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NATIONAL BROADBAND PLANS

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FOREWORD

In December 2010 this report was presented to the Working Party on Communication Infrastructure and Services (CISP). It was recommended to be made public by the Committee for Information, Computer and Communications Policy (ICCP) in March 2011. The report was prepared by Mr Ewan Sutherland. It is published on the responsibility of the Secretary General of the OECD.

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NATIONAL BROADBAND PLANS

Main Points

This report surveys national broadband plans (NBP) across the OECD area, providing an overview of common elements and goals in those plans. An annex to this report contains references and links to the plans.

OECD countries have previously-agreed key areas of broadband policies, which have been incorporated into NBPs, notably the 2004 Council Recommendation on Broadband and the 2008 Declaration of the Seoul Ministerial for the Future of the Internet Economy.

Policy makers have been updating NBPs, taking into account the effects of the global financial crisis (GFC). The communications industry has emerged relatively well from the GFC, partly due to the experience of the "dot-com bubble". There has been continued growth in demand for broadband services, at a time when many other sectors experienced a decline. Some governments injected funds, either directly or through support for loans, to help the geographic expansion of broadband access networks, the upgrading of existing networks to higher speeds and also through measures to encourage adoption amongst social and economic groups with limited use of broadband. Governments assessed these interventions based on their costs, benefits and effects on markets.

The benefits of NBPs are expected to be extensive across economies and societies. This has required co-ordination amongst many ministries and agencies, in order to identify realistic targets and to ensure that processes are in place to monitor their achievement.

NBPs have become more prominent, particularly during elections, with increased civic engagement. Many countries have created a broadband forum to engage operators, business and consumers, while some have used "town hall" meetings to debate key policy issues. Public consultations on NBPs have been held in several countries. These have helped to develop appropriate objectives and have improved the means to achieve them.

There has been a widespread recognition of the role played by ICTs in the productivity improvements over the last decade. Further gains are forecast from the increased use of high speed broadband set out in the plans, this is expected to require monitoring to ensure that the gains are being achieved and any obstacles identified and overcome.

A range of oversight mechanisms have been deployed, including inquiries by parliamentary committees, supported by national audit offices. As yet, however, there has been no peer review of a NBP.

Governments are seeking to increase private sector investment in high-speed broadband networks and many have reviewed their legal and regulatory frameworks to ensure they are appropriate for the levels of investment necessary to achieve their policy goals.

Most governments have set targets as part of their plans, for example, requiring certain levels of geographic coverage and minimum or average transmission speeds (*e.g.*, 100 Mbps). Some of these are relatively short term with detailed explanations of their achievement, while others are longer term, being less specific and are expected to require further refinement and development. Minimally, governments are aspiring to reach an OECD average level of broadband, though some wish to be "world class", and a few aim to be the global broadband leader.

Increasingly, targets are being set for the adoption rather than for the availability of broadband. This has required governments to specify a different set of indicators and policies, addressing those socio-economic groups that have been slower in their adoption of ICTs.

In order to ensure the roll-out of broadband networks, some countries have introduced publicly owned operators to construct networks, while others have used Public Private Partnerships (PPPs). Most countries, however, have preferred to set the legal and regulatory framework, providing targeted economic support.

The provision of broadband to schools and universities is important in many NBPs, especially where there are high costs in reaching schools in remote areas and where commercial offers are limited. In such cases, a school may act as an anchor for an optical fibre connection and may offer out-of-hours use to those without their own broadband access. In other countries, it is primarily a matter for education ministries, able to take advantage of the existing provision of broadband, sometimes including the use of dark fibre.

An important focus has been on making high speed broadband available at affordable prices in rural and remote areas. Several countries have programmes for existing broadband technologies, including in more remote areas provision of satellite services. Many countries envisage further work to identify the appropriate measures needed to ensure high speed broadband is available in remoter areas without unreasonable delays.

One of the significant challenges in crafting NBPs has been to devise policies that overcome the barriers to broadband adoption for those with no experience of computers, perhaps lacking in digital literacy and who may see no reason to use broadband. This has required governments to develop a range of new programmes and interventions, to complement the economic measures for infrastructure provision.

The OECD has undertaken extensive work in e-government and, for example, on e-health. The first presents similar challenges to NBPs, with a requirement to co-ordinate across many parts of government and other stakeholders. Both also require widespread availability of broadband networks to link government offices, hospitals and clinics, plus the widest possible adoption of broadband, so that citizens and business (particularly SMEs) can access e-government services on demand. Only then can governments achieve the savings and quality improvements they have forecast.

Introduction

Over the past decade, an increasing number of OECD governments have developed or have been updating national broadband plans (NBPs). This has involved the setting of a range of targets, the encouragement of investment by private network operators and the promotion of the wider adoption and use of broadband Internet access by consumers and business.

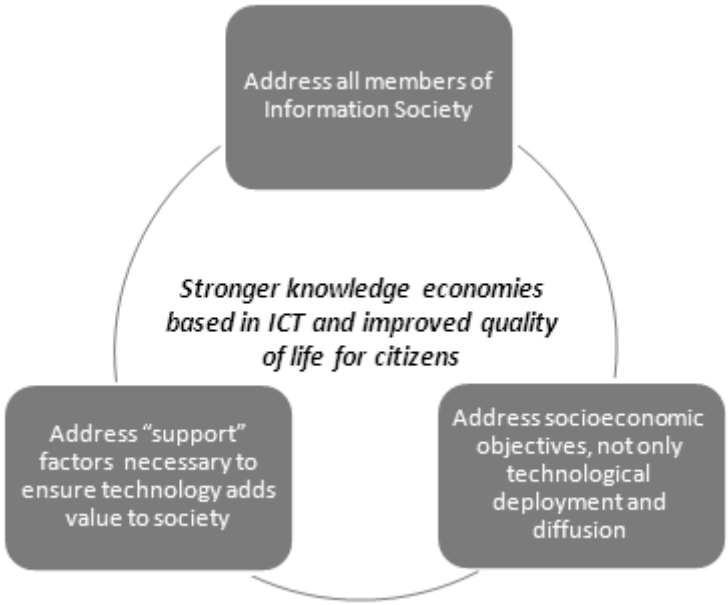
Recent developments in broadband plans have been made against the background of the global financial crisis (GFC). Irrespective of the GFC, but taking into account its effects, policy makers have identified higher speed broadband, and its more widespread availability and take-up, as opportunities for economic growth. In particular they see broadband communication networks as a tool to stimulate and enable innovation. They aim to apply those innovations to improve and to transform the provision of communication services across their economies, in areas such as education, health and transport.

Whereas the financial crisis undoubtedly curbed demand for some goods and services, demand for broadband services has continued to grow. The *OECD Communications Outlook 2011*, documents the continuing strength of the sector, highlighting growth in the take-up of high-speed fixed and wireless broadband communications. While some governments injected money into the construction of networks as one of the special measures to stimulate their economies, in most cases this was directed towards geographic expansion of availability and wider social and economic inclusion in the use of services, rather than as a measure to compensate for any reduction in demand for broadband. With the worst of the crisis over, governments have been winding down stimulus spending, to rebalance their budgets, with plans emphasising the essential and continuing roles of the private sector and private investment. [1]

While policy approaches in NBPs vary, debate and discussion has increased in prominence both through greater civic engagement and election campaigns. In many of the manifestos of political parties and of individual candidates there have been statements about ambitions for the greater availability and wider adoption of broadband networks, together with aspirations towards faster broadband services and, in some cases, towards global leadership in the provision and use of broadband networks. Many political parties and individual members of parliaments have been elected with such commitments. In some cases these have been formalised in a subsequent programme for government, for example, in coalition agreements.[2]

The wider context is often provided by an Information Society (IS) strategy, seen by policy-makers and stakeholders as an instrument for societal change, and for the building of competitive, equitable and sustainable knowledge economies.[3] The full scope of an information society strategy, of which NBPs represent a significant part, can be represented graphically (Figure 1).

Figure 1. The characteristics of an information society strategy



The OECD has established models for the review of policies, including peer review.[4] The information society strategy of Spain, the *Plan Avanza*, for example, was subject to a voluntary peer review in late 2009, significant elements of which referred to policies and actions addressing the availability and use of broadband.[5]

Engagement with stakeholders is important in order to improve the quality of laws, policies and their implementation, by integrating public input into processes, strengthening public trust in government for which an array of methods has been developed (see Table 1). These are being applied to broadband plans and to specific measures.

Table 1. Analytical framework for engagement with citizens, business and civil society[6]

	Laws	*Policy*	*Institutions*	*Tools*
Information	Freedom of information	Charging	Information offices	Registers, brochures
Consultation	Regulatory impact assessment	Special groups	Advisory bodies	Public hearings
Active participation	Popular legislative initiative	Co-operative agreements	Central policy units	Citizens' juries

This report identifies the range of existing OECD work on broadband that is applicable to NBPs. It considers:

- How governments have engaged in co-ordination between ministries and agencies and with other stakeholders.
- The use of investments in broadband as an economic stimulus, together with the economic effects of broadband access.
- The changes being made to legal frameworks.
- The use of a range of mechanisms for the oversight of NBPs.
- The targets set for the various plans with general aspirations to leadership.
- The use of technology foresight in plans, both for networks and for applications

- The provision of broadband access for educational and research establishments.
- The extension of high speed broadband to rural and remote areas,
- The extension of access through increased digital literacy,
- The articulation of NBPs with similar plans for e-government and e-health.

Established OECD work on broadband

OECD countries have already agreed on important reference points to assist them in considering and developing NBPs.

In 2004, the OECD Council Recommendation on broadband called for:[7]

- Effective competition and continued liberalisation.
- Encouragement of investment in new infrastructure, content and applications.
- Technologically neutral policy and regulations.
- Recognition of the primary role of the private sector.
- A culture of security to enhance trust in the use of ICTs.
- Both supply-based approaches and demand-based approaches.
- Promotion of access on fair terms, irrespective of location.
- Assessment of market-driven availability and diffusion.
- Regulatory frameworks that balance the interests of suppliers and users; and
- Encouragement of research and development.

In 2008, at the Seoul Ministerial for the Future of the Internet Economy, Ministers undertook to:[8]

- Stimulate investment and competition in the development of high capacity information and communication infrastructures and the delivery of Internet-enabled services within and across borders.
- Ensure that broadband networks and services are developed to attain the greatest practical national coverage and use.
- Encourage a more efficient use of the radio frequency spectrum to facilitate access to the Internet and the introduction of new and innovative services, while taking into account public interest objectives.

The Chairman's Report, from the Seoul Ministerial, noted the importance of digital solidarity and that it should be a "…political priority to avoid the creation of new digital divides".[9] OECD countries are addressing urban/rural divides and ensuring provision for the poor and overcoming the challenges of achieving effective broadband access for those with disabilities, including the challenges of ageing societies.

The Seoul Declaration on the Future of the Internet Economy, also highlighted the importance of making its benefits available around the world. The OECD and the World Bank (infoDev), in 2009, followed up with a workshop addressing policies and practices that could be adopted to improve access to ICTs in developing countries.[10] The issue of broadband Internet access was also taken up, by both organisations, at a workshop at the Internet Governance Forum in November 2009.[11] The ITU/UNESCO Broadband Commission recently addressed the issue of the divide between developed and developing countries.[12] There is also continuing work at the OECD Development Centre.[13]

Policy co-ordination

Where countries have engaged in the widest coordination, NBPs have links to many and potentially almost all areas of government policy:

- Crime and justice.
- Economy and finance.
- Education and training.
- Environment.
- Health.
- Industry.
- Regional and rural development.
- Science, technology & innovation; and
- Transport.

The extent of such co-ordination varies greatly between countries in both its scope and emphasis. There is often overlap with plans for e-government, in which the wider adoption of broadband by citizens and SMEs is, understandably, viewed as a prerequisite for success. The co-ordination mechanism for e-government is very similar to that required for NBPs and can share some of the same mechanisms.

There are usually cross-references in the NBP to other plans, policies and strategies. However, such links may be asymmetric, more commonly from the NBP to other policy areas than *vice versa*. Some governments have introduced "chief information officers" or adjusted ministerial portfolios, with the aim of improving co-ordination to ensure the achievement of the productivity and other benefits they expect from the use of broadband networks.

Some critics suggest that authors of NBPs may be overly enthusiastic in describing the benefits for other areas of government policy and the economy or at least more enthusiastic than those working directly in those areas. Closer co-ordination would serve to ensure that all parties had realistic goals and assessments of the factors that will ensure their successful achievement.

In some countries there are formal co-ordination mechanisms such as participation of the various ministries and agencies in a broadband programme steering group. Elsewhere the co-ordination seems to be less formal. Without transparency in these processes there may be risks of duplication of effort or gaps in provision.

A "platform" or forum has been created by several governments to involve ministries, vendors, operators, business users and consumers. Another tool, which has also been used, is "town hall" meetings where stakeholders debate issues and address areas of public interest.

Finally, NBPs need to address the issues arising from convergence between different parts of the communications sector. With this in mind, a number of governments or their agencies are addressing issues such as the future of broadcasting which is likely to be transformed through the use of higher speed broadband, mirroring some of the changes seen in telecommunication services with the first generation of broadband.

Broadband as an economic stimulus

The OECD has addressed the role of investment in communication infrastructure as part of efforts to accelerate economic recovery.[14] Such investments are intended:

- To extend access to un-served or under-served communities; and

- To upgrade existing networks to much higher speeds.

Broadband infrastructure was recognised as a good target for economic stimulus spending projects. It could be initiated relatively quickly, would be labour-intensive and promised stronger marginal impacts on supply and productivity than investing in established networks such as electricity, gas, water and transportation. The strongly pro-cyclical nature of communication network investment also meant that skilled labour and equipment might be left idle and planned projects shelved until the economy improved. Thus labour and equipment could be quickly shifted to government-sponsored projects. At the same time, governments had to ensure that interventions did not interfere with properly functioning markets or displace private investment.

Where public investment in broadband infrastructure takes place, OECD work has suggested that policy makers need to evaluate the costs and benefits of such investment. It advised the selection of projects that deliver both strong immediate aggregate demand effects, such as the employment created by rolling out networks, and strong longer-term aggregate supply-side effects, which would increase the productive capacity of the entire economy, as an improved foundation for commerce and communication.

In the event, relatively small proportions of stimulus funds appear to have been used on broadband projects. Preference has been for more traditional infrastructure such as bridges, railways and roads, with some countries also subsidising the purchase of motor vehicles and consumer durables.

Nonetheless, many governments remain concerned that investment in high-speed broadband may not be sufficient to achieve the targets to which they aspire and to which they are committed.

The economic effects of broadband access

Among the benefits suggested for the wider adoption of broadband Internet access are an increase in economic growth and improvements in labour productivity. While these are frequently recognised in the NBP, economic budgets and policies are much less likely to mention this benefit. Such measurements are far from simple, as the many years taken to resolve the Solow Paradox showed.[15]

There are relatively few instances of key performance indicators in NBPs that would allow monitoring of the achievement of the economic goals.

Some economists have found that investment in broadband Internet access directly correlates to growth in GDP and gains in productivity. For example, the World Bank found that in low and middle income countries every 10 percentage point increase in broadband penetration accelerated economic growth by 1.38 percentage points, significantly more than in high income countries and more than for other telecommunications services.[16,17] McKinsey & Company suggested that a "consensus" view was that a 10% increase in household penetration of broadband boosted GDP by 0.1% to 1.3%.[18] The variation was accounted for, to some degree, by differences in the methodologies used, for example, measuring penetration in terms of individuals and households.

Booz & Company found that a 10% higher broadband penetration in a specific year correlated to 1.5 per cent increase in labour productivity growth over the following five years.[19]

The economic evidence remains uncertain, not least since the data available are often only for ten years and generally with initially fairly low penetration rates and related to the slower broadband speeds, rather than for higher-speed broadband networks. Consequently, it will continue to be important to collect and to analyse data in order to monitor the progress being made in harnessing the many potential economic and social benefits, which have been identified as being possible.

Competition and regulation

National plans have emphasised the role of investment in new networks and consequently the environment for operators. Governments have recognised the considerable scale of investments needed to achieve, for example, full fibre to the household (FTTH) and the number of years this will require.

The question of the balance between service-based and infrastructure-based or inter-modal competition has been re-examined, with different conclusions being reached by different governments.

National frameworks for competition law remain important for broadband, but are relatively static. There have been some advances through decisions in specific cases and some reviews of, and amendments to, legislation.

Primary legislation for telecommunications, including broadband, changes a little more rapidly. For example, the European Union is updating its telecommunications legislative package, having adopted new directives, which are now being transposed into the national laws of its member states and those of the European Economic Area. Next generation broadband networks were a major consideration in those changes. Following extensive consultations, the European Commission adopted its Recommendation on Next Generation Access in September 2010.[20]

Switzerland conducted a review of its legislation, looking at the need for changes required by advances in broadband. However, the government concluded there was no need to update its law.

Australia and New Zealand have both been engaged in reconsidering their legal and regulatory frameworks, reviewing their own experiences and those of other OECD countries. The Australian Parliament has recently passed the Telecommunications Legislation Amendment (Competition and Consumer Safeguards) Act to make significant detailed changes, necessary for the achievement of its National Broadband Network project. In New Zealand, a number of measures have been introduced by the government and by the Commerce Commission to support the deployment of fibre to the premises, including the continuing use of operational separation.

While most governments agree that some legislative measures are necessary to achieve the goals contained in NBPs, there is less agreement on the detailed measures and, in particular, the forms of competition to be achieved. This reflects different histories of broadband development and different proposed paths, albeit towards very similar goals.

Oversight and reviews

Given the potentially large sums of money involved in broadband, it is unsurprising that parliaments would seek to oversee spending on, and the policies for, broadband networks. Such inquiries require a degree of specialist expertise in the parliament and in the supporting institutions (*e.g.*, national audit office).

The Australian National Audit Office (ANAO) has reviewed the processes followed in the request for proposals for the National Broadband Network.[21] In the United States, the Government Accountability Office (GAO) has produced reports for the Congress on the need for performance goals and possible improvements for broadband measures.[22,23] This has supported a number of hearings conducted by committees examining developments in the broadband plans and specific policies.

In the United Kingdom, a Select Committee of the House of Commons published a report on broadband early in 2010, examining the likely effectiveness of the policies then in force.[24] A Committee of the French parliament has received reports from the regulator on broadband in France.[25] In Canada, the

Standing Committee on Transport and Communications of the Senate conducted an inquiry into a possible plan for a Digital Canada.[26]

There have been a number of very useful contributions from parliamentary committees and from audit offices. However, to date, there has not been a peer review of a national broadband policy

Public consultations

Procedures for consultations by governments are widely adopted by OECD countries. They are expected to ensure that: [27]

- The information is complete, objective, reliable, relevant, easy to find and understand.
- There are clear goals and rules defining the limits of the exercise and government's obligation to account for its use of the input; and
- Sufficient time and flexibility is available to allow the emergence of new ideas and proposals by citizens as well as mechanisms for their integration into the government's policy-making process.

OECD countries which have held consultations on their draft national broadband plans are:

- Canada: "Improving Canada's Digital Advantage".
- Czech Republic: "Digital Czech Republic".
- France: "National programme for very high speed broadband".
- Ireland: "Next Generation Broadband".
- Japan: "Path of light".
- Slovak Republic: "National Strategy for Broadband Access in the Slovak Republic; and
- United States: "Connecting America: The National Broadband Plan".

While in most cases it was the government that conducted the consultation, in the United States it was its independent regulatory authority, the Federal Communications Commission (FCC). It is worth noting that this process led to many thousands of submissions from operators, state governments, business and individual consumers.[28] The FCC's National Broadband Plan is being evaluated by the executive and legislative branches to consider its merits and implement those provisions outside the authority of the FCC.

The scopes of the consultations varied considerably, from the relatively broad to some quite specific issues. These exercises have helped governments achieve a consensus on the objectives to be achieved and on the means to do so.

Regulatory impact assessments

The use of regulatory impact assessments (RIAs) has become increasingly common, being used in a wide range of policy and regulatory decision-making.[29] In particular, RIAs are used by national regulatory authorities in their decision-making.

In developing its NBP, the ministry in Hungary followed the *Kormányzati Stratégia-alkotási Követelményrendszere* (KSaK) or Government Requirements for Strategy Compilation.[30] For this, the ministry undertook a series of measures to prove the appropriateness of the broadband strategy.

The Court of Auditors of the European Union recently assessed the use by the European Commission of regulatory impact assessments.[31] It suggested that while practice within the European Commission had improved and was becoming both better and more consistent, it was necessary to track amendments to legislation after the European Commission had made its formal legislative proposal, as texts progressed

through the Council and Parliament, modifying the RIA accordingly. This was to help achieving full transparency of legislative measures and to assist with subsequent reviews.

This raises the question of the extent to which political decision making should be subject to RIAs, rather than subject to an electoral mandate, and whether it should be limited to administrative decisions. While specific measures associated with plans, such as secondary legislation and regulatory decision have been required to produce an RIA, governments have chosen not to subject NBPs to this approach.

Targets

A majority of governments have made statements about their aspirations to achieving or sustaining world class broadband or global leadership. The latter is usually expressed as very high levels of availability with an increasing focus on adoption, combined with higher transmission speeds and other technical characteristics (*e.g.,* latency). If all these aspirations are to be achieved, then there will have to be a considerable reduction in the variation in policy outcomes, with countries converging through much improved performances.

The current broadband targets, which vary considerably in time scales and in the measures employed can be summarised (Table 2). In addition to targets for deployment, adoption and throughput, some NBPs include targets for innovation in devices, applications, services and their use.

Table 21 Broadband targets

Country	Commitment
Australia	By 2021, the National Broadband Network will cover 100% of premises, 93% of homes, schools and businesses at up to 100 Mbps over fibre, with the remainder at up to 12 Mbps over next generation wireless and satellite.
Austria	By 2013, 100% of population will be provided with access speeds of at least 25 Mbps.
Belgium	By 2015, 90% of families to have broadband and 50% of residents to be using the mobile Internet.
Canada	Consultation in 2010 on "Building a World-Class Digital Infrastructure".
Chile	By 2011, to provide Internet access to 3 million rural households. By 2014, 100% of school and 70% of households to have broadband. By 2018, 100% of households.
Czech Rep.	By 2013, in all populated localities a minimum of 2 Mbps and in cities a minimum of 10 Mbps. By 2015, rural areas to have at least one half of the average speed in cities and 30% of premises in cities to have access to at least 30 Mbps.
Denmark	By 2020 100% of households and businesses to have access to 100 Mbps.
Finland	By 2010, every permanent residence and permanent office of business or public administration body must have access to a fixed or wireless subscriber connection with an average downstream rate of at least 1 Mbit/s. By 2015 practically all (more than 99% of population) permanent residences and permanent offices of businesses or public administration bodies will be no more than two kilometres from an optical fibre or cable network permitting 100 Mbps connections.
France	By 2012, 100% of the population to have access to broadband. By 2025 100% of home to have access to very high speed broadband.
Germany	By 2014, 75% of households will have download speeds of 50 Mbps.
Greece	By 2017, 100 Mbps to all homes.
Hungary	By 2013, broadband coverage will be 100%, and average speed will be 2 Mbps, with a target for 2020 of 30 Mbps.
Iceland	2007: All Icelanders who so desire should have access to a high-speed connection.
Ireland	October 2010: in areas where there was no broadband a mobile service (using HSPA), was required to be in place with a minimum download speed of 1.2 Mbps and a minimum upload speed of 200 kbps.
Israel	Broadband included in universal service.
Italy	By 2012, all Italians to have access to the Internet at between 2 and 20 Mbps.
Japan	By 2015, fibre optic highways will be completed enabling every household to enjoy a broadband

Country	Commitment
	service.
Korea	By 2010, to provide broadband multi-media services to 12 million households and 23 million wireless subscribers. By 2012 to raise average speeds to 10 Mbps with a maximum of 1 Gbps.
Luxembourg	By 2015, FTTH to every household. By 2020 1, Gbps to every household.
Mexico	By 2012, 22% broadband penetration.
Netherlands	-
New Zealand	By 2019, ultra fast broadband to 75% of New Zealanders where they live, work and study. By 2015, 80% of rural households to have speeds of at least 5Mbps, with the remainder to achieve speeds of at least 1Mbps.
Norway	By 2007, all citizens to be offered high-speed broadband .
Poland	By 2013, 23% of population to have access to broadband. A citizen who has no computer may use one of the numerous points of access to digital services, which are located in public institutions.
Portugal	By 2012, 100% of municipalities covered by fixed NGN. By 2015, 100% national coverage by LTE.
Slovak Republic	By 2013, 100% of population to have a minimum speed of 1 Mbps. By 2020, to provide access to high speed broadband of at least 30 Mbps.
Spain	By 2011, minimum speed of 1 Mbps broadband access available to 100% of population. By 2015, 100 Mbps broadband available to 50% of population.
Sweden	By 2015 40 per cent of households and businesses should have access to 100 Mbps. By 2020 90 per cent of households and businesses should have access to 100 Mbps.
Switzerland	Since 2008 a universal service obligation of 600 kpbs.
Turkey	The opportunity of high quality and affordable broadband access to all segments of society.
United Kingdom	By 2015, to bring “superfast broadband” to all parts of the UK and to create the “best broadband network” in Europe. To provide everyone with at least 2 Mbps and superfast broadband to be available to 90% of people.
United States	By 2010, at least 100 million homes should have affordable access to actual download speeds of at least 100 Mbps and actual upload speeds of at least 50 Mbps. By 2020, every household should have access to actual download speeds of 4 Mbps and actual upload speeds of 1 Mbps.

In many cases governments have identified targets for the roll-out of infrastructure in terms of coverage of the population or of households and, sometimes, of business premises. Availability is neither simply nor precisely measured, but implies that customers can in short order and at a reasonable cost for installation, obtain a broadband service.

One important policy focus has been on making broadband more readily available in rural and remote areas by deploying additional network equipment. For example, Estonia and Ireland have sought to cover areas without a fixed broadband service using wireless technologies, in the first case with WiMAX and in second case with HSPA, plus some use of satellite services. Further work is envisaged, by many countries, to identify the appropriate measures that will ensure the availability of affordable high speed broadband in rural and, especially, in more remote areas.

Where a high speed broadband service is available and potentially affordable, attention is switching to adoption by households and individuals. This raises more complex issues, requiring the purchase and use of a computer, the availability of a sufficient range of content and services to generate interest and the willingness to pay.

A concern raised by some operators has been whether customers are willing to pay more for higher speeds of broadband or, at least, sufficiently larger monthly fees to pay for the necessary network upgrades and investments. While it is true that some people, for a variety of reasons, may not wish to have Internet access, let alone high-speed broadband, the evidence from the most competitive markets, is that consumers

will readily embrace enhanced capabilities and improved services when they become available. There is clearly unmet demand in those countries with the highest prices and most limited broadband offers or where, for geographical reasons, only limited or high priced services are available.

In order to achieve full adoption of broadband it is also necessary to address the challenges of the urban and rural poor. This requires analysis of the affordability of services for the least well off in society, in order to construct interventions that would support their use of the Internet. Solutions for such groups include targeted subsidies and public access telecentres (e.g., libraries), combined with digital literacy training and other initiatives to encourage adoption.

The BRICS countries, in part because of their large geographical sizes, are further from widespread broadband availability than the OECD countries. Currently, they are typically setting targets in terms of expanding the areas of coverage (see Table 3). For low income users, telecentres and other public access points are seen as especially important, both now and for the foreseeable future.

Table 3. Broadband targets in the BRICS countries

Country	*Commitment*
Brazil	By 2014, to have 30 million fixed broadband connections, including homes, businesses and co-operatives, plus 100 000 telecentres.
Russia	By 2010, to have 15 lines per 100 population. By 2015, to have 35 lines per 100 population.
India	By 2010, to have 20 million broadband connections.
China	By 2014, to raise broadband accessibility to 45% of the population.
South Africa	By 2014, to have 5% broadband penetration (min. 256 kbps).

The BRICS countries are also looking to 3G and 4G wireless networks for both fixed and mobile broadband access. They already have competitive wireless markets, with the widespread adoption of voice telephony and have growing adoption of mobile broadband services. Their consumers may find these services more affordable both in terms of pre-paid tariffs and, especially, in terms of the costs of a handset, tablet or netbook computer.

A number of OECD countries have undertaken to raise the minimum download speed available for households. Finland has imposed a statutory minimum download speed of 1 Mbps since July 2010, with an intention to raise this in the future.[32] Slovenia has required a minimum of 2 Mbps for 90% of homes by the end of 2010 and 98% by 2012, recognising the difficulties and diminishing economic returns in reaching more remote households. Singapore has required the provision of FTTH, with customers left to select from a range of suppliers and speeds of access.

The issue of the accuracy of advertised speeds, for download and upload, has usually been left to *ex post* regulation, rather than being included in broadband plans. It is typically seen as a matter for consumer protection or advertising legislation and enforcement. A number of regulators have set-up their own or supported the establishment of independent services that offer speed tests.

As part of its economic stimulus package, the United States funded a number of mapping exercises in its states and territories, in parallel with initiatives to deploy backhaul and access networks. The results of those have been aggregated into a public, searchable, national map of broadband availability.[33] Smaller scale mapping exercises have previously been conducted by Canada and Denmark, with a view to supporting detailed planning for interventions.

An increasing number of targets involve the adoption of broadband services. For example, Estonia has said that 75% of residents will be using the Internet by 2013 and Belgium that 90% of families would be

using broadband. The European Commission has adopted key performance targets for broadband in the European Union:[34]

- By 2013:
  - basic broadband for all.
- By 2020:
  - broadband coverage with at least 30 Mbps available for 100% of European Union citizens;
  - 50% of households should have taken out subscriptions at speeds of more than 100 Mbps.

This is monitored by surveys by Eurostat on Internet adoption across all the European Union member states.[35]

This type of target requires a set of indicators to measure adoption by individuals and households that is dependent on surveys of representative samples of individuals and homes, rather than using data provided by suppliers. The United States government has recently published such an analysis, identifying a range of groups with lower levels of interest in broadband and a range of barriers to their adoption.[36] There are also benefits from some more detailed studies of specific groups, such as the elderly, the poor, the disabled and linguistic minorities.

World leadership

World leadership in broadband can be defined in several ways. A number of organisations offer generic rankings, for example, the EIU e-readiness rankings[37] and World Economic Forum's Network Readiness Index.[38] The ITU developed an index measuring the cost of 1 Mbps per month, from which a ranking for broadband has been derived. One challenge, with the interpretation of the different indices, is the weightings given to the various components.

Akamai, which from its perspective of providing global distribution of content across the Internet, publishes quarterly *State of the Internet* reports which show broadband adoption and net usage indicators.[39] Speedtest compiles tables of results from its global network of test sites.[40] Cisco and the University of Oxford have published their third assessment of global broadband quality, noting that one country in five was now prepared for "applications of tomorrow".[41] These provide insights into usage and performance, as against advertised and possible speeds.

OECD countries also have indicators compiled from subscription data, reported by operators, as well as household and business surveys, to assist in measuring their performance in broadband services.

Some countries prefer to construct a peer group for comparisons, seeking broadly comparable countries, neighbours, trading partners or traditional rivals. For example, the Nordic countries tend to compare amongst themselves, Chile with other Latin American countries, while South Africa compares itself with the other BRICS. In the United States the FCC is required by legislation to make comparisons with at least 25 countries in its annual report on advanced services, it has chosen to use a superset of the OECD and other countries.[42]

The construction of a "comparator group" is likely to reflect:

- Geographical size;
- Patterns of population density; and
- Level of economic development.

There is a consensus that developed countries require advanced networks in order to sustain their economies, which is broadly categorised as being "world class". A few countries seek leadership, usually

linked to greater innovation and industry policy, and requiring careful analysis of their position with respect to specific economic rivals, both in terms of their current performance and their plans for the future.

Technology foresight

Plans have to consider, and to some extent have been driven by, advances in technology and the migration of access networks to recently available and future broadband technologies including DSL, cable modem service and FTTx.[43] While a number of operators provide retail FTTH services, many of these operate at a maximum download speed of 100 Mbps, with only a few offering the current upper speed limit of 1 Gbps (*e.g.*, Portugal, Sweden, Hong Kong SAR and Singapore).[44] There are different ways of delivering these speeds over fibre, either point-to-point networks or Passive Optical Networks (PON), typically EPON in Asia and G-PON in Europe and in the Americas.[45] The possible effects of technology choices were considered in the report "Fibre access – network developments in the OECD area" (DSTI/ICCP/CISP(2010)10).

While EPON and G-PON technologies are expected to meet demand for bandwidth from retail customers for some years, there has been work in laboratories and in standards making organisations for faster speeds. There are already laboratory and field trials of XG-PON1 which would offer 10 Gbps downstream and 2.5 Gbps upstream.[46] Beyond that there is XG-PON2, which has symmetric 10 Gbps upload and download. However, until there is express demand for such high bandwidths, deployment of equipment would be likely only when unit costs fall to the level of EPON and G-PON. At the same time, work has been underway to develop Gigabit Ethernet, in particular for enterprise customers, with 100 Gbps services now becoming available.

In a report for the government of the Netherlands, TNO identified the following likely launch dates for advanced network access technologies:[47]

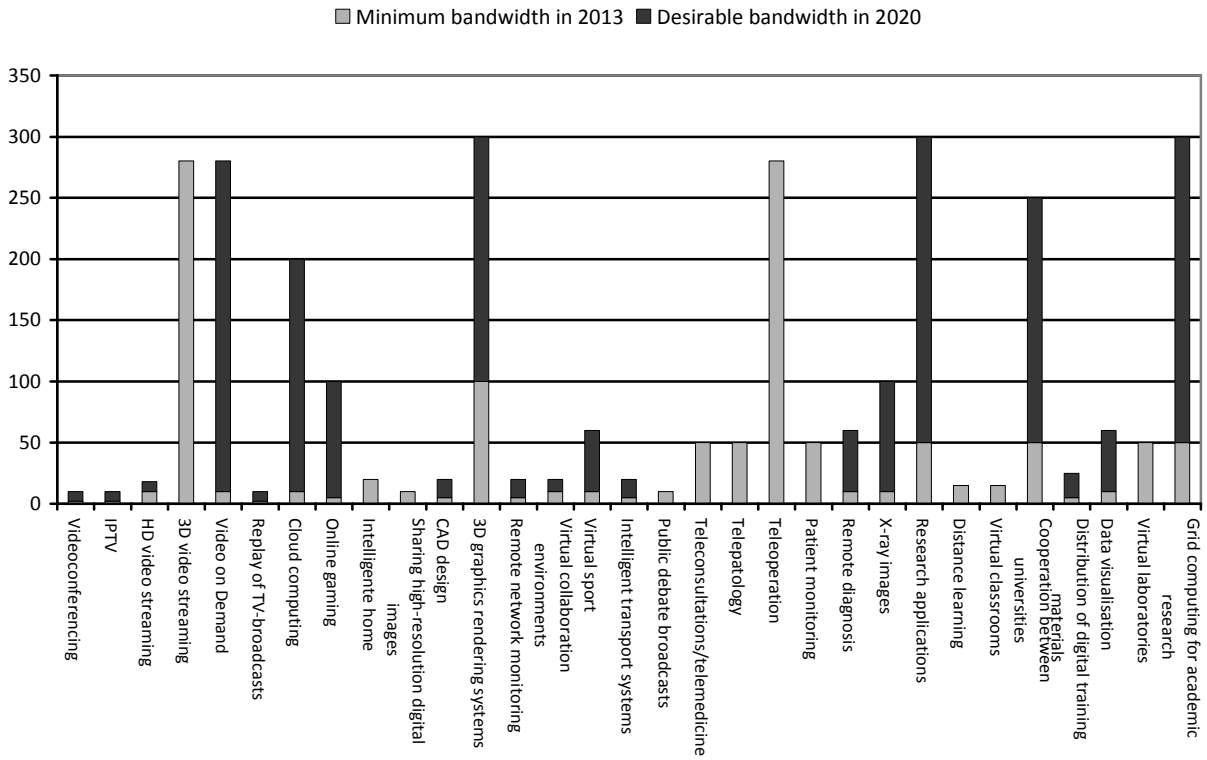
- 2012 HFC DOCSIS 3.0 (16 ch)
- 2012 Hybrid FTTH/VDSL2 (50m)
- 2015 Hybrid FTTH/Ultimate DSL (50m)
- 2016 FTTH 10GbE

These would gradually make available to operators speeds of up to 10 Gbps in both directions.

On behalf of the committee which advised the Danish government on its broadband policy the Gartner Group examined applications that might need higher speeds (see Figure 222). It identified several that it considered would require 200 Mbps, including:

- Video on demand;
- 3D video streaming;
- 3D graphics rendering systems; and
- Scientific research applications.

Figure 22 Minimum and desirable bandwidths for services (Mbps)



Source: Gartner Group for *Højhastighedskomiteen*.

Much faster network technologies are certainly going to become available. Planning for such networks is seen as difficult, while the patterns of demand and usage remain uncertain. Where there are competitive pressures, operators will be interested in deploying yet faster networks, provided they can make returns on the investments. In some cases the upgrades necessary for higher speeds are relatively small incremental investments, limited to the equipment on either ends of the access network, while in other cases they require the installation of new networks at considerable cost.

State-owned operators

In a few countries, the government has created a new state-owned operator in order to participate directly in the construction of broadband networks:

- Australia – NBN Company Limited;[48]
- Brasil – Telebras;[49]
- Luxembourg – Luxconnect;[50]
- New Zealand – Crown Fibre Holdings;[51] and
- South Africa – Infraco.[52]

Some countries, such as Chile and Norway, have used Public Private Partnerships (PPPs) as an appropriate vehicle for interventions. There are also municipal networks sometimes owned by local government or PPPs. Otherwise, OECD countries have not found it necessary to re-enter the business of

the direct supply of telecommunications, preferring to set the regulatory framework and to provide targeted economic support through a variety of forms of public investment.

Schools, colleges and universities

A number of governments have set targets to provide broadband access in all schools, while some have already achieved this goal. The funding can be from:

- Education budget;
- Universal service fund; and
- Universal service obligations.

For many years, the United States has operated an "E-rate" programme, supporting Internet access in schools and libraries, through universal service funds collected from users of inter-state and international telecommunications services. Today, 94% of classrooms in the United States have at least some internet access, and virtually all its schools are online. The FCC has recently revised the Schools and Libraries Universal Service programme, in the light of demand for faster connections from end-users. The arrangements now provide USD 2.25 billion annually which can be used to pay for fibre optic connections. There is also an option to serve as an anchor tenant, providing broadband through "School Spots" to the local community after pupils go home.[53] The FCC has also implemented a pilot programme to test the merits and challenges of supporting off-premises wireless connectivity for mobile learning and research.[54]

In 2008 the government of Brazil launched the *Projeto Banda Larga nas Escolas Públicas Urbanas*, requiring fixed telecommunications operators to provide broadband Internet access, free of charge, to schools. Thus the costs fell on their existing customers, though the extent of this cross-subsidy has not been calculated.[55] By April 2010, 44 000 or 68% of urban schools had been connected, with a commitment to extend this to 90%.[56]

New Zealand has recently announced a programme for fibre connections to 97% of schools, with the remaining 3% per cent to be covered by the Remote Schools Broadband Initiative in order to receive 10 Mbps or more via point-to-point wireless or satellite.[57] Its objective is to ensure that New Zealand schools are among the most connected in the world.

One of the most advanced "private" networks in most countries are the National Research and Education Networks (NRENs), serving universities and scientific research establishments. Funding for NRENs is a long established item for education or research budgets, rather than coming from the telecommunications sector or from economic stimulus budgets. The high capacity and low cost of such networks have been made possible by liberalisation, for example, through the availability of dark fibre on major routes. Typically a connection to a university campus is now in the range of 1 to 10 Gbps.

The most advanced networks use multiple individual light wavelengths, lambda networking, giving a research community its own private network at 10 Gbps. For example, this is used is to transfer data from the Large Hadron Collider (LHC) in Geneva, which can generate 100 Petabytes of data annually.[58] Researchers in the United States use the National Lambda Rail and a trans-Atlantic connection to access LHC data sets.

In some countries NRENs are extended to schools, at lower speeds but benefitting from the substantial low cost capacity of the core network.

In many countries the provision of broadband to schools and universities is a matter for education departments, able to take advantage of the liberalisation of telecommunication markets, especially where dark fibre is commercially available. In some countries, especially where infrastructure is not available, for

example, in less developed or in more remote regions, governments have been able to use the provision of high speed broadband to schools as a means to stimulate the commercial provision of broadband, while also contributing towards the achievement of educational policy objectives.

Rural and remote areas

The challenges of achieving affordable broadband services in rural and remote areas are well understood and recognised in NBPs. Long distances from homes to exchanges and from rural exchanges to the core network make for high costs in traditional networks. Low population densities generate relatively low revenues overall, though individual users may have to pay high charges, perhaps significantly larger parts of their disposable income, in order to overcome the barrier of distance. The OECD addressed these issues in a workshop in Porto, Portugal, in October 2004.[59]

There is considerable political will concerning prices in rural areas, with governments seeking to ensure widespread service at prices considered reasonable or comparable with those in major urban centres. In some cases it is not practicable to pass on additional costs incurred to rural subscribers, with significant pressure to ensure national tariffs are applied. In addition there may be a lack of sufficient competition to ensure sufficient discipline on pricing for rural users. Consequently, there may be government subvention to pay the difference, a cross-subsidy from urban to rural subscribers or rural users bear higher costs.

For example, in Australia, the National Broadband Network (NBN) is expected to reach 93% of homes, with the remainder being served by wireless services: fixed, cellular and satellite. Australian Islands, such as Christmas, Cocos and Norfolk are linked by satellite, with little prospect of undersea cables being laid, due to the very high costs and the modest revenues available to pay for them. The Premier of the state of Tasmania was especially keen that his island be first to obtain access to the NBN in order to overcome the obstacle of its distance from major urban centres and to boost the economy.[60, 61]

The French government is considering measures for the provision of FTTH in less densely populated areas of metropolitan France. It also has very distant territories in the Atlantic, Indian and Pacific Oceans, where it has sought to ensure access to the current generation of broadband services that are of qualities and prices comparable to those available in metropolitan France. This has presented significant challenges, which the regulator set out in a report to the French parliament.[62]

The Portuguese government in 2009 launched five tenders for up to USD 155 million for the installation, management, operation and maintenance of high-speed electronic networks in rural areas, where there was no investment by alternative network providers or cable operators. Using public and private funds the goal is to connect 1 million users, all schools and public services to high speed broadband networks with a minimum of 40 Mbps downstream. Those bidding for the project would have to connect at least 50% of the population, have a wholesale network offer, and comply with transparency and non-discrimination principles.

Except in extremely compact and heavily urbanised countries such as Singapore and Luxembourg, NBPs have held back, for the present, from detailed commitments to install very high speed broadband to every home, because of the anticipated cost.

Digital literacy

Many of those not yet having a subscription to the Internet lack any experience of computers and data networking, making it a challenge to convince them to pay for the service. Many countries now have detailed surveys indicating the extent of obstacles and challenges amongst, for example, the remote, the elderly, the poor and ethnic and linguistic minorities.

A number of national plans address questions of raising digital literacy or of, as in the case of Hungary, eliminating digital illiteracy. The United Kingdom has re-appointed its Digital Champion who heads an initiative known as the Race Online 2012.[63] This seeks to ensure that all people in employment are online and that "no one should retire without web skills". It notes a number of economic benefits for individuals and households, such as discounts or services not available without Internet access. "Our vision is for the United Kingdom to be one of the first places in the world where everyone can use the web."

An area of growing attention is amongst the elderly, those who have often not acquired computer and Internet skills during their working life and who see insufficient reasons to do so now. Governments are looking for means to engage and to inspire the elderly to acquire sufficient skills and confidence to take up broadband both for their own benefit and to help achieve savings in e-government and e-health programmes.

In seeking to raise digital literacy or to eliminate digital illiteracy, broadband plans contain much softer policy measures than the economic instruments for network construction, with less certainty of success. It represents an area where sharing of experiences and best practices is likely to be valuable.

e-Government

In 2001 the OECD launched the e-Government Project to explore how governments can best exploit information and communication technologies (ICTs) to embed good governance principles and to achieve public policy goals.[64] It has produced reports on the following countries:

- Belgium;[65]
- Denmark;[66]
- Finland;[67]
- Hungary;[68]
- Mexico;[69]
- Netherlands;[70]
- Norway;[71] and
- Turkey.[72]

A primary concern for e-government has been to ensure universal access to services, whether from fixed or mobile broadband, from a household computer or a mobile phone. This creates a significant overlap with the NBP and an important potential synergy.

The high-level OECD E-Leaders Meeting in October 2010, hosted by the Belgian Government, addressed issues of e-government.[73] This addressed issues of indicators, benchmarking, the performance and effects of e-government.

Japan views e-government as being important to raise the quality and lower the cost of public services, through the delivery of services by cloud computing on a 24 hours a day and seven days a week basis. This is seen as sufficiently important and significant to raise its national competitiveness, once it is fully achieved.

The OECD Health Ministerial Meeting, held in Paris in October 2010, addressed priorities following the global financial crisis, which had increased the stress on health systems.[74] The challenges faced included pandemics that had implications for economic well-being, the increase in the number of people suffering from chronic diseases and the trend in obesity.[75] The meeting noted that the expanded use of ICTs could help to deliver:

- Better quality of care;
- A reduction in medical errors; and
- A streamlining of administration.

The fragmentation of care delivery processes and the poor transfer of information was recognised as a source of inefficiencies.[76] ICTs in the various and separate "silos" had seldom been linked into a seamless system for the sharing of information across a country. The European Union had been active in encouraging nation-wide implementation of e-health solutions and national e-health strategies, within a trans-national framework.[77]

Governments in most OECD countries are seeking to improve their understanding of the adoption of ICTs by health care providers and the conditions under which ICTs would deliver anticipated efficiency improvements.

A number of governments have committed to connect hospitals, health clinics and pharmacies to broadband networks, where this is not already the case. There are expectations of savings and benefits from the use of ICTs at home for diagnosis, monitoring and information, including health promotion and disease prevention, with the widespread household adoption of broadband seen as a means to facilitate this.

The achievement of the goals of e-government and of e-health in particular rely on the achievement of the primary goal of the NBPs, widespread access to and use of high speed broadband.

Cyber security

With a growing number of households online and the expectation that this will soon be all households and individuals, one concern has been to ensure the security of the computers. Governments have uniformly adopted policies to protect children from a number of dangers.

Some countries, such as Belgium and Canada, have introduced strategies to improve the security of citizens using broadband Internet connections from a range of cyber-threats.

Internet openness

A number of countries have addressed issues concerning "Internet openness" (*e.g.* network neutrality and traffic prioritisation). For example, the FCC's original statement on the issue of network neutrality was first conceived in 2005.[78] More recently, in 2009, the FCC adopted a Notice of Proposed Rulemaking (NPRM) on "Preserving the Open Internet" and in December 2010 adopted these rules. These provide guidance in relation to transparency, non-discrimination, unreasonable blocking and reasonable network management practices.[79] Chile has adopted legislation requiring operators to observe network neutrality in their provision of services to all categories of users. [80]

Conclusion

Given the high profile of broadband policies, headline goals are increasingly likely to be found in formal government programmes. At the same time, NBPs are, in most countries, adopted by an individual ministry or by the council of ministers, giving them less standing than legislation and often leaving them

outside formal processes for assessment and review. This also provides flexibility for adjustments when these are required.

With more targets requiring adoption of high-speed broadband, rather than availability, broadband plans are increasingly found to contain a wider range of mechanisms, supplementing the traditional focus on economic interventions.

In many countries there are complex co-ordination mechanisms between the broadband activities of different levels of government: federal, state or provincial and municipal. There is also co-ordination between ministries, to ensure appropriate targets and outcomes for e-inclusion, e-government, e-health, plus contributions to the creation of jobs and to economic growth.

ANNEX - LINKS TO DOCUMENTS FROM NATIONAL GOVERNMENTS, COMMITTEE REPORTS AND REGULATORS

Australia

Consultation document: *National Broadband Network: Regulatory reform for 21st Century broadband NBN implementation study* (McKinsey/KPMG)
Final Report of the Parliamentary Select Committee on the National Broadband Network
National Broadband Network Company (NBN Co)
See also, for example, the *Victoria State ICT Plan*

Austria

Breitband Austria Zwanzigdreizehn BBA_2013 (Broadband Austria Twenty Three Ten)
ICT Master Plan - 2007
e-Inclusion in Austria: fields of action and examples
Forschungsförderungsgesellschaft mbH (FFG) *Austrian electronic network - AT:net*
Internet Offensive: *Österreichische Internetdeklaration* (Austrian Internet Declaration)

Belgium

Digital heart of Europe – 30 Action points:

- *Coeur de l'Europe numérique 2010-2015: 30 points d'action*
- *Digitaal hart van Europa 2010-2015: 30 Actiepunten*

Start2Surf@Home

Canada

Broadband programme of the Economic Action Plan
Broadband Canada: Connecting Rural Canadians
Consultation document: *Building a World-Class Digital Infrastructure*
Standing Committee on Transport and Communications of the Canadian Senate: *Report on a plan for a Digital Canada*

Chile

Proyecto Bicentenario: *Red de Internet Rural: Todo Chile Comunicado* (Bicentenary Project – Rural Internet – All Chile communicates)
Ministerial *statement of targets*
Plan de Acción Digital 2008-2010 (Digital action plan 2008-2010)
Acuerdo Nacional para la Conectividad Digital (National Agreement for Digital Connectivity)
Statute: Ley núm. 20.453 *Consagra el principio de neutralidad en la red para los consumidores y usuarios de Internet* (Enshrines the principle of net neutrality for consumers and Internet users)

Czech Republic

Consultation on *Digitální Cesko* (Digital Czech Republic)

Denmark

Announcement of broadband targets
Digital roads to growth programme
Report: *Denmark as a high speed society*

Finland

Laajakaista kaikille (Broadband for all)
Broadband to everyone in Finland programme
Access to a minimum of 1 Mbit Internet connection available to everyone in Finland by July 2010
Ubiquitous information society programme

France

Programme national « très haut débit » (Very high speed broadband programme)
La Stratégie de Cohérence Régionale d'Aménagement Numérique (An integrated strategy for regional digital development)
Statute: *Loi du 17 décembre 2009 relative à la lutte contre la fracture numérique* (Law on the fight against the digital divide)
France numérique 2012 - Plan de développement de l'économie numérique (Digital France 2012 - Plan for the development of the digital economy)

Germany

2010 Annual Economic Report: Shaping the future with renewed strength
Breitbandstrategie der Bundesregierung (Broadband strategy of the Federal government)
IKT 2020 – research for innovation
Broadband Access Networks for the Next Generation
Zukunft breitband (Future broadband portal)

Greece

ΓΙΑ ΤΑ «ΔΙΚΤΥΑ ΠΡΟΣΒΑΣΗΣ ΕΠΟΜΕΝΗΣ ΓΕΝΙΑΣ» (For next generation networks)
Ministerial announcement*: ΣΥΝΕΝΤΕΥΞΗ ΤΥΠΟΥ ΤΟΥ ΥΜΕ ΓΙΑ ΤΟ ΣΧΕΔΙΟ ΝΟΜΟΥ ΓΙΑ ΤΙΣ ΟΠΤΙΚΕΣ ΙΝΕΣ* (Launch of the draft law on optical fibre networks)
NRA: *EETT regulatory strategy 2008-11*

Hungary

I*nformatikai Átfogó Stratégia* (Comprehensive strategy for informatics)
2005 *National Broadband Strategy*
Digital Literacy Action Plan 2008–2010
NRA*: NHH 2010 Work Plan*

Iceland

Iceland the e-Nation
Ministry of Transport and Communications: *Telecom Policy Statement* 2005-2010

Ireland

Progress and future priorities for the smart economy
Technology actions to support the smart economy
Next Generation Broadband – Gateway to a Knowledge Ireland
National Broadband Scheme
Schools Broadband Access Programme
NRA: *COMREG's strategy 2010-2012*

Italy

Banda larga: Internet per tutti entro il 2012 (Broadband Internet for all by 2012)
Tlc e digitale: progetto banda larga avviati 500 cantieri (TLC and digital broadband project launched 500 yards)
Report: *Portare l'Italia verso la leadership europea nella banda larga: Considerazioni sulle opzioni di politica industrial* (Bringing Italy into European broadband leadership – industrial policy options)
Firma del Protocollo sulla Banda Larga tra Ministero dello Sviluppo Economico - Dipartimento per le Comunicazioni e l'Unione delle Province d'Italia (Protocol on Broadband between the Ministry of Economic Development and the Union of Italian Provinces)

Japan

On the new growth strategy
A new strategy in information and communications technology
Telecommunications Action Plan 2011
「新しい成長戦略ー原口ビジョンII ー」 (New growth strategy - Vision Haraguchi II)
2007 *U-Japan policy*

Korea, Republic of

2010 Informatization White Paper
Giga Internet Promotion Plan
Korean Internet speeds to be ten times faster by 2012
IT Korea 5 Future Strategies
Information Network Villages (Invil)

Luxembourg

Présentation de la stratégie de développement des réseaux Internet de nouvelle generation (Presentation of the strategy for the development of the next generation Internet)
Stratégie nationale pour les réseaux à « ultra-haut » debit - L'« ultra-haut » débit pour tous (National strategy for ultra-high speed networks – ultra-high speed broadband for all)
L'Internet ultra rapide pour tous (Ultra high speed broadband for all)
Statute: *Loi du 22 décembre 2006 sur la construction d'autoroutes de l'information* (Law on the construction of information highways)

Mexico

Revitalisation of the information society policies in Mexico in 2009
Coordinación de la Sociedad de la Información y el Conocimiento (Coordination of the Information and Knowledge Society)

Netherlands

Ministry of Economics: *Broadband policies*
Task force on high speed broadband in the Netherlands

New Zealand

Broadband investment proposal
Rural Broadband Initiative
Ultra-Fast Broadband Initiative

Norway

Soria Moria Declaration 2005-09
eNorway 2009, the digital leap
An Information Society for All
Høykom Programme

Poland

Strategy for the Development of the Information Society in Poland until 2013
National Computerisation Plan 2007-2010

Portugal

Agenda Digital 2015 (also in *English*)
Connecting Portugal (2005-2010)
Resolution of the Council of Ministers No. 120/2008, of 30 July

Slovak Republic

Information Society Strategy from 2009 to 2013
National Electronic Communications Policy 2009 - 2013
National Strategy for Broadband Access in the Slovak Republic

Spain

Estrategia de Banda Ancha (Broadband strategy)
Avanza Infrastructures Programme (Avanza infrastructures programme)

Sweden

2009 broadband strategy
Rural areas programme
Broadband for growth, innovation and competitiveness
Accessible communications for everyone – regardless of functional capacity

A Green Knowledge Society - An ICT policy agenda to 2015 for Europe's future knowledge society

Switzerland

Strategy of the Federal Council for an Information Society in Switzerland
Evaluation du marché des télécommunications (Evaluation of the telecommunications market)

Turkey

Information Society Strategy 2006-2010
Ninth Development Plan 2007-2013

United Kingdom

Britain's Superfast Broadband Future
Broadband Delivery UK
Race online 2012
NRA: *Consultation document on broadband*
See also, for example, Scottish Executive, *A Digital Ambition for Scotland*, and Wales *Economic Renewal Programme*

United States

National Broadband Plan
Statute: *American Recovery and Reinvestment Act of 2009*
6th Report on Schools and Libraries Universal Service Support Mechanism
Telecommunications: current broadband measures have limitations and new measures are promising but need improvement
National Broadband Map

European Commission

Digital Agenda
Communication setting out a coherent framework for meeting the Digital Agenda broadband targets
2006 Riga Declaration on e-inclusion
2007 Ageing well in the information society

Estonia

Knowledge-based Estonia 2007-2013
Information Society Development Plan 2013
Estonian Broadband Development Foundation

Russia

2008 Information Society Strategy
Information Society Programme 2011 to 2020

Slovenia

Broadband Network Development Strategy

Brazil

Plano Nacional de Banda Larga (National Broadband Plan)
Steering Committee of the Digital Inclusion Program (CGPID)
Programa Nacional de Telecomunicações Rurais (National Rural Telecommunications Programme)
Projeto Banda Larga nas Escolas Públicas Urbanas (Broadband Project for Urban Public Schools)

China

White Paper on the Internet in China

India

National Broadband Plan – *consultation document* and *responses*
Regulator's Recommendation on National Broadband Plan

South Africa

Ministerial statement to Parliament
Broadband plan
Department of Communications Strategic Plan 2010-2013

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[3] OECD (2010),"Good governance in information society strategies" Paris, Organisation for Economic Co-operation and Development. *www.oecd.org/document/10/0,3343,en_2649_33735_44279178_1_1_1_1,00.html*

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