Response to the Department of Communications, Energy and Natural Resources' Next Generation Broadband Consultation Paper

15 October 2008

Executive Summary

The development agencies work to facilitate and promote the development of enterprise in Ireland. Forfás is the national policy and advisory board for enterprise, science, technology and innovation. IDA Ireland is responsible for the promotion of foreign direct investment into Ireland through the development of the existing client base and the attraction of new clients to Ireland while Enterprise Ireland is responsible for the development and promotion of the indigenous business sector. Science Foundation Ireland is investing in research in Ireland.

In 2007, total permanent full time employment in agency assisted companies operating in the manufacturing or internationally traded services sectors amounted to 305,121. Total full time employment in Irish owned companies amounted to 151,613 while foreign owned companies employed 153,508 people.

Total exports of agency assisted companies in manufacturing and internationally traded services amounted to €106.9 billion in 2006, with foreign owned companies accounting for €96.4 billion of this total. Exports by Irish-owned companies in 2006 totalled €10.5 billion. Manufacturing accounted for €78.3 billion of total exports and €28.6 billion came from internationally traded services.

Expenditure in the economy by agency assisted companies on local services, raw materials and payroll totalled €34.7 billion in 2006. Irish owned companies accounted for €16.5 billion of the direct expenditure with raw material inputs accounting for the largest share. Foreign-owned companies spent around €18.2 billion directly in the economy. Approximately €6.4 billion of this expenditure was spent on services purchased in Ireland, €4.2 billion on raw materials and €7.6 billion was spent on payroll costs.

Forfás, IDA Ireland, Enterprise Ireland, and SFI welcome the publication of the Department of Communications, Energy and Natural Resources' consultation paper on next generation broadband and the opportunity to provide inputs on this issue of great importance to future national competitiveness.

NGNs and Competitiveness

Future competitiveness and growth in Ireland will depend on the availability of next generation services to a greater degree than in most other developed economies because:

- We have a relatively high reliance on traded services, and future traded services will depend on access to next generation services. Next generation services will be a crucial accompaniment to the industries and technologies promoted and supported by the development agencies.
- Next generation services will facilitate trade with remote locations. They will mitigate the disadvantages of our geographic remoteness and will enable us to access global markets from our regional cities and towns as well as from Dublin.

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- As a developed and relatively high cost location we need to be among the leaders in employing information and communications technologies if we are to maintain the high productivity (in both traded and non traded activities) necessary to compete.

- Next Generation Networks (NGNs) will provide the basis for a new range of information-intensive service industries, particularly in the areas of business and consumer software applications, digital media, entertainment, education, and health. They will also provide a test-bed for new technological developments in software and equipment, including those being developed under SFI auspices.

- Future social and quality of life improvements, which next generation services will enable (remote access to education, healthcare, entertainment and social networking), can help to attract and retain the kind of highly skilled people our economy will require. These mobile people might otherwise choose to live elsewhere.

The Way Forward

We consider next generation services and high quality education to be the most important levers available to the State to enhance competition and economic growth, and that these should henceforth be the areas of highest priority for capital investment under the NDP.

We believe that Ireland's poor performance relative to other developed countries in providing telecommunications services to date, and the low likelihood that we will catch up with the leading western European regions by 2012 are both understated in the paper.

We believe that radical measures which
- enhance the timely rollout of advanced communication infrastructure at minimum cost to the State; and

- promote a strong telecommunications sector and a competitive range of telecommunications services including next generation services which will underpin our competitiveness and put Ireland on a par with leading countries and regions in Europe.

The consultation paper sets out Government commitments to deliver next generation broadband which we consider very appropriate and valuable. The paper proposes some policy initiatives to achieve those commitments which we fully support. It is our view that these initiatives are necessary, but not sufficient to achieve the Government commitments and position Ireland as a leading digital and knowledge economy.

The agencies consider that the desired NGN is unlikely to be delivered in a timely way unless the State makes better use of its existing assets and makes additional investments to integrate and extend them.

The central points of our response to the consultation paper are:
- In view of the high importance of next generation networks for enterprise growth and competitiveness, we welcome the Government pledge that by 2012 our broadband speeds will equal or exceed those in comparator EU regions;

- We support the ten Government commitments set out in the consultation paper and the actions proposed to deliver them. It is essential in our view that these actions are implemented and in some cases made more ambitious in order to provide an underlying framework for a next generation network;

- We are strongly of the view that while the ten commitments will have positive medium term effects, they will not be sufficient to achieve the timely rollout of next generation communications services or to meet the vision set out in the consultation paper; and

- We believe that further initiatives over and above those proposed in the consultation paper will be necessary to ensure that Ireland has a next generation network infrastructure in place which will allow us to become one of the most competitive regions in the world.

We recommend that the following additional measures as necessary to ensure that Ireland maintains its competitiveness:

- Bundling all the existing State telecommunications assets (commercial semi state, local authorities, MANs);

- Providing, or tendering for the provision of, a fully open access next generation network capable of delivering advanced telecom services in Dublin by 2010, in the gateway towns by 2012 in the hub and county towns by 2015;

- Exploiting the digital dividend to optimise the advanced telecommunications potential of wireless technologies and to ensure the future availability of the necessary spectrum for NGN services;

- Developing a coherent and committed approach across government departments to aggregate demand for broadband services outside of the main urban centres;

- Developing a next generation broadband implementation plan by the end of 2008; and

- Establishing a dedicated unit in the Government, fully-resourced and empowered to coordinate the activities of both public sector authorities and other government initiatives in the telecommunications market to ensure consistency in approach and planning, to achieve economies of scale in the contracting of civil engineering works and in providing open access at the highest levels of service to operators wishing to provide competitive broadband services.

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1. Introduction

Forfás, IDA Ireland and Enterprise Ireland strongly welcome the publication of the consultation paper from the Department of Communications, Energy and Natural Resources on next generation broadband because we believe that:

- the availability of next generation telecommunications services will be crucial for Ireland's competitiveness. These services will be required to enable the development of the knowledge economy and a return to export led growth which will be driven primarily by communication intensive services;

- despite recent progress, Ireland continues to lag behind competitor regions in the range, speed and cost of broadband services. Critically, we also remain behind leading regions in developing a next generation network that will allow Irish businesses and households access to the advanced broadband services of tomorrow; and

- Ireland's current telecommunications industry structure, infrastructure and market characteristics make the timely availability of next generation services very unlikely unless Government plays a strong role in progressing the range of actions necessary to ensure that advanced services become available in Ireland no later than they become available in leading European countries.

The consultation paper sets out the importance of advanced broadband provision for Ireland's economic and social progress and identifies the need for Ireland to catch-up with comparator regions. It also provides a comprehensive review of the range of opportunities and challenges that Ireland faces in developing a world class communications infrastructure to support the knowledge economy. By putting the development of a knowledge society at the heart of economic and social policy, the paper acknowledges that there is a need for a truly national next generation broadband infrastructure to be put in place, and the paper acknowledges that this will require "*a leap ahead if Ireland is to become a leading digital and knowledge country*".

2. What is a Next Generation Network and why is it critical for competitiveness?

Global trends indicate a future of bandwidth-intensive services that will demand greatly increased broadband speeds which are symmetric, where upload capacity is similar to download capacity and uncontended, and where the transmitted speeds are not significantly impacted by sharing infrastructure with other users (see Box 1 for further detail on these terms). New IP-based next generation networks (NGNs) are emerging which can transport these services.

Services provided over NGNs will represent a significant step change from those over broadband as the typical user in Ireland experiences it today. Today users are supported by basic broadband but the powerful services of the future will demand much higher speeds, low latency, and symmetric services.

Box 1. Definition of key terms

Symmetry means that the new networks will provide equal speeds in both directions. Businesses, employees and consumers will increasingly move from being primarily consumers of digital content to also being producers (for example, through video links). Upload speeds will become as critical as download speeds.

Latency relates to the speed of response of the system to the user. This, too, will become critical for the success of many services. *Uncontended* means that a user does not share bandwidth with other users due to infrastructure constraints.

Open access refers to the provision of services on a fair and equitable basis for all carriers including wholesale access, bit stream access, and duct sharing.

2.1   Capturing new business opportunities for Ireland

Next generation networks will be required for Ireland to win market share in high value activities to achieve the productivity necessary to sustain our high-income levels and to improve access to healthcare, education, social networking and entertainment. The impact of next generation communication services will be particularly dramatic in the traded services sector and in regional locations. The particular importance of traded services to the economy, especially those services that are structured around electronic transactions and information flows, makes it essential that Ireland has a highly efficient and reliable communications system.

The ESRI predicts that over 70 per cent of our exports will be traded services by 2025. The main sectors driving that growth, financial, business and software services will increasingly rely on a high performance communications network to support their business activities.

Importance of Traded Services to the Irish Economy

- Traded services accounted for 50.3 per cent of GDP and 60 per cent of GNP in 2007;

- Between 2000 and 2007, the contribution of services to total Irish exports increased from 21 per cent to 43 per cent.

- Ireland has the highest services exports per capita in the world;

- Between 2000 and 2007, commercial services exports grew at an annual growth rate of 25 per cent compared to an annual average rate of 11 per cent in the OECD; and

- Ireland has the potential to become a regional hub for electronically traded services.

Next generation networks and the advanced communications services they enable can foster:

- *Development of new sectors and industries:* NGNs will provide the basis for a new range of information-intensive service industries, particularly in the areas of business and consumer software applications, entertainment, education and health. They will also provide a test-bed for new technological developments in software and equipment. For example, video developers in California are able to contact, contract with, and develop remote services for customers world-wide through a new fibre-enabled communications network in Palo Alto[1].

- *The continued attraction of overseas FDI:* A majority of new investments in Ireland are driven by ICT intensive firms in digital media, financial services, ICT, and research and development. The ability to work from home and to communicate electronically with Irish and overseas offices is increasingly regarded as essential. For Ireland to remain competitive in attracting FDI in these information intensive industries, the timely availability of next generation networks will be essential. The export of highly specialised software products, for example by Google and Microsoft in Ireland, are enabled through use of ICT systems including broadband at next generation speeds.

- *Lower costs and improved productivity:* Ireland has become a relatively high cost location, and the need to maintain competitiveness places a huge premium on the productivity improvements which next generation networks can enable. Applications that exploit next generation networks (e.g. advanced video conferencing and remote working, telemedicine, security or learning applications) will significantly change the way Irish businesses operate, providing huge potential for both service improvements and cost

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[1] For more information, see http://www.go-cvs.com/ and http://www.prnewswire.com/

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reduction. The benefit of next generation infrastructure is that vital cost-saving services, such as VOIP and video teleconferencing, are available at bundled costs, thereby further reducing business overhead.

- *Technology development:* SFI is directly supporting world-leading research and R&D work in the telecoms sector with direct and immediate relevance for Next Generation Broadband. This advanced research is leading to spin-out company formation and is contributing directly to inward investment. Our infrastructure must match our ambitions in this field.

- *The growth of small businesses:* For SMEs, effective use of ICT allows them to compete more effectively with their counterparts in other markets, for example, by reducing costs and improving the quality of services to their customer base.

2.2   Improving social benefits and sustainability

NGN services provide benefits to society, from health and well being to sustainability gains. Accessibility of public services, especially for remotely located segments of the population, is enhanced by access to broadband services. With the electronic data and communications capabilities enabled by NGN services, physical co-location of services may be augmented by remote services. For example, distance learning, already a cornerstone of primary education in the sparsely populated US state of Alaska, reduces the need for travel for students while enhancing instruction through ICT experience.

Next generation broadband can also play a strong role in reducing the cost of public service provision. Potential cost reductions in healthcare are possible through electronic monitoring delivered through next generation broadband. Monitoring, such as blood pressure, is a key component of preventative care.

Access to telecommuting and teleconferencing with high definition video links, made possible by next generation broadband infrastructure, can also substantially reduce the need to travel and the associated energy usage, greenhouse gas emissions and congestion on our roads.

Integrated policy is necessary to address the burgeoning sustainable and renewable energy challenges. For instance, there is a growing realization that data should go to sources of computing power, pointing to the need for high and reliable data transmission bandwidth. The issue of physical laying and commissioning of NGB backbone can be addressed in tandem with the urgent needs for enhancing capability of the national power grid (cf. sections 4.1, relating to the East-West electricity interconnector; and section 7.2 relating to "last mile" infrastructure).

2.3   Supporting regional development objectives

Social gains are coupled with economic benefits. Innovation activity, which accompanies utilisation of NGN services, such as remote health monitoring, is spurred by take-up of such

services. Countries like the UK, who recently established a TeleHealth centre in Northern Ireland with world class next generation infrastructure, are realising the potential niche competition advantages of targeted state investment.

Attracting and retaining talent for regional development purposes is also enhanced by access to NGN services. Highly skilled people can increasingly choose to live and work where they find access to social and entertainment services. The availability of next generation services, such as high definition TV and video, facilitate these location decisions.

Cities and regions that cannot provide NGN connectivity will not be in a position to compete for information intensive FDI and local companies will face a distinct disadvantage relative to competitors. It is notable that, today, many of the most data intensive firms are located in the greater Dublin area. The Metropolitan Area Networks (MANs) have also contributed to the development of competitive regions in Ireland by enabling increased service availability and offerings. At present there are 32 service operators using the MANs, an improvement over past levels of competition. Additionally, other initiatives are improving service offerings outside of Dublin, notably in Cork and Waterford cities.

3. Where do we stand?

Ireland has made significant progress in recent years in the availability of basic broadband services. As of June 2008, there were over a million broadband subscribers in Ireland, largely driven by competitively priced entry-level broadband offerings. The speed and cost of offerings available has also improved, with DSL business services of up to 12 Mbps now available in most of the main urban centres and up to 24 Mbps in the larger centres. Competitively priced cable services of up to 20 Mbps are available to residential users in the main cities.

3.1   Speed and Cost Benchmarked

Despite this recent progress, we continue to lag behind the OECD average in terms of take up, speed and cost of broadband service. A particular concern for enterprise development is the availability of fast, competitively priced broadband services: in terms of the fastest speeds available to business from the incumbent and the costs of those services, a considerable gap remains between Ireland and the leading European countries. This is illustrated in Figure 1[2].

Figure 1 Speed and Annual Cost of Fastest Incumbent Business ADSL Service, October 2008
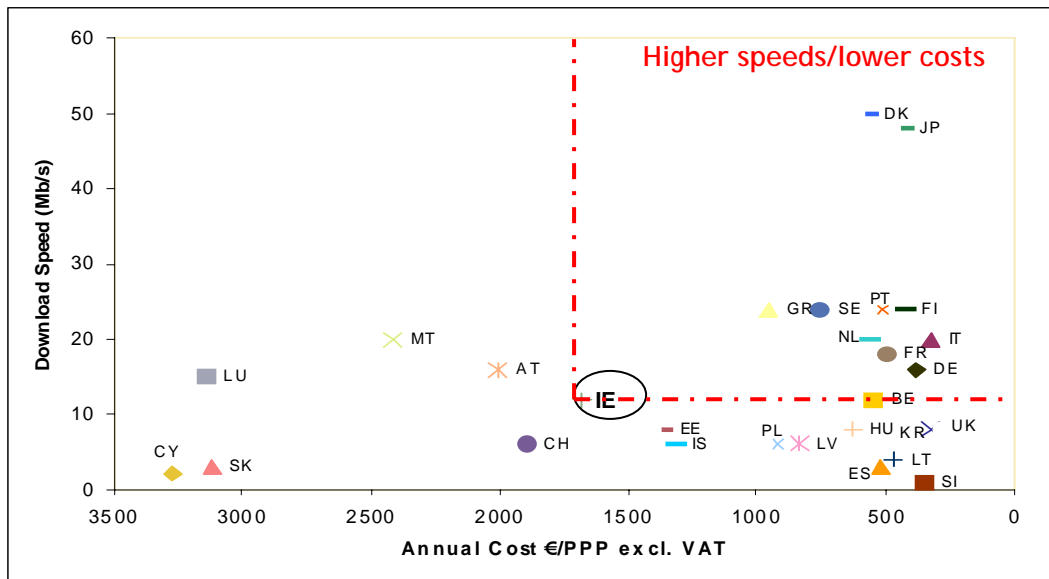
Source: Teligen data

National broadband performance statistics reflect the differing economic, geographic and demographic challenges that face individual countries. However, they also reflect the policy priority given to addressing them. City level statistics are less susceptible to these issues. But again, our performance is relatively poor. Speeds of up to 100 Mbps are being offered over fibre in many parts of Amsterdam, Cologne, Copenhagen and Paris, while the fastest speed available in Dublin is 24 Mbps.

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[2] The incumbent's broadband offerings are used as they are the most widely available services.

3.2 Infrastructure Benchmarked

Therefore, despite the apparent progress in recent years, Ireland is falling behind in the deployment of more advanced telecommunications infrastructure. This is borne out by a recent study commissioned by Cisco which shows that while no country, with the exception of Japan, has the capability today to support next generation services, Ireland is further behind than most of its competitors (Figure 2).

Ireland's main competitors for foreign investment and trade include Denmark, the Netherlands, Sweden, and Switzerland. Eastern European countries, such as Poland, are also becoming more important. We need to ensure that Ireland can provide communications networks and services on a par with these countries.

Figure 2 Readiness to Support Next Generation Broadband Services
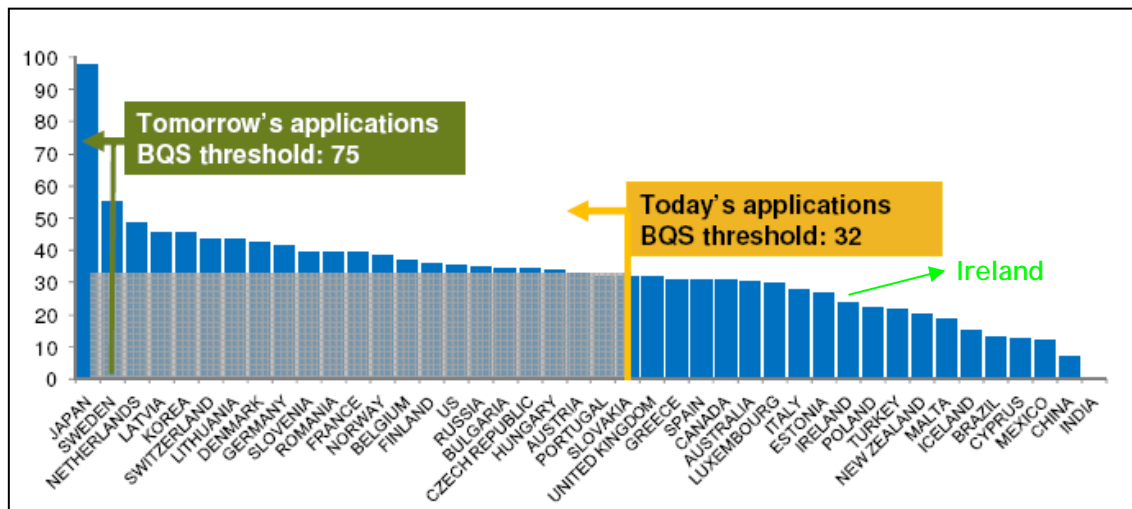
Source: CISCO

Note: The Broadband Quality Score (BQS) is an indication of each country's readiness to support next generation video and web services. A BQS threshold for today's and tomorrow's applications is also calculated. The BQS threshold for today is 32 and a conservative estimate of future needs results in a threshold of 75 for tomorrow's applications

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4. Developing the infrastructure necessary for an NGN

Several components make up the access path from international connectivity to the home or business premises. Figure 3 shows the components of an NGN infrastructure in Ireland and the characteristics of the components. As the diagram indicates, an adequate core fibre network exists. A gap remains in the access layer. Backhaul constraints and open access to the core network are current access constraints. The access component is emerging, with mobile, cable, DSL, and fibre all playing a role; however, sufficient next generation access has not yet been achieved. The final component, the service layer, is developing. In the near future, services will develop on a global scale. Ireland will compete with other nations for FDI and highly talented workers on a basket of offerings, including access to key next generation services.

Figure 3 The NGN Infrastructure Development Components in Ireland
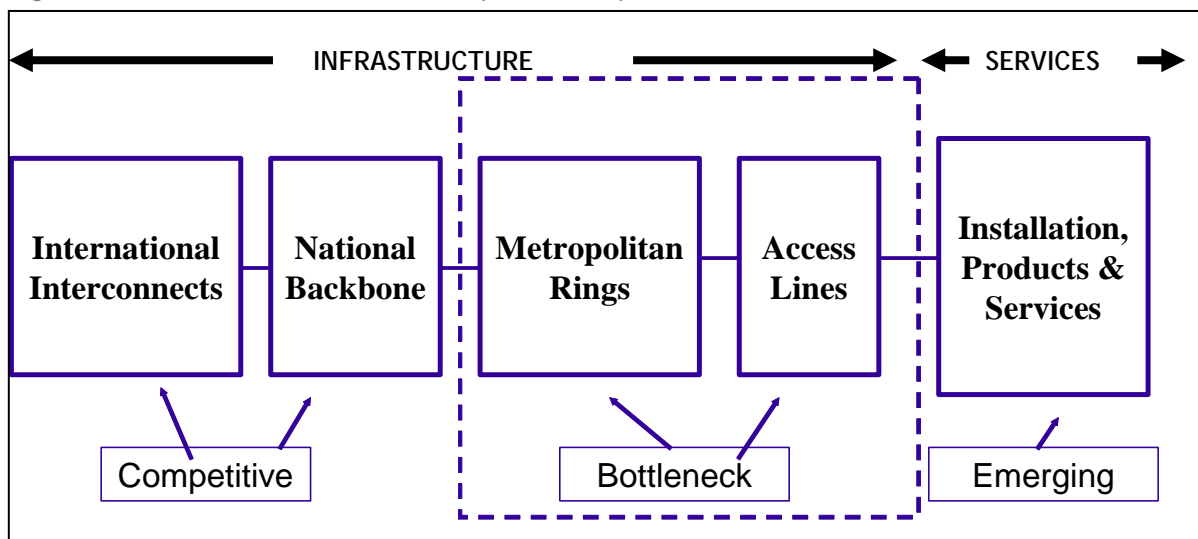
Source: Forfás

4.1   International Connectivity

In terms of international NGN infrastructure, Ireland is well served with high capacity international connectivity to the UK, Europe and the USA. International connectivity is adequate for current demand and there is healthy competition in the market. This connectivity, together with our attractive business tax environment and skills base, is enabling Ireland, particularly Dublin, to become a hub for the communications intensive sectors (e.g. digital commerce and financial sectors). Government investment in international telecommunications connectivity, through partnership with Global Crossing, played an essential role in stimulating the development of this infrastructure. Important initiatives, such as Project Kelvin in Donegal, are enhancing Irish international interconnectivity and will provide vital pathways for enhanced regional development in the future.

While Ireland currently has first rate international connectivity with significant capacity at competitive prices, we must ensure that our longer term international connectivity requirements will be met given the considerable growth in data traffic. In particular, the possibility of installing a fibre link in the East-West electricity interconnector should be considered.

4.2   National Backbone

Ireland has an extensive fibre backbone network, and there is competition in backbone capacity linking about 40 towns. In addition to the incumbent's network and those of other private operators, the State, through ESB, CIÉ and BGÉ, owns the components of an extensive fibre network. RTÉ also provides spectrum. Telecommunication services are not the core business of these state firms and future investment plans are not clear. Additionally, local authorities hold significant assets around the country, particularly passive assets such as ducting.

Overall the backbone network is largely in place to support the development of next generation networks. The challenge for the future is to make cost effective availability of neutral, open access backbone infrastructure to support an NGN. This could be progressed by making use of state owned backbone capacity. This will help ensure the emergence of competition in all significant centres of population, particularly all those with MANs.

4.3   Access Network

The government funded MANs have been developed at a city/town level. The towns included in Phase 1 of the MANs (which have both a choice of backbone networks and large business customers) have seen significant improvements in communications services in terms of quality, price and resilience.   The MANs have also spurred competition by encouraging existing providers to lower cost and add service provision.

Significant challenges remain, however. Existing MANs have been deployed to serve key parts of cities and towns (retail/business parks, hospitals, etc.) Potential exists to extend these MANs further to bring fibre closer to business premises and homes to allow high speed symmetrical access to be provided by fibre, cable or wireless access infrastructure. Cost effective options using the MANs to provide service to SMEs and residential users are currently limited.   Another key challenge is to determine the best method to address the issue of backhaul availability for certain underutilised MANs and address connectivity between the MANs to allow them to function at maximum capacity and cost-effectiveness.

If next generation services are to be brought to the NSS gateways and hubs, the regional network access layer must be addressed. An effective approach would be to extend the MANs on a scale which can support access to next generation services for both businesses and consumers. Open access is a necessary component of any solution.

4.4   Last Mile Access

There are a number of providers with assets in Ireland's access layer, primarily eircom (mainly copper-based network), UPC (cable network) and a number of wireless/mobile providers (Digiweb, Vodafone etc). While these assets have some potential to offer higher quality services, they are in general not capable of delivering Ireland's next generation network without substantial investment.

The National Broadband Scheme will bring broadband services to the 10-15 percent of the population currently without service during 2009/2010, although the specifications for this scheme are not demanding (1Mbps minimum). It will, however, ensure that all areas of the country have access to a basic, minimum level of broadband access by 2010.

Addressing last mile access will require significant investment. Telecom firms, the State, and property owners are all potential sources of investment.

4.5   Products and Services

As highlighted earlier, opportunities are now emerging that will require bandwidth far greater than that currently available. Today users are supported by basic broadband (a few megabits/second download speeds, less than 1 megabit /second upload speed, and variable contention ratios), which enables internet access and simple ecommerce (with at most basic video) and remote computer access with the sharing of small files. In a few years time, next generation telecom services will include high quality video streaming, thereby enabling visual networking for more effective remote working, large file sharing, advanced ecommerce, and remote access to powerful computing (cloud computing), remote healthcare, and education and entertainment. Fast online access that is pervasive and ubiquitous is crucial for all aspects of Ireland's information infrastructure. For example, Microsoft's data centre near Dublin will support 100 million of its 300 million active email users.

5. What do we need?

The consultation paper sets as its vision that Ireland's broadband speeds will equal or exceed those in comparator EU regions by 2012. We believe this is required to sustain competitiveness and we agree with the consultation paper's conclusion that this will require "*a leap ahead if Ireland is to become a leading digital and knowledge country*". It is an ambitious target and one which the enterprise development agencies support fully. Achieving the target will be challenging and will require the commitment of all stakeholders, public and private. In particular, Government can play a key role in providing the policy direction and certainty that will allow all stakeholders to play their part in enabling Ireland to meet the needs of the knowledge economy by making the necessary investments.

While endorsing the broadband speed target outlined in the paper, we believe it should be amplified. The target should explicitly incorporate a vision not just of broadband speeds, but of next generation networks. Ireland should aspire to be among the leaders in Europe in the provision of next generation telecommunications infrastructure, access and services by 2012. Ireland needs to ensure that there is the capability for businesses and other users to avail of speeds and levels of quality comparable to those in other countries with which we compete.

This means we must aim for a degree of speed, symmetry latency, and geographic coverage sufficient to achieve this goal. In terms of meeting the future needs of the enterprise sector, and supporting wider social, environmental and regional development objectives, the following targets are proposed:

- Access to next generation infrastructure and services in Dublin and all the gateways of at least 12Mbps uncontended, symmetric service for homes and premises by 2012;

- Access to next generation infrastructure and services in all the hubs and county towns of at least 12Mbps uncontended, symmetric service for homes and premises by 2015.

6.   What is likely to happen?

As highlighted in section 3, despite recent progress Ireland still lags behind most competitor countries in terms of the range of speeds provided and the cost of high bandwidth. To meet the Government's ambitious vision, Ireland faces a number of significant challenges:

▪ Our spatial distribution dilutes the business case for private investment in next generation networks in many parts of the country;

▪ Current competition in the Irish telecommunications market does not provide adequate incentives to continuously upgrade product offerings and services to customers.

These factors, together with the current turmoil in the financial markets, suggest that without significant state intervention Ireland will not deliver next generation capacity within a timescale that ensures a competitive position against comparator nations. The current next generation broadband investment in Ireland is not sufficient to put us among the leaders by 2012.

Competitor countries (European, North American and Asian) are taking effective actions to future-proof their communications infrastructures because they recognise the long-term strategic importance of aggressively developing next generation services. In Singapore, the government has committed funds in excess of $750 million for deployment of a to-the-premises fibre network which will cover approximately 60 percent of homes and business in the country at speeds up to 1Gbps.[3] In order to spur investment in infrastructure, the United States offered a limited regulatory holiday for companies deploying fibre infrastructure. The Government of Japan mandates uncontended services, thereby guaranteeing the full speeds offered by service operators.

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[3] http://www.unpan.org/

7. What does Government need to do?

We believe it is necessary to ensure that next generation communication services can be delivered to a growing proportion of Ireland's population at least in line with the growth in availability in leading western European cities such as Amsterdam, Paris, London, Frankfurt, Cologne, Munich, Helsinki, Stockholm and Copenhagen.

We consider that all the proposed policy actions in the consultation paper are positive and should be implemented with immediate effect to provide an underlying framework for next generation networks and services.

Most importantly, there are a number of key actions that need to be addressed to ensure that Ireland meets the future advanced broadband needs of the Irish economy:

▪ Bundling all the existing State telecommunications assets (commercial semi state, local authorities, MANs);

▪ Providing, or tendering for the provision of, a fully open access next generation network capable of delivering advanced telecom services in Dublin by 2010, in the gateway towns by 2012 in the hub and county towns by 2015;

▪ Exploiting the digital dividend to optimise the advanced telecommunications potential of wireless technologies and to ensure the future availability of the necessary spectrum for NGN services;

▪ Developing a coherent and committed approach across government departments to aggregate demand for broadband services outside of the main urban centres;

▪ Developing a next generation broadband implementation plan by the end of 2008; and

▪ Establishing a dedicated unit in the Government, fully-resourced and empowered to coordinate both the activities of public sector authorities and other government initiatives in the telecommunications market to ensure consistency in approach and planning, to achieve economies of scale in the contracting of civil engineering works and in providing open access at the highest levels of service to operators wishing to provide competitive broadband services.

7.1   Developing the Access Layer

The network that connects between towns and cities is an essential building block of a next generation network. Competitive and open access core networks are essential to provide the increased capacity and range of services at competitive costs required to enable operators and service providers to deliver next generation broadband services to end users.

As outlined in the consultation paper, the State, through the commercial semi-state companies and other utility entities, has the components of an extensive fibre core network and ducting network that connects the main urban centres across the country. The bundling of the existing State assets has the potential to enable more efficient and integrated advanced services which best support the regional development objectives that they were designed to achieve.

The consultation paper includes a proposal for a clearing house to facilitate access by private network providers to ducting owned by the State. It also proposes that the assets be centrally managed. We need to go further: combining all of the state assets would build on this proposal, increase its effectiveness, bring us closer to next generation services, and enable the full intrinsic value in these assets to be realised.

This would be consistent with the fiduciary responsibility of Government to maximise the potential of its publicly funded and owned assets. To allow valuable components of a new high quality national fibre network to remain underutilised is clearly undesirable. Linking these networks together increases the total value.

The managing entity, whose responsibility would be limited to managing, maintaining and upgrading this network together with access to ducting owned by the State, could be drawn from existing organisations. It should have articles of association that strictly confine it to the central network function of providing the hardware on an equal basis and at commercial cost to all service providers. Use of international tendering should be used in order to ensure the lowest cost provision for the necessary NGN infrastructure. The creation of an implementation plan which outlines the key milestones and time frames for accomplishing the provision of NGN infrastructure in Ireland should be developed by the Department of Communications, Energy and Natural Resources.

7.2   Developing the Last Mile

The second key challenge for Ireland is getting from the national and regional network to street level, and thereafter to customer premises (the "last mile"). Many cities in other countries are already offering next generation 100Mbps services to homes and to businesses over fibre as a result of local government and private sector investment and initiatives. It is imperative for Ireland's continued attractiveness as a business location that the main urban centres, particularly Dublin, can match those service offerings.

We believe that the model for Ireland, given our unique industry structure, population dispersion and potential to benefit from traded services, must continue to be a combination of both private and targeted government investment. To ensure the timely availability of advanced telecom services, programmes (similar to those for the MANs and regional backhaul networks) must be designed to promote the delivery of next generation infrastructure in key centres.

The enterprise development agencies propose that the best way to address this issue is to develop an extensive fibre-based open access network to street/cabinet level. This opens up a range of options for demand driven deployment of next generation telecommunications infrastructure from there to premises. A variety of companies could connect to the network using different platforms.

There should be a wide recognition of local access fibre deployment as an important infrastructure initiative by local and road authorities and a facilitative approach to road openings and infrastructure sharing, as was adopted in the deployment of the MANs, with accelerated road opening permits and approval processes to be developed by the Department of the Environment, Heritage and Local Government.

The steps necessary to ensure timely infrastructure development include:

- the provision of open access NGN infrastructure in the remaining National Spatial Strategy centres which are not already covered by a MAN, namely, Castlebar, Ennis, Mallow, Shannon, Thurles and Tuam. Additionally, the possibility of the extension of the MANs in Cork and Waterford cities should be fully explored;

- the recognition of fibre to the home or premises (FTTH/FTTP) as the optimal access method currently available on the market, offering scalability and symmetry to a degree far greater than any of the alternatives. The opportunities for high speed wireless broadband provided by the additional spectrum which will be made available by the move from analogue to digital television should also be fully explored;

- mandatory optical fibre ducting in all new premises and developments as set out in the consultation paper would have a positive long term impact and needs to be progressed as quickly as possible by the relevant Government departments;

- also, mandatory provision of ducting as part of all State infrastructure development programmes at regional, city/town and local level including as part of road developments, water and waste water investments, rail and public transport enhancement programmes, smart metering programmes etc. All operators, public and private should have access to this ducting to lay fibre without any restrictions or delays, subject to appropriate coordination. Changes in the planning regulations should compel the inclusion of ducting in all public works. There is and will continue to be considerable activity by local authorities in enhancing water quality and distribution systems, and these works should include the building of ducting, where practical, as a matter of course. The same applies to all road works whether carried out by the NRA or the local authorities. Data should be collected on a standardised basis as to the location, capacity, and ownership of all ducting, and this should be updated continually.

7.3   Utilisation of NGNs

The enterprise development agencies agree with the view in the consultation paper that Government has an important role to play in stimulating demand for advanced services. In particular, a coherent and committed approach across Government departments to aggregate demand for broadband services outside of the main urban centres is required.

The implementation of the ICT Strategy for Schools is of the utmost importance to Ireland's continued development as a knowledge economy. The commitment in the consultation paper to provide a 100Mbps connection to all secondary schools will provide the enabling infrastructure to support the implementation of the ICT strategy. However, a detailed action plan for the delivery of these speeds to schools will be necessary. The action plan should take into account extension of the infrastructure where practical to facilitate lowering costs of final deployment. The proposed NDP expenditure of €252 million to implement the ICT strategy for schools is the minimum level of investment required in order to deliver the knowledge economy and needs to be a priority for the Government.

The proposal to promote home working as a means of reducing the need to travel, highlighted in the draft Sustainable Travel and Transport Action Plan, would require the availability of the broadband infrastructure and services to support this.

Accessibility of public services, especially for the geographically dispersed segments of the population, is enhanced by access to broadband services. Remote services for ehealth (such as remote blood pressure monitoring) and distance learning reduce the need for physical co-location of services in communities while enhancing access to services and client experience.

8   Consequences of Inaction

In the absence of a coherent government-led approach, piecemeal solutions are likely to be pursued with different degrees of urgency and lower quality solutions in many areas. Failing to take decisive action at this stage to address the competitiveness gap that exists with other countries could result in Ireland failing to realise the significant potential for jobs and export growth and wealth creation from bandwidth intensive services and for more balanced regional development.

As ICT services improve and new information-intensive industries emerge, commercial companies are increasingly considering telecommunications infrastructure as a key location requirement and Ireland may be at risk of losing its international competitiveness. As already highlighted, a number of European and Asian nations are deploying NGNs to upgrade their national infrastructure. If these countries can offer more advanced communications infrastructure, Ireland will face a real challenge for future FDI and in sustaining existing businesses already here.

With comprehensive accelerated action, the essential core hardware platform would be provided, allowing competition and economic activity to concentrate on service provision on open access and fully interoperable networks.

This will ensure:

- the provision of advanced infrastructure at the lowest cost with minimum duplication
- competition in service provision which will enable Irish businesses to optimise productivity and to exploit fully the potential for international trade in existing and new markets including business services, education, health, and entertainment.

9   Conclusions

While the consultation paper provides a valuable overview of the challenges that Ireland faces in delivering an NGN, the actions proposed are necessary but, on their own, are not sufficient for Ireland to achieve a position among the top comparator regions in the EU by 2012.

The key public policy challenge is ensure that the necessary investments are made to establish Ireland among the leaders by 2012. Government must use all of the policy instruments at its disposal to ensure that the necessary investments are made. The following principles should be applied in taking policy actions.

- Focus on the outcomes necessary for competitiveness as a national priority: we must have enough NGN infrastructures in place to allow us to compete with the leading European countries and, in particular, with key city-regions.

- We fully appreciate that in the present financial circumstances, the need for selectivity in state investment is crucial, and it will have to take place on a phased basis. Immediately, however, some state investment is needed to link and reorganise the existing state assets, and selective tendering can then encourage the private sector and local authorities to develop the access layer. In specifying tenders, economies of scale and the need for rapid progress should be important considerations.

- Another key policy principle is that an open access network optimises service delivery: the NGN concept includes separation of the physical infrastructure layer from the service provided on it, and fair and transparent use of the NGN network by all interested businesses will encourage competition in the provision of services, which will be the real focus of international markets in the future. This access should be at a regulated price which provides an appropriate return on investment.

- Technology change in the NGN field is rapid, and the primary specification of requirements for the tendering process should be focused on the targets for capacities and capabilities, rather than on particular technologies.

- Realistic choices need to be made to maintain our competitiveness position. Monitoring of developments in other countries as well as in the Irish market needs to be continuous, in order to ensure that the directions being taken are still the correct ones, and to modulate the pace of the phased approach to ensure that it is sufficient, while not overly ambitious. This in turn implies a dedicated executive, a clear delineation of responsibilities and a more rapid decision-making process in government.

In addition to the proposals set out in the consultation paper to deliver the ten commitments, the following actions are required by Government to ensure the deployment of a next generation network to the gateways and hubs by 2012:

- Bundling all the existing State telecommunications assets (commercial semi state, local authorities, MANs);

- Providing, or tendering for the provision of, a fully open access next generation network capable of delivering advanced telecom services in Dublin by 2010, in the gateway towns by 2012 in the hub and county towns by 2015;

- Exploiting the digital dividend to optimise the advanced telecommunications potential of wireless technologies and to ensure the future availability of the necessary spectrum for NGN services;

- Developing a coherent and committed approach across Government departments to aggregate demand for broadband services outside of the main urban centres;

- Developing a next generation broadband implementation plan by the end of 2008; and

- Establishing a dedicated unit in the Government, fully-resourced and empowered to coordinate both the activities of public sector authorities and other Government initiatives in the telecommunications market to ensure consistency in approach and planning, to achieve economies of scale in the contracting of civil engineering works and in providing open access at the highest levels of service to operators wishing to provide competitive broadband services.

Appendix 1: What Are Next Generation Networks and How Do They Differ From Existing Broadband Services?

Next generation networks (NGNs) are a broad term to describe architectural evolutions in telecommunications networks that will be deployed worldwide over the next 5 to 10 years. Technically, NGNs include a separation of different layers of activity on a network, but in terms of usage, they represent a convergence of a range of services (telephony, data, broadcasting, etc. all using the same platform and the same protocols).

NGNs will provide the foundation for the next stage of economic growth for digital and knowledge-intensive economies. NGNs are already improving productivity growth, facilitating innovation and the development of new industries, and enhancing social and cultural development. Global trends indicate a future of bandwidth-intensive services (e.g. cloud computing) that will demand greatly increased broadband speeds over these new IP-based NGNs. Many cities and countries are making significant progress in terms of developing Next Generation Networks.

NGNs represent a significant step change from broadband as the typical user in Ireland experiences it today. The difference will not only be in speed, but also in terms of symmetry and latency. Symmetry means that the new networks will provide equal speeds in both directions. As businesses, employees, entrepreneurs and consumers are increasingly moving from being consumers of digital content to be producers, up load speeds will be as critical as download speeds. Latency is crucial because the perceived responsiveness of the system to the user will be critical for the success of many services.