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European Broadband: investing in digitally driven growth

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1. INTRODUCTION: THE BROADBAND TARGET

By 2020, all Europeans should have access to internet of above 30 Megabits per second (Mbps) and 50% or more of European households have subscriptions above 100Mbps.

This target is from the Digital Agenda for Europe[1], a flagship initiative of the Europe 2020 strategy[2] for a smart, sustainable and inclusive economy. The Digital Agenda also restated the objective endorsed by the European Council to bring basic broadband to all Europeans by 2013. To reach these ambitious objectives it is necessary to develop a comprehensive policy, based on a mix of technologies, and to carefully monitor progress over time[3].

The target for fast and ultra-fast internet access was chosen because of the central role it will play in economic recovery and in providing a platform to support innovation throughout the economy, as electricity and transport did in the past. The roll-out of ultra-fast open and competitive networks will stimulate a virtuous cycle in the development of the digital economy, allowing new bandwidth-hungry services to take off and fuelling growing citizen demand, which in turn will stimulate further demand for bandwidth.

World demand for bandwidth has been growing at roughly 50-60% per year[4], driven by the extension of internet use, from simple email and text files (in the era of 56 Kbps dial-up internet) to internet surfing (with the advent of always-on broadband) and then increased integration of graphical and audiovisual content on websites (supported by the current generation of ADSL, which offers download speeds of 2 Mbps or more and uploads of 256 Kbps).

Not only download speeds are important in that context, but higher symmetry (much higher upload speeds) and lower latency may be required for innovative services and applications. There are already examples of services that depend on such connections: smart electrical grids that require low latency and can cut consumer expenditure and lower generating costs; real-time cloud computing services that require symmetrical upload and download speeds and can be used by small businesses to lower their costs; and intensive e-health services offered to remote hospitals and patients. Moreover, the OECD has recently concluded that the cost savings in just four sectors of the economy (transport, health, electricity and education) would justify the construction of a national fibre-to-the-home network[5].

Thus, smart, sustainable and inclusive growth as envisaged by the Europe 2020 strategy will very much depend on the efficient and effective use of the internet, and internet access speed will be a key factor in achieving this. Internet access is provided by — generally private — network operators under a competitive regulatory framework and driven by commercial interests. Yet because of the critical role of the internet, the benefits for society as a whole appear to be much greater than the private incentives to invest in faster networks. Stimulating

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1 A Digital Agenda for Europe - COM(2010) 245.

2 EUROPE 2020, A strategy for smart, sustainable and inclusive growth - COM(2010) 2020.

3 For instance, it could be expected that, to be on-track for the 100Mbps target, in 2015 around 15% of European households should have subscriptions with such speeds.

4 See: Network developments in support of innovation and user needs, OECD, 2009.

5 Network developments in support of innovation and user needs, OECD, 2009.

investment in fast internet access beyond the current market-driven development, taking into account the recent economic downturn, is the key to achieving the broadband target.

Investment in new open and competitive networks should be supported by the actions of national and local authorities in lowering costs. The Commission has already assisted such actions through the adoption last year of its Guidelines on the application of state aid rules[6]. These lay down the conditions for public financial support on non-market terms for broadband and high-speed broadband deployment in areas where commercial investments are unlikely to take place in the foreseeable future. The main objective of this Communication is to further assist the actions of national and local authorities. It is presented as a broadband package with the two other broadband commitments made by the Commission in the Digital Agenda action on fast and ultra fast internet. These are the Next Generation Access (NGA) Recommendation to provide regulatory guidance to national regulators and the Radio Spectrum Policy Programme to improve the coordination and management of spectrum and hence facilitate, among other things, the growth of wireless broadband.

The following section reviews technological and market developments to provide the context for where Europe is now. Section 3 takes each of the four proposals made to Member States in the Digital Agenda and outlines how these will be supported at European level. Finally, section 4 outlines some of the main follow-up actions.

2. TECHNOLOGY AND MARKET DEVELOPMENTS IN BROADBAND

Currently, broadband is predominantly delivered to home users through copper (e.g. telephone) or coaxial (e.g. cable TV) networks and/or wireless access networks such as 3G mobile communications or fixed wireless access. There are about 124 million fixed and 25 million mobile broadband subscriber lines in the EU[7], which is one of the world leaders in first-generation broadband deployment. Speeds on offer vary widely, but typically download speeds are in excess of 2 Mbps and upload speeds are above 256 Kbps. Speeds are increasing, and the chart below illustrates the functionality of different broadband speeds and likely future applications.

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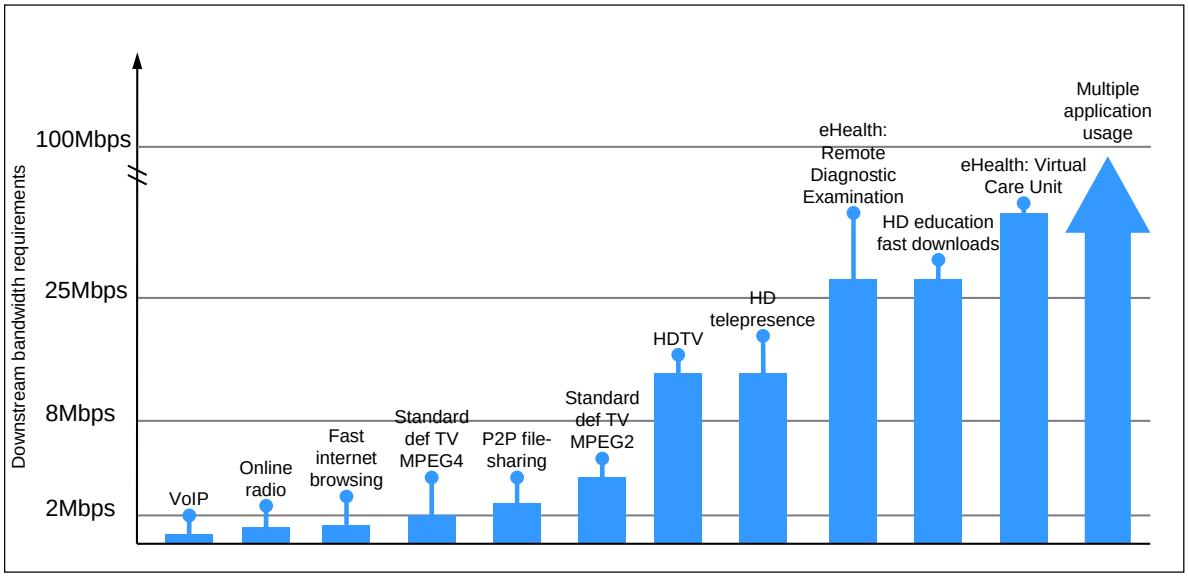
6 Community Guidelines for the Application of State Aid Rules in relation to rapid deployment of Broadband Networks (OJ C 235, 30.9.2009).

7 *Europe's Digital Competitiveness Report* - SEC(2010) 627. Mobile 'lines'= dedicated data cards + usb-keys + dongles.



Source: Analysis based on Broadband Stakeholder Group

Market-led upgrades of fixed internet access to higher speeds are underway. Collectively, these are referred to as NGA networks[8]. However, developments are uneven both between Member States and among regions within them.

Cable networks – that serve about 73 million EU households – are being gradually upgraded to higher speeds through deployment of DOCSIS3[9] and extension of their backhaul networks. Cable competition gives incentives to copper network operators to invest in VDSL – a technology which exploits the existing copper telephone infrastructure - and in optical fibre to the home (FTTH). Both FTTH and DOCSIS3 can meet the broadband target with speeds above 100 Mbps. More open FTTH architectures also enhance infrastructure based competition among ISPs, on the basis of unbundling and gradual deployment of alternative infrastructures, thereby driving the development of new services and applications.

Outside areas where they face infrastructure competition, operators have been reluctant to move beyond their established ADSL business. Most operators do not see a convincing business case for a large scale network upgrade to FTTH, also considering that there are not, as yet, enough attractive services available that would make customers pay a premium price. The NGA Recommendation and the application of the new regulatory framework will be crucial in this respect, as they will provide regulatory certainty, promoting investment and competition.

Next-generation terrestrial wireless services can offer transfer rates of over 30 Mbps and therefore meet the broadband coverage target.[10] They are particularly important in regions with difficult terrain where wired access is impractical. Wireless connections via satellite could also play a role in these regions, but further technological development will be needed if satellite is to contribute to universal coverage at the target speed of 30 Mbps by 2020.

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8 See [URL] for a summary of the main technologies.

9 Data Over Cable Service Interface Specification

10 It should however be noted that bandwidth provided to individual wireless users will depend on the number of cells serving a given area and the number of users of the service at a given moment,

To achieve the ambitious broadband target, substantial investment will be needed. The amounts needed are difficult to calculate but a review of recent studies indicates that between € 38bn and € 58bn would be needed to achieve the 30 Mbps coverage for all by 2020 (using a mix of VDSL and next generation wireless) and between € 181bn and € 268bn to provide sufficient coverage so that 50% of households are on 100 Mbps services[11].

With growing internet traffic and rising bandwidth demands, more efficient management of network resources is increasingly seen as important to the provision of high-speed broadband. A debate has started on the impact of traffic management on the open decentralised character of the public internet which is central to its capacity to allow users to access and distribute information, run applications and enjoy services of their choice. The importance of preserving these features is reflected in the amendments introduced by the 2009 reform to the EU regulatory framework for e-communications[12]. A public consultation on the open internet and net neutrality launched by the Commission[13] on 30 June 2010 seeks to explore techniques used by operators to manage data flows over their networks, and the potential impact these may have on internet users' experience. An outcome that preserves the open and neutral character of the public internet and avoids unwarranted discrimination, while allowing operators to maximise the efficiency of their networks and to develop new business models and enhanced commercial service offerings, should help encourage continued investment in high-capacity broadband infrastructure. The Commission will report later this year on the outcome of this public consultation. The Commission will also monitor further the functioning of the market from a consumer perspective (retail prices, choice problems, complaints, etc.)

3. ACHIEVING THE BROADBAND TARGET

Against these developments, an EU broadband policy should promote concrete measures which could (i) foster investment by, for example, reducing investment costs and (ii) enhance infrastructure competition, taking into account that the competitive threat of alternative public and private investors (including local administrations and public utilities) would incentivise investments in NGA by incumbent operators. Such actions should be coordinated both at EU and national level. This is why the Commission will work with Member States to generate effective national broadband plans.

National Broadband Plans

All Member States have a broadband strategy[14] but few have fully operational plans for ultra-high speed networks with concrete implementing measures to realise their targets, notably as regards the necessary funding. The broadband target will only be achieved if all Member States commit to it and set out an operational plan defining national targets. As part of the governance of the Digital Agenda, the Commission will work with Member States to coordinate the establishment of national targets and will encourage peer-review processes

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11 Differences are mainly due to varying distributions of household density and the mix of technologies. The sources are Plum/Cave – Broadband Stakeholder Group, JP Morgan and Analysis Mason (UK).

12 Article 8(3)(b) and 8(4)(g) of Directive 2002/21/EC (Framework Directive) amended by Directive 2009/140/EC.

13 http://ec.europa.eu/information_society/policy/ecomm/library/public_consult/net_neutrality/index_en.htm

14 See [URL] for a summary of Member State broadband plans.

among Member States in order to accelerate the transfer of best practice between policy makers. This work will be supported by an action-oriented broadband platform with a wide range of stakeholders.

Member State plans should comprise a balanced set of policy actions to incentivise and supplement private-sector action using the common framework resulting from a consistent and thorough implementation of the recently revised EU regulatory framework for e-communications and the State aid Broadband Guidelines recently adopted by the Commission. Private investment should be encouraged by appropriate coordination of planning and rules for sharing physical infrastructure and by targeted financing measures to reduce risk and promote new open infrastructures. Wireless infrastructure will play a key role in achieving the broadband coverage target in most Member States. Plans should take a long-term and balanced view of the costs and benefits of spectrum allocation and licensing agreements, in particular, the net positive effects of early investment and roll-out. The plans should also give clear guidance on the uptake of EU broadband funds and EIB instruments in eligible regions.

To support the planning process, the Commission will strengthen the monitoring of NGA deployment. This will utilise a revised form of existing instruments such as the Implementation and Digital Competitiveness Reports and a new Digital Agenda Scoreboard will detail performance indicators to enable individual Member States to monitor and compare broadband plans. The Scoreboard will be assisted by a new web-based tool to disseminate statistics and research reports on the broadband economy.

Promoting investment and reducing investment costs

A number of regulatory and financing measures can be adopted at national and local level to promote investment and reduce investment costs.

It is estimated that around 80% of the costs of deploying new fixed infrastructure are civil engineering costs which can be significantly reduced through a proper coordination by national and local authorities, using town planning rules and remedies mandating access to passive infrastructures[15]. Wireless infrastructure costs can similarly be reduced by such measures. Possible cost-cutting measures include:

- Making the installation of new passive infrastructures and in-building wiring a requirement for planning authorisations.

- Encouraging local authorities and regulators to make use of their powers to require the disclosure of the existence and condition of local access infrastructures from operators[16] with the aim of stimulating competition. In particular, national regulators should use their powers under Directive 2002/21/EC to obtain all relevant information on the location, capacity and availability of ducts and other local loop facilities, to provide alternative operators with the possibility to deploy their fibre networks at the same time as incumbents, sharing the costs of civil engineering works.

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15 See amendments to Directive 2002/21/EC, Article 12 (OJ L 337, 18.12.2009).

16 In accordance with Article 12(4) of the revised Framework Directive and Article 9(4) of the Access Directive.

- Co-ordinating civil works (such as digging of the public domain, construction of ducts) to enable and streamline the deployment of network elements.

- Provision of general powers for the acquisition of rights of way by streamlining laws and regulations concerning civil works, town planning, environment, public health and general administration to simplify and accelerate procedures e.g. for granting rights of way or mast planning, if necessary by establishing a one-stop-shop for these purposes.

- Planning authorities could also reduce the investment cost for the roll-out of wireless broadband, by removing administrative obstacles (e.g. difficulties in obtaining permissions for new base stations or in renewing contracts for existing ones).

Moreover, national or local authorities can support broadband deployment through direct public investment or public financing in line with State aid rules. Public financing could help make high-speed networks feasible where costs would otherwise be unmanageable. Such public funding should be targeted so as to alleviate barriers to private investment.

- Public authorities may decide to undertake, at their expense, civil works in order to enable and accelerate the deployment by the operators concerned of their own network elements. If such works are, in principle, open to all potential users and not just electronic communications operators, and thereby create the necessary pre-conditions for the deployment by utility operators of their own infrastructure without discriminating in favour of a given sector or a company, they do not constitute State aid and do not have to be notified to the Commission[17].

- Public authorities could build or finance sector specific infrastructure in line with the State aid Broadband Guidelines, allowing fair and non-discriminatory access to broadband operators, thereby triggering the take-off of competitive service provision in areas that would otherwise be uneconomic to serve.

- Local authorities should also consider using fibre core networks that have been or are being constructed to link up public entities (schools, libraries, clinics) in order to bring high-speed connections to unserved communities[18]. Where appropriate, Member States should consider setting up broadband funds at national level on which local authorities can call for the construction of such passive infrastructures.

- In order to speed up the use of State aid for broadband, Member States are strongly encouraged to notify national framework schemes and thereby avoiding multiple notifications of individual projects.

The Commission will undertake a review of existing cost reduction practices and report in 2012. As actions are undertaken predominantly at local level, the Commission will develop and improve mechanisms to enable local actors to obtain relevant information to reduce investment costs. The Commission would support the use of the EU Regional Funds to create and maintain the mapping of infrastructures at local and regional level.

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17 See State aid Guidelines, paragraph 61, *op cit* footnote 6.

18 This has been done successfully in the UK (cf. www.nynet.co.uk and http://wales.gov.uk/topics/businessand economy/broadbandandict/).

The Commission will also assist Member States by cooperating with the recently established Body of European Regulators for Electronic Communications (BEREC). As part of its activities, BEREC should include measures to support broadband development as a priority in its 2011 work programme. At EU level, the Commission has sought to create the right investment climate and to set attractive incentives for the deployment of new open and competitive networks by means of a Recommendation for regulated access to NGA. The NGA Recommendation, adopted in association with this Communication, gives guidance to national regulators, with a view to enhancing regulatory certainty and promoting investment and innovation in the market for broadband services taking due account of the risks incurred by all investing undertakings and the need to maintain effective competition, which is an important driver of investment over time. Significant efforts by the competent national authorities will also be needed to ensure the rapid and effective implementation of the Radio Spectrum Policy Programme which will foster the deployment of wireless broadband.

Promoting wireless broadband

The highest growth rate in the EU broadband market is in mobile broadband, where take-up more than doubled in the last year. Wireless technologies are therefore increasingly important in meeting the need for broadband communications services.

Spectrum has been designated for electronic communication services, technically optimised in particular for wireless broadband access through several Commission Decisions, but in many Member States substantial parts of this spectrum are still subject to restrictions on assignment or parts of it have not been assigned at all.

As demand for wireless services increases, the key priority will be to make effectively available to users those frequencies that have already been earmarked through harmonised allocations, including radio spectrum to be released from the digital dividend and from the reutilisation of frequencies hitherto reserved for second-generation (GSM) services. Secondly, sufficient and appropriate spectrum for both the coverage and the capacity needs of wireless broadband technologies should be designated and made available to achieve the target set for 2020. Broadband development can be further enhanced by pro-competitive measures such as the introduction of spectrum trading and measures to prevent potential distortions when existing licences are modified.

The Commission is proposing coordinated action to achieve these objectives in its first draft multi-annual Radio Spectrum Policy Programme, submitted for adoption by the European Parliament and Council. However, individual Member States could help achieve the broadband coverage target rapidly if they immediately adopted policies to:

- Make available sufficiently large bands of spectrum[19];
- Award rights of use quickly;
- Increase flexibility and competition;

[19] It is essential for designated spectrum to be made available *effectively*; this must be done both by opening new spectrum (such as 2.6 GHz as well as 800 MHz) and by liberalising the use of existing spectrum (e.g. the 900/1800 MHz band — see the revised GSM Directive and the 900/1800 MHz Decision).

- Allow secondary trading to adapt to market developments.

Increasingly mobile operators point to major difficulties to extend their infrastructure to meet the increasing demand, in particular as to base stations, because of increased planning burden and uncertainties, and non-harmonised and unpredictable safety requirements. The Commission will pursue this issue with Member States to ensure rational and non-distortive national regulations in this regard.

Reinforce and rationalise the use of the Structural and Rural Development Funds

The European Union supports the construction of broadband infrastructure and internet take-up through both rural development and structural funds, and has clarified the application of state aid rules on use of public funds for broadband deployment.

In the 2007-2013 programming period, a total of €2.3bn of Structural Funds was allocated to broadband infrastructure investments; and €12.9bn to information society services. Expenditure figures for the Structural Funds show relatively slow absorption of funds targeted on broadband projects. In this period, €418m had been committed by September 2009, which represents 18% of planned expenditure. By the same date, the average committed for all measures was 27% [20].

In the same programming period, € 1.02bn was added to the Fund for Rural Development (EAFRD) and of this, € 360m was programmed on broadband projects.

To help expand the usage of Structural and Rural Development funds, both for broadband and other information society services, the Commission will:

- Publish, in 2011, guidance on broadband investment for local and regional authorities to encourage the full absorption of EU funds.

- Engage more closely with regions, in view of helping them to reinforce their capacity to absorb funds. In 2011, within the European network for Rural Development, stakeholders will be invited to an EU-wide event on good practice in ICT implementation in regions and rural areas and make recommendations for further actions to meet the broadband target.

- Further, guidance will be provided on the use of funds from public-private partnerships (PPPs) and other financial instruments such as matching funds complementing the Operational Programmes of the European Structural Funds. Structural Funds can be used within public private partnerships, provided EU principles in relation to procurement for PPPs of this kind are followed.

- Relaunch and extend the European Broadband Portal[21] to provide a multilingual platform for the exchange of material on the implementation of broadband projects and to offer additional guidance on issues such as the state aid rules and implementation of the regulatory framework.

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[20] A Strategic Report of March 2010- COM(2010) 110 - on the implementation of the programmes 2007-2013 includes an assessment of broadband implementation and a forthcoming Communication, *Regional Policy contributing to smart growth in Europe 2020*, will give recommendations to Managing Authorities. A breakdown of broadband expenditure is available at [URL].

[21] http://www.broadband-europe.eu/Pages/Home.aspx

Develop broadband finance instruments

Many investment proposals, in particular those involving infrastructure sharing by private sector operators or resulting from public-private co-operation, are perceived by potential investors as higher risk transactions and therefore more likely to fail to attract private financing. This may be because they have a longer pay back period or simply because the promoters are too small and inexperienced to attract the interest of large financial institutions. Difficult liquidity conditions and uncertain economic prospects also limit the risk appetite of private financiers and, in effect, raise the costs of financing.

The European Investment Bank (EIB) is already lending an average of € 2bn each year to economically viable broadband projects. In the case of higher risk transactions, risk-sharing instruments, such as the Risk Sharing Finance Facility, developed by the EIB and the Commission are now being put to use. EIB involvement is planned to increase as the Bank re-focuses its lending strategy on the Europe 2020 priorities. Further, the benefits of EIB involvement in a project usually exceed the Bank's direct capital contribution which has a 'catalytic effect' on the banking sector and potential promoters and thus attracts further interest in broadband.

Local and regional authorities are increasingly exploring alternative financing arrangements, including public-private partnerships (PPP), for financing broadband infrastructure. These solutions aim to optimize synergies from combining public and private sector financial resources as well as their respective competencies in regulation and in risk based investments. To support such PPPs, the EU and the EIB will make proposals by spring 2011 on ways to mobilise the know-how of the European PPP Expertise Centre (EPEC), an EIB TA/advisory instrument co-financed by the EIB and the EU Budget, as well as to channel existing and future technical assistance funds of the Member States and the EU Budget, to project preparation. Furthermore, promoters will also benefit from the EIB’s detailed knowledge of the sector’s technological basis and its business models as well as its expertise in structuring complex multi-party financial transactions for a rapidly changing environment.

In the context of the preparation of EU programmes under the next Multi-Annual Financial Framework and the role of the EIB thereunder, the Commission and the EIB will also, by spring 2011, set out concrete proposals for financing instruments to complement existing means of the financing of broadband infrastructure. Such instruments, which could be of debt, guarantee or equity type or a combination thereof, should match to the needs of investment projects in terms of flexibility, maturity and risk. They will benefit from the lower cost of funds stemming from the EIB's AAA rating and non-profit status, as well as potentially drawing from the budgetary resources of the Union. The instruments will also be designed to serve as conduits for funds earmarked by Member States[22] and by private sector investors for financing the roll out of broadband infrastructure.

To unlock the financing for the higher-risk infrastructure projects, such instruments would require dedicated financial resources to be provided by an EU contribution. To illustrate the potential impact, a financial contribution of €1bn from the EU Budget is likely to attract other funds from public or private sectors which could underpin gross investment of €6bn - €15bn depending on the financing needs and the risk profiles of the underlying investments.

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[22] Member States' fund are to be used in line with the *Community Guidelines for the Application of State Aid Rules in Relation to Rapid Deployment of Broadband Networks*.

Until such an instrument is in place, the EIB will use available resources to develop and finance pilot projects and innovative funding schemes in duly justified cases. Moreover, the Commission and the EIB will investigate whether experience from other joint financial instruments (such as RSFF, LGTT or the Marguerite Fund) could be used for the benefit of broadband financing.

4. MAIN ACTIONS

The Commission will:

- In 2011: make a proposal, in cooperation with the EIB, for broadband financing; issue guidance for local and regional authorities on the use of EU funds for broadband project design and preparation; and adopt investment guidelines on broadband for local and regional authorities to facilitate full absorption of EU funds.

- By 2012: complete a review of cost reduction practices.

- By end 2013: reinforce and rationalise the use of funding of high-speed broadband through EU instruments under the current financial framework (e.g. ERDF, ERDP, EAFRD, TEN, CIP).

The Commission also calls upon Member States to:

- Implement rapidly the NGA Recommendation and anticipate key aspects of the European Radio Spectrum Policy Programme,

- Set national broadband targets and adopt operational plans that are in line with the European broadband target; the Commission will review the national plans in 2011,

- Take national actions to reduce broadband investment costs.