5G

5G is the critical new generation network technology that will enable innovation and support the digital transformation.

© European Commission - 5G for Europe: from fixed and mobile to transport corridors and campuses fix-empty

5G provides virtually universal, ultra-high bandwidth, and low latency "connectivity" not only to individual users but also to connected objects. It is expected to serve a wide range of applications and sectors including professional uses. For example, connected automated mobility, eHealth, energy management, possibly safety applications, and more.

5G will also be a key enabler of artificial intelligence systems, as it will provide real-time data collection and analysis. At the same time, it will bring the cloud to a new dimension by enabling the distribution of computing and storage, such as edge cloud, and mobile edge computing, throughout the infrastructure,

Europe shaping the 5G vision

The European Commission identified 5G opportunities early, establishing a public-private partnership on 5G (5G-PPP) in 2013 to accelerate research and innovation in 5G technology. The European Commission has committed public funding of more than €700 million through the Horizon 2020 Programme to support this activity.

These activities are accompanied by an international plan to ensure global consensus building on 5G. EU investment in 5G research and standards is necessary to support the traffic volume expected by 2025. EU investment will also boost networks and Internet architectures in emerging areas such as machine-to-machine (M2M) communication and the Internet of Things (IoT).

The Commission adopted a 5G action plan for Europe in 2016 to ensure the early deployment of 5G infrastructure across Europe. The objective of the action plan was to start launching 5G services in all EU Member States by end 2020 at the latest. Following this, it suggests a rapid build-up to ensure uninterrupted 5G coverage in urban areas and along main transport paths by 2025.

The Digital Compass: The European way for the digital decade adopted in 2021 sets the additional target to cover all populated areas with 5G by 2030.

To monitor the progress of the 5G Action Plan and the Digital Decade strategy, the Commission is supporting the European 5G Observatory. The Observatory is a monitoring tool covering major market developments in Europe in a global context. It also reports on preparatory actions taken by Member States such as spectrum auctions and national 5G strategies.

The deployment of 5G networks depends closely upon access to radio spectrum, the basis of wireless technologies. As the rate of connected devices and their use increases, spectrum resources and their

uses have to be harmonised across Europe to allow for interoperability of infrastructure across borders. This is the basis for a broad range of services delivered with 5G for consumers, such as new smartphone apps, and professional services for various industrial sectors.

Beyond 5G, towards 6G

5G technology and standards will evolve over the next few years as deployment advances. Research and Innovation (R&I) initiatives on 6G technologies are now starting around the world, with the first products and infrastructures expected for the end of this decade.

6G systems will move us from Gigabit to Terabit capacities and sub-millisecond response times. This will enable new applications such as real-time automation or extended reality sensing ("Internet of Senses"), collecting data for a digital twin of the physical world.

In Europe, a first set of 6G projects worth €60 million was launched under the 5G-PPP. The Hexa-X flagship is developing a first 6G system concept complemented by 8 projects investigating specific technologies for 6G.

The European Commission adopted its legislative proposal for a strategic European partnership on Smart Network and Services as a Joint Undertaking in February 2021. This proposal includes a public R&I investment of €900 million over the period 2021-2027.

The Joint Undertaking will coordinate research activities on 6G technology under Horizon Europe as well as 5G deployment initiatives under the Connecting Europe Facility Digital and other programmes.

Public Private Partnership on 5G

The Smart Networks and Services Joint Undertaking

5G: Questions and Answers

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The Commission has proposed to set up 10 new European Partnerships between the European Union, Member States and/or the industry. The goal is to speed up the transition towards a green, climate neutral and digital Europe, and to make European industry more resilient and competitive. The EU will provide nearly €10 billion of funding that the partners will match with at least an equivalent amount of investment.

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Big Picture

Connectivity

The EU's goal is for Europe to be the most connected continent by 2030.

Dig deeper

Europe's 5G strategy in the Digital Decade

The Commission has set new strategic objectives for 5G deployment in the Digital Decade as the basis for a digital and green recovery.

The Smart Networks and Services Joint Undertaking

The European Smart Networks and Services Joint Undertaking (SNS JU) will pool resources to ensure industrial leadership for Europe in 5G and 6G.

5G Research & standards

The European Commission works with the industry in the 5G Public Private Partnership as a research and innovation vehicle to structure and steer European 5G research.

5G and Electromagnetic fields

The European electronic communication code plays a key role in ensuring consistent 5G deployment conditions while protecting public health.

5G Observatory

The European 5G Observatory enables the EU to assess the progress of the 5G Action Plan and take action to fully implement it.

5G Action plan

The 5G Action Plan is a strategic initiative that will make 5G a reality for all citizens and businesses across the EU.

See Also

Open Internet

EU rules enshrine the principle of open Internet access: internet traffic shall be treated without discrimination, blocking, throttling or prioritisation.

Body of European Regulators for Electronic Communications

The Body of European Regulators for Electronic Communications (BEREC) improves consistency of EU telecoms rules.

ICT and standardisation

ICT specifications ensure that products can connect and interoperate with each other, boosting innovation, and keeping ICT markets open and competitive.

Electronic communications laws

The EU's electronic communications policy improves competition, drives innovation, and boosts consumer rights within the European single market.

The Connectivity Toolbox

The connectivity toolbox offers guidance for the deployment of fibre and 5G networks. These networks will offer significant economic opportunities.

Radio spectrum: the basis of wireless communications

Wireless communications, via public or private networks, use radio spectrum, i.e. a range of radio waves, to carry information. Such communication can be between people, people and machines or systems ("things" more general) or between things. In this context, radio spectrum is...

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Support for Broadband rollout

The European Commission is supporting EU businesses, project managers and authorities in increasing network coverage to reach the EU's Gigabit Society goals.

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