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REVIEW

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JOHN P JANKA

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Chapter 17

LUXEMBOURG

Linda Funck¹

I OVERVIEW

The Luxembourg TMT sector has evolved from being predominantly a provider of voice services into a diverse, competitive and interconnected industry using terrestrial, satellite and wireless transmission systems. Today, Luxembourg has first-class infrastructures and telecommunication networks and is counted among the top locations for electronic communication services and infrastructures. In the 2016 edition of the 'Global Information Technology Report' (the GITR Report) published by the World Economic Forum, Luxembourg is listed ninth out of 139 countries with regard to innovation in the digital economy and Luxembourg's steady upward trend relating to its overall score is recognised.

Traditionally the sector was limited to a very few players. Telecommunication and postal services were operated for several decades as a public monopoly of the state-owned *Entreprise des Postes et Télécommunications (EPT)*.² The radio and television sector was controlled and developed from its early years by a privately owned company. Indeed, the first radio broadcasting in Luxembourg was initiated by the founders of the current broadcaster *CLT-UFA*. The privately held operator was ensured a leading role in the national and international development of the radio and television sector and today *RTL Group* ranks as the top television and radio broadcaster in Europe. Luxembourg has also been a pioneer in non-terrestrial communication technology. *SES-Astra*, a Luxembourg-based company created in 1985, was Europe's first private satellite operator and today *SES* has global standing.

The presence of important market players in the TMT and TMT-related sectors in Luxembourg and the related know-how and experience have led the Luxembourg government to make efforts to maintain, create and further develop its electronic telecommunication technologies with the aim of being among the best places in Europe and abroad to do business within the sector and being a hub for e-services in Europe. This aim has been constantly

¹ Linda Funck is a partner at *Elvinger Hoss Prussen*.

² The new commercial name is '*Post Luxembourg*'.

pursued and reaffirmed by the Luxembourg government since 2010 until 2016. In order to reach this aim, the Luxembourg government together with a group of private investors set up a fund dedicated to ICT³ start-ups which is named 'Digital Tech Fund'. The GTR Report⁴ confirms the success of these efforts, as Luxembourg is in first and second position in relation to its political and regulatory environment respectively in relation to individual usage. Luxembourg is also ranked fifth and sixth respectively in terms of importance of ICT in government vision and government success in ICT promotion.

Luxembourg combines many features that are beneficial to the development of an ICT sector, including the diversity and multilingual skills of the population and workforce, a geographical location in the centre of Europe and an important financial industry in need of high performance communication technologies. In addition, Luxembourg has gradually developed a state-of-the-art digital infrastructure, international telecommunication connections (offering fast and reliable connectivity to other European cities at very low latency rates), efficient national communication networks, performant data centres, a comprehensive, evolving, and innovative legal framework, cutting-edge research, safety and security, all of which contribute to Luxembourg's increasing attractiveness to technology organisations and electronic communication services, but also to financial institutions, companies active in biotechnology and medicine and other e-businesses. Luxembourg figures among the top locations for ICT infrastructures (data centres, high speed connectivity and internet traffic, low latency internet) and it offers specialised expertise to keep data safe.

The presence of regulated ICT 'support' professionals of the financial sector (PSF), who are subject to the same confidentiality obligation as banks, provides considerable comfort and security to clients in the financial sector in areas such as the outsourcing of IT functions.

More recently, Luxembourg is focusing strongly on the development of the fintech industry, for which Luxembourg is very attractive as it combines a huge range and variety of financial services, performant and innovative technology and open-minded regulators, public authorities, private players and associations who are ambitious to follow and develop a sector that is evolving rapidly and is omnipresent in the overall global economy.

The quality of the communication infrastructure has led numerous actors in the gaming sector (online video games) and gambling sector to set up their headquarters in Luxembourg.⁵ Global brands in the media and internet world such as Amazon, eBay, PayPal, Vodafone Procurement, RTL Group and Skype all have European headquarters or major operations in Luxembourg. The presence of Level 3 in Luxembourg (one of the most important operators of telecommunication services at the level of the backbone internet) confirms Luxembourg as a centre of excellence in the internet sector. Luxembourg is also attractive to a number of e-payment and e-money services institutions and can be considered as Europe's e-payment hub with brands including Digicash, Amazon Payments, PayCash Europe, Microsoft, Yapital, Six Payment Services and Rakuten all based in Luxembourg. Luxembourg also has a strong reputation for service availability, security and data protection and responsive and open-minded authorities.

The Luxembourg Commission de Surveillance du Secteur Financier (CSSF) has granted Bitstamp a payment institution licence, and has made the company the first

3 Information and communication technologies.

4 See footnote 2.

5 Big Fish Games, Bigpoint, Nexon Europe S.à.r.l., Innova.

nationally licensed Bitcoin exchange. There are still other companies, active in the virtual currencies sector, that want to establish themselves in Luxembourg and which are currently trying to obtain their licence, such as Ripple Labs, CoinPay and BitFlyer,⁶ confirming once more the attractiveness of Luxembourg for ICT businesses and openmindedness.

Luxembourg has a longstanding official policy of welcoming pan-European companies in addition to creating the appropriate framework for the development of local businesses and offers multiple opportunities to start-ups by creating an environment that allows existing market players to come into contact with young entrepreneurs.

In 2016, the proportion of employees in the ICT sector in relation to the total of employees is 5.1 per cent (+0.2 per cent compared to 2015) which constitutes the third highest proportion in the European Union after Finland and Sweden with an average of only 3.7 per cent in the European Union.⁷

Efforts are also being made in ICT research, with a focus on the security, reliability and trustworthiness of ICT systems and services.⁸ In the context of increasing the influence of digital technologies in every aspect of our lives and throughout all business areas and with the further and constantly evolving development in cloud computing and e-archiving, digital security is a key element of the success of the digital economy. Important improvements are being made to the legislation in order to adapt the national legal framework to overcome barriers related to the use of new technologies.

Luxembourg is also keen to join forces with other European countries and is planning, for example, in cooperation with the European Commission, France, Spain and Italy, to create a European supercalculator, allowing private and public players access to top-notch software tools.⁹

Luxembourg is very present at European-level discussions and negotiations and stout in its defence of its position in the global process of harmonisation and liberalisation, while supporting the direction of European regulation. At a national level, research and development in the ICT sector is conducted by a number of government-promoted institutions.¹⁰ In developing its communication networks in the context of the investment realities and opportunities in the telecoms and media sector, the challenge is to direct investment in a way that ensures that the right type of network is built and that public investment works in cooperation with the private sector so as to promote a more competitive telecoms environment. The government has been very active in negotiating and defending the interests of Luxembourg in the adoption process of the European Telecoms Package. Similarly the government has actively taken part in the discussions regarding the Data Protection Regulation adopted on 14 April 2016 and it will be applicable from 28 May 2018.

6 www.list.lu/fr/a-propos-de-list/presse/fintech-innovation-in-financial-services/.

7 <https://ec.europa.eu/digital-single-market/en/scoreboard/luxembourg>.

8 Interdisciplinary Centre for Security, Reliability and Trust (SnT), Computer Science and Communication (CSC).

9 www.digital-luxembourg.public.lu/fr/actualites/promotion/2016/itwXavierBettel/index.html.

10 For instance, the Luxembourg Institute of Science and Technology (LIST), which is the result of the merger of the Public Research Centre Henri Tudor and the Public Research Centre Gabriel Lippmann, and the University of Luxembourg, which has a computer science and communications research unit. LISER (Luxembourg Institute of Socio-Economic Research) and LCSB (Luxembourg Centre for Systems Biomedicine) are other examples.

The development of the information society is one of the key priorities of the government. In addition to the aforementioned policies, it has created an action plan called 'e-Luxembourg' with the ultimate goal that Luxembourg administrations, corporations, education personnel and individuals may efficiently use and have access to electronic communication means and to help improve their quality of life. At present, many filings, registrations and requests to public administrations (such as those of the tax, social security and energy sectors) can be made online. In 2015, 135,000 administrative procedures were transmitted electronically, which represents an increase of 330 per cent compared to 2014.¹¹ The government has adopted a GED system (electronic document management) and banned the use of paper, with the aim of streamlining the internal government structures so as to become more cost effective. Luxembourg has also introduced electronic identity cards.

Back in 2014, the Council of Government announced the launch of a new strategy called "Digital Luxembourg". The objective of this strategy is to strengthen and consolidate the position of Luxembourg in the ICT sector. The Digital Luxembourg platform aims to assemble private players and public institutions federating inter-sectoral and cross-sectoral interaction. Taking into account the constant need for a workforce with strong skills in IT, Luxembourg implemented the 'Digital (4) Education' strategy. The first WebForce3 school has been implemented which aims to train people in three-and-a-half months to allow them to become qualified for a developer or junior integrator job.¹² This school is part of the initiative 'Fit4coding' launched by the Luxembourg government and co-financed by the European Social Fund.

Luxembourg strongly encourages the development of a Digital Single Market as it will strengthen Luxembourg's position within the European area.

In addition, the government is fully aware of the fact that the continuance of the success and the competitiveness of Luxembourg's financial sector will depend, *inter alia*, on the availability of cutting edge services based on fintech.¹³ A fintech working group has been established with representatives from different associations active in the financial and technological sectors with the aim of solving and answering specific problems and questions related to fintech. The Luxembourg House of Financial Technology is about to be launched, which is an initiative of the agency, Luxembourg for Finance. Convergence has been achieved by creating rules and regulations, regulatory authorities and consulting entities at national, European and international level that embrace the diversity, interconnectivity and interrelatedness of the various industries and players. The increasing convergence between telecommunications, information technology and media has led to the adoption of the regulatory framework that was introduced into Luxembourg law by two laws of 27 February 2011 (the Telecoms Package). The Telecoms Package is designed to provide for one set of rules for all electronic communication services and networks. The continuing development of the ICT sector constantly calls for adjustment of the current legislation and regulations at national and European level (see Section II.ii, *infra*).

As a result of convergence, it is extremely important that interconnectivity and free access to all operators and service providers within the TMT sector is ensured in an equal manner. The use of one infrastructure for different types of services is of particular importance

11 Rapport du Gouvernement 2015, p. 11.

12 www.gouvernement.lu/5507489/08-ecole-webforce.

13 Financial sector related technology.

and it is crucial that the operators and owners of the infrastructure or networks make these available to the other participants in the TMT sector. This is particularly true in Luxembourg because of the small size of the market. Efforts are constantly being undertaken to ensure competitiveness among the players in the TMT sector. Ensuring Luxembourg's international connectivity is at the top of the agenda in future years with the aim of ensuring the lowest latency rates with major capitals, the lowest prices and the presence of the most important carriers.

Importantly, the government supports the principles of network neutrality (i.e., keeping a free architecture, open and non-discriminatory terms, guaranteed access without unjustified conditions on electronic communication networks) and pushed towards the adoption of EU Regulation 2015/2120, laying down measures concerning open internet access and amending Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services and Regulation (EU) No. 531/2012 on roaming on public mobile communications networks within the European Union, which was finally adopted on 25 November 2015 during Luxembourg's presidency of the European Union Council. This regulation is seen as major achievement for the Digital Single Market.

Competition among incumbent operators and alternative operators remains an important element for e-industry players.

II REGULATION

TMT services cover an extremely wide scope of technology and services, with different laws and regulations applicable that entail various regulatory authorities to supervise different services and related technology. The competent ministry in Luxembourg for the telecommunication and media industry is currently the Ministry for Communication and Media.

i Regulators and regulated activities

The Law of 1997 created the Luxembourg Institute of Telecommunications (ILT), whose duty is to supervise and regulate the telecommunications sector. In 2000, the tasks of the ILT were widened to encompass the Luxembourg energy sector and postal services and, as a consequence of the Law of 1997, it was renamed the Luxembourg Institute of Regulation (ILR).¹⁴ The scope of the ILR's tasks has been modified on several occasions and for the last time by the Laws of 27 February 2011 and 26 July 2011. The ILR is an independent regulator and is not funded by public state funds paid for by taxpayers, but is rather financed by the operators of the sector supervised and regulated by the ILR.

Electronic Communication Law and the Spectrum Law clarify the allocation of competences between the Minister for Communication and the ILR in different sectors. The ILR is entitled to set rules in accordance with European directives and national law. Additionally, it controls the efficient use of infrastructure for the benefit of consumers. It is entitled to determine the fees and conditions under which communication networks are operated and services rendered so as to allow the formation of a competitive market. It also has the authority to draw up reports and proposals, which it must submit to its board and the government. It gives advice, and prepares statistics and regulations.

14 www.ilr.lu.

The ILR is competent to receive notifications and to grant authorisations or licences in relation to the provision or operation of electronic communication network services and assists the competent minister in the allocation of licences for radio spectrum. It is also in charge of establishing the plan for frequencies and, updating the public registers required by law for the various TMT sectors.

It has the power to issue administrative sanctions against operators that breach laws or regulations. It may also act as a dispute settler between competing operators and acts as mediator between customers and operators.¹⁵

The ILR is not empowered to monitor and regulate abuses of dominance. It is however responsible for ensuring that dominant players do not exclude other competitors from the sector and it may take measures and issue rules to ensure a competitive market if in its opinion proper competition is no longer possible.

In regard to media, the Media Law (as defined hereafter) has been amended by the Law of 27 August 2013. The governmental commissions existing under the former law (i.e., Communication Media Service (CMS), Independent Radio Broadcasting Commission (CIR) and the National Programming Council (CNP)) have been replaced by one single authority: the Luxembourg Independent Audiovisual Authority (LIAA). Its main responsibilities are to:

- a ensure service providers' compliance with the law;
- b grant or withdraw broadcast permits;
- c ensure access to audiovisual programmes for persons with a visual or hearing disability;
- d stimulate on-demand audiovisual media service providers to promote and distribute European works;
- e encourage audiovisual media service providers to elaborate codes of conduct concerning the broadcast of inappropriate contents; and
- f impose sanctions on non-compliant service providers such as fines, withdrawal of permits, warnings and suspension of transmission.

The National Commission for Data Protection (CNPDP), created by the Law of 2 August 2002 on the protection of individuals with regard to the processing of personal data, is the authority in charge of the supervision of the electronic communication market, as far as data protection issues are concerned.

The CNPDP controls the processing of personal data in Luxembourg and ensures compliance with the data protection regulations, in particular those relating to the confidentiality and security of processing operations. In addition, it has advisory competence towards the government. Although the CNPDP is a public institution, it enjoys independence in carrying out its mission.

It has investigative competence that allows it direct access to data of processing operations. As an investigative body, the CNPDP is allowed to issue administrative sanctions. Upon the entry into force of the new European Data Protection Regulation in 2018, the CNPDP will see its powers enhanced as it will, *inter alia*, be able to impose fines of up to 4 per cent of the company's worldwide turnover.

¹⁵ ILR Regulation 11/151/ILR of 4 April 2011. See annual report 2013 at www.ilr.public.lu/publications/rapports-annuels/2013.pdf.

The TMT sector is extremely broad and diversified. Due to the specifics of the various industries on the one hand and their interrelatedness on the other hand, it appears that laws and regulations apply to more than one specific service within the TMT sector, resulting thus in a large amount of applicable legislation and regulations.

The main laws are:

- a the Law of 27 July 1991 as amended by Law of 17 December 2010, and the Law of 8 April 2011 on electronic media (the Media Law) as amended for the last time by a Law of 27 August 2013;
- b the Law of 11 April 2010 on freedom of expression in electronic media, amending the Law of 8 June 2004 (as amended) on the freedom of expression in the media sector;
- c the Law of 27 February 2011 on electronic communication services and networks (the Electronic Communication Law), abrogating the Law of 30 May 2005 on electronic communication services and networks (Former Electronic Communication Law);
- d the Law of 30 May 2005 as amended by the Law of 27 February 2011 on organisation and management of radio spectrum (the Spectrum Law);
- e the Law of 30 May 2005 regarding the organisation of the ILR as amended (most recently by a Law of 19 June 2015);
- f the Law of 30 May 2005 on the specific provisions regarding the protection of individuals as to the processing of personal data in the electronic communication sector and amending Articles 88-2 and 88-4 of the Criminal Instruction Code as amended by the Law of 27 July 2007 and the Law of 24 July 2010 and by the Law of 28 July 2011 (the Electronic Data Protection Law);
- g the Law of 14 August 2000 on electronic commerce as amended (the Electronic Commerce Law);
- h the Law of 18 April 2001 on copyrights as amended (the Copyright Law);
- i the Law of 2 August 2002 as amended (most recently by a Law of 23 July 2016) regarding the protection of individuals as to the processing of personal data (the Data Protection Law);¹⁶
- j the Luxembourg Constitution;
- k the Law of 11 August 1982 on privacy (the Privacy Law);
- l Article L222-12 to L222-23 of the Consumer Code regarding distance contracts on financial services, abrogating the Law of 18 December 2006 on distance selling of financial services;
- m Article L222-2 to L222-11 of the Consumer Code;
- n general laws are applicable to all aspects not specifically regulated by specific laws or regulations, and in particular the provisions of the Luxembourg Criminal Code (LCC) (e.g., in relation to pornography, discrimination, racism, violence, theft and piracy) and the commercial code with the amended Article 567 (See Section VI.i, *infra*);
- o the Law of 2 April 2014, amending, *inter alia*, the Consumer Code, Electronic Data Protection the Law and Electronic Commerce Law (the 2014 Law);

¹⁶ The Data Protection Regulation proposed by the European Commission in January 2012 for the purpose of satisfying the modernisation of the data protection frameworks will entail amendments to the existing data protection laws.

- p the Law of 18 July 2014 on cybercrime¹⁷ (the Cybercrime Law);
- q the Law of 25 July 2015 on electronic archiving as well as two Grand-Ducal regulations on the execution of Article 4 Section 1 of the Law and on the dematerialisation and conservation of the documents (the Electronic Archiving Law);
- r Bill of Law No. 6763 modifying the Criminal Procedure Code and Electronic Data Protection Law;
- s Bill of Law No. 6867 on measures to reduce the cost of deploying high-speed electronic communications networks;
- t Bill of Law No. 6976 on the exchange of personal data and information in police matters;
- u Bill of Law No. 7049 modifying the Law of 2 August 2002 regarding the protection of individuals as to the processing of personal data; and
- v Bill of Law No. 7052 modifying the Law of 27 February 2011 on electronic communication services and networks.

In addition, a large number of Grand-Ducal regulations and other regulations (particularly from the ILR) have been adopted in relation to the implementation of the various laws.

ii Ownership and market access restrictions

Luxembourg rules and regulations do not, in principle, impose ownership restrictions within the TMT sector, except for in certain specific sectors. Regarding telecommunications services, the previous authorisation regime has been replaced by a less stringent notification regime.

There are no ownership restrictions for being granted a concession to operate Luxembourg satellite systems or broadcast a Luxembourg programme via satellite or cable except that for the latter a broadcasting licence may only be granted to a legal entity incorporated under Luxembourg law.

Because spectrum is considered a rare resource, its management and use is reserved to the state. Licences to use spectrum may, however, be granted to third parties subject to the conditions of national legislation, related regulations or international or European agreements and treaties.

There is no specific national regulation on cross-ownership of media companies. However, general laws on competition still apply.

iii Mergers and acquisitions

There is no specific Luxembourg authority regulating mergers or acquisitions in the TMT sector. The ILR's competences are to guarantee competitiveness on the Luxembourg TMT market and as such it will monitor acquisitions and mergers in the sector so as to evaluate their position on the market *ex post*.

The Law of 23 October 2011 on competition, which prohibits restrictive agreements and abuses of dominant position, provides for an independent authority the Council for Competition Matters (CCM), which is in charge of investigating cases, consultative missions and sectoral inquiries (or by types of agreement). The Investigation Division for Competition Affairs has been abolished. The CCM is also the decision-making body and exercises various powers for the execution of its mission (i.e., finding and sanctioning legal violations, drafting

¹⁷ See Section III.iv, 'Cybersecurity', *infra*.

opinions, undertaking market studies, gaining information about companies and executing missions allotted to the national CCM). Decisions by the ILR in relation to regulation of competition must be taken in agreement with the CCM. None of the relevant authorities has *ex ante* powers nor may they prevent mergers or acquisitions.

III INTERNET AND IP-BASED SERVICES

i Internet and internet protocol regulation

Internet services were regulated, prior to the Electronic Communication Law, by the Law of 21 March 1997 relating to telecommunication services and the operation of telecommunications networks (Law of 1997).

Even though the Law of 1997 did not provide for specific internet or internet protocol regulations, but covered telecommunications services and networks more generally, in the absence of the express exclusion of internet services and in the light of the definition of 'telecommunication services and networks',¹⁸ internet services were considered to be governed by this Law.

The Former Electronic Communication Law introduced certain changes and widened the scope of existing regulation to a larger range of communication technologies and introduced the definitions of 'electronic communication network' and 'electronic communication services' as opposed to 'telecommunication services'. The new terminology reflected the increased scope of the services and networks that are regulated. Express reference to internet services is made.

Neither the Law of 1997 nor the current Electronic Communication Law provide for any specific rules applicable to internet services or IP-based services as opposed to traditional telephony services, except that due to the specific nature of the telephony services, certain additional rules apply to the provision of telecommunication services that are offered to the public. The Electronic Communication Law provides for certain specific obligations applying to publicly available telephony services and public telephone networks.¹⁹ These specific regulations are to ensure a universal service to the resident population and apply only to traditional telephony.

As previously noted, the ILR is the competent regulator in charge of the supervision of the services rendered both in relation to internet services and traditional telephony services. The operation or provision of electronic communication services or networks is subject to notification to the ILR.²⁰ No distinction is made between traditional telephony and internet or IP-based services. To the extent the definition of electronic communication services can be broad, there are circumstances where a follow up might be of interest as certain case-by-case exemptions do apply. Although no licence is required, notified entities are subject to a certain number of formalities, filings and have to pay an administrative fee.

¹⁸ The abrogated Law of 1997 provided for a definition of 'telecommunication services' and 'telecommunication networks', with 'telecommunication' having been defined as 'each transmission, issue or reception of signals, images, sounds or data of any nature, by wire, radio, by optical or by electromagnetic means'.

¹⁹ Articles 11 and 12 of the Electronic Communication Law.

²⁰ Article 5 of the Electronic Communication Law.

The Electronic Communication Law provides for a global legal framework applicable to all electronic telecommunication services and networks, with certain specifics depending on the type of service or network, ensuring however that the whole sector is consistently governed by the same legislative and regulatory national framework.

ii Universal service

The development of communication infrastructure in Luxembourg is among the top priorities of the governmental programmes in the field of the information and communication technology. The government has been developing the broadband infrastructure services for approximately 10 years.

Since the end of 2011, Luxembourg has a 100 per cent standard (fixed) broadband coverage (DSL up to 25Mbps) available to all Luxembourg households.²¹ By the end of 2015, NGA²² reached to 94.4 per cent (+0.4 per cent compared to end of 2014) of the households.²³ 4G broadband availability in Luxembourg reached around 96 per cent²⁴ in urban and 91 per cent in rural areas.²⁵ Luxembourg residents are very connected (97 per cent are internet users).²⁶

The installation of the optical fibre is in constant progress since 1997 and Luxconnect,²⁷ the city of Luxembourg and EPT are joining the efforts to cover the whole territory with optical fibre. FTTH, using fibre optic cable, is further progressing and was usable by 61 per cent (+21 per cent since 2015) of all Luxembourg households.²⁸ In addition to work being carried out on the deployment of optical fibre throughout the country, efforts are also being made on the existing networks to increase the broadband speed.

By the end of 2015, around 55 per cent have broadband subscriptions for less than 30Mbps, 32.5 per cent between 30 and below 100Mbps and 12.5 per cent above 100Mbps²⁹ showing the trend by Luxembourg's population to subscribe to high-speed broadband.

In Luxembourg a notable market trend towards bundled offers (broadband mobile or fixed telephony and TV) continues. By the end of 2015, 81 per cent of all internet access had been commercialised with at least one other service.³⁰ As of today, Luxembourg benefits from an extremely developed FTTH architecture.

The ultimate aim of the government was to provide households and businesses with access to ultra-high-speed broadband by 2015. In 2016, more than 94 per cent of Luxembourg's territory has access to ultra-high speed broadband.³¹

21 Luxembourg 2011 Telecommunication Market and Regulatory Developments.

22 Next Generation Access (VDSL, DOCSIS 3 cable and FTTP).

23 <https://ec.europa.eu/digital-single-market/en/country-information-luxembourg>.

24 Digital Agenda Scoreboard 2016, Connectivity, p. 14.

25 <https://ec.europa.eu/digital-single-market/scoreboard/luxembourg>.

26 <https://ec.europa.eu/digital-single-market/scoreboard/luxembourg>.

27 Luxconnect was created at the initiative of the government.

28 ILR Statistical Report 2015 p. 7.

29 ILR statistical report 2015, p. 7.

30 ILR statistical report 2015, p. 8.

31 <https://ec.europa.eu/digital-agenda/en/scoreboard/luxembourg>.

Another aim of the government is to provide households and businesses with downstream speeds ranging up to 1GB/s and upstream speeds of 500Mbps in 2020. The EPT and other alternative operators offer ultra-high speed internet access.

At the end of 2014, the ILR adopted two regulations facilitating access by alternative operations to the network of the dominant operator.

iii Restrictions on the provision of service

Pursuant to the Electronic Data Protection Law and the Data Protection Law, ISPs and operators of electronic communication services and networks are compelled to ensure the confidentiality of communications exchanged by way of electronic communication means. The general rule is that other than the user, no person is allowed to listen to, intercept or store communications and data relating to the traffic and location without the agreement of the user.

This prohibition does not apply to:

- a communications relating to emergency calls;
- b commercial transactions to the extent that they constitute proof of the transactions;
- c authorities investigating and acting in relation to a *flagrante delicto* act or within the scope of criminal offences in order to ensure national and public security; and
- d cookies.

In relation to data resulting from commercial transactions and cookies, the user or parties to the transaction must be informed that their data may be processed, the conditions (in particular the duration) and aim of the storage, and the possibility of the user opposing such data processing. Moreover, in relation to cookies, a specific consent to the storage (opt-in) is required. Group Article 29 issued a number of recommendations and clarifications as to the use of cookies. With the entry into force of the new Data Protection Regulation in 2018 the use of cookies can only be carried out with the express consent of the user. The user must have a real choice and no risk of deception or negative consequences if the user chooses not to give his or her consent.

For the purpose of criminal law enforcement, specific conditions must be met to have recourse to intercepted communications data. In addition, for the purpose of research, monitoring and pursuit of criminal offences and with the sole aim of providing relevant information to the judicial authorities, each ISP or operator must store traffic information and locational data for a period of six months. The Law of 24 July 2010 has amended the scope of criminal offences by limiting the possibility of only consulting the data that relates to criminal offences resulting in penal sanctions of more than one year's imprisonment. Grand-Ducal Regulation of 24 July 2010 relating to traffic data and localisation data determines the category of traffic data that may be useful for the research, observation and prosecution of criminal offences, as well as the manner pursuant to which such information is made available to the authorities.

by RENITA. RENITA is based on the Terrestrial Trunked Radio digital technology and, in the case of a congestion of mobile networks, the RENITA network is less exposed to inherent risks. RENITA has been operational since July 2015.

On an international scale, the government has actively cooperated on the strengthening of emergency telecommunication and rapid response in the event of disasters. It has developed a nomadic satellite-based telecommunication system, 'emergency.lu', which aims to assist humanitarian agencies to respond to communities affected by natural disasters, conflicts or protracted crisis.³⁸ As of 2012, this platform was available as a public global service. At the end of 2014, the emergency.lu solution was extended for a period of six years by the government.³⁹

At an EU level, harmonisation of the digital frequency relating to these services has been achieved, permitting interoperability.

IV SPECTRUM POLICY

i Development

The increasing development of wireless communication, media and information technology also affects spectrum policy in Luxembourg.

The need for radio spectrum has increased significantly over the past few years, and Luxembourg actively participates in the elaboration of a pan-European spectrum policy and favours a more flexible and efficient use of spectrum.

In its contribution paper to the European Commission in 2010, Luxembourg indicated that it is in favour of a more flexible use of spectrum, emphasising however that it is crucial that the more flexible use will not negatively impair the current quality of services or entail harmful interferences. Luxembourg has expressed its concern that a more flexible use would need to take into consideration the characteristics of more specific and sensitive technology, which would be more prone to harmful interference than others.

During the negotiations that led to the adoption of the European regulatory framework, Luxembourg explained that one of its top priorities was to maintain national competence in relation to the management of the spectrum and a full subsidiarity in this area.

ii Flexible spectrum use

As a result of the Law of 27 February 2011 amending the Spectrum Law, allocated licences are no longer personal.⁴⁰ On that account, it is currently possible to sell, transfer or sublease allocated spectrum, thus enhancing the flexibility of spectrum use. The Spectrum Law also provides for the possibility of spectrum sharing.

The mobile use of spectrum dedicated to fixed use is possible as a matter of applicable law and regulations and is in line with the principle of technological neutrality.

38 www.itu.int/net/pressoffice/press_releases/2011/52.aspx#.VecVX11cQUI.

39 www.scs.com/4233325/news/2014/20469026.

40 Article 2 of the Law of 27 February 2011 amending Law of 30 May 2005 on organisation of the management of electronic waves.

iii Broadband and next-generation mobile spectrum use

According to the 12th edition of the 'eGovernment benchmark' of the European Commission, fixed high-speed internet is accessible for 100 per cent of the population of Luxembourg, compared with 97 per cent for the rest of the European Union. For the 'new generation' high-speed internet (>30Mbps), 94 per cent of the population is covered compared with only 72 per cent for the other EU Member States.⁴¹

In Luxembourg, the increasing need for spectrum for use by the offer of increasing broadband services is partly solved by opening additional frequencies or release of spectrum for the use of broadband and next generation mobile services.

Luxembourg completed the switch-off of analogue television broadcasting in 2006, replaced by DTTV. The released spectrum (referred to generally as 'the first digital dividend') is used for next-generation mobile services.

The ILR has adopted a new frequency plan, which came into force in January 2016. The new frequency plan takes into account the decision (EU) 2015/750 of 8 May 2015 from the European Commission on the harmonisation of the 1,452–1,492MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

In 2015, Frequency bands 900MHz and 1,800MHz were made available for various mobile communication technologies. Frequency bands 800MHz and 2.6GHz have also been opened. In that respect, in October 2011 Luxembourg concluded an agreement with its neighbouring countries regarding reducing the risks of interference due to overlapping coverage in the frequency band 790–862MHz. This agreement became effective on 1 January 2014.⁴² Another multilateral agreement between France, Germany, Switzerland and Luxembourg was concluded in 2014 concerning the allotment of preferential frequency blocks in the band 406.100–410.000MHz in order to ensure equal spectrum access in the respective border areas. A bilateral agreement has been signed with Germany regarding Luxembourg and Germany's common approach on dealing with the 470–694MHz and the 694–790MHz frequency bands.

The licences within the 900MHz have been renewed to the existing operators and one new operator and the use thereof has been expanded to different technologies. These licences allowed the introduction of 4G technology in Luxembourg specifically (LTE). In addition, the three operators have spectrum in the 1,800MHz band allowing flexibility for the introduction of innovative new technologies. Certain operators⁴³ have spread out an operational 4G network covering a large number of the Luxembourg population and offer 4G services. By the end of 2014, 96 per cent of the population in Luxembourg had access to this network.⁴⁴

A test licence for a one-year duration has been established by the ILR and granted by the Ministry of Media and Communications for the implementation of a 4G test network in the frequency band 3.5GHz. In this frequency band, 400MHz of spectrum is available, which allows very high-speed transmission rates.⁴⁵

41 See footnote 25.

42 ILR, Annual Report, 2013, p. 36.

43 Orange, Tango, EPT (now Post Telecom), Join Wireless, Cegecom.

44 <https://ec.europa.eu/digital-agenda/en/country-information-luxembourg>.

45 ILR, activity report, 2015, p. 41.

In July 2016, another public consultation for frequency band 2.1GHz was launched by the ILR as the licences of Post, Tango and Orange will expire in two years.⁴⁶ The competent minister decided to align the expiry date of the licences of these two operators with that of Orange, which will expire in July 2018.

At a European level, the European Commission also proposed to make more spectrum available for mobile services in the 700MHz band (694–790MHz) by 2020 allowing to provide high-quality internet to users, whereas the sub-700MHz area (470–694MHz) will remain available, as a priority, for audiovisual services.⁴⁷ This development is in line with the deployment of 5G, foreseen as from 2020.

iv Spectrum auctions and fees

Given the small size of the market and the limited number of operators, the experience of the authorities shows that allocations of spectrum through auctions or 'beauty contests' do not produce satisfactory results. Hence, although theoretically possible as a matter of law, auctions are not currently practised.

The Spectrum Law provides for various procedures for the allocation of spectrum licences such as competitive selection, comparative selection or by a public bidding procedure for the best offeror. The competent minister will determine the applicable procedure on a case-by-case basis after having undertaken a public consultation and publish this decision in the Luxembourg Official Gazette and in the EU Official Journal at least one month prior to the launch of the procedure.⁴⁸

The fees payable to the state (as owner of the national spectrum) for the allocated spectrum are determined by a Grand-Ducal Regulation of 21 February 2013 on royalties for radio frequencies.⁴⁹ The Spectrum Law has modified the allocation and recovery of the fees payable in relation to spectrum licences in favour of the ILR. Public services and authorities are not subject to the payment duty to the extent that spectrum is used for the provision of services within the scope of national defence, public security or emergency services.

V MEDIA⁵⁰

i Restrictions on the provision of service

The Media Law has been amended several times, with the most recent amendment having taken place on 27 August 2013. The Law aims to cover all types of audiovisual and sonorous media. High importance is attributed to content regulation, protection of children, non-discriminatory content and the form and the content of commercial advertising.

⁴⁶ ILR Annual Report 2015, p. 43.

⁴⁷ http://europa.eu/rapid/press-release_IP-16-207_en.htm.

⁴⁸ Article 6 of the Spectrum Law.

⁴⁹ Grand-Ducal Regulation of 21 February 2013 on royalties for radio frequencies.

⁵⁰ Information in this section has been largely drawn from the government's annual report 2011 and 2012.

ii Internet-delivered video content

It is difficult to measure the importance of internet video distribution in Luxembourg given the absence of surveys or statistics on this phenomenon. The only indicator is the fact that, as in most other Western countries, people watch less traditional TV, which seems to indicate that internet video is becoming more popular, particularly with the younger public. Given the general availability of cable and satellite TV, the impact so far has been minimal. In addition, based on the high connection rates of Luxembourg residents to the internet, it should be expected that this move will not pose dramatic problems for consumers.

VI THE YEAR IN REVIEW

i Key legislation

Considering the increasing importance of transnational transactions carried out by electronic means, Luxembourg is, besides the implementation of Digital Single Market policies, also in favour of the implementation of a uniform framework on electronic identification and electronic authentication that should help to increase security and trust in online transactions and electronic commerce. This was proposed to be achieved at EU level through EU Regulation No. 910/2014 of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market, which entered into force on 1 July 2016, and the adoption of a regulation of the European Parliament and of the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC, 2002/22/EC, and Regulations (EC) No. 1211/2009 and (EU) No. 531/2012, which is still being discussed within the Council.

In the era of the development of internet payment services where one of the main challenges remains compliance with know-your-customer requirements, Luxembourg adopted a regulation that softens the identification requirements for transactions below certain threshold amounts.

EU Regulation 2015/2120, adopted on 25 November 2015, will definitely abolish roaming charges by June 2017. It will enhance competition among operators and create attractive offers for consumers. This is of particular importance to Luxembourg residents given the small size of the Luxembourg territory. A bilateral agreement concluded in 2015 between the ILR and the Belgian Institute for Postal Services and Telecommunications (IBPT) opened the possibility for Luxembourg and Belgian customers to use their mobile phones between those two countries without paying roaming charges.

Luxembourg has been actively cooperating with other European countries on the data protection reform, which was adopted on 14 April 2016 and has already introduced, on 31 August 2016, a bill of law No. 7049 to facilitate the transition from the present data protection regime to the European data protection regime.

The announcement of the government 'Digital Letzebuerg' strategy, launched in August 2014, and 'Digital (4) Education' strategy launched in May 2015, evidences the government's intention to pursue efforts to continue the development of the ICT sector with the aim of making Luxembourg a 'high-tech centre' of excellence.

Government policy aims at further promoting the ITC sector and related infrastructure (data centres, etc.) as one of the pillars of the Luxembourg economy. The government is continuing to invest heavily in the security of the networks and infrastructures as one of the main pillars of the development of the electronic communication systems. In

2015, Luxembourg, with its seven Tier IV data centres, had 40 per cent of the total number of Tier IV data centres in Europe, Tier IV being the highest level possible for a data centre with very high security and availability standards.⁵¹ In June 2016, Luxconnect established Luxembourg's eighth Tier IV data centre.

The creation of various structures at national level evidences the government's priority to prevent and combat cybercrime and other attacks on electronic communication services and infrastructures. The creation of the Cybersecurity Board and the CERT, and the adoption of a national strategy in cybercrime matters, demonstrate the government's absolute determination to fight and prevent cybercrime.

Mobile services are now included in the frequency band 2GHz. Many other decisions and policies taken in this field have been in line with European policy. During the ITU World Radio Conference, which took place in November 2015, mobile broadband has been enabled globally in the 694–790MHz frequency band and is expected to enable manufacturers and mobile operators to offer mobile broadband at an affordable price in currently undeserved areas.⁵² However, the opening of additional frequency will need to be discussed in the context of technical implementation and Luxembourg's need for additional spectrum.

The continuing development of the online video games sector in Luxembourg and the establishment of internationally known companies is encouraging LU-CIX to develop its services. The government has renewed its prior efforts to establish efficient technical infrastructures and a business-friendly legal environment to assure the best development possible for these companies in Luxembourg.

The government, through its competent organ, has continued its ICT promotion efforts and visited various countries and states in 2015 and 2016. A Luxembourg delegation travelled to various countries to show the government's support for Luxembourg start-ups. Indeed, a digital tech fund has been launched in April 2016 by the Luxembourg government and various private investors. The €20 million raised by the fund will be used to support Luxembourg-based early-stage ICT start-ups. This public-private seed fund is aiming primarily, but not exclusively, to invest into areas such as fintech, cybersecurity, Big Data, Digital Health, media and next generation communication networks and digital learning.⁵³

Luxembourg has also been present at various conferences organised in Luxembourg and throughout the world.

Every year since 2010, Luxembourg has been hosting the ICT Spring conference in June. In 2016, the ICT Spring Conference was mainly focused on fintech and cybersecurity. Luxembourg's government representative, the prime minister, recalled the importance of encouraging the digital transformation in a consistent way. To achieve this goal, the principle of security by design should be promoted to create an environment of trust and minimise the risk of a more and more interconnected society.⁵⁴

In the satellite sector, SES has continued to expand its fleet of satellites, offering a global connectivity covering 99 per cent of the world's population. It is investing in new onsite infrastructures. SES is also planning to launch two more satellites in 2017 with the

51 www.innovation.public.lu/en/decouvrir/pourquoi/secteursinnovants/finance/index.html.

52 www.itu.int/net/pressoffice/press_releases/2015/55.aspx#.V45IcFicS-4.

53 www.luxembourgforfinance.com/en/news/launch-digital-tech-fund-support-luxembourg-based-early-stage-ict-startups.

54 www.gouvernement.lu/5977011/10-ict-spring.

aim of expanding its activities in Europe, Asia and South America.⁵⁵ The broadcasting of ultra HD (UHD) content is another SES priority and it has already started testing the first UHD diffusion architecture in the United States⁵⁶ and is now broadcasting 24 UHD channels worldwide.⁵⁷

SES also announced its support of the European Commission's action plan for the deployment of 5G in Europe and strongly believes that Europe has the potential to become the global leader in 5G, permitting the enablement of economic growth, sustainability and high-quality jobs.⁵⁸

ii Key mergers and takeover activity

No major takeover activity has taken place over the past six months, but the actors in the ICT sector have taken the opportunity to develop their activities and services in the respective areas of predilection in the light of new technologies (cloud, e-archiving, roaming, digital payment services, etc.).

VII CONCLUSIONS AND OUTLOOK

The digital economy is an important Luxembourg pillar, and is a top priority of the government. Luxembourg is considered to be located in the middle of the 'Golden Ring'.⁵⁹ Continuing efforts are made to favour the development of new communication and information technologies. The development of international connectivity and security in the current context remain key priorities. The adoption of the 'Digital Letzebuerg' and 'Digital (4) Education' strategies show the government's commitment and awareness of the importance of the ICT sector and ICT-related services. The development of fintech services is strongly supported by many market players and the government. The creation of Luxembourg House of Financial Technology was also announced in November 2015, aiming to support the development of fintech in Luxembourg.

Luxembourg has become one of the European leaders in terms of broadband penetration. It has attracted and continues to attract a number of new companies active in the ICT sector. The fast development of ICT services has increased the need for additional spectrum. The radio spectrum policy programme (RSPP)⁶⁰ thus aimed to identify at least 1,200MHz of available spectrum for the mobile services by 2015. In May 2015, additional 1,452–1,492MHz frequency bands were opened on top of the 990MHz already available.⁶¹ The European Commission Proposal of 2 February 2016 on the coordinated release of the 694–790MHz band is also consistent with the RSPP.

The rapid development of cloud computing services and the creation of a legal framework for e-archiving will continue to be a driving force in the development in data

55 www.ses.com/4233325/news/2015/20673281.

56 www.ses.com/4233325/news/2015/21277018.

57 www.ses.com/ultra-hd.

58 fr.ses.com/6859799/news/2016/22331759.

59 Luxembourg and ICT: a Snapshot.

60 Radio spectrum policy programme decision EU 243/2012.

61 <http://ec.europa.eu/digital-agenda/en/news/commission-decision-opens-new-frequency-band-advanced-mobile-services>.

Intellectual property theft and piracy are regulated by:

- a the Copyright Law;
- b the LCC;³²
- c the Privacy Law; and
- d the Electronic Data Protection Law and the Data Protection Law.

There is currently no public authority in Luxembourg that exercises global supervisory or monitoring power over the content and traffic data of network operators, ISPs and users, as this would violate the essential privacy principles.

Similarly, and for the same reasons, network operators may not control the content, application and services accessed by their network users.

The practice of deep packet inspection is prohibited in Luxembourg, as it infringes confidentiality rules and constitutes an invasion of privacy in complete violation of the above-mentioned legislation. The same analysis would apply to the filtering of data processed by means of electronic communication means.

However, network operators, data centre operators and PSF are obliged, in order to comply with the secrecy or confidentiality requirements, and to avoid invasion of privacy, piracy or intellectual property theft, to take appropriate technical and organisation measures, and to have systems and procedures (firewalls, encryption, secured and restricted access, etc.) in place that render the network and the data processing via their network secure.

iv Security

National security

The Electronic Communication Law, the Electronic Communication Data Protection Law and the Data Protection Law provide for specific applicable measures to ensure national interests.

In certain circumstances, where national security (including public health and public order) is endangered, the government may requisition the entire electronic communication network established in Luxembourg, as well as the connected equipment, or prohibit the provision of some or all electronic communication services.

The government may also, in order to maintain access to the emergency services, dictate special conditions for the use of electronic communication services and networks. Although storage of personal data is generally prohibited, the Electronic Communication Law provides for an exception in relation to storage of traffic data relating to emergency calls or inspection of false alerts or attacks or abusive calls.

The Law of 23 July 2016, creating a High Commission for national protection, attributes special powers to this High Commission in order to prevent, anticipate or manage a crisis and its effects and consequently encourage the return to a normal state. For example, the protection of critical infrastructure includes all activities aiming to prevent, attenuate or neutralise the risks of a reduction or discontinuity of services essential to the protection of vital interests or personal needs for all or part of the country or its population.

³² Articles 309, 460, 488, 505, 509-1 et seq. of the Luxembourg Criminal Code.

Furthermore, following the recent terrorist attacks, a bill of law on the exchange of personal data and information in police matters has been introduced in order to transpose the EU framework decision 2006/960/JAI and certain dispositions of the EU framework decision 2008/960/JAI.

Finally, the bill of law No. 7052 is aiming to abolish anonymous prepaid SIM cards for mobile phones. Mobile operators will have to collect certain data in relation to the identification of their clients before activating the purchased prepaid cards.

Privacy and consumer protection

Privacy and consumer protection in the electronic communication domain is guaranteed by both the Consumer Code and the Media Law. They set guidelines and restrictions in relation to commercial advertisements and specific provisions for the protection of children.

Information about consumers must be treated confidentially and may not be rendered accessible to third parties and the processing of consumer data is allowed only if it falls within the criteria defined by the relevant laws. Processing of data is subject to the principle of legitimacy of processing. Each data processor located or using physical means located in Luxembourg to process data is subject to a notification or prior authorisation procedure addressed to the CNPD depending on the nature of the data processed and the purpose for doing so.

Sharing of consumers' personal data is strictly prohibited by law, unless the consumers give their express consent. Where locational data is being stored and processed by an operator, a user must be informed thereof and must be able to oppose any such action (the process of which must be clearly set out and communicated to the user).

Luxembourg law prohibits the addressing of advertisements or other unrequested communication to persons by electronic means without their consent. If the supplier of a product received the email addresses during a previous sale, he or she can use those email addresses to promote analogous products and services unless the concerned persons requests such actions to be stopped.³³

Protection of children

There is no specific legislation or regulation that ensures the protection of children online.

In 2011, Luxembourg ratified the United Nation Convention in relation to children's rights and the Convention of the Council of Europe concerning protection of children against exploitation and sexual abuses and is involved in the implementation of their provisions.

Moreover, the government is issuing a number of recommendations and is supporting various projects to render children and their parents aware of the risk related to the use of the internet. The 'Bee Secure' project has been drawn up in the context of the EU Safer Internet Programme, which gives directions for the use of the internet to children, parents and educational staff.

Generally, the policy is to familiarise children with new technology rather than filtering or blocking access to various types of information (which might, however, be an alternative); the intention is to teach children how to use the internet safely and to always be aware of the risks related to such use.

³³ Article 11 of the Electronic Data Protection Law.

Children's rights are protected by provisions of the Luxembourg Criminal Code (LCC). Further to the adoption of the Law of 21 February 2013 amending Articles 372 and 377 of the LCC, the LCC provides for enhanced sanctions in relation to sexual child abuse matters. The 'BEE Secure Stopline' is a project operated by a national consortium that provides a structure to report illegal information transmitted over the internet anonymously. The E-commerce Law requires information service providers to withdraw or render inaccessible any illegal content that they become aware of. The Media Law includes specific children protection provisions.

The University of Luxembourg is an active member of the 'EU Kids Online' project, which is a multinational research network seeking to enhance European children's opportunities, risks and safety.³⁴

In relation to the adoption of the 2014 Law, CNP lobbied to introduce an appropriate visual warning obligation. A Grand-Ducal Regulation was adopted on 8 January 2015 for the protection of minors regarding audiovisual media services.

Cybersecurity

Cybersecurity is one of the priorities of the government.

Individuals and companies are encouraged to take appropriate technical measures to defend themselves against cyberattacks.

Similarly, as with the internet project for children, the government has created 'CASES Luxembourg', a project that is accessible by all internet users and whose purpose is to make the public aware of potential cyberattacks that are inherent in internet use and advises on how to identify potential cyberattacks. In this context it is worth mentioning the certification authority, Luxtrust, which manages electronic certificates with the highest level of security.

Network operators and ISPs are required by applicable law to comply with stringent security measures.

As a response to the increasing number of cyberattacks, the LCC has been amended so as to include offences in the electronic communication sector.

The government pursues efforts to prevent and fight cybercrime and in 2011 created two dedicated structures: the Luxembourgish Cybersecurity Board (CSB), whose mission is to work on a strategic plan against attacks via the internet; and the governmental 'Computer Emergency Response Team' (GOVCERT), linked to the Agence nationale de la sécurité des systèmes d'information (ANSSI), the competent body to deal with incidents of cybercrime in the public information systems, created in 2015.

GOVCERT also cooperates with the High Commissioner for Protection (HCPN) and the Technology Centre for State Information. Both HCPN and GOVCERT have adopted a cybersecurity plan that has been submitted to the counsel of government. The CSB has determined five priorities (on both the national and international scale) on which Luxembourg shall focus.³⁵ The CSB has asked a working group to review the national strategy regarding cybersecurity to determine whether any amendments are necessary. Furthermore, the government has signed a letter of intent with Belgium and the Netherlands to cooperate in the prevention and fight against cybercrime. Luxembourg regularly hosts conferences on cybersecurity that are mainly dedicated to experts in security matters.

³⁴ www.saferinternetday.org/web/eu-kids-online/home.

³⁵ Ministère d'Etat- Stratégie nationale en matière de cyber sécurité.

The CSB acts as a central point of information and contact for users to report cybersecurity incidents, which should allow the CSB to supply businesses with this information and put them in a position to take appropriate action to fight the risk against security.

The Computer Incident Response Center Luxembourg, official computer emergency response team (CERT) of 'Security made in Lëtzebuerg' (SMILE), is competent for the private sector, municipalities and non-governmental entities in Luxembourg.

After the delay in the implementation of the European Council Convention on Cybersecurity (CCC) and Directive 2013/40/EU relating to attacks against information systems, a law relating to cybercrime was adopted on 18 July 2014. Such law adapts the national substantive and procedural criminal law to the specific needs of fighting cybercrime. The law introduces certain new criminal offences into the LCC, including in particular the misuse of identity, 'phishing' and illegal interception of computer data supplementing the legal instrument of computer-related crimes, which includes the illegal access, hacking and deletion of computer data. The law also amends the Criminal Procedure Code to achieve the requirements of the CCC regarding the prompt preservation of stored computer data and traffic data.

In 2015, ANSSI, the national agency for the security of the information systems for the public sector and critical infrastructures, was created.

Further, SECURITYMADEIN.LU, launched in 2015 by SMILE, is an initiative with the objectives of coordinating governmental initiatives, and supporting and making the public more aware of cybersecurity issues. In addition, SECURITYMADEIN.LU aims to develop an ecosystem for cybersecurity that will reinforce the visibility of Luxembourg information security players and services. SECURITYMADEIN.LU and the activities of SMILE are an integral part of the national strategy that intends to position Luxembourg as a trusted ICT centre.³⁶

In May 2016, the Luxembourg government announced a collaboration between the new national agency for the security of information systems and SMILE through their respective CERT³⁷ in relation to all activities in connection with the detection, management and notification of incidents.

In addition, at the European level, Directive EU 2016/1148 on network and information security of the European Parliament and the Council was adopted on 6 July 2016. This directive will aim to ensure a high common level of network and information security in the EU.

Finally, the EU Regulation EIDAS will allow an appropriate security level for electronic identification means to be reached and consequently enhance security for e-businesses and electronic communication services.

Emergency response networks

Traditionally, Luxembourg first responders and other emergency responders (such as police, customs and civil protection) benefit from a dedicated network. This network was still analogue (RIFO). With the adoption of the Law of 20 May 2014 for the financing of a national integrated radio communication network for Luxembourg, RIFO has been replaced

³⁶ www.gouvernement.lu, 9 June 2015.

³⁷ www.gouvernement.lu/6037806/30-cybersecurite-anssi.

protection legislation and the internet security sector. The ultimate aim is to consolidate a feeling of trust in the online environment, which is essential to the development of this sector of the economy.

Luxembourg is keen to take advantage of the growing demand for high performance infrastructure bandwidth capacity and the connectivity needs of the e-economy. Its geographical location close to the major European cities is a clear advantage.

Luxembourg will continue to develop high standard data centre services and facilities. It had the first green centre worldwide, showing its commitment to research and development into new infrastructure and technologies. Many Luxembourg data centres (eight out of a total of 23 data centres) offer Tier IV design, and most of the other centres are classified Tier III. Luxembourg is actively working on cybersecurity, and participated in the discussions and negotiations on the data protection reform that was adopted in April 2016. Luxembourg is already hosting the European Commission's data processing centres.

Besides the importance of developing networks and guaranteeing security, the government and its partners are aware that the long-lasting and efficient development of the digital economy requires e-skills, and it is thus active in promoting ICT business to students. Awareness of the training opportunities and carriers in the ICT sector is one of the areas of development of the digital economy in Luxembourg (e-skills project) and goes hand in hand with the new 'Digital (4) Education' strategy. Children, students and teachers are, for instance, granted free access to 'Office 365', an environment proposing platforms and computer applications to satisfy administrative and educational needs for the national education. MathemaTIC has also been created, which is proposing a digital learning environment in mathematics for children.

BEEcreative is another initiative of the Ministry for Education, constituting a place of discovery and creation intending to stimulate the creativity of the next generation.

Luxembourg is also keen to adopt the necessary measures and implementing actions to allow an efficient and consistent application of the new data protection regulation once it comes into force. A number of consultations and conferences have been organised by the regulator to ensure the implementation of the new regulation will be consistent and well prepared.

Also the recent adoption of the network and information security directive will have an impact on the national legislative framework and Luxembourg is keen to count itself among the countries that can ensure very high standard in terms of security.

Furthermore, the EU Regulation EIDAS entered into force in July 2016 and also constitutes a legal European framework that will enhance security for e-businesses and electronic communication services.

Finally, the Law of 23 July 2016, creating a High Commission for national protection, will enhance national protection in the event of a crisis by creating a special commission and consequently contribute to ensure an effective cooperation on a national and international level.