



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère d'État

Service des médias et des communications



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et du Commerce extérieur

National strategy for very high-speed networks

- Very high-speed broadband for all

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Very high-speed broadband for all

I. Introduction

The development of communications infrastructures is one of the priorities of the Luxembourg Government's programme in the field of Information and Communication Technologies (ICT). The transition from traditional telecommunications networks to a broadband network, or high-speed broadband¹, has a positive socio-economic impact. This impact is expected to intensify with the transition to networks which, using the appropriate technologies, reach up to 1 Gigabit per second (Gbit/s) for fixed networks, and up to 150 Megabits per second (Mbit/s) for mobile networks (very high-speed broadband). According to a study commissioned by the European Commission²:

- labour productivity increases by 5% in the manufacturing sector and by 10% in the services sector when companies adopt broadband-based processes;
- specialisation in knowledge-intensive activities yields a productivity improvement of 0.15% per year at European level.

According to a recent analysis by the World Bank³, for every 10% increase in the penetration of broadband services, there is an increase in economic growth of 1.3%.

It is obvious that the success of a diversified service economy largely depends on very high-speed broadband access at competitive rates. "Telecommunications and broadband development [play a fundamental role] in terms of European investment, job creation and overall economic recovery."⁴

The development of very high-speed broadband is also one of the objectives of the EUROPE 2020 strategy.⁵

In recent years, Luxembourg has become one of the European leaders in terms of broadband penetration. Given the already deployed optical fibre, Luxembourg has again the exceptional opportunity to progress rapidly and, in the short term, to position itself among the most advanced countries when it comes to very high-speed broadband.

Yet, in order to definitely ensure the position of the Grand Duchy amongst European telecommunications centres, it is important to set clear and measurable objectives and to identify the means to achieve them.

¹ The definition of "high speed" varies considerably from one country to the next. In the US, high speed refers to speeds above 768 kbit/s; in Canada, speeds above 1.5 Mbit/s; In Japan, speeds above 100 Mbit/s; for the Organisation for Economic Co-operation and Development (OECD) speeds above 256 kbit/s.

² Micus Management Consulting GmbH, *The impact of Broadband on Growth and Productivity*, A study on behalf of the European Commission (DG Information Society and Media), 2008.

³ World Bank, *Information and Communications for Development 2009: Extending Reach and Increasing Impact*, 2009.

⁴ European Council, Brussels, *Presidency Conclusions*, 19 and 20 March 2009

⁵ European Commission, *Europe 2020 - A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.

To reach this goal, the Government has put in place a national strategy for very high-speed broadband. The Government does not intend to support this plan with public financing but will see to favourably influence the costs of network deployment, using the means set out below.

II. National action plan for very high-speed broadband

1. Objectives

Access to very high-speed broadband by both citizens and businesses is a key factor in the future development of the national economy. The main technical means to ensure such access in Luxembourg is optical fibre. Mobile and satellite networks will continue to play an important role in this move towards very high-speed broadband infrastructure. While generalising access to optical fibre networks, traditional networks will provide increasingly high-speed connections thanks to progressive technologies. Therefore, an action plan for the very high-speed broadband should aim for two goals:

- increase, in the short term, the speeds of the existing networks, and,
- provide, in the medium term, access to optical fibre in the entire territory and hence become the first “fibred” country of the European Union.

Achieving these objectives requires important investments.

While the incumbent operator has an important role to play in this context, competition remains the best way to guarantee access to diversified and innovative services. The Government firmly supports a strategy based on open and transparent access to networks respecting network neutrality. A central role is to be played by the national regulatory authority, the Institut luxembourgeois de régulation (ILR), whose staff, incidentally, will be increased.

Additionally, the Government intends to favour network deployment at national, regional or local level, including an upgrade of cable networks.

Frequency policy will be adapted to the objectives of the action plan, in particular by an optimal exploitation of the digital dividend and by putting in place a favourable framework for the use of new mobile technologies (e.g. 4G networks).

Furthermore, the Government is determined to rapidly transpose the new regulatory framework for electronic communications which entered into force on 19 December 2009⁶ (3rd telecoms package).

Responding to the demand for a more rapid Internet, an upgrade in terms of connectivity of both governmental administrations and academic institutions will be undertaken.

In order to become a leader in terms of very high-speed broadband, and have citizens, businesses and public actors benefit from the socio-economic impact, the Government decided on the following qualitative and quantitative objectives:

⁶ Official Journal L337 of 18 December 2009.

- Include high-speed broadband in the scope of universal service⁷:
 - o access for all users to a minimum quality of service, irrespective of their geographic situation in the national territory:
 - as of 2010: 2 Mbit/s downstream and 512 kbit/s upstream;
 - as of 2015: 100 Mbit/s downstream and 50 Mbit/s upstream;
 - as of 2020: 1 Gbit/s downstream and 500 Mbit/s upstream.
- Progressive extension of coverage:
 - o min. 25 Mbit/s downstream and min. 10 Mbit/s upstream
 - 95% coverage of the population in 2011.
 - o min. 100 Mbit/s downstream and min. 50 Mbit/s upstream
 - 80% coverage of the population in 2013;
 - 100% coverage of the population in 2015.
 - o min. 1 Gbit/s downstream and min. 500 Mbit/s upstream
 - 25% coverage of the population in 2013;
 - 50% coverage of the population in 2015;
 - 100% coverage of the population in 2020.
- Creation of economic activity zones connected to very high-speed broadband:
 - o by 2013, equip all economic activity zones with redundant infrastructure including at least one optical fibre ring to secure business access to telecommunications services;
 - o create a label identifying the economic activity zones equipped in such a way.
- Very high-speed broadband penetration:
 - o be among the European leaders in terms of very high-speed broadband penetration in 2013.
- Connect all public administrations, academic institutions and research centres to very high-speed broadband by the end of 2013.
- Wholesale and retail prices:
 - o competitive prices (within the European average) ;
 - o putting in place a price monitoring mechanism by the competent authorities.

⁷ Guaranteed speeds

- Evaluation and periodical reviews:
 - o the very high-speed broadband offers will be evaluated regularly in order to assess their coherence with the action plan's objectives;
 - o the objectives will be reviewed regularly to evaluate their consistency with market and technology developments, to take into account any other relevant factors and to adapt them accordingly if necessary;
 - o regular consultations will be organised with all stakeholders to ensure follow-up of the action plan.

2. Means

2.1. Encourage infrastructure deployment

Traditionally, the incumbent EPT (Entreprise des Postes et Télécommunications) was the only operator to own a fixed electronic communications copper network with national coverage. Therefore, there was never a need to designate a universal service provider in the Grand Duchy as this was provided for by EPT. EPT may also be the only operator to build a national optical fibre network with fibre-to-the-home delivery.

In the context of the economic crisis and the Government's recovery plan (*plan de conjuncture*), EPT, in 2009, considerably increased its investments as to its initial budgeting plans. During that year, the public enterprise thus invested EUR 30.6 million in fixed telecommunications infrastructures, surpassing its 2008 budget by 42%.

EPT took the engagement to connect all economic activity zones to optical fibre networks and to install redundant infrastructures to secure business access to telecommunications. EPT will further invest into mobile networks with a view to develop very-high speed broadband and into information technology.

Moreover, EPT's investment programme foresees at least EUR 130 million for the installation of a FTTH network covering 80% of households by 2015. With no disregards to the role of alternative operators whose planned short-and medium-term investments are not communicated, EPT is hence expected to be the main driving force for reaching the Government's very high-speed broadband objectives.

Besides EPT, the prevailing actor in terms of fixed networks and only operator to own a network with national coverage, cable companies own the densest network. Indeed, Luxembourg has a second network of quasi-national coverage (94%) alongside the incumbent's, an unusual situation on a European and even global scale. Yet the cable distribution landscape is very heterogeneous and fragmented. Also, technical evolution varies considerably from one network to the next.

The high civil engineering costs constitute one of the main disincentives to infrastructure investment. Consequently, it is important to reduce these costs as much as possible. As a matter of fact, civil engineering works represent

approximately 70% of the total costs of NGN deployment.⁸ Given that the applicable regulation in Luxembourg requires operators to dig deeper trenches for the roll-out of electronic communications lines than in most European countries, one can suppose that this percentage is even higher in Luxembourg.

6 means to reach the targeted objective for infrastructure deployment :

1. Ensure access to the local loop

It is crucial to provide the possibility of access to the local fibre-loop in order to encourage prior network deployment. Such access enables operators to offer point-to-point services and ensures the emergence of innovative services for the end user.

Further, as shown above, the mere fact that several operators are able to access the same infrastructure will allow for an optimised return on investment and will benefit all parties involved.

In its draft recommendation on regulated access to Next Generation Access Networks, the European Commission encourages the deployment of multifibre networks including for the local loop⁹. The Government supports this approach and plans to set as an objective that all very high-speed network connections consist of at least 4 optical fibres. To allow for an optimal exploitation, an obligation to pool these fibres in easily accessible point-to-point architectures is required.

2. Put in place a national construction works register

In order to help operators in their network deployment plans, the Government is going to speed up the availability of a website informing on all delivered permits related to civil engineering works. Each permit will have to include an indication of costs to be borne by the operator willing to roll out its infrastructure during the same period of time.

3. Put in place a national infrastructure register

The Government will request the ILR to put in place a national infrastructures register to increase transparency of existing networks. This type of register will provide for more synergies when deploying optical fibre networks. In turn, these synergies will entail a reduction of the overall investment and an acceleration of the actual network roll-out. The register will rely on relevant data from the different network elements owned by the local authorities, the Administration des Ponts & Chaussées and other networks managers.

Public authorities, administrations, communes and other public entities are called upon to participate actively in the set up of this register.

⁸ Source : FTTH Council Europe, *FTTH Handbook*, Revision 1 February 2009

⁹ European Commission, *Draft Commission Recommendation on regulated access to Next Generation Access Networks (NGA)*, 12 June 2009 (second version).

4. *Introduce an obligation to roll out associated facilities for optical fibre*

With a view to reducing the investment barrier related to the high civil engineering costs, public authorities (State and communes) are called upon to lay empty ducts appropriate for the injection of optical fibre when carrying out street works, which can then be made available to operators on an open, transparent and non-discriminatory basis.

This same obligation will be imposed on private promoters when developing new housing estates.

5. *In-house wiring in new buildings*

The Government invites local authorities to take the necessary measures so that, as of 2011, every new building is equipped with the passive ducts and connected equipment necessary for the continuation of the optical fibre network.

6. *Broaden the mandate of Luxconnect*

The mandate of Luxconnect is currently limited to the following missions:

- construction, exploitation, management and promotion of one or more primary Internet access points ;
- development activities, promotion and exploitation of one or more optical fibre networks linking the country to primary Internet access points situated outside the Luxembourg borders;
- development activities, promotion and exploitation of optical fibre networks linking national Internet access points to national primary access points ; and
- administration and resource management associated with these networks.

If necessary and in order to speed up the deployment of optical fibre services, the Government could broaden the Luxconnect mandate.

2.2. Open and transparent network access

The necessary and important investments in Next Generation Network deployment require an amortisation period covering several decades. In a small economy such as Luxembourg, it is difficult to bring economies of scale into play. In this situation, building more than one optical fibre network with national coverage is economically hardly justifiable. It is therefore useful to encourage competitors to use existing networks based on open and transparent criteria. The exploitation of the same infrastructure by several operators will allow optimising the return on investment and, in the end, benefit to all parties.

The proposed measures are:

1. *Invite the ILR to support a rapid deployment of Next Generation Networks*

In full respect of the regulator's independence, the Government will invite the ILR to actively support, within the limits of its competences, the

implementation of this action plan. The ILR will be asked to consider all the instruments currently at its disposal and, once the new regulatory framework for electronic communications having been transposed, to indicate how and in what timeframe it intends to apply them in order to achieve the objectives set out. The ILR will be called upon to signal to the Government any element likely to slow down the development of Next Generation Networks according to the principles set out in this action plan.

An important first step to carry out this mission was taken with the adoption of the Règlement grand-ducal of 4 December 2009¹⁰, increasing the ILR's staff.

2. *Encourage all electronic communications networks owners to offer open and transparent conditions that allow the emergence of innovative services at affordable prices*

The exploitation of the same infrastructure by several operators should benefit all parties. The more a network is able to provide diversified and innovative services, the more valued it will be by private and professional end users.

In this sense, the Government calls out to all electronic communications networks owners to take a proactive and future-oriented approach in offering voluntarily, and without prior regulatory intervention, open and transparent network access conditions. These conditions should allow the operator owning the network and its competitors to offer diversified and innovative services at acceptable prices while allowing for reasonable revenues and margins.

3. *Ensure network neutrality*

The Government supports the principle of network neutrality, meaning the maintaining of a free, open and non-discriminatory architecture guaranteeing access to electronic communications networks without unjustified conditions. It is this openness, characteristic for the Internet, that is at the origins of its success. This principle, which ensures that end users – professional and private – can access and use content, applications and services of their choice, thus creating a level playing field, will contribute to the competitiveness of the Luxembourg economy at both European and global levels.

2.3. Radio spectrum policy

The added value of mobile networks consists mainly in their mobility, which makes them complementary to optical fibre networks.

1. *Using the digital dividend*

The digital dividend refers to the frequencies freed up by the switchover from analogue to digital terrestrial broadcasting. The recent decisions by the

¹⁰ Règlement grand-ducal du 4 décembre 2009 fixant un nombre limite pour le cadre du personnel de l'Institut Luxembourgeois de Régulation

European Commission allow for the reallocation of these frequencies to electronic communications operators.

In order to accelerate the deployment of high-speed mobile networks, the Government decided in 2009 to open up the digital dividend spectrum (790-862 MHz) to mobile electronic communications operators. Further, in order to encourage the development of innovative new technologies while respecting the principle of technological neutrality, the national frequency plan was modified to open up the 900 MHz band to technologies other than GSM.¹¹

2. *Develop 4th generation mobile networks (4G)*

4th generation mobile technologies are expected to provide very high-speed broadband up to 100 Mbit/s downstream and more than 50 Mbit/s upstream. The development of these networks will be facilitated by an appropriate regulatory framework.

3. *Satellites*

High-speed broadband via satellites is a solution that is economic, rapidly available and covers entire regions irrespective of their topography. It is thus an ideal means to achieve 100% coverage since it reaches even those areas that are remote or sparsely populated where there is no business case for optical fibre network roll-out. The Government supports the development of high-speed broadband via satellite offers by an appropriate regulatory framework.

2.4. Rapid transposition of the new regulatory framework on electronic communications

The new regulatory framework for electronic communications (3rd telecoms package) entered into force on 19 December 2009. One of the objectives of the new rules is to put an adequate framework for the development of Next Generation Networks which “support innovation in content-rich Internet services and strengthen the international competitiveness of the European Union. Such networks have enormous potential to deliver benefits to consumers and businesses across the European Union. It is therefore vital to promote sustainable investment in the development of these new networks, while safeguarding competition and boosting consumer choice through regulatory predictability and consistency.”¹² It is precisely those objectives that this action plan aims to implement.

Another crucial objective of the new telecoms package is the strengthening of consumer rights. The European legislator has taken measures to better protect the consumer in facing numerous and complex commercial offers, in particular by reinforcing quality of service guarantees and increasing transparency.

¹¹ Règlement grand-ducal du 23 mars 2009 portant modification du règlement grand-ducal du 29 juillet 2008 déterminant le plan d’allotissement et d’attribution des ondes radioélectriques (Plan des fréquences).

¹² Directive 2009/140/CE of 25 November 2009 (“Access” Directive).

The Government aims to transpose the package into national law ahead of the requested timeframe. Accordingly, the Government will table its proposals and launch the legislative procedure as soon as possible.

The Government will pay close attention to the fact that these proposals are in conformity with the European texts while taking into account the particularities of the Grand Duchy and the objectives set out in this strategy.

2.5. Public administrations (including academic institutions and research centres) connected to very high-speed broadband by the end of 2013

In order to respond to the demand for very high-speed broadband, public administrations will be connected to very high-speed networks by the end of 2013. Local authorities are invited to do the same at their level and to coordinate their initiatives with those at Government level.