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Evolution of the EU broadband policy: Towards an integrated framework?

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Evolution of the EU broadband policy: Towards an integrated framework?

Abstract

Since more than two decades, broadband has been recognized in the EU as having great benefits to 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 mechanism could be used as the tools to bring all those benefits to the European citizens. Although the policy in the following years emphasized the competition mechanism, many additional instruments were developed and implemented in order to make broadband available to all European citizen. Some instruments can be seen in the form of Directives, and some instruments are shown in many policy strategies. All of them have a considerable contribution to the growth of broadband deployment in the EU. However, with globalization, the policy impetus for broadband has shifted toward a means to increase 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 which instruments can serve a new concept of future broadband policy.

Against this background, the paper will present an evolutionary concept of broadband policy in the EU by providing a model to integrate the related broadband policy instruments. A timeline of all instruments and initiatives being implemented will be explored. This evolution will be analyzed in order to see what kind of future model is applicable when broadband policy is based on a perspective of globalization and regional competitiveness. The analysis will address how well the existing instruments can serve a new concept of broadband policy and what the needs are for new policy instruments and working structures.

Keywords: network society, post-industrial society, broadband policy, the EU, sector agenda, strategic agenda

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Evolution of the EU broadband policy: Towards an integrated framework?

1. Introduction

For more than two hundred years that the society has been directed by the concept of industrial economy as a result of technological evolution. This concept has a big impact to every nation, not only in terms of economic development but also social structure. Nations produced what they could produce best based on resources, technology, and skilled labor (Bell, 1999). Therefore, most of developed countries did the major share of manufacturing because they own technologies.

However, for less than fifty years old, the new concept of society has been observed because of emergent features of information technologies to the society. This new concept is called post-industrial society or network society, the society which is based on telecommunications infrastructures as a major factor for country development. Its importance is not only for the development within a country but also as a crucial factor for competing with other nations. Many policies are initiated in order to provide a good and efficient telecommunications infrastructures, in particular broadband. Therefore, the structure of telecommunications industry has also been changed as a result of the changing value.

For the EU, since more than two decades, broadband has been recognized as having great benefits to 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 mechanism could be used as the tools to bring all those benefits to the European citizens. Although the policy in the following years emphasized the competition mechanism, many additional instruments were developed and implemented in order to make broadband available to all European citizen. Some instruments can be seen in the form of Directives, and some instruments are shown in many policy strategies. All of them have a considerable contribution to the growth of broadband deployment in the EU. However, with globalization, the policy impetus for broadband has shifted toward a means to increase competitiveness of a nation or region. This changing emphasis due to globalization and competitiveness impacts the design of policy instruments.

The aim of the paper is therefore to present an evolutionary concept of broadband policy in the EU and to discuss that concept from the network society viewpoint. Section 2 presents a brief overview and provides some main features of the post-industrial society or network society. Next, Section 3 provides the changing structure of telecommunications sector from traditional structure to the new

dimension where globalization has a strong impact and leads to the changing policies in many countries. The paper also addresses the evolution of the EU policies, rules and regulations in coping with the changing of telecommunications structure overtime in Section 4 to see how the policies and regulations have been developed. A timeline of all instruments and initiatives being implemented are explored. Section 5 analyzes broadband policy in the EU by providing a framework to integrate the related broadband policy instruments. This evolution will be analyzed in order to see what kind of future model is applicable when broadband policy is based on a perspective of globalization and regional competitiveness.

2. The emergence of network society

According to Bell (1999), technological revolution has a profound effect to the changes of society for hundred years. Since the industrial revolution in 18th century, the society has faced three major technological revolutions which have an impact to the development of society. The first technological revolution was the use of steam for pumps, controlled chambers for locomotion, and machines, paved the ways to industrial revolution. Steam engines are typically external combustion engines where heat is supplied to the working fluid from fuel burned outside the enginechange of social structure. The second technological revolution, only a hundred years, can be identified with two innovations: electricity and chemistry. Electricity enhanced new form of power that could be transmitted hundred of miles, transformed voice electric signals so as to create telephone and radio. Chemistry allowed to create synthetics, from dyes to plastics, from fibers to vinyls. The third technological revolution which is the foundation of the post-industrial society or network society is built on four innovations, that are, the change of all mechanical and electrical systems to electronics, miniaturization, digitalization, and software.

The most crucial fact about this new technological revolution is that it is a set of changes that pervade all aspects of society and reorganize all older relationships. The changes of old relationships can be witnesses from daily life of people up to the relationships between nation states. Communications through several kinds of technologies begins to replace transportation as the major mode of connection between people and as the mode of business transaction. With the ability to work from any places through Internet connection means that fixed sites for work are less meaningful. The conceptions of time and space transcend the boundaries of geography and take place in real time. With Internet connection, it brings in the ordinary citizen as a user and consumer, emphasizing interaction and participation. It provides enormous access to the cultural resources of humankind in a way never known before. It multiplies the number of affinity groups across national boundaries.

Therefore, the key feature of the network society is the networked connection between the local and the global (Castells, 2010). Digital networking technologies powered social and organizational networks in ways that allowed their endless expansion and reconfiguration, overcoming the traditional limitations of networking forms of organization to manage complexity beyond the certain size of network. The consequences of these new evolution is an increase in the importance of the awareness of new opportunities and possibilities for advancement through new information and, most important, by acquiring connections. However, the Internet, while spanning the world, is limited, actually, to those countries and areas that have a supporting infrastructure, essentially a modern telecommunications system (Bells, 1999). While everybody felt the effects of this new social structure, global networks included some people and territories while excluding others, so inducing a geography of social, economic, and technological inequality. In a parallel development, social movements and geopolitical strategies became largely global so as to act on the global sources of power, while the institutions of the nation-state inherited from the industrial society gradually lost their capacity to control and regulate global flows of wealth and information (Castells, 2010). The needs to have the efficient and high capacity of telecommunication networks are increasing overtime.

When telecommunications infrastructures have a profound effect to the society as a result of transforming into post-industrial/network society, several consequences can be drawn from this new development as following:

2.1 A strategic importance of having the advance telecommunication infrastructures

The advance telecommunication infrastructures are necessary for the emergence of a new form of social structure as roads and transportations were in the past. It becomes a strategic important as they are the backbone of network society that should be made available to all people. From literatures, many research show that broadband can have both economic and social impact to a country. In terms of economic impact, an incremental of broadband penetration can result in the growth of GDP (Katz et al., 2009; Bohlin et al., 2009; MICUS, 2008; Climate group, 2008). Also broadband can contribute to the employment growth (Lehr et al., 2005; Crandall et al., 2007; ITIF, 2009; Gillett et al., 2006). Several studies show that lacking of broadband access can increase knowledge gap between social classes (Kim, 2008; Norris, 2001). The study of Forman, Goldfarb, and Greenstein (2009) also suggests the existence of a considerable divide in the benefits of advanced Internet use across urban and rural areas.

2.2 Capacity building is necessary

The divide among people is not the result of an option; it is, rather, the fruit of a society in which the necessary cognitive resources are distributed unequally amongst the generations, so that societies in which formal learning and literacy are historically better established present transition processes that accentuate the generational differences to a lesser degree (Cardoso, 2005). The network society is a society based on an informational development model, in which some cognitive skills are more valued than others, namely: the highest education level, formal literacy and technological literacies. Therefore, the correction of this massive exclusionary process requires concerted international public policy acting on the roots of the new model of development (technology, infrastructure, education, diffusion and management of knowledge) rather than just providing for the needs arising from social exclusion in the form of charity (Castells, 2005).

2.3 The challenging of sociologizing mode

According to Bell (2001), in modern industrial life, economizing mode of life is introduced. The conditions of economizing are a market mechanism as the arbiter of allocation, and a fluid price system which is responsive to the shifting of supply and demand. However, economizing mode is based on the proposition that individual satisfaction is the unit in which costs and benefits are to be judged. In contrast, a sociologizing mode or the effort to judge society's needs in more conscious fashion and to do so on the basis of some explicit conception of the public interest. Therefore, the major sociological problem ahead, for example, environmental pollution or education, will test the public sector to foresee the effects of social and technological change and to construct alternative courses in accordance with different valuations of ends, at different costs.

3. Telecommunications development: The changing structure

The world has been in a process of structural transformation for over two decades. This process is multidimensional, but it is associated with the emergence of a new technological paradigm, based in information and communication technologies, that took shape in the 1970s and diffused unevenly around the world (Castells, 2005). This structural transformation can be associated with the coming of broadband technologies to telecommunications industry. Since an advance telecommunications networks, in particular broadband networks, become a major factor of the society in moving towards network society, having a good and high capacity of broadband infrastructure is set as a policy target in most countries around the world.

However, the telecommunications market is dynamic, not only in terms of the industry, itself, but also in terms of demand and regulation. When the telephone was first introduced to the market

more than a hundred year ago, no one ever imagined the tremendous impact of that innovation on society as a whole. Today, telecommunications infrastructure is not only a means to communicate but also a major factor for social and economic development of a country. Therefore, the perception of telecommunications structure is changing overtime, in parallel with the emerging of the post-industrial society or network society.

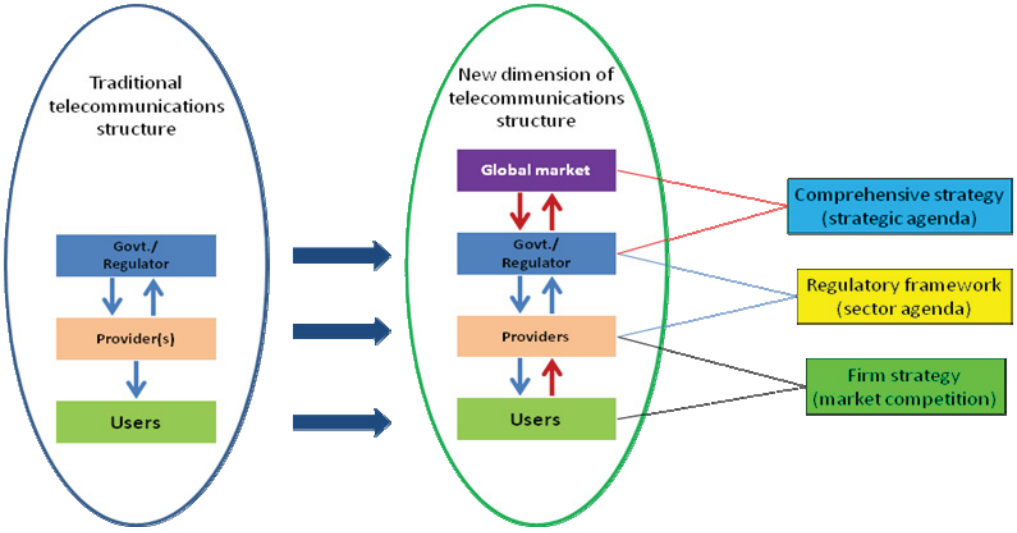

Fig. 1. Drivers to new policy framework

3.1 Traditional structure

The traditional structure of the telecommunications market applied from the early era of telecommunications until 1980s. During that time, most countries had a telecommunications monopoly, either by public provider or a private firm. Interactions were limited to the relationship between the government or regulatory agency, the provider, and the users (see Fig. 3). It can also be noted that during that time the government and the provider could be the same institution in most countries around the world, and monopolized by state-owned company. In addition, as the telecommunications infrastructure was regarded as a means for communication amongst people, major policy concerns were focused on accessibility, availability and affordability. As a result, regulatory issues during that period of time were not complicated, and primarily related to controlling the prices charged by the monopoly provider in order to make telecommunications services affordable, accessible and available to most people.

3.2 The transition of traditional structure to the new dimension

The transition from the traditional telecommunications structure to the new dimension of telecommunications structure has taken place around 1980s where the concept of liberalization was introduced into the market, together with technological development towards digitalization. The

traditional relationship between the government, the provider, and the users was more complicated than the old one as a result of competition in the market and the needs from the users to have a greater capacity of the network. Therefore, the main objectives of policy and regulations for broadband in the new dimension of telecommunications structure are not only to make telecommunications infrastructure available, accessible and affordable, but also to maintain competition in the market, remove barrier to entry for the new entrants, and facilitate innovation and technological development.

In order to reach the objectives under the new environments, many broadband initiatives have been introduced into the market, and can be primarily categorized into three main approaches (see Fig. 2).

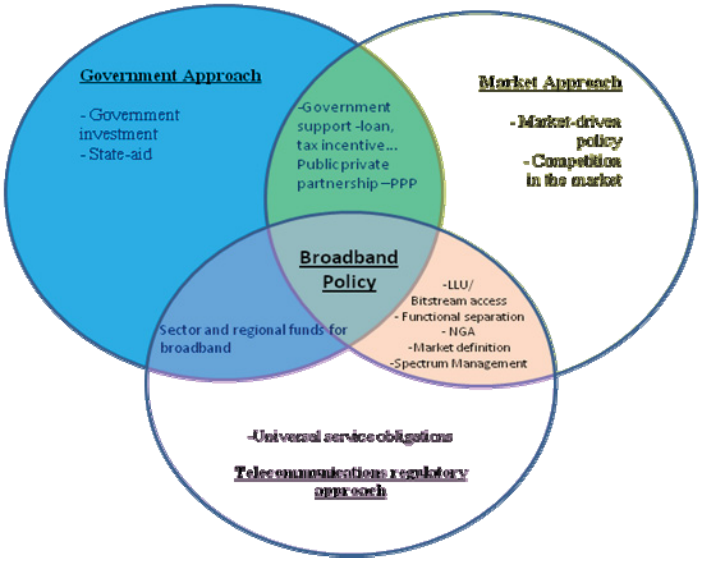

Fig. 2. Three approaches of broadband initiatives

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

Secondly, the telecommunications regulatory approach: this could be in the form of both ex-ante and ex-post regulation, for which encouraging competition in the broadband market and removing barriers to entry are primary objectives. These mechanisms are active at both international level and national 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; 2010), local loop unbundling, functional separation, and recently the NGA framework. 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 authority of the respective countries.

Thirdly, the market approach: this dimension can be seen in many countries nowadays as a leading policy where private investment is achieved as a result of liberalization and technological development. Japan, for example, relied much on competition in broadband market at the early era of broadband development (ICR, 2002). This dimension also links to the actions taken by the telecommunications regulatory body (in the 2nd dimension) in terms of balancing competition in the market.

3.3 From national to global market

A new factor is added to the new dimension of telecommunication structure, that is, global market because of the ability of broadband networks to connect people in every part of the world. Advance broadband infrastructure becomes a major factor for the society in moving towards the network society. National network becomes global network. National market becomes global market. Every country has to compete in this new market, particularly developed countries, in order to maintain their leader and powerful position at international level.

There are many issues from global perspective that can be improved by having an advance broadband infrastructure. Competitiveness of a nation is one of them. Several criteria are used in order to judge the level of nation competitiveness, among them, the penetration of an advance telecommunication infrastructure is a crucial one. Broadband is becoming vital for business and offers such competitive advantages that it is being compared to utilities such as water and electricity (UNCTAD, 2006). Availability of telecommunications infrastructure benefits users and downstream industries. Users can easily access information and communicate with others. At the same time, having a good telecommunications infrastructure also enhances efficiency in other sectors, such as

transport, education, healthcare, and emergency services - all sectors regarded as major factors in improving national welfare.

Sustainability is another one. On the one hand, broadband connection can help to reduce energy consumption, for instance by lowering transport needs, reducing logistic costs and improving cross-border trade and transportation in landlocked countries. In addition, broadband can also improve electricity generation and distribution and to improve environmental performance of urban systems and building. On the other hand, broadband technologies can also bring in negative effects, both direct and indirect (Teppayayon, Bohlin, & Forge, 2009). Direct effects include increased electricity use from ICT equipment and waste, while indirect effects relate to increased consumption of goods and sevices, fuelled by broadband. These indirect effects are typically devoted rebound effects (Hilty et al., 2006), especially in the situation where adverse effects if increased ICT use come about as a secondary effect of initially desirable ICT use (i.e. reduced travel due to on-line shopping but more transport due to customised delivery). The increased use of sophisticated IT equipment and broadband has accelerated the flow of information and resulted in increased consumption of electrical power. As a result of broadband connectivity, energy consumption from devices such as handsets, PCs and terminal equipments can have environmental impacts such as the direct energy used by devices and the power consumption involved in connecting remote networks.

Therefore, as illustrated in Fig. 2, the new telecommunications structure is an integration of three main aspects: national strategy, regulatory framework and firm strategy. National strategy or strategic agenda is a country's vision for the future. It is a long-term development that requires collaboration and participation from every sector in order to strengthen the capability of a nation to compete on the global market. Regulatory framework or sector agenda is a sector policy aimed at shaping the national telecommunications market. Its perspective is a short-term one, compared to national strategy, with an aim to improve or provide telecommunications infrastructure throughout a country. Firm strategy is the interaction between telecom providers and the users. Even though one could say that firm strategy focuses on the potential profit of a company, this strategy is undeniably influenced by government rules and regulations.

4. Broadband policies and regulations in the EU

The evolutions of broadband policies and regulations in the EU are actually corresponded to the emergence of the post-industrial society or network society where they started about two decades

ago. During these periods of time, the development of telecommunications sector can be divided into four major stages (see fig. 3).

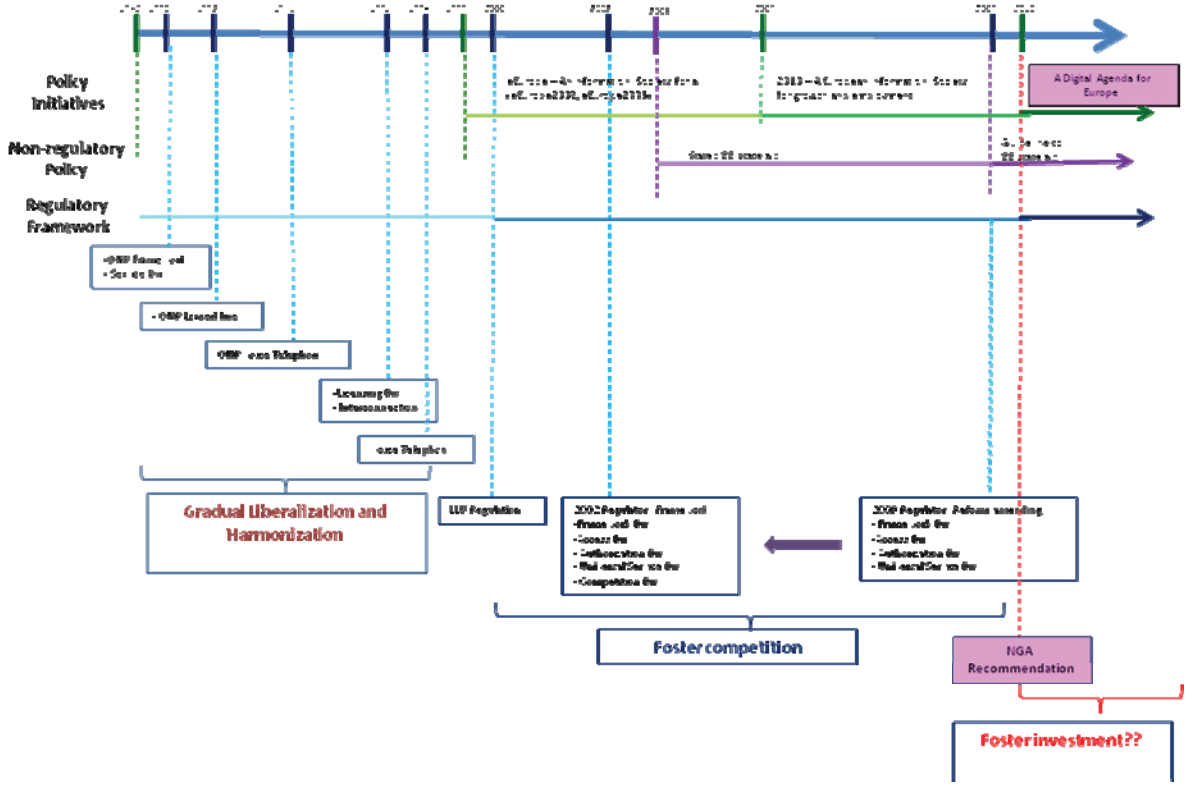

Fig. 3. The evolution of telecommunications regulatory framework in the EU

4.1 The development before 1987: The national agenda

Before 1987, telecommunications services in the EU countries were the issues at national level and that telecommunications infrastructure and services were viewed as a natural monopoly in most countries in the EU. During that period of time, 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). As a result, the first policy paper was proposed in 1987 in order to level the telecommunications sector up the European Commission.

4.2 The development during the year 1987-1999: Gradual liberalization and harmonization

The second stage of development started when the 1987 Green Paper on the development of the common market for telecommunications services and equipment was issued. It is the first major initiative in telecommunications made by the European Commission. A two-pronged strategy, liberalization and re-regulation or harmonization, was introduced to the European market. During that time, a broadband vision was already stated in the 1987 Green Paper, before broadband penetration was recorded. The vision referred to narrowband and broadband as the prerequisite for future efficient national, community-wide and worldwide communications, essential for future economic and social development but also for emergency and security purposes. In addition, member states were to ensure that the new digital narrowband and broadband infrastructure would be provided in all member states within a reasonably equal time (EC, 1987).

The main mechanisms being implemented during the transition period from national agenda to the harmonization at the EU level, and from natural monopoly to liberalization process relied mainly on regulatory tools, starting from the 1990 Service Directive which mandated member states to withdraw all special or exclusive rights for the supply of telecommunication 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 had also introduced in order 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. Later on, many regulations were put in place, for example, 1992 ONP leased line Directive, 1995 ONP voice telephony Directive, 1997 Licensing and Interconnection Directive, and 1998 Voice telephony Directive. All of them were resulted in gradual liberalization and harmonization in the EU telecommunications market.

4.3 The development during the year 1999-2009: Foster competition

The stage of liberalizing and harmonizing telecommunications market in the EU took more than ten years since the first Green Paper was issued in 1987. However, only the open access policy which was implemented as a result of liberalization policy was not enough to maintain competition in the broadband market, and cannot contribute much to broadband growth in the regions where the gap still exists within and among the EU countries. Therefore, many policies and regulations are initiated and implemented, starting from 1999 to cope with competition and broadband growth.
Though broadband was recognized of its importance in policy statement since 1987, the main policy that emphasized 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 the change towards the information society was cohesive, integrated and open, so that the benefits of

the information society could be reached all Europeans (CEC, 1999). Together with An Information Society for All, the Lisbon strategy, launched in Portugal in 2000, recognised the importance of ICT for growth in modern economies, and opened the way to 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, but the information society has continued to expand. The creation of a favourable environment for the spread of ICT remains an important responsibility for policy makers (Liikanen, 2005).

During this period of time, many policies have been initiated at the EU level to stimulate broadband coverage. Though the primary role of the market as the common approach for broadband deployment was recognized, many regulatory policies and non-regulatory policies have been implemented. Among them the Local Loop Unbundling Regulation in 2000 was issued as a tool to that foster broadband growth through competition mechanisms.

The 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 government online, though the Internet penetration rate was about 40% of population at that time (CEC, 2001). Therefore, the adoption of the regulatory framework for electronic communications was given as one of the priority areas to be implemented. The new regulatory framework was issued in 2002 with the main objectives to promote and sustain 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 high speed infrastructure was also set as one of 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, the eEurope 2005 was proposed to stimulate the development of services, applications and contents while speeding up the deployment of secure broadband Internet access (CEC, 2002). Under this policy agenda, having wide availability of broadband access was focused, and that use of the new regulatory framework for radio spectrum policy to guarantee frequency availability for wireless broadband services and the 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 of changing regulatory structure, rather 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 have been approved for compliance with state aid rules.

i2010 was the last policy agenda for broadband issueing in this stage. It was introduced in 2005 with the aims to coordinate the actions undertaken by Member States to facilitate digital convergence and to respond to the challenges associated with the information society (CEC, 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, increasing the speed of broadband services in Europe was targeted, and the Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks and the review of the regulatory framework for electronic communications were issued in 2009.

4.4 The development from 2010 onwards: Foster investment

Policies, non-regulatory policies, and regulations implemented in the third stage result to the high broadband penetration in many EU countries. Although Europe may have some of the highest broadband penetration rates in the world, the rest of the world is catching up and some countries have better quality networks. As the high growth rate of broadband deployment in the EU is largely based on DSL technology, it will make Europe less competitive in the long run (Kroes, 2010). The target for fast and ultra-fast internet access was chosen because of the central role it will play in economic recovery and in providing a platform to support innovation throughout the economy, as electricity and transport have done in the past (EC, 2010).

Therefore, the new initiative proposed by the European Commission under Europe 2020 Strategy in 2010. Under this new strategy, one flagship initiative to promote “smart growth – an economy based on knowledge and innovation” is “A Digital Agenda for Europe”(CEC, 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 (CEC, 2010).

Nevertheless, the deployment of this new fibre-based network requires substantial investment. The key is to stimulate investment in fast internet access beyond the current market-driven development. Many strategies have been put forward, among them the NGA Recommendation. The NGA Recommendation has been issued in order to provide regulatory certainty to investors and to foster competitive investment and innovation for the benefit of all parties involved and ultimately for consumers. 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 on LLU. The new NGA Recommendation has many aspects that need to be discussed, but the main focus of this paper is the role of the NGA Recommendation in the context of serving both the strategic agenda, to foster competitive investment and enhance national and regional competitiveness, and the sector agenda, to maintain competition in the telecommunications market.

And at the same time, the issue of using ICT sector as a key role for improving energy efficiency is mentioned. 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 (CEC, 2010b).

5. Discussions

5.1 The two conceptual frameworks of broadband policy

The coming of post-industrial society or network society is unavoidable and has a big impact to social structure. It changes the ways of people living, the ways of doing business transactions, and removing the physical boundaries of the countries. The result of this social changing requires an advance telecommunications structure, in particular, broadband. Having an advance and high speed broadband networks is not only for the purpose of allowing people to enjoy the benefits that the broadband networks can bring, but also allow the countries to acquire a greater opportunities to position themselves in the global market. Therefore, broadband policy under the challenges of network society can be view from two perspectives: sector agenda and strategic agenda (see Fig. 4).

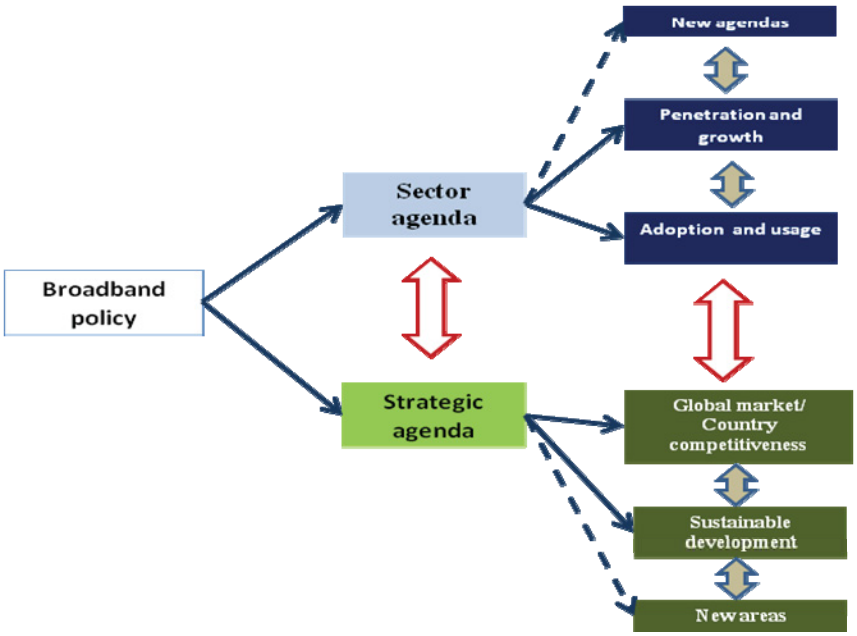

Fig.4. The two perspectives of braodband policy

The sector agenda consists of strategies or measures implemented by a country with the primary objective of increasing broadband growth in a country.

Meanwhile, the strategic agenda comprises strategies of using broadband for some specific national agenda consisting of, for example, the global market, country competitiveness and sustainable development.

However, one observation can be made regarding the proposed framework and that is the issues under each agenda can be changed over time depending on national and global development. Once the new issue has come into attention of a country, the detail analysis has to be changed, both empirical and theoretical discussion.

5.2 Broadband policy: A major initiative for the sector agenda

Having an advance broadband infrastructures, both wireline and wireless, are a fundamental factor of moving towards network society. That is a justification why most broadband policies implemented around the world these days have the primary objectives to serve the sector agenda, where several strategies have been implemented with an intention to increase broadband penetration and growth in a country (see Fig. 5).

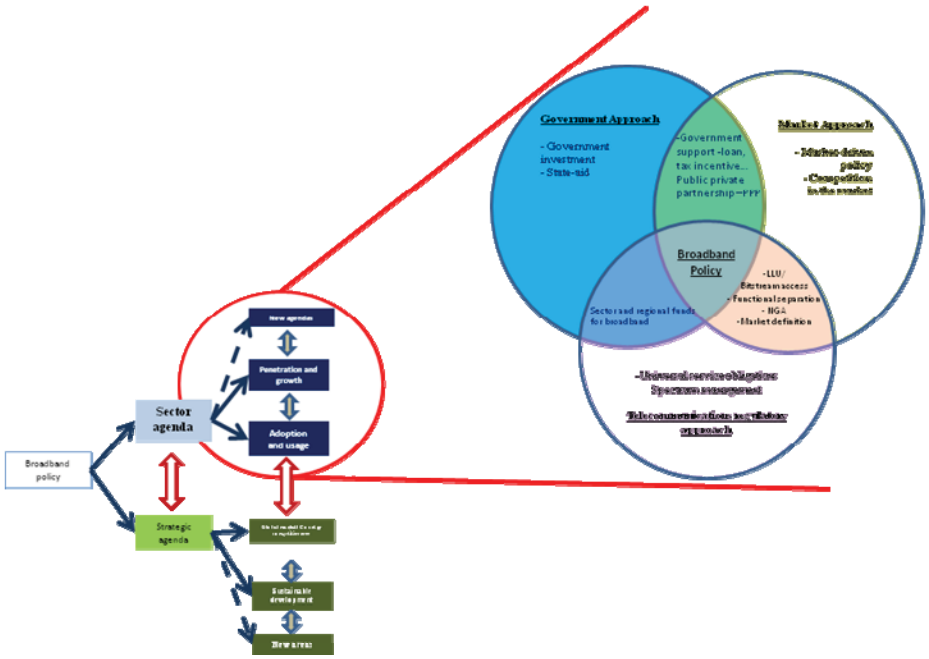

Fig. 5

The strategies to secure the sector agenda of a country can fall into in all or in part of the three-dimensional framework composed of the government approach, market approach, and telecommunications regulatory approach as discussed in section 3.2. However, according to Bauer (2010), at the level of policy models and particularly instruments, the experience elsewhere may likewise sharpen the understanding of what is possible and what works and does not work. Given the diversity of institutional arrangements and the dependence of policy choices and outcome of complementary arrangements, effective learning will typically have to go beyond simple forms of imitation. Therefore, there is no pattern in terms of sector agenda for a country to implement which results in significantly increasing broadband deployment, because increasing broadband growth depends on the social and economic circumstances of each country. The same strategy may not give the same result even among developed countries. There are other purposes that could be regarded as sector agendas, for example, interoperability, security or quality of service, but this paper does not elaborate them in detail because they require another set of discussions.

In the EU, the development of broadband policies and regulations for more than two decades since 1987 was focused mainly on the sector agenda. Particularly, the regulatory approach can be treated as the crucial strategy for broadband penetration. Many regulations have been put in place to cope with the changing environment from monopoly system to competition. It is interesting to note that most of those regulations have been directed towards the legacy networks which are cable or copper inherited from PSTN networks. LLU regulation, for example, is treated as one of the successful policy

for increasing competition in broadband market but the LLU regulation is not applied to fibre network. Therefore, fibre investment has been left to market mechanism since 2001. Until today, though most of the EU countries are at the forefront of broadband penetration rate, that high growth rate is based much from DSL and cable technology not fibre technology.

However, in order to reach the goal set by political agenda, in particular 'A Digital Agenda for Europe', it is undeniable that fibre technology is important. To have fibre technology rolling out in Europe is a big issue due to a mixed picture exists for most European countries. As a result, if the EU migrates to fiber technology, it has to undergo costly investment. The main strategy, namely the NGA Recommendation, being introduced in 2010 by the European Commission to encourage this new investment still follow that same path of history, and that is to repeat the mechanisms of the LLU Regulation. In this sense, even though fiber network upgrades are often held essential to national economic competitiveness, they are pursued less aggressive in the EU (Atkinson & Noam, 2010).

Nevertheless, given the high investment needs, and considering practices of other governments around the world, fiber broadband network deployment can be encouraged by other approaches. Interestingly, most of them have been taken mainly from government approach, except for the US which has a more market-based approach. These include:

- government ownership of new infrastructure: this approach is a strong approach for countries like South Korea, and, recently, Australia;
- tax incentives;
- government as lead user;
- subsidies, especially to rural areas or to low income users;
- ease of access to public rights of way;
- social compacts of upgrade commitments in return for approval of higher prices;
- permission of infrastructure sharing among competitors;
- provision of more spectrum, especially from under-utilized government frequencies (whose use need to be audited)
- public private partnership;
- support of the demand side by removing barriers to the entry of entertainment providers, educational services, and tele-medicine;
- support of the supply of content and network utilization by encouraging content access.

The case for public upgrade support programs is mixed. It is strongest for high-cost rural areas to prevent them from falling behind. It can also be extended to encouraging the demand side by supporting content and applications. But such supportive policies can also be a double-edged sword,

because they might be tied to regulatory conditions. Whatever one may think of these policies, the mere fact of their entry into the public debate shows the transition from the competition-based model of just a few years ago. Now, with major investment requirements looming, and the long-term need for countries to remain competitive, a frequent acceptance of the government's active role in 'industrial policy' has returned. Thus, ICT policy might move in different directions in Europe than it does for other countries (Atkinson & Noam, 2010).

5.3 Broadband policy: The strategic agenda for country

Apart from sector agenda, strategic agenda becomes more and more important for network society which can be integrated into national broadband policy. This strategic agenda is set for some specific national agenda, particularly when broadband is considered as an infrastructure for future development, which means that broadband can contribute to the increasing potential of social and economic status at the global level (see Fig. 10). For example, a strategic broadband policy could affect national capacity in competing in the global market. In addition, it can increase country competitiveness in the long run where broadband infrastructure is a fundamental factor for country and business growth in every sector. Moreover, when climate change attracts attention from people all over the world, broadband can contribute its capabilities to energy saving in other sector. However, to reach that goal in terms of energy saving, a concrete policy needs to be in place because broadband itself can have an impact in terms of energy consumption at the same time.

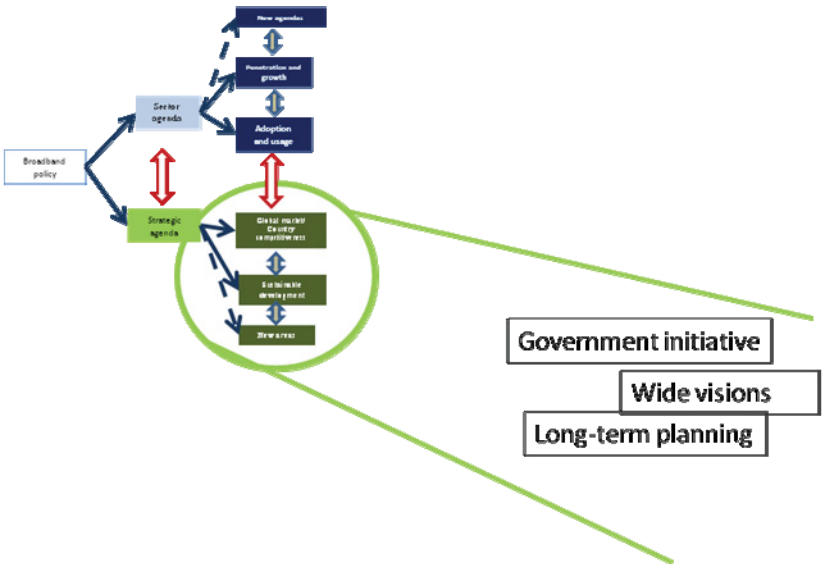

Fig. 6.

However, the strategic agenda needs long-term planning and vision of a government, and the most important is that it may need strong government support. The collaboration between public and private organizations is possible in terms of implementing these kinds of policy but, at the initial stage, government involvement is important.

As in the case of the EU, an information society has been set as a target in order to strengthen social and economic development and region competitiveness for more than two decades, several mechanisms have to be put in place. Therefore, recognition of the growing importance of broadband as a means to promote an information society presents challenges for policy-makers in introducing efficient strategies, not only to serve the increasing demand for broadband among people in society but also to increase their economic contribution both in the short run and in the long run. Having fast and ultra-fast high speed broadband network through fiber technology under A Digital Agenda for Europe has been mentioned for the first time of its contribution to environmental issue (EC, 2010b).

Apart from the contribution to environmental issue, the issue of increasing regional competitiveness through a telecommunications network has also raised again in the recent policy agenda, the Digital Agenda for Europe. The new policy aims to increase the competitiveness of the EU through fast and ultra-fast internet access, in particular a fibre-based infrastructure, the availability of which is still very low in terms of percentage. From this viewpoint, the new policy of the EU then takes broadband infrastructure as not only a means of moving towards an information society but also an important infrastructure for the region to strengthen its ability to increase the social standard of living and national competitiveness, at the same time. However, most of the actions proposed under this new strategy seem to place more responsibility on the firms or industry rather than government authorities. The past experience on encouraging broadband growth through market mechanism would be a good example that market mechanism may not be an efficient approach for the EU, in particular when the issue is beyond the competence of firms.

Moreover, a new context of broadband policy from sector agenda perspective requires new institutional frameworks to effectively pursue political and policy agenda (Freeman & Soete, 1997; Perez, 2002). Changes in institutional frameworks can involve new priorities for the issues because of resources limitation, and new boundaries between different government agencies (Poel et al., 2010). Therefore the typical broadband policy which focuses more on broadband growth may need to be reconsidered in order to lay down a foundation for the future.

5.4 Disconnected between network society and the EU broadband policy

The readiness of the EU in terms of corresponding to the new social structure or network society seems to be slow in some sense. Considering that the network society concept was introduced in 1970s, several issues were observed from the changes of technological development and its impact to society. At the same period of times, the 1970s, telecommunications networks and services in the European Community have been forced to reform by exogenous factors, namely technological and economic developments (Goodman, 2005).

Even though the first movement of the EU policy as stipulated in 1987 Green paper had recognized the notion of having a high capacity broadband network has come with two agendas: to increase the welfare of the people through a good infrastructure (the sector agenda) and to increase the competitiveness of the region (the strategic agenda), still, later implementation focused only to increase penetration of telecommunication infrastructure for 30 years.

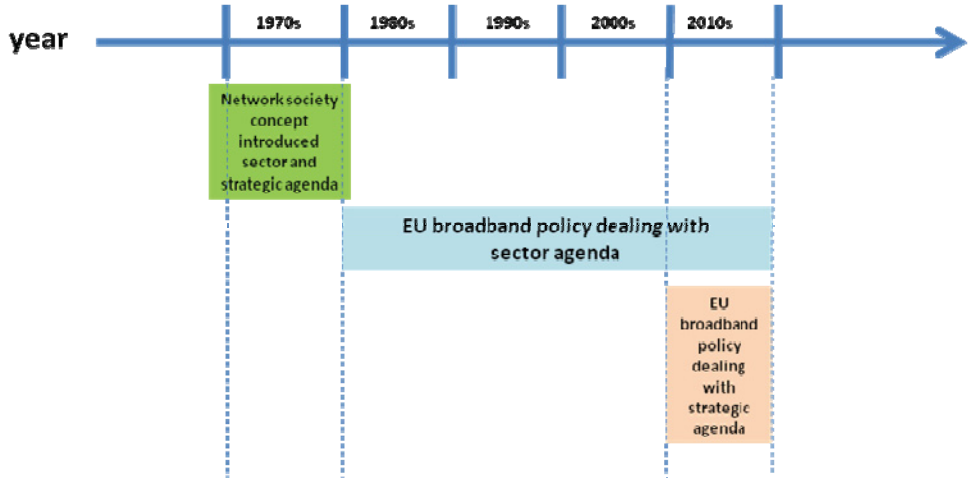

Fig. 7.

The development towards network society or information society as used the European Commission started since 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 of the realization of strategic agenda that broadband policy could bring.

As pointed out by Castells (2005), when in 2000 the European Union approved a strategy known as the Lisbon Agenda to catch up with the United States in 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 effects on productivity, on learning, on creativity, and on entrepreneurialism, were very limited. This is because acting on the developmental potential specific to the network society requires a combination of initiatives in technology, business, education, culture, spatial restructuring, infrastructure development, organizational change, and institutional reform. It is the synergy between these processes that acts as a lever of change on the mechanisms of the network society.

Even though the latest policy agenda has mentioned for the first time of strategic agenda in broadband networks, the mechanism to be implemented may not be able to result in the expecting outcome. Since dealing with strategic agenda may requires different mechanisms, not the same as sector agenda, due to its complexity, therefore, the objectives as set may not be able to reach.

6. Conclusions

More than a decade that broadband has been recognised as having great benefits to economic and social development. The European Commission, for example, perceived the importance of broadband in the Green paper in 1987 (CEC, 1987). Different measures and strategies have been implemented in many countries in order to encourage broadband deployment.

This perspective may need to be changed if broadband is viewed as an important strategy for future development. On the one hand, broadband is regarded as one of the basic infrastructures for improving the quality of life of people and the economic efficiency of a country. On the other hand, its capabilities can contribute to future development and the strategic agenda of a nation. In this sense, broadband is not only a mean in moving toward information society as set by political agenda but also an important infrastructure for a country to strengthen its capability to increase social living and nation competitiveness at the same time. In order to reach that goal, government policy is important because the response of market or industry will depend on how policy will be shaped.

Therefore broadband policy should be viewed from two main perspectives. The first perspective is called sector agenda which is based on the ongoing development tools and strategies in order to increase broadband growth. The second perspective is called strategic agenda which view broadband policy in terms of long term development in order to compete in global market. Those two perspectives should be integrated into broadband policy for the purpose of future development. From exploration, some observations can be made to the EU broadband policy being implemented during these twenty years. The EU policy has been successful from sector agenda viewpoint, and that is to increase broadband penetration in last twenty years. However, the EU success may not be able

to sustain from strategic agenda viewpoint because of new technological development and the new movement under the theme of globalization of post-industrial society or network society.

References

Atkinson, R., Noam, E., & Schultz, I. (2010). *Has telecom investment peaked?* Paper presented at the 38th TPRC conference held in Michigan, the U.S., 1-3 October, 2010.

Berkman (2010). *Next generation connectivity: A review of broadband Internet transitions and policy around the world*. Berkman Center for Internet & Society, February, 2010.

Bohlin, E. (2001). A new age of enlightenment. *Foresight*, 3(2).

Bohlin, E., & Teppayayon, O. (2009). Broadband universal service: A future path for Europe?. *International Journal of Management and Network Economics,* 1(3), 275 – 298.

Bohlin, E., & Teppayayon, O. (2010). Broadband universal service in Europe: A review of policy consultations 2005-2010. *Communications & Strategies*,

CEC (1987). *Towards a dynamic European economy*. Green Paper on the development of the common market for telecommunications sector services and equipment, COM(87) 290, June 1987.

CEC (1999). *eEurope: An information society for all*. Communication on a Commission Initiative for the special European Council of Lisbon. COM (1999) 687 final. December, 1999.

CEC (2001). *eEurope 2002: Impact and Priorities*. Communication from the Commission to the Council and the European Parliament. COM (2001) 140 Final. March 2010.

CEC (2002). *eEurope 2005: An information society for all*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2002) 263 Final. 28.5.2002

CEC (2005). *i2010 - A European Information Society for growth and employment*. Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions entitled. COM(2005) 229 final, June 2005.

CEC (2010a). *Europe 2020: A strategy for smart, sustainable and inclusive growth*. Communication from the Commission. COM(2010) 2020, March 2010.

CEC (2010b). *A digital agenda for Europe*. Communication from the Commission of 19 May 2010 to the European Parliament, the Council, the European Economic and Social Committee and the

Committee of the Regions. COM(2010) 245 final, May 2010.

Coase, R. H. (1937). The nature of the firm. *Economica*, 16, 386-405.

Cremer, H., Cremer, J., & De Donder, P. (2007). Costs and benefits of vertical divestiture. *Communications & Strategies*, 68, 41-56.

Ducatel, K. (2001). Balance of nature? Sustainable society in digital economy. *Foresight*, 3(2).

Eskelinen, H., Frank, L. & Hirvonen, T. (2008). Does strategy matter? A comparison of broadband rollout policies in Finland and Sweden. *Telecommunications Policy,* 32, 412–421.

Goodman, J. W. (2005). *Telecommunication policy-making in the European Union.* Edward Elgar. London.

Hilty, L. M., Köhler, A., Von Schéele, F., Zah, R., & Ruddy, T. (2006). Rebound effects of progress in information technology. *Poiesis Prax*, 4, 19-38.

Noam, E. (1992). *Telecommunications in Europe.* Oxford University Press, USA.

OECD (2009). *Broadband statistics in OECD in December, 2009*. OECD broadband portal. Retrieved from http://www.oecd.org/sti/ict/broadband

Teppayayon, O. (2010). *Assessing broadband policy: Towards a conceptual model*. Licentiate thesis. Chalmers University of Technology.

Teppayayon, O., Bohlin, E., & Forge, S. (2009). Will broadband networks make the world greener? Evaluating pros and cons of broadband development. *Communications & Strategies*, 76 (4th quarter 2009), 19-38.

UNCTAD (2006). *Information economy report 2006*. United Nations Conference on Trade and Development.

Van Eijk, N. (2004). *Universa service, a new look at an old concept: Broadband access as a universal service in Europe*. Paper presented at the 15th Biennial Conference van de International Telecommunication Society, Berlijn, September 5-7, 2004. Retrieved from http://ssrn.com/abstract=1609880