

5G: Opportunities and Legal Challenges



Part 1. Overview of 5G technology opportunities

This article is the first of a series of following publications, which will focus on more specific 5G topics.

What is 5G?

5G is the 5th generation of wireless technology that will considerably improve the current framework of telecommunications based on the existing 4G. It is expected to be one of the fastest wireless technologies ever created. It will allow the emergence of new services, applications and capabilities. It will have a particular impact on the ISP's business model and their offer of services thanks to the so-called "network slicing" technology, which will enable them to virtualise "slices" of the network and provide services specifically tailored and continually scalable to the needs of each users. Last but not least, it will enable technologies which will facilitate network management and reduce costs considerably. The 5G technology is expected to be deployed by the end of this year in Luxembourg in accordance with the European roadmap aiming to make 5G available in at least one city per Member State by 2020.

What will change?

More than simply enhancing the mobile broadband (i.e. speed of data transfers in bits/s), 5G allows the use of applications requiring ultra-reliable and low latency connections (i.e. the delay between a command and its execution) and pave solid steps for the development of the Internet of Things ("IoT") industry. The opportunities foreseen include, in particular, autonomous driving and car-to-car real-time communications (e.g. detection of traffic jams or accidents and alerting other drivers on the way), road traffic management, smart homes, smart cities, remote surgery, remote surveillance and maintenance of industrial machines, etc.

What can 5G be used for?

At least 3 different usage scenarios of 5G have been identified together with their specific technical requirements:

Enhanced mobile broadband i.e. greater bandwidth and support of more connected devices ("eMBB"): eMBB is an extension to existing 4G technology and addresses the applications supporting a small number of devices (compared to MMTTC – see below), each of which requires

high bandwidth (5G's data rate is up to 20Gbps downlink), such as augmented reality, virtual reality, and other services requiring mobility, low latency, high data rate and wide area coverage. It will also support the growing data traffic needs (e.g. 3D video, 4K video transmission, streaming services, UHD screens, etc.).

Ultra-reliable and low latency communications (“UR-LLC”): UR-LLC addresses applications with strict requirements for specifications such as low latency (5G provides 1ms latency, compared to 20ms for 4G), high reliability, security and throughput (self-driving and car-to-car communications, remote surgery, public safety services, operation of mining, oil and pipelines, etc.)

Massive machine-type communications (“mMTC”): mMTC refers to networks supporting a large number of devices (i.e. about 10⁶ devices/km²) requiring low bandwidth connectivity as they receive and transmit short packets. Such devices typically do not need low latency while security and resilience are essential to their functions (e.g. smart homes, smart cities, smart industries, etc.)

What impact will it have on society?

The 5G technology will affect a large part of our society in many different ways, including social, industrial, medical, environmental, financial and economic activities. It reveals new challenges from a legal and regulatory perspective both in relation to the deployment of this technology (e.g. allocation of spectrum, installation of antennas, administrative authorisation, access to public infrastructures, network security, etc.), with the development of new activities based on this technology (e.g. automation, digitalisation), and in relation to the day-to-day use of this technology (related criminal and civil responsibility, privacy and data protection, etc.).

Is there a legal framework covering 5G?

5G is covered in various aspects by several Luxembourg laws and European Regulations, in particular the Law of 27 February 2011 on network and electronic communication services (as amended)¹, the Law of 30 May 2005 on the management of radio waves (as amended), the Law of 30 May 2005 on the protection of persons in relation to the processing of personal data in the sector of electronic communications (as amended) (e-Privacy law), Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data (General Data Protection Regulation), the Law of 28 May 2019 concerning measures for a high common level of security of network and information systems (NIS Law), and the Law of 23 October 2011 on competition (as amended). As regards the “network slicing” technology, particular concerns have also been raised in relation to Regulation (EU) 2015/2120 laying down measures concerning open internet access, which aims to ensure an equal and non-discriminatory treatment of internet traffic (net neutrality).

Are there other related laws and regulations?

Other legislation at European and Luxembourg level also apply in relation to the deployment of

and investments in the 5G infrastructures and technologies, which are not covered in this overview, such as Regulation (EU) 2018/1971 establishing the Body of European Regulators for Electronic Communications (BEREC), Regulation (EU) 531/2012 on roaming on public mobile communications networks in the Union, Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment, transposed in Luxembourg by the Law of 27 June 2016, Directive 2014/61/EU on measures to reduce the cost of deploying high-speed electronic communications networks, transposed in Luxembourg notably by the Law of 22 March 2017 and the Law of 24 May 2011 on services in the internal market, Directive 2014/24/EU on public procurement, transposed in Luxembourg by the Law of 8 April 2018, Regulation (EU) 2019/452 establishing a framework for the screening of foreign direct investments into the Union, Regulation (EC) 428/2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, Regulation (EU) 2016/1036 on protection against dumped imports from countries not members of the European Union, Regulation (EU) 2016/1037 on protection against subsidised imports from countries not members of the European Union, Regulation (EU) 2015/478 on common rules for imports, etc..

Read our next publication

In our next publication dedicated to the 5G theme, we will cover matters related to the allocation of part of the spectrum to the 4 Luxembourg telecom operators who won the auction organised by the Institut Luxembourgeois de Régulation (“ILR”), as well as their rights and obligations resulting from the licences that they obtained, and the effective deployment of 5G technology in Luxembourg.

1. The applicable Law of 27 February 2011 will be repealed and replaced by a new law (Bill of law No. 7632 currently being discussed at the Chamber of Deputies) transposing the Directive (EU) 2018/1972 establishing the European Electronic Communications Code, which is a recast of the 2002 Telecoms Package including the (i) Framework Directive 2002/21/EC; (ii) Access Directive 2002/19/EC; (iii) Authorisation Directive 2002/20/EC; (iv) Universal Service Directive 2002/22/EC and Citizens' Rights Directive 2009/136/EC and; (v) e-Privacy Directive 2002/58/EC.