EVOLUTION OF THE EU BROADBAND POLICY: TOWARDS AN INTEGRATED FRAMEWORK?

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ABSTRACT

More than two decades, broadband has been recognized in the EU as having great benefits for economic and social development. This recognition is evident in the first EU policy document on the telecommunications market – the 1987 Green Paper – which assumed that harmonization and liberalization through competition mechanisms could be used as tools to bring all these benefits to European citizens. Although the policy emphasized the competition mechanism in the years that followed, many additional instruments were developed and implemented in order to make broadband available to all European citizens. Some of the instruments can be seen in the form of regulatory directives and some in more general policies. All of them make a considerable contribution to the growth of broadband deployment in the EU. However, with globalization, the policy impetus for broadband has shifted towards a means to increase the competitiveness of a nation or region. This changing emphasis, due to globalization and competitiveness, impacts the design of policy instruments. A question can be raised as to which instruments can serve as a new concept for future broadband policy.

This paper presents an evolutionary concept for broadband policy in the EU by providing a conceptual framework for integrating the related broadband policy instruments. A timeline of all the instruments and initiatives that are being implemented in the EU is explored. This evolution is analysed to see what kind of future concept is applicable when broadband policy is based on a perspective of globalization, regional competitiveness and sustainability. The analysis addresses how far the existing instruments of the EU can serve a new concept of broadband policy and what the needs are for new policy instruments.

KEYWORDS: broadband policy, sector agenda, strategic agenda, network society, the EU

1. INTRODUCTION

Back at the end of the 19th century when the telephone system was first invented, no one could have imagined how far-reaching the effects of the changes of this new, innovated technology would be on society and the economics of the world. Even though the technological revolution had a profound effect on society for a hundred years, since the industrial revolution in the 18th century (Bell, 1999), no technology has been able to
compress time and space the way the telecommunications network has. It compresses time by enabling synchronization of many different human activities and space by allowing people to communicate over great distances (Tomlinson, 2010). It also facilitates a large number of transactions and brings in many aspects beyond the physical boundaries of countries. Today, the technological revolution of telecommunications network encompasses not only many dynamic changes in this industry but also the changes on society as a whole. Therefore, policies, rules and regulations in this sector need to be relevant for the increasingly large scope of the telecommunications network.

Although the contribution by broadband to social and economic development is very important, it may not be the only benefit that broadband can bring about. Today, the focus of most broadband policy is not only on increasing broadband growth within a country but also on contributing to the sustainability, competitiveness of a nation and globalization, which forms the basis for future development. The aim of this paper is to apply a conceptual framework of broadband policy to the evolution of the EU broadband policy. Particularly, the framework addresses both wide society concerns and more narrow industry interests over broadband – the strategic and the sector agenda. The timeline of the analysis covers 24 years of development, starting from the first broadband policy initiated in 1987, in which the telecommunications market was integrated in the single market policy by the European Commission, until the year 2011.

Against this background, the paper is structured as follows. A review of literature is explored together with conceptual considerations that are relevant to the proposed concepts in Section 2. Section 3 addresses the evolution of the telecommunications sector more generally, and in the EU specifically. The proposed concepts are applied to the EU broadband policy evolution in Section 4. Conclusions are given in Section 5.

2. LITERATURE REVIEWS

2.1 PREVIOUS RESEARCH ON TELECOMMUNICATIONS POLICY AND REGULATIONS

Literature has been chosen that is relevant to broadband development in the EU. A large amount of research on broadband policies and initiatives has been conducted from the literature. An observation can be made that most of this research primarily pays attention to the implementation of regulatory regimes in the telecommunications sector. Some studies focus on broadband policy in general, for example, research on convergence issues (Burgelman & Pauwels, 1991; Bohlin, 2003), research on information superhighways (Melody, 1996), research on the importance of the government’s role in the development of broadband networks (Hundt & Rosston, 1998; Cave, Prosperetti, & Doyle, 2006) and research on the effectiveness of different policy choices to promote broadband (Cava-Ferreruela & Alabau-Munoz, 2006; Falch & Henten, 2009).
Apart from broadband policy in general, some literature focuses on specific tools or measures being implemented in broadband networks, for example, research on unbundling policy (Garcia-Murillo, 2005), research on the role of inter-platform versus intra-platform competition (Distaso, Lupi & Manenti, 2006), research on Next Generation Access Networks (NGANs) promotion (Huigen & Cave, 2008; Houpis, Lucena Betriu & Santamaria, 2011), research on the public-private partnership (PPP) initiative and the municipal role (Lattemann, Stieglitz, Kupke & Schneider, 2009; Troulos & Maglaris, 2011) and comparative study on some specific tools between countries (Changa, Koski & Majumdar, 2003; Polykalas & Vlachos, 2006; Picot & Wernick, 2007; Falch, 2007; Trkman, Blazic & Turk, 2008; Eskelinen, Frank & Hirvonen, 2008; Bouckaert, vanDijk & Verboven, 2010; Ruhle, Brusic, Kittl & Ehrler, 2011). Some studies consider the relationship between broadband networks and sustainability issues in particular (Ducatel, 2001; Dodd, 2007; Saunders, 2007; Fuhr & Pociask, 2007; Middleton, 2009).

2.2 IMPLICATIONS TO THE PROPOSED FRAMEWORK

The literature review in the previous section provides the basic idea for understanding how broadband has been viewed by academic research and what the primary focus is of that research. There are several implications in relation to this paper.

Firstly, most of the literature focuses on the one-sided issue of telecommunications, which is about the development within the telecommunications industry itself. Much attention has been paid to policies and regulatory measures, particularly those that develop over time. An observation can be made that the main aim of these policies and regulatory measures addresses more narrow industry interests which is to increase the penetration rate or cope with market and technological developments in the telecommunications sector.

Secondly, the results of broadband penetration can be evidenced in growth and productivity in many studies (e.g., Lehr et al., 2005; Gillett et al., 2006; Crandall et al., 2007; MICUS, 2008; Katz et al., 2009). At the same time, the outcomes of being an information society in the EU are not only improved quality of life of EU citizens but also a greater ability of the EU to compete in the global market as a result of globalization. Even though some research points to important issues for which the EU needs to be prepared in order to move towards an information society, most of them do not address the issue of how much impact government policy has on the market and society in terms of influencing changes in the whole system.

Thirdly, there is growing concern over environmental issues all over the world. Some research raises the issue that telecommunications technologies, in particular broadband, can support a reduction in energy consumption in other sectors. Some research also points out the negative impact of ICT equipment in terms of energy consumption and that although ICTs are important in achieving sustainability, they cannot do it by themselves or by any technical solution without supporting changes in the system. However, very little research has been conducted by integrating the challenges of telecommunications into broadband policy.
2.3 PERSPECTIVES FOR THE PROPOSED FRAMEWORK

Considering the comprehensive issues currently surrounding broadband, there needs to be a conceptual foundation that encompasses a broad public policy perspective. The concepts proposed in this paper are therefore based on the four levels of social analysis (Williamson, 1998, 2000) and the network society (Bell, 1999; Castell, 2009).

Based on the framework developed by Williamson (1998, 2000), governance mechanisms have been separated into four levels, with corresponding differential durability. These four levels have a hierarchical relationship in the way that the higher governance level imposes constraints on the level immediately below, with the longer term governance impacting the shorter term, however, with a possible feedback from the lower levels. Figure 1 summarizes the framework.

![Figure 1: Four Levels of Social Analysis by Williamson](Source: Williamson (2000))

The framework has been referred to in many research areas such as the telecommunications, electricity and energy sectors. In telecommunications, research by van Leiden and Monasso (2005) and Kodwani (2006) have addressed the Williamson’s framework to explain the relationship between players in the telecommunications market. Van Leiden and Monasso (2005) conducted research on an under-serviced area of licensing in South Africa, where they stressed the need for a comprehensive...
approach that included values, as well as institutions and market mechanisms. Research on governance mechanisms for telecommunications and electricity industries in India by Kodwani (2006) addressed the importance of institutions on each level of matter for economic performance and firm behaviour.

Williamson’s framework explains the governance structure of a system. It suggests that in order to understand economic behaviour, it is important to know the institutional mechanisms surrounding the issues. Consequently, the relationship between each level in the framework has a more top-down approach. Changing a behaviour at the lower level, the mechanisms at the upper level need to be changed, and that require long times. In this sense, some observations can be made:

- In the telecommunications sector, though most countries around the world have introduced competition into the telecommunications market, the outcomes in each country may differ. It may therefore not be possible to replicate the success of a country or region (Bauer, 2010b). This is because each country has different environments such as market structure, geography, socio-economics, social structure, etc., and also different governance mechanisms in each level. Broadband penetration, for example, differs from country to country, though competition mechanisms have been introduced in most countries.

- Long run changes in behaviour is influenced and constrained by the hierarchical levels of governance. For instance, if the underlying principle of the telecommunications industry is competition, the tendency of the governance structure will focus more on the economic perspective which addresses more narrow industry interests. While the underlying principle of sustainability, green IT in particular, is based on a social perspective which addresses wide society concerns, changing the regulatory practices may be needed to achieve sustainability.

The perspective of the network society (Bell, 1999; Castell, 2009) emphasizes on the other hand the long-run change of industrial and social logic of the society. The most crucial fact about the network society is the reorganization of all previous relationships. The changes to the old relationships can be witnessed from the daily life of people up to the relationships between nation states. Communications through several kinds of technologies are beginning to replace transportation as the major mode of connection between people and the mode of the business transaction. For instance, the ability to work from any place through the network means that fixed sites for work are less meaningful. The key feature of the network society is the networked connection between local and global (Castells, 2010). Digital networking technologies power social and organizational networks in ways that allow expansion and reconfiguration, overcoming the traditional limitations of organization. The consequences of this new evolution are an increase in the importance of awareness of new opportunities and possibilities for advancement through new information. However, while spanning the world, the network is in fact limited to those countries and areas that have a supporting infrastructure, essentially a modern telecommunications system (Bells, 1999). While everybody has felt the effects of this new social structure, global networks have included some people and territories while excluding others, thus introducing geography of social, economic and
technological inequality. In a parallel development, social movements and geopolitical strategies have become largely global in order to act on the global sources of power while the institutions of the nation state inherited from the industrial society have gradually lost their capacity to control and regulate global flows of wealth and information (Castells, 2010).

2.4 CONCEPTUAL FRAMEWORK OF BROADBAND POLICY: SECTOR AND STRATEGIC AGENDA

In earlier papers (Teppayayon, 2010, Teppayayon and Bohlin, 2010), broadband policy has been identified as consisting of two dimensions: the sector agenda which addresses industry interests and the strategic agenda which addresses wide society concerns. The sector agenda consists of strategies or measures implemented by a country with the primary objective of increasing broadband penetration in a country. This objective of the sector agenda is based on the existing structure of telecommunications, which can be pursued under the current regulatory regimes. Another objective of the sector agenda is to increase adoption usage. Meanwhile, the strategic agenda comprises a set of objectives that is regarded as the new challenges of the telecommunications sector but go beyond the telecommunications boundary. Nowadays, these objectives consist of, for example, country competitiveness and sustainable development (see Figure 2).

The network society concept suggested that social structure is changed as a result of broadband technologies. The changes may require a new policy design that can address all benefits of broadband to both economic and society as a whole. Meanwhile, the Williamson’s framework suggested that the outcomes of any economic behaviour are a result of interrelationship between different hierarchies. Therefore, broadband policy should be able to encompass multiple societal levels, both from a long term and short term perspective address the new challenges that broadband technologies could bring.
3. EVOLUTION OF THE TELECOMMUNICATIONS STRUCTURE

3.1 TECHNOLOGICAL DEVELOPMENT IN TELECOMMUNICATIONS

Since the industrial revolution in the 18th century, society has faced three major technological revolutions that have had dramatic social and economic effects on industrialization. The first technological revolution was the invention of steam engines and railroads and the growth of the iron industry, which took place in Britain before spreading effectively to the Continental states of Europe (McNeese, 2000). The second technological revolution, just a hundred years ago, can be identified by two innovations: electricity and chemistry. Electricity, in particular, enhanced a new form of power that could be transmitted hundreds of miles, transforming voice into electric signals to create telephone and radio. During this era, the revolution brought about tremendous progress in the field of communications, beginning with the invention of the telegraph in the mid-19th century, followed by the invention of the telephone, which was patented in the USA, in 1876 (McNeese, 2000). The third technological revolution was built on four innovations: the change of all mechanical and electrical systems to electronics, miniaturization, digitalization and software (Bell, 1999).

Of these three revolutions, the last two have contributed greatly to the changes in telecommunications networks. When the telephone was invented, the system was the plain old telephone service (POTS), the voice-grade telephone service that remains the basic form of residential and small business service connection to other telephone networks. During that time, voice communications could be transmitted over a copper line to people living far away. Later, POTS also allowed for data transmission through dial-up technology, so-called narrowband, at a transmission rate of 56 kbps.

The development of data transmission technologies in the late 20th century has increased the data transmission capacity to beyond 56 kbps, data services have become important and broadband has become familiar to the public. Today, there are many choices of technology that allow for broadband connections, not only through copper line technology such as xDSL, cable modem and power line communication (PLC) but also through fibre optics and mobile technology.

3.2 EMERGENCE OF THE TELECOMMUNICATIONS FRAMEWORK

Along with the technological development, the industry structure and regulatory framework in this sector have changed over time. In the early era of the telephone industry (during the POTS period), the attitude that the ideal condition for a telephone service was a complete monopoly was applied (Stehman, 1925; Brock, 1981; Noam, 1992; Bauer, 2010a) because it was believed that increasing returns to scale could best be obtained by a single firm supply (Fransman, 2003). The natural monopoly regime was applied to the telephone industry in most countries and the monopolistic firm was
regulated through several kinds of price regulations and a universal service regime (Mueller, 1989).

At the time when broadband technology was invented, competition was also introduced into the telecommunications market, for example, in the USA in the 1970s (Brock, 1981) and the EU in the 1980s (EC, 1987; Noam, 1992). During the transition period from monopoly structure to competition, many regulatory regimes were implemented, for example, an interconnection regime, an access regime and a licensing regime. Even though there are many positive effects of competition such as price reduction, effective resource allocation and quality of service improvement, the drawbacks of competition can also be seen, for example, uneven development due to low investment in unprofitable areas. Therefore, policies and measures have been initiated in most countries around the world with the aim of encouraging broadband deployment.

Observations show that three approaches have been deployed in many countries around the world to encourage broadband penetration: a government approach, a market approach and a regulatory approach. Firstly, in the government approach, actions are mostly taken by the government though in many different forms. The most aggressive strategies of this type are government investment and state-aid policy. In Sweden, for example, government funding for broadband expansion was stipulated by laws according to which the government undertakes special responsibility to stimulate broadband expansion in rural areas where public interest is not fulfilled by market-oriented forces. Under this approach, several kinds of public interventions can be seen, ranging from the allocating of a national budget for broadband infrastructure construction, operation and public-private partnership to subsidization for broadband services. It is interesting to note that the results from countries that have implemented this approach, e.g. Sweden, Korea, and, recently, Australia, can also be seen from the high broadband penetration rate over time.

Secondly, in the telecommunications regulatory approach, which can be in the form of both ex-ante and ex-post regulation, the primary objectives are to encourage competition in the broadband market and remove barriers to entry. These mechanisms are active at both national and international level. At international level, the European Union, a supra-national organization, has introduced several regulatory frameworks to encourage broadband competition and deployment in member states. The leading framework that targets broadband can be seen from the proposal to include broadband in the scope of universal service (Bohlin & Teppayayon, 2009; Teppayayon & Bohlin, 2010), local loop unbundling, functional separation and recently the NGA framework (Teppayayon & Bohlin, 2011). At national level, this dimension has been implemented by most of the national regulatory bodies around the world such as Ofcom in the UK, ARCEP in France, etc., and in some cases it is enforced by the competition authorities of the respective countries.

Lastly, the market approach is the dimension that can now be seen in many countries as a leading policy for which private investment is achieved as a result of liberalization and technological development. Japan, for example, relied heavily on competition in the broadband market in the early era of broadband development (ICR, 2002). This
dimension also links to the actions taken by the telecommunications regulatory body (in the second dimension) in terms of balancing competition in the market.

3.3 NEW DIMENSIONS OF TELECOMMUNICATIONS

Natural disasters around the world, such as Hurricane Katrina in 2005 in the USA, the earthquake and tsunami in Japan in 2011, the tsunami in 2004 and the severe flooding in Bangkok in 2011, have attracted attention from people and governments everywhere and made them think more seriously about the importance of the telecommunications infrastructure. Having a good and efficient telecommunications infrastructure not only serves the demand for bandwidth from the business sector and individual users but also contributes to the long-term development of a country. Available, accessible and usable telecommunications infrastructures are necessary before and during disasters.

The growing concern over environmental issues is resulting in growing awareness of the impact that humans and their activities have on the earth and that calls for sustainability through information technologies (IT). In recent years, the term Green IT has begun to be used to describe a field at the juncture of the growing concern over environmental issues and the use of IT itself. The rapid growth and acceptance of IT worldwide suggests that this may be a fruitful area in which to look for possibilities for environmental change, as Green IT can help reduce the impact of e-waste, enable sustainable interaction design and decrease energy consumption by computational systems (Tomlinson, 2010; Teppayayon, Bohlin, & Forge, 2009).

The use of telecommunications infrastructures can also improve the effectiveness of business transactions in other sectors such as transportation, health care, etc. In all or part, the telecommunications infrastructure and its uses are a factor that can be used to measure the competitiveness of a country. Observations can be made in several competitiveness indices such as the World Competitiveness Year Book of the IMD business school and the Global Competitiveness Report of the World Economic Forum that countries that rank highly in terms of competitiveness have a high penetration in the telecommunications infrastructure (Teppayayon, 2010; Bauer, 2010b).

3.4 EVOLUTION IN THE EU

The EU shared the same line of development in the telecommunications regulatory regime as that around the world. For a century, telephony throughout Europe had been a ubiquitous, centralized, hierarchical network operated by a monopolist (Noam, 1992). When the telecommunications infrastructure and services were viewed as a natural monopoly, the Post, Telephone and Telegraph administrations (PTTs) operated the national telecommunications infrastructures and maintained special and exclusive rights over the supply of telecommunications services (Goodman, 2005). Since the 1970s, telecommunications networks and services in the European Community have been reformed by a number of exogenous factors, such as technological and economic
developments (Goodman, 2005), among them the breaking down of cartels and cross-subsidies (Noam, 1992).

The evolution of telecommunications developments in the EU can be viewed from two major periods. The first period was the development before 1987 when the telecommunications sector was an issue at national level. The second period started in 1987 when the telecommunications sector became a major concern for the European Commission. The latter period will be analysed here, and divided into three main stages.

### 3.4.1 DEVELOPMENT DURING THE YEARS 1987-1999: GRADUAL LIBERALIZATION AND HARMONIZATION

During the late 1980s, Europe, stirred by a sense that its telecommunications industry was falling behind that of the USA and a few emerging nations in Asia, embarked on an ambitious programme of market structure and regulatory reform. National fragmentation was also seen as a major obstacle to the integration of the European market (Bauer, 2010a).

Led by the European Commission, for more than a decade, monopolies were abandoned and replaced by a more openly competitive market structure (Michalis, 2006; Steinfeld et al., 1994). In the beginning of the 1980s, the European Commission, Council and Parliament began to harmonize national policies to liberalize national and trans-European markets and introduce transparent regulation, and, in 1987, the Green Paper on the development of the common market for telecommunications services and equipment was issued. It was the first major initiative in telecommunications by the European Commission. A two-pronged strategy, liberalization and re-regulation or harmonization, was introduced to the European market. At that time, a broadband vision had already been stated in the 1987 Green Paper, before broadband penetration was recorded. The vision referred to narrowband and broadband as prerequisites for future efficient national, community-wide and worldwide communications, essential to future economic and social development as well as emergency and security purposes. Member states were to ensure that the new digital narrowband and broadband infrastructure would be provided in all member states within reasonably similar times (EC, 1987).

The main mechanisms implemented during the transition period from the national agenda to harmonization at EU level and from the natural monopoly to the liberalization process relied mainly on regulatory tools, starting with the 1990 Service Directive, which mandated member states to withdraw all special and exclusive rights to the supply of telecommunications services other than voice telephony. An exception was made for voice telephony to safeguard the financial stability of the incumbent provider (van Eijk, 2004). In addition to the Service Directive, the 1990 ONP Directive was introduced to harmonize principles and conditions for open network provision. With this directive, access to networks and services could not be restricted except for reasons of general public interest. Many regulations were later put in place, for example, the 1992 ONP Leased Line Directive, the 1995 ONP Voice Telephony Directive, the 1997 Licensing
and Interconnection Directive, and the 1998 Voice Telephony Directive. All of these resulted in the gradual liberalization and harmonization of the EU telecommunications market.

Shaped by nearly 30 European directives since 1988, terminal equipment, value-added services, mobile services, cable services and satellite services were liberalized. In 1998, the last remaining monopoly domain, entry into basic services and network infrastructure, was eliminated (Cave & Valletti, 2000; Hulsink, 1999; Jordana, 2002).

3.4.2 DEVELOPMENT DURING THE YEARS 1999-2009: FOSTERING COMPETITION

The stage of liberalizing and harmonizing the telecommunications market in the EU took more than ten years from the first Green Paper being issued in 1987. By 1998, all market segments were fully liberalized, with regulation gradually shifting from retail to wholesale markets. However, the open access policy that was implemented as a result of the liberalization policy was not enough on its own to maintain competition in the broadband market, and it could not contribute much to broadband growth in the regions in which there was still a gap within and among the EU countries. Many policies and regulations have therefore been initiated and implemented, starting in 1999, to cope with competition and broadband growth.

Although broadband was recognized for its importance in the policy statement in 1987, the main policy that emphasized the first broadband development was ‘An Information Society for All’ in 1999. This political initiative was intended to accelerate positive change in the EU by aiming to ensure that the change towards the information society was cohesive, integrated and open, so that the benefits of the information society could be reached by all Europeans (EC, 1999). Together with ‘An Information Society for All’, the Lisbon Strategy, launched in Portugal in 2000, recognized the importance of ICT to growth in modern economies and opened the way for the launch of the first eEurope action plan in Feira in June 2000. Since that time, parts of the ICT sector have faced a slowdown, though the information society has continued to expand (Liikanen, 2005).

During this period, many policies were initiated at EU level to stimulate broadband coverage. Though the primary role of the market as the common approach to broadband deployment was recognized, many policies were implemented. Here follows a brief chronological overview.

An important development was the Local Loop Unbundling Regulation in 2000, as a tool to foster broadband growth through competition mechanisms.

eEurope 2002 was introduced in 2001 in order to increase Internet connectivity in the EU. Under this new policy initiative, the adoption of digital technologies was considered a problem due to the fact that not even 5% of Internet users shopped online and only 10% interacted with the government online, though the Internet penetration rate was about 40% of the population at that time (EC, 2001). The adoption of the regulatory framework for electronic communications was therefore given as one of the priority areas to be implemented. The new regulatory framework was issued in 2002 with the...
main objectives of promoting and sustaining an open and competitive European market for communications services and to consolidate the internal market in a converging environment. It is important to note that the issue of having a high-speed infrastructure, including wireless, was also set as one of the priority areas, but it was directed as a primary task for the private sector to deploy the networks without any guidance except that member states should work towards co-ordination of frequency allocations and promote interoperability.

In 2002, eEurope 2005 was proposed to stimulate the development of services, applications and contents while speeding up the deployment of secure broadband Internet access (EC, 2002). Under this policy agenda, the focus was on having wide availability of broadband access, and support for broadband access in less-favoured areas were mentioned as main activities. Under the broad policy framework of eEurope 2005, there was no proposal for changing the regulatory structure, instead non-regulatory policies were put in place, for instance, the state aid mechanism for the deployment of broadband infrastructure in rural areas in 2003. Up until February 2010, almost 60 broadband projects were approved for compliance with the state aid rules.

i2010 was the last policy agenda for broadband issued in this time period. It was introduced in 2005 with the aims of coordinating the actions undertaken by Member States to facilitate digital convergence and respond to the challenges associated with the information society (EC, 2005). In order to foster an open and competitive internal market for the information society and the media, the first objective of i2010 was to establish a Single European Information Space offering affordable and secure high-bandwidth communications, rich and diverse content and digital services. Under this objective, the aim was to increase the speed of broadband services in Europe, and the Community Guidelines for the application of state aid rules in relation to rapid deployment of broadband infrastructure and the review of the regulatory framework for electronic communications were issued in 2009.

### 3.4.3 DEVELOPMENT FROM 2010 ONWARDS: FOSTERING INVESTMENT

A new initiative was proposed by the European Commission under the Europe 2020 Strategy in 2010. Under this new strategy, one flagship initiative to promote “smart growth – an economy based on knowledge and innovation” is the Digital Agenda for Europe (EC, 2010a). The aim is to deliver sustainable economic and social benefits from a Digital Single Market based on fast and ultra-fast Internet and interoperable applications, with broadband access for all by 2013, access for all to much higher Internet speeds (30 Mbp/s or above) by 2020, and 50% or more of European households subscribing to Internet connections above 100 Mbp/s (EC, 2010).

Nevertheless, the deployment of this new fibre-based network requires substantial investment, and the NGA Recommendation seeks to provide investment incentives. The NGA Recommendation is part of the Digital Agenda, and has been issued to provide regulatory certainty to investors and foster competitive investment and innovation for the benefit of all parties involved. At the same time, the NGA Recommendation attempts to
build a continued, consistent approach to competition in telecommunications in line with previous legislation at EU level, especially continuing with unbundling broadband networks (the LLU Regulation). Moreover, the NGA Recommendation has many other aspects, but the main ones are to enhance national and regional competitiveness, and to maintain competition in the telecommunications market.

At the same time, the role of ICT sector to improve energy efficiency is mentioned in the Digital Agenda. In so doing, the ICT sector should lead the way by reporting its own environmental performance by adopting a common measurement framework as a basis for setting targets to reduce energy use and greenhouse gas emissions of all processes involved in production, distribution, use and disposal of ICT products and delivery of ICT services together with cooperation between the ICT industry, other sectors and public authorities in order to accelerate development and wide-scale roll out of ICT-based solutions (EC, 2010b).

4. APPLYING THE TWO CONCEPTS OF BROADBAND POLICY

An analysis of the EU broadband policies from the viewpoint of the sector agenda and the strategic agenda is given below.

4.1 THE SECTOR AGENDA IN THE EU

Until today, the development of broadband policies and regulations in the EU has focused mostly on the sector agenda. The regulatory approach, in particular, can be regarded as the crucial strategy for changing the environment from a monopoly system to liberalization and harmonization from 1987 to 2000. The presence of market power inherited from a publically owned monopoly structure led to control over the legacy network of the incumbent. The Local Loop Unbundling (LLU) regulation, for example, was regarded as one of the successful policies for increasing competition in the broadband market, but the LLU regulation is only applied to copper-based networks not to other technologies such as fibre networks.

The development towards an information society, as termed by the European Commission, started in the late 1990s. The shift towards an information society policy by the European Commission was inspired by a confluence of factors, including the widening of the productivity and competitiveness gap with the USA (Michalis, 2007). Many policy initiatives have been issued to lead the change towards an information society in the EU. The development can be observed in An information society for all in 1999, eEurope 2002, eEurope 2005, i2010 and, recently, the Digital Agenda for Europe. Nevertheless, all of these share the main goal of having wide availability of broadband access by fostering an open and competitive internal market for the information society, lacking the realization of the strategic agenda that broadband policy could bring. The result is successful in terms of broadband penetration. Many of the EU countries are world leaders in terms of broadband growth.
Nowadays, the greater capacity of the fibre optic network attracts attention from the public. While the main technology deployed throughout Europe is based on DSL technology, the European Commission has launched A Digital Agenda, requiring a new investment in fibre technology. Rolling out fibre technology in Europe is a big issue as there are mixed picture for most European countries. As a result, if the EU migrates to fibre technology, it has to undergo costly investment. The main strategy, namely the NGA Recommendation, which was introduced by the European Commission in 2010 to encourage this new investment still followed that same path of history, and that is to repeat the mechanisms of the LLU Regulation.

The requirement for a huge investment in fibre networks through pure competition in the telecommunications market may not be workable as much research suggests that there is tension between competition and investment. Many policies that tend to increase competition may lower investment. Therefore, the road ahead is challenging for the EU on this path.

4.2 THE STRATEGIC AGENDA IN THE EU

Even though the first movement of the EU telecommunications policy, the 1987 Green Paper, recognized that the notion of having a high capacity broadband network came with two agendas: to increase the welfare of the people through an advanced infrastructure (the sector agenda) and to increase the competitiveness of the region (the strategic agenda), the later implementation focused mainly only on increased penetration of the telecommunications infrastructure. The strategic agenda has developed rather slowly and piecemeal.

The first policy initiated in the EU, an information society in late 1990s was set up with the aim of strengthening social and economic development and regional competitiveness. Several mechanisms have to be put in place. The recognition of the growing importance of broadband as a means to promote an information society therefore presents challenges for policymakers introducing efficient strategies, not only to serve the increasing demand for broadband among people in society but also to increase their economic contribution in the short and long run.

When the European Union approved a strategy known as the Lisbon Agenda in 2000 to catch up with the USA in terms of economic competitiveness while strengthening the European social model, much of the emphasis was placed on technological upgrading and enhancement of research capabilities. The European technological infrastructure improved considerably, but the effects on productivity, learning, creativity and entrepreneurialism were very limited due to lacking of the synergy between related agencies.

Today, there is recognition from the European Commission that the competitiveness of the European industry crucially depends on the quality and efficiency of the energy, transport and communication infrastructure services (EC, 2010c). An integration of sector agenda and strategic agenda in the EU broadband policy can be clearly seen in
the recent policy agenda, the Digital Agenda for Europe. Particularly, the issue of increasing regional competitiveness through fibre network and the contribution of broadband technology to the environmental issue are addressed.

As for the issue of increasing competitiveness, most of the actions proposed under this new strategy seem to place more responsibility on firms and industry than government authorities. Past experience of encouraging broadband growth through a market mechanism would be a good example of the market mechanism not being an effective approach for the EU, in particular when the issue is beyond the competence of firms. Even though fibre network upgrades are often essential to national economic competitiveness, they are pursued less aggressively in the EU (Atkinson et al., 2010).

Though the environmental issue is recognized for the first time in the broadband policy document, unfortunately, it contains little concrete action that will be taken by the EU:

“…ICT should lead the way by reporting its own environmental performance by adopting a common measurement framework as a basis for setting targets to reduce energy use and greenhouse gas emissions of all processes involved in production, distribution, use and disposal of ICT products and delivery of ICT services…” and the action is “to adopt common measurement methodologies for the sector’s own energy performance and green house gas emission and propose legal measurement if appropriate.” (A Digital Agenda, 2010)

Even though the latest policy agenda has mentioned, for the first time, several objectives that form the strategic agenda on broadband networks, these objectives may not be easily achievable under the existing structures unless changed strategies and working concepts are implemented. As dealing with the strategic agenda may require different mechanisms to those of the sector agenda, due to its complexity, the objectives as they are set may not be achievable.

5. CONCLUSIONS

Broadband connectivity is widely accepted as being of strategic importance to all countries because of its ability to accelerate the contribution to economic growth in all sectors, enhance social and cultural development and facilitate innovation. Though the contribution of broadband to social and economic development is very important, it may not be able to yield all the expected benefits that broadband could bring about to society under the existing perspective of broadband policy. The developments in the telecommunications sector over more than hundred years have suggested that most telecommunications policy focuses primarily on increasing broadband penetration, which has been pursued through a three-dimensional approach: a government approach, market approach and telecommunications regulatory approach. Meanwhile, the changes to the telecommunications structure over time, in part due to the technological revolution and the emergence of the new challenges towards the telecommunications infrastructure as a crucial factor for efficiency improvements in other sectors, suggest
that the existing broadband policy design may not be appropriate for this new emergence.

A new framework to assess broadband policy can thus be formulated, and the sector agenda and the strategic agenda should be integrated into the new broadband policy. The necessity for the division between the sector agenda and the strategic agenda results from the fact that they are based on different concepts and objectives that cannot be achieved through the same path. While the sector agenda evolves from the development of the traditional telecommunications structure, which focuses on the growth of telecommunications availability for users, the strategic agenda has emerged from the new challenges and expectations outside the telecommunications sector. The integration of these two perspectives needs a new policy design and new policy instruments. Nevertheless, the development of broadband policies and regulations in the EU since 1987 has focused primarily on the sector agenda. Even though the European Commission has been considering broadband policy as a strategy to strengthen capability the EU which can be regarded as strategic agenda, no concrete policy instruments has been developed to achieve the goals. The mechanisms that have been implemented over time are based on narrow industry interests which may not be able to apply to the new social structure inherited from broadband technologies. Therefore, broadband policy should be redesigned by integrating both sector and strategic agenda. The new instruments or mechanisms that are applicable for both the sector and the strategic agenda will be the topics for future research. This future research will need to address a number of complexities, among them to design new policy instruments that more clearly support collaboration from several related agencies, in order to achieve the wide ambitions reflected in the strategic agenda.

REFERENCES


