.

EU actions guarantee competitiveness in the telecom markets

- The regulation of wholesale broadband markets has encouraged operators to compete to invest in high capacity networks. This ensures more EU citizens have access to high-speed internet services at affordable prices.
- National telecoms regulators consult with the Commission, and with each other, on their plans to regulate telecoms markets in advance.
- The Commission aims at regulating only those markets that would not be effectively competitive without such intervention.

Since 2003, the Commission has analyzed over 2,000 draft regulatory decisions, providing guidance to national regulatory authorities (NRAs) and ensuring harmonization of regulatory approaches. The Commission works closely with the Body of European Regulators of Electronic Communications (BEREC), and in some cases, after receiving BEREC's opinion, the Commission has blocked measures which were either not compatible with Union laws, or would create a barrier to internal market. Over the years, with the progressing development of competitive markets, the sector specific regulation was significantly rolled back. Since December 2020, only 2 wholesale markets are still considered to be susceptible to ex ante regulation at EU level, according to the updated Recommendation on relevant markets. The number of such markets went down from 18 in 2003, to 7 in 2007, and 5 in 2014.

New telecom rules

The European Electronic Communications Code (EECC or 'the Code') and the BEREC Regulation entered into force on 20 December 2018. The Code should have been transposed into national law by 21 December 2020. The new EU telecom rules will make it easier to invest in secure high capacity networks that will change the way we live, work and travel. They will notably:

- facilitate the roll-out of new, very high capacity fixed and wireless networks, including through co-investment and infrastructure sharing by competing players
- promote competition, including efficient infrastructure-based competition
- benefit and protect consumers, irrespective of whether they communicate through traditional calls or SMS, or web-based services such as Skype, WhatsApp, etc.
- enhance coordination in radio spectrum management at Union and national level

Steps towards 5G

5G will be one of the most critical building blocks of our digital economy and society in the next decade.

The deployment of 5G is expected to generate € 213 billion in revenues worldwide in 2025 and could lead to € 113 billion in benefits per year across the health, energy, transport and automotive sectors

- Doctors could operate remotely or closely monitor patients at home
- Cities could turn to intelligent energy consumption or traffic lights based on real-time needs
- Factories of the future would have interconnected machines, robots, automated processes, goods, remote workers in real time
- We could have connected cars driving on European roads

Radio spectrum management

The deployment of 5G requires the timely availability of harmonised radio spectrum, or the use of the same frequency bands for 5G across the EU. The Commission has adopted harmonisation decisions for the EU-wide availability of three 5G 'pioneer' bands, which are intended for use with initial 5G deployments. These are:

- 700 MHz band (to give wide territorial coverage, including in rural areas);
- 3.4-3.8 GHz band (to give higher data capacity with moderate reach);
- 26 GHz band (for very high capacity in dense areas, such as cities or factories).

The Member States should authorise the use of these three bands (with some limited exceptions) by the end of 2020. This will ensure access to appropriate spectrum for providers of innovative 5G services. Furthermore, the Commission will update the technical conditions for use of all EU-harmonised mobile bands to make them "5G-ready" by the end 2021 as well as harmonise more mm-wave spectrum.

Facilitating the roll-out of 5G networks

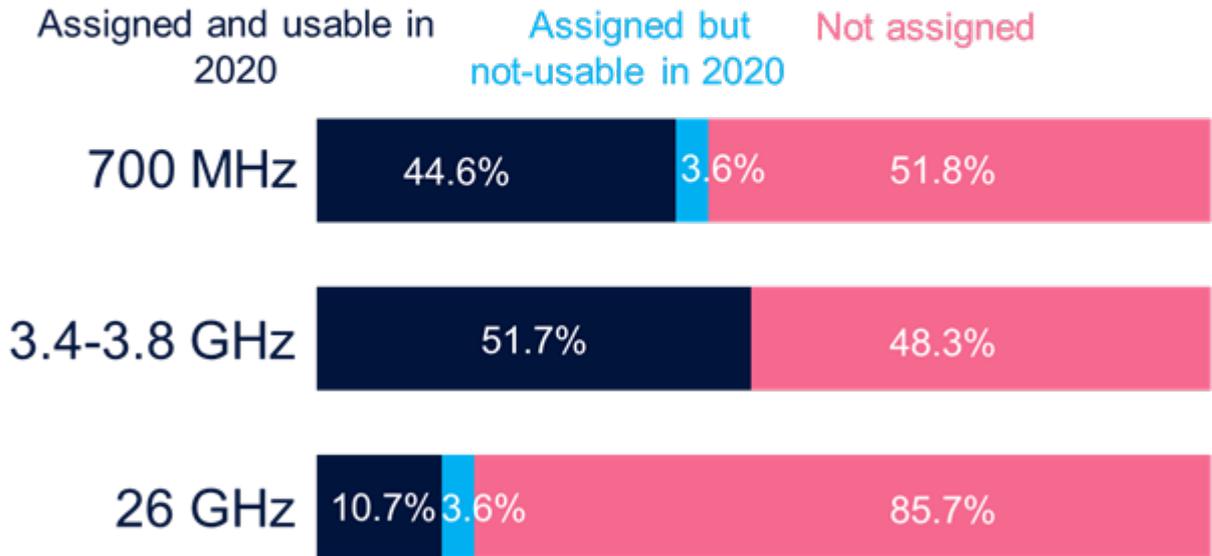
Deployment of 5G networks already benefits from the EU's Broadband Cost Reduction Directive, which simplifies and speeds up permit-granting. From mid-2020, the Code will require Member States to allow the deployment of low-power small antenna systems, as stipulated by the **Commission Implementing Regulation**, without making them subject to any individual town planning permit or other individual prior permits. These small antenna systems are essential to increase the data capacity of 5G networks where it is needed most, such as in dense urban areas.

5G state of play

The amount of spectrum assigned for 5G remains at a low level and only 13 out of the 27 Member States have published national 5G roadmaps.

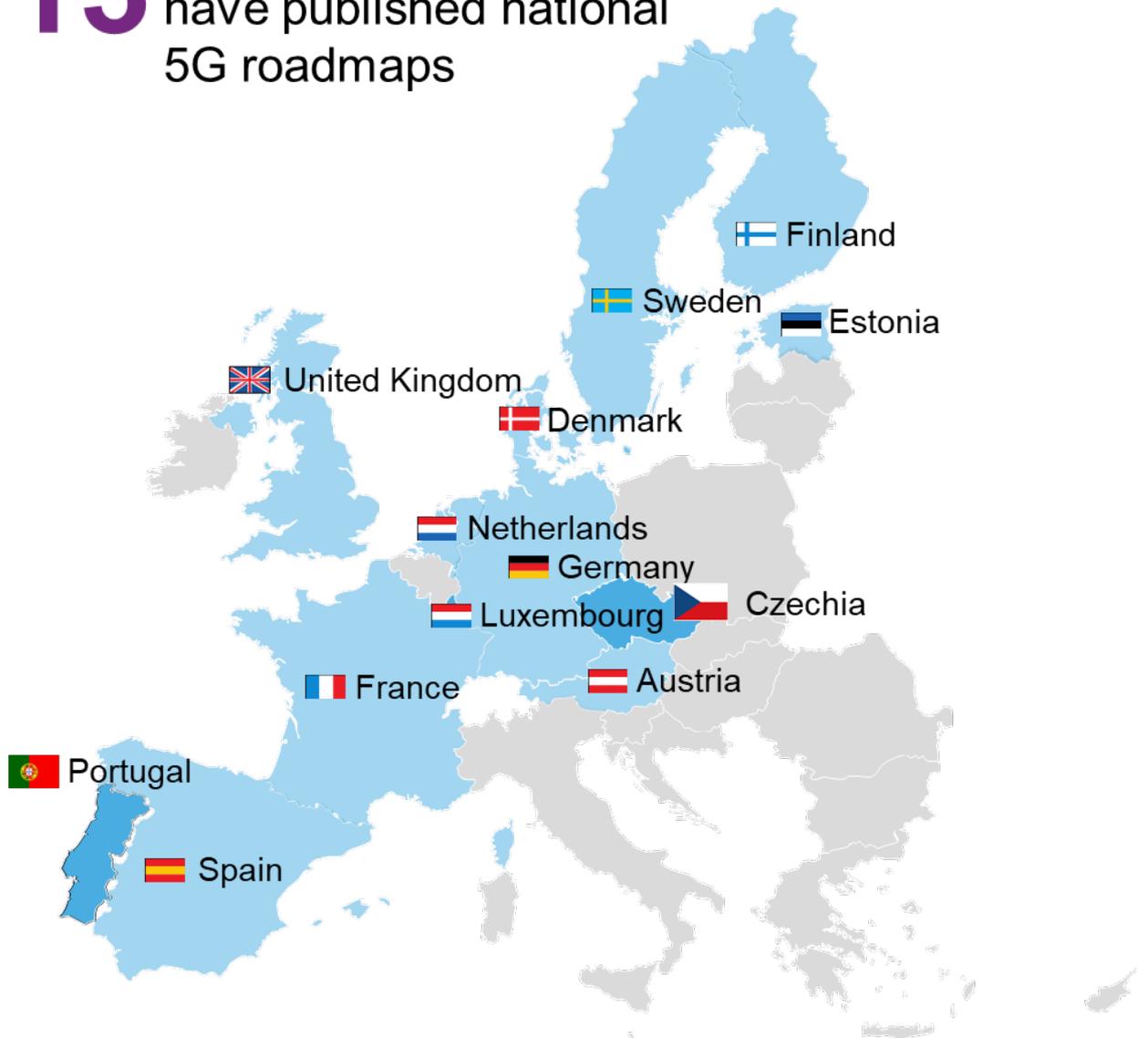
35.7% 5G spectrum assigned throughout the EU-27 plus the UK*

5G pioneer spectrum



* represents the total amount of spectrum assigned in all 27 Member States and in the UK. The figure is expected to increase following the recently updated EU telecom rules.

13 Member States + UK have published national 5G roadmaps



Connectivity toolbox Recommendation

The Recommendation invites Member States to cooperate and develop a common Union Toolbox of best practices by 30 March 2021 with regard to two key areas: reducing the cost of network deployment and giving access to 5G radio spectrum. On 17 December 2020, Member States agreed **a compilation report of best practices**, which identifies main trends and provides examples of the reported best practices from national experience, as the first step towards agreeing the Toolbox. The Toolbox of best practices will help Member States reach the Gigabit connectivity goals by 2025 and support the objectives of the European Electronic Communications Code. The implementation of the Toolbox can contribute to the Member States' preparation of their intended reforms in the context of the recovery and resilience plans in the area of digital, to which 20% of the funds have to be allocated.

EU support to bridge the connectivity divide

Telecom operators are the main driver in the deployment and upgrade of broadband networks. However, commercial investment generally focuses on the more profitable areas where potential demand is higher and concentrated. In certain areas, especially rural zones, public financial support may be necessary to ensure that no European is left behind. The EU financially supports Member States and private investors, using several instruments to correct imbalances in EU countries. For the period of 2021-2027, the Commission has included broadband infrastructures among the areas where national and regional authorities can invest in very high capacity networks with support from the European Structure and Investments Funds. In addition, the Commission proposes to continue supporting the EIB lending activity for broadband networks through the Invest EU Programme.

The Connecting Europe Broadband Fund

The **Connecting Europe Broadband Fund** (CEBF), is a key instrument for broadband, established under the CEF Equity Instrument with support from the European Fund for Strategic Investment (EFSI). To date, the CEBF has invested in seven very-high capacity network projects in rural and semi-rural across Europe, representing total commitments of up to €183 million. Nine other projects are already in the works, representing a total of up to €255 million of possible commitments. It raised EUR 420 million at first closing through commitments from the European Commission, as well as the EIB, three national promotional banks, and one private investor. A second closing took place in July 2020, with two new private investors joining in for EUR 50 million additional commitments. The fund is on track to raise funds from private investors to reach the EUR 550-600 million on final close, which is to be held before June 2021.

WiFi4EU

In the period of 2018-2020, more than 8.800 vouchers have been awarded through the **WiFi4EU Programme** with a budget of €130 million. A voucher of €15,000 is granted to municipalities to install free public Wi-Fi in parks, squares, public buildings, libraries, health centres, and museums throughout Europe. The network installations are steadily increasing, reaching 4.000 in the first quarter of 2021.

For the period of 2021-2027, building on its success, the European Commission is proposing to evolve the WiFi4EU initiative into a new programme that aims to deploy 5G systems to support innovative use cases in future “5G communities”.

The new Connecting Europe Facility programme 2021-2027

The new Connecting Europe Facility (CEF2 Digital) will fund very high capacity networks including 5G. CEF2 Digital will provide connectivity to ensure that the digital services and capabilities funded by the Digital Europe Programme are widely accessible across Europe, such as supercomputing and artificial intelligence. The Budget proposed by the Commission amounts to €2 billion. CEF2 Digital will provide funding for:

- 5G corridors along transport paths, including for connected and automated mobility.
- Gigabit connections for socio-economic drivers and 5G-ready communities: educational and medical centers; public buildings; business parks; households in surrounding areas.
- Key backbone connectivity networks of strategic importance, such as: submarine cables; terabit-capacity connections for high performance computing; cross-border interconnections of

European cloud infrastructures of strategic importance.

Connectivity for Recovery and Resilience - Digital Decade

The COVID-19 crisis and the ensuing prolonged lockdowns underlined the fundamental value of high quality internet connections at home, not only for continuing economic activities, but also for social, educational and cultural purposes, as well as for access to public service. The crisis also exposed the gap between the connected and the unconnected, exacerbating pre-existing inequalities.

President von der Leyen proposed and the Council agreed that 20% of the Recovery and Resilience Facility will be invested in the digital transition. Connectivity was identified as one of the 4 digital flagships to pool resources and scale up digital capacities. The objective is to ensure comprehensive 5G and fibre coverage, including large-scale deployment of 5G corridors and smart traffic management systems along transport pathways, and to enable universal and affordable access to Gigabit connectivity in all urban and rural areas.

To achieve these goals, we urgently need to:

- Invest in future-proof infrastructures (fibre and 5G), connect digital capacities (data, cloud, HPC...) and enable innovation and new business models for the digital sector.
- Accelerate reforms such as the necessary assignment of 5G radio spectrum, remove unnecessary administrative hurdles, streamline permit granting procedures and fees as well as facilitate access to physical infrastructure, boost know-how as well as digital planning tools to minimise the environmental impact of the infrastructure projects, as well as increase the number of qualified professionals.

The Digital strand of the national investments under the Recovery and Resilience Facility (20% of the whole RRF envelope) coupled with the new Connecting Europe Facility (CEF Digital) will accelerate the deployment of 5G and fibre connectivity. Whereas RRF investments should be used to fill in a significant portion of the EUR 42 billion investment gap to achieve the 2025 Gigabit Society goals, the EUR 2 billion of CEF Digital will focus on pan-European infrastructures and stimulating deployment and take up of 5G (including in local communities). RRF and national funding should be used to bring fibre connectivity to every city and village in areas where no such networks exists.

Coming up for Connectivity

In her State of the Union speech 2020, President von der Leyen stressed the need for “a common plan for digital Europe ... with defined goals for 2030... clear principles....”. The European Council of October 2020 further confirmed such needs and invited the Commission to present, by March 2021, a comprehensive Digital Compass which sets out the EU’s concrete digital ambitions for 2030.

Such a Digital Compass should establish a monitoring system for European strategic digital capacities and capabilities, and outline the means and key milestones to achieve our ambitions.

The European Commission will therefore present a Communication on a Europe’s digital decade and 2030 digital targets with an envisaged publication in March 2021. It would help setting out a “European way” for digital transformation and propose digital principles to strengthen the recognition and protection of human rights online. The Communication will build on the ‘Shaping Europe’s digital future’, the Data Strategy, the New industrial policy, the White paper on AI, the Recovery Plan for Europe and the Recovery and Resilience Facility.

Related topics

5G

Article 7

Broadband Competence Offices Network

Broadband Europe
Connecting Europe Facility
Improving connectivity and access
Investing in network and technologies
Telecom laws
Wireless Europe

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