

# From the "Broadband Ditch" to the Release of the 2010 US National Broadband Plan

## A Short History of the Broadband Penetration Debate in the US

**Jean-Paul SIMON**

IPTS (Institute for Prospective Technological Studies),  
JRC , European Commission, Sevilla, Spain

**Abstract:** The paper provides an historical account of the policy debate that took place in the United States after the 2007 release of the OECD's broadband statistics. It explains why and in what context such a debate occurred (lack of relevant statistics from the FCC, dissatisfaction of some stakeholders with the deregulation of broadband, role of new players). The paper reviews the policy options proposed by the main players to foster the deployment of broadband, among others the potential inclusion of broadband in the scope of the US universal service, the need for a national policy, and implementation/funding issues. It puts into perspective the national broadband plan proposed by the FCC in March 2010.

**Key words:** broadband, competition, industrial policies, government intervention, universal service, open internet, deregulation, rankings/ benchmarking countries.

In April 2007, the OECD released its "*broadband statistics*". Rather unexpectedly it initiated a hot debate about the "rise and fall" of the US, e.g. the US having slipped to the 15<sup>th</sup> position. According to the FCC Commissioner Michael J. Copps, the US was indeed falling in a "*broadband ditch*". Hearings were held at the US Congress to further investigate the issue<sup>1</sup>. Sen. Daniel Inouye (D-Hawaii), who chaired the Commerce, Science, and Transportation Committee, stated:

"The broadband bottom line is that too many of our international counterparts are passing us by. For this we are paying a price. Some experts estimate that universal broadband adoption would add \$500 billion to the U.S. economy and create more than a million new jobs.<sup>2</sup>"

---

<sup>1</sup> United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Telecommunications and the Internet, 2007.

<sup>2</sup> <http://commerce.senate.gov/public/index.cfm?FuseAction=Hearings.Statemen...> The hearing was held a day after the Organization for Economic Cooperation and Development (OECD)

For an observer, even seasoned enough in the intricacies of the US telecom policy, the bubbling up of the issue was something fascinating and bizarre as the United States were perceived as a leader in the field.

The goal of this article<sup>3</sup> is to provide an historical account of this debate as it offers a golden path to better understand the stakes and to identify the positions of the various players most often linked to other major regulatory issues such as the regulatory status of broadband, an Open Internet, and universal service and its future. However, it is not meant to provide any scientific explanation of how penetration was gauged or should be, but to follow the arguments used by companies, policy makers, advocacy groups, Think Tanks, taking them almost at face value and not investigating further the validity of their claims<sup>4</sup>.

The first part will set the scene in 2007 and explain why such a debate happened (lack of relevant statistics from the FCC, dissatisfaction of some stakeholders with the deregulation of broadband, role of new players, and potential impact of broadband). The second part will concentrate on a key element: the deregulation of broadband. The third chapter will trail how this debate was fleshed out in terms of policies, new ways to implement existing policies, and new initiatives such as ConnectNation, the Mapping Bill. The final part will track the same elements and describe their eventual incorporation within the National Broadband Plan, delivered in March 2010.

---

issued new global broadband per-capita penetration data that saw the U.S. fall from 12<sup>th</sup> to 15<sup>th</sup> place out of 30 countries.

<sup>3</sup> The material for this paper stems from the author's annual surveys of the US regulation (based on an average of 20 interviews per year, official reports and industry surveys). These annual surveys provide a review of the opinions gathered through interviews, but not of the scientific literature.

<sup>4</sup> The paper is aiming at an EU audience to introduce some of the US policies and politics and may be less relevant for a US reader.

## ■ Setting up the scene: why such a debate?

### The broadband crisis: the rise and fall of the US

Let us start with the main suspect<sup>5</sup>, the OECD. The intergovernmental agency released<sup>6</sup>, its third Broadband Statistics<sup>7</sup> with a table, showing the United States at rank 15 while they ranked 4<sup>th</sup> when the OECD first stated collecting such data in 2000.

Commissioner Michael J. Copps issued a press release where such ranking (moving down toward the 15<sup>th</sup> rank) was described as a "national embarrassment":

"Every year brings more bad news as the United States slides farther down the broadband rankings. It's a national embarrassment and the only way to change it is to develop a broadband strategy like every other industrialized nation has already done. These rankings aren't a beauty contest – they're about our competitiveness as a country and creating economic opportunity for all our people."<sup>8</sup>

This declaration was supporting an earlier one, the same month, where he was bemoaning:

"The fact remains that America is now 15<sup>th</sup> in the world in broadband penetration according to the ITU, or 21<sup>st</sup> according the same organization's newer Digital Opportunity Index"<sup>9</sup>.

---

<sup>5</sup> The simple metric used by the OECD has been criticized for quite a long time as being highly problematic, but as stated in the introduction, the paper is not accounting for the more complex economic debate about this ranking and how to rank properly. Therefore, the paper does not investigate on what the data are, when they were collected.

<sup>6</sup> It seems that the first OECD Broadband Statistics was released in 2005, with data for 2004. At that time, the US ranked 12<sup>th</sup>. The OECD, *STI Scoreboard 2001*, only covered Internet penetration.

<sup>7</sup> *OECD Broadband Statistics to December 2006*, OECD broadband statistics portal: [www.oecd.org/sti/ict/broadband](http://www.oecd.org/sti/ict/broadband). The table was listing broadband subscribers per 100 inhabitants, by technology. Denmark, the Netherlands, Iceland, Korea and Switzerland were the five leading countries (in that order).

<sup>8</sup> Press release of April 23, 2007, "Commissioner Copps Reiterates Call for a National Broadband Strategy to Address America's Drop in Broadband Rankings". <http://www.fcc.gov/commissioners/copps/statements2007.html>

<sup>9</sup> 4/16/07, FCC Begins Inquiries on Broadband Deployment (FCC 07-21). Statement of Commissioner Michael J. COPPS; Re: Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and

The claim was assuming a positive impact of broadband on the economy, a result of some economical studies<sup>10</sup>.

His position was not completely new either as he deplored before the slippery slope of the US rankings. He dissented in 2004 when the fourth Broadband Report was released<sup>11</sup>. In 2007, he was sending a political message (lack of a consistent public policy) as a democrat commissioner in an Agency chaired by a Republican under a Republican administration. The month before, his fellow FCC commissioner Jonathan Adelstein, another democrat, was also blaming the Bush administration for not having implemented its goal of affordable, universal broadband access by 2007. From a political viewpoint, such signals were no doubt timely as Congress was now led by the Democrats.

These statements were met with some scepticism mostly on the industry side, even if the positions of the various stakeholders were far from being unanimous. On the democrat side it was obviously a good opportunity to (re)launch a public debate. Analysts like Rob Atkinson, president of the Information Technology and Innovation Foundation (ITIF) (CORREA, 2007; ATKINSON, 2007) or associated with the Democratic Party like the Benton Foundation (KOLHENBERGER, 2007), came up with reports advocating the adoption of ambitious national policies for broadband<sup>12</sup>. ITIF was backing more proactive policies that would focus on "stimulating both the supply and the demand for high-speed broadband"<sup>13</sup>. The policy Think Tank stressed that rank mattered for policy, they argued that being in the top five of this industrial hit parade was bringing "four kinds of broadband externalities: (1) network externalities; (2) "prosumer" investment externalities;

---

Possible Steps to Accelerate Such Deployment. Pursuant to Section 706 of the Telecommunications Act of 1996.

<sup>10</sup> The most influential and frequently quoted was CRANDALL & JACKSON (2001): "We conclude that the universal adoption of broadband Internet connections by U.S. households could eventually provide consumers with benefits in the range of \$200 billion to \$400 billion per year". At 2. D.Inouye was hinting at this landmark study when he quoted the \$ 500 million figure.

<sup>11</sup> *Availability of Advanced Telecommunications Capability in the United States*, FCC 04-208, GN Docket No. 04-54, Fourth Report to Congress, September 9, 2004, at 5.

<sup>12</sup> To be noted many of the institutes and foundations quoted in this paper produce "sponsored research" often do not disclose their funders and affiliations. This kind of research produces papers aiming to affect the policy making process by stating outcomes not necessarily proven by facts. As stressed earlier on we focus on the public debate and the policy process.

<sup>13</sup> *The Case for a National Broadband Policy*, p.12.

<http://www.itif.org/files/CaseForNationalBroadbandPolicy.pdf>

(3) competitiveness externalities; and (4) regional externalities<sup>14</sup>." They proposed improvements in the way to compare the achievements, adding speed and price to the adoption rate<sup>15</sup>.

The Benton report went much further on the activist side, making the issue appear much more dramatic in terms of global, economic survival:

"This is now our Sputnik moment. Instead of slipping to second place we have slipped to 20<sup>th</sup>. Just as Sputnik forced us to ask how we can regain our lead in outer space, today we must ask how we can regain our lead in cyberspace" (KOLHENBERGER, p. 5, mimeo, p. 3 report).

To go beyond, they deemed unavoidable modifying the scope of the universal service and including broadband. The Benton report called "for an aggressive new approach, a national broadband strategy"<sup>16</sup>. They advised moving universal service "from safety net to trampoline"<sup>17</sup> emphasizing the "enormous" benefits of universally available broadband.

The two FCC commissioners were deploring the low quality of broadband data-gathering (lack of reliable granular data, reported by carriers, on the range of broadband speeds and prices). A survey released in 2006 by the Government Accounting Office (GAO, 2006) underlined the flaws of the FCC methodology to collect data. Where the FCC data showed almost 39 million residential broadband connections in June 2005<sup>18</sup>, the GAO/SRI survey estimated that about 30 million US households, about 28% of the total, had broadband connections in the spring of 2005. Pew (HORRIGAN, 2006) showed data very close to the GAO/SRI survey: about 30% of adults with broadband at home in March 2005. A 9 million gap is clearly significant.

---

<sup>14</sup> The Case for a National Broadband Policy, p. 6.

<http://www.itif.org/files/CaseForNationalBroadbandPolicy.pdf>

<sup>15</sup> "Assessing Broadband in America: OECD and ITIF Broadband Rankings".

<http://www.itif.org/files/BroadbandRankings.pdf>

<sup>16</sup> *2007 Annual Report*.

[http://www.benton.org/sites/benton.org/files/2007AnnualReport\\_Final.pdf](http://www.benton.org/sites/benton.org/files/2007AnnualReport_Final.pdf).

Earlier that year, Benton Foundation Chairman and CEO Charles Benton sent a letter to President Bush urging the President to create a national broadband strategy.

<sup>17</sup> "Universal Affordable Broadband for All Americans", p. 6 of the December report.

<sup>18</sup> FCC zip code-level data. The Federal Communications Commission has been gathering data on U.S. broadband service deployment since 1999. The FCC defines a high-speed ["broadband"] line to be one with a speed exceeding 200 kilobits per second (kbps) in at least one direction, while an advanced services line is a high speed line with a 200 kbps rate in both directions.

In any case, how to improve the quality of data was a topic already discussed in various fora<sup>19</sup> and academic circles<sup>20</sup> as it was difficult to gauge properly any progress without good data about broadband adoption, deployment, price, and quality. The use of imperfect data by the OECD was seen as an explanation of the attributed ranking.

Other studies, offered improved methodologies to assess the performance of a country. The Phoenix Center criticized what they called the "raw" (FORD, KOUTSKY, & SPIWAK, 2007) data used in the in the OECD and ITU reports (e.g. per capita subscription data alone). They called for an alternative approach based on more appropriate criteria such as economic and demographic endowments. They introduced a Broadband Performance Index (BPI), building a multivariable econometric model<sup>21</sup>. The introduction of other parameters and their computation, allowed them to take a strong stance against the idea that the US were "falling behind".

"Our results are interesting, as they show that broadband adoption in the United States is largely in line with what would expect from its economic and demographic conditions. This stands counter to allegations of some that U.S. policy has failed and pushed the country into a "broadband ditch"<sup>22</sup>."

This was an attempt to take a serious look at the effective performance of a nation, how a country managed to use its resources. Nevertheless, the performance of the US did not appear particularly impressive:

"The United States ranks 14th, with a BPI score of -0.006. This means that the broadband subscription rate in the United States is commensurate with its demographic and economic endowments, no better but no worse"<sup>23</sup>.

---

<sup>19</sup> Such as the TPRC conference. For instance a session on "Understanding Broadband Diffusion" took place in 2006.

<sup>20</sup> In June 2006, Pew Internet & American Life Project, the University of Texas at Austin, organised a workshop with the support from the National Science Foundation, and The Massachusetts Institute of Technology.

<sup>21</sup> Broadband subscriptions per capita in OECD country, gross domestic product per capita, broadband price, the nation's Gini Coefficient (a measure of income inequality), the percent of persons with post-secondary or tertiary education, the percent of the labour force age sixty-five or older as a percentage of the labour force, the number of households per square kilometre, the percent of the population living in the country's largest city, the number of telephones (landline and mobile) per 100 persons (plus its square), a measure of persons per household, and of persons per business establishment.

<sup>22</sup> Id. at 31.

<sup>23</sup> Id at 31. The US was one of the first countries on the underperformance side.

---

## Did the market deliver? The viewpoint of the industry

The industry (Incumbents Local Exchange Carriers: ILECs) was somewhat more optimistic about the output and, as mentioned, more sceptical about the rhetoric of the fall. For instance, it appears amazing that a country with 90 % coverage of cable (and 90% subscription rate) could be described as some kind of "ditch". Industry representatives would highlight the deployment of fibre, the growth of the services provided and the continuing decrease of prices: at the time the first offer for DSL was around \$15 per month<sup>24</sup>. AT&T claimed at the end of 2006 to be in line with its deployment plan of FTTH/ FTTN (\$ 5 billion to serve 18 million households i.e. 60% of their customer base). Verizon announced as well that the FiOS network build-out was on target for the same period<sup>25</sup>.

Their telecom trade association US Telecommunications Associations (USTA)<sup>26</sup> confirmed similar commitment from his constituents. Manufacturers such as Alcatel-Lucent rejoiced about the very rapid growth of broadband networks (15 million lines deployed by Alcatel as of 2008): "more bandwidth, more services, more convergence underway"<sup>27</sup>. Investment was taking place and competition even if held insufficient (cable/ telco duopoly) avoided getting involved in the tricky issue of access and unbundling regulation.

Some economists held that the market was working properly. J.A. Eisenbach did not hesitate to claim:

"[...] the evidence suggests the American broadband market is meeting the needs of the vast majority of American consumers, and that performance will continue to advance as the pro-infrastructure competition policies that constitute the American model continue to result in higher level of investments and innovation" (Chairman Criterion Economics, EISENACH, September 14, 2008, p. 13).

Almost unanimously, industry representatives deem it difficult to gauge the issue without any proper data and relevant criteria.

---

<sup>24</sup> Source: Interview, Earthlink an alternative provider.

<sup>25</sup> News release du 27 September 2006 : "Verizon Provides New Financial and Operational Details on its Fiber Network as Company Gains Momentum", "The FiOS network build-out is on target to pass a total of 6 million premises by year-end 2006". By the end of 2009 the investments reached \$18 billion for AT&T, \$ 23 billion for Verizon around 50% of their footprint.

<sup>26</sup> Now USTelecom, the "broadband association".

<sup>27</sup> Interview.

Another argument, often used, was that it was unfair to compare the U.S. against the smaller and more densely populated countries that beat the U.S. in the OECD rankings (i.e. United Kingdom is smaller geographically than California). But even for rural areas, the National Telecommunications Cooperative Association (NTCA), the trade association of rural carriers was proud to emphasize that their members were deploying broadband: up to 90% of the answers to their annual survey<sup>28</sup> (out of which 32% were introducing fibre: FTTH/FTTC).

Most of the industry representatives regretted that these international comparisons were focusing on the supply side therefore ignoring the demand side of the equation. In other words, a technical deployment is not equivalent to adoption. The international ratings do not consider the patterns of usages although according to the National Cable Television Association (NCTA)<sup>29</sup>, with a penetration ratio reaching some 90% for cable in the US, it is the relevant issue.

Finally the link with a potential inclusion of broadband within the scope of the universal service was not perceived with that much enthusiasm. There were good reasons for that. Around the same time it was recognised that the funding system for universal service was heading for a major crisis, as the funds needed to support the goals had skyrocketed from \$955 million in 1997 up to over \$7 billion in 2007<sup>30</sup>, in less than a decade. The FCC has been trying to reform the fund but without much success so far. The industry was involved in that attempt but reluctant to step into a new direction before having found a solution to fix that system under stress.

---

<sup>28</sup> NCTA 2007 Broadband/Internet Availability Survey Report, 19 p; September 2007. 99% of the firms answering to the questionnaire are using ADSL; the 32% ratio for FTTH/FTTC was forecast to grow steadily. National Telecommunications Cooperative Association (NTCA: The voice of rural telecommunications).

<sup>29</sup> Interview.

<sup>30</sup> Data from McLean & Brown: "Universal Service – Rural Infrastructure at Risk Release 3.0", October 2007. McLean&Brown is a Think Tank promoting the deployment of telecommunications in rural areas. In March of 2005, McLean & Brown released the initial version of "Universal Service – Rural Infrastructure at Risk". In April of 2006 they published Release 2.0. Other data can be found on the FCC website or the NTCA: [www.ntca.org](http://www.ntca.org). The fund is subsidized through an 11.4% overcharge on the customer bill (so-called subscriber line charges).



## ■ The long long winding road toward the deregulation: the status of broadband

Another very important reason for the industry to be not only sceptical but also very cautious was that questioning the existing (or their lack of) policies, and requesting more proactive ones was sounding like some kind of threat of re-regulating broadband. The two regulatory debates that bloomed at the same time "the broadband ditch" and the "net neutrality" were clearly linked to the deregulation of broadband that was achieved only two years earlier with the FCC 2005 decision on *Broadband Internet Access Services*. Some players feared that this landmark decision to deregulate may well jeopardize the future growth of the Internet and lobbied for some protective measures.

The net neutrality debate is already well-known<sup>31</sup>. Suffice to say that the four "net neutrality" principles (four freedoms) were proposed, in February 2004, by the former chairman of the FCC, Michael Powell, in the perspective of the forthcoming deregulation of broadband so as to protect consumers. A little more than one year after, the FCC adopted the four principles (Open Internet principles) the very day the agency adopted its decision on *Broadband Internet Access Services*<sup>32</sup>.

This soft law announcement opened the door for the well known hot debate. It allowed players from the Internet sector to start various lobbying campaigns but also other players to jump in (Competitive Local Exchange Carriers: CLECS, non integrated mobile operators), trying to fight back the deregulatory measures. New entrants (mostly CLECs) challenged the decision of the FCC.

Since the initial implementation of the Telecommunications Act of 1996, US telecom policy underwent several notable changes. The first move was to enforce various network sharing and unbundling obligations that were designed to jump-start competition through "intra-modal" means. To encourage competitive entry into local telephone markets, the '96 Act places a number of interconnection requirements on ILECs, including a duty to provide access to unbundled network elements at any technically feasible

---

<sup>31</sup> A recent comprehensive work on the topic: Christopher T.MARSDEN, "Net Neutrality. Towards a Co-regulatory Solution", Bloomsbury Academic.  
<http://www.bloomsburyacademic.com/pdf%20files/NetNeutrality.pdf>

<sup>32</sup> Press release, "FCC Adopts Policy Statement. New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet".

point in their networks. The '96 Act also requires the FCC to establish rules to implement these requirements<sup>33</sup>.

The results were a mixed bag and the implementation of the unbundling obligations ended up in constant legal fights in which the FCC did not fare too well. Defining the rules for the unbundled elements (UNEs) was not an easy job. The FCC took some time to draft rules for unbundling that could withstand judicial review and the agency received some severe blows in the meantime.

Progressively, the goal of policy shifted toward a willingness to promote and rely upon facilities-based, the so-called "inter-modal competition", competition among network platforms and not any more within a single platform. The FCC was trying to define away telecom services under the classification of "information services" (Title I of the Communication Act). However, much of the IT markets were deregulated already (CPEs, personal computers, servers and packet switches) long before 1999.

In June 27, 2005 the US Supreme Court upheld as reasonable the qualification of cable modem service as an interstate 'information' service and not a telecommunications service. The ruling probably ended cable's "open-access" judicial odyssey that began in 1998 when the then-America Online Inc. chairman and CEO Steve Case urged the then-Federal Communications Commission chairman William Kennard to condition AT&T Corp.'s merger with Tele-Communications Inc. on granting AOL access to TCI's high-speed-data affiliate. It is worth providing some background elements about this legal odyssey.

This Supreme Court decision meant that cable systems were not legally required to lease access to competing providers of high-speed Internet access. After the FCC decision, information service providers were not subject to mandatory regulation by the FCC as common carriers, while telecommunications carriers were subject to such regulation (under title II of the '34.Act).

---

<sup>33</sup> According to Sec. 251 (c) (3): "Incumbents Local Exchange Carriers (ILECs) are obliged to provide to any requesting telecommunications carrier for the provision of a telecommunications service, non discriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, non discriminatory [...]".

To achieve the deregulation of broadband several steps were required. The FCC was under an obligation to review (Triennial Review) the rules for the UNEs. The rules were revised in 1999, 2003. In its August 21, 2003 Triennial Review Order the FCC revised the rules under which ILECs must make unbundled network elements (UNEs) available to new entrants seeking to provide competitive local telephone services. The FCC concluded that the broadband capabilities of fibre loops that extend to a customer's single-family home, known as fibre-to-the-home (FTTH) loops, would not be subject to unbundling requirements. The FCC was now heading toward the deregulation of broadband. In 2004 more orders followed<sup>34</sup>.

The 2005 *Report and Order and Notice of Proposed Rulemaking*<sup>35</sup> placed wireline broadband Internet access services, commonly delivered by digital subscriber line (DSL) technology, on an equal regulatory footing with cable modem Internet access services. The order establishes a new regulatory framework for broadband Internet access services offered by wireline facilities-based providers. Both DSL and cable modem service are now classified as "information" services under title I of the '34 Act.

The Regional Bell Operating Companies (RBOCs) have been asking for "regulatory parity" for quite some time. They pleaded for different rules to be applied to the new networks under the motto "Old networks/ Old rules. New networks/ new rules". They argued they were at a competitive disadvantage vis-à-vis the cable networks and that the lack of parity was a disincentive to invest in the next generation of broadband networks. The FCC under chairman M. Powell and K. Martin (both Republicans) tended to agree and was more and more unwilling to extend the legacy regulation to new technologies. Taking into account the investments plans in fibre of companies like Verizon and SBC (later to merge with AT&T), the agency considered that such huge investments were most likely to come from deep pockets companies rather than from smaller entrants<sup>36</sup>. The dot-com bubble has burst and most the companies filed for bankruptcy.

---

<sup>34</sup> Among others: October 18, 2004, *Order on Reconsideration* removing the requirement that incumbent local exchange carriers (ILECs) provide their competitors with unbundled access to their fibre-to-the-curb (FTTC) facilities. October 27, 2004, *Memorandum Opinion and Order* ruling that the Bell Operating Companies (BOCs) are no longer required to provide certain broadband unbundled network elements (UNEs) to competitors as one of the conditions contained in the '96 Act for allowing them to provide long distance telephone service within their operating territories.

<sup>35</sup> August 5 decision, released on September 23, 2005.

<sup>36</sup> Indeed, as of the end of 2009 the investments reached \$18 billion for AT&T, \$ 23 billion for Verizon to serve around 50% of its footprint.

The FCC was removing the kind of unbundling requirements that were developed under the three *Computer Inquiries* meant to foster service competition between ISPs.<sup>37</sup> In other words, mass market broadband services were deemed competitive. As Peter Huber once remarked:

"[...] the thin-and-slow pipes have to be unbundled, because no one can afford to replicate them, but the fat-and-fast pipes need not be, because they can be provided competitively, and have been" (HUBER, KELLOG, THORNE & LEO, 2005, p. 67).

This is what the 2005 decision acknowledged:

" In the past, the primary, if not sole facility-based platform available for the provision of "information services" to consumers was an incumbent local exchange carrier's (incumbent LEC's) telephone network. By contrast, the record before us demonstrates that the broadband Internet access market today is characterised by several emerging platforms and providers, both intermodal and intramodal, in most areas of the country"<sup>38</sup>.

In the US context, the legal saga is an endless one. The recent court decision (Court of Appeal DC Circuit) in the Comcast case, called into question the Commission's legal rationale and ability to enforce a significant number of its Internet-related rules<sup>39</sup> relying on Title I (Information services). The FCC proposed to reclassify part of broadband access under Title II common carrier regulations, a so-called "third way approach" in June 2010<sup>40</sup>. A key point in the broadband debate, underscored by this

---

<sup>37</sup> Basically, it set forth an obligation for a facility-based provider to provide basic transmission on an unbundled basis. Computer Inquiry I, II, and III, conducted during the 1970s and 1980s, sought to establish a level playing field for competitors providing information services by requiring incumbents, to offer unbundled basic telecommunications services on a regulated, common-carrier basis. The legislative mandate for unbundling still exists but the FCC has abandoned all such requirements.

<sup>38</sup> Order, p. 4 section 3.

<sup>39</sup> *Comcast Corp. v. FCC*, 600 F.3d 642 (D.C. Cir. 2010). Comcast was held responsible by the FCC for its infringement of the Net neutrality principles. In 2008, FCC found that the cable company violated the non discrimination principles of the 96'Act. The cable operator blocked applications such as BitTorrent. Comcast took the FCC to the courts, challenging its jurisdiction and was upheld: principles are not law. Comcast is also the fourth largest wireline telecommunications company in the US.

<sup>40</sup> *In the Matter of Framework for Broadband Internet Service*, GN Docket no. 10-127, Notice of Inquiry, FCC 10-114 (rel. June 17, 2010). "A "third way" under which the Commission would reaffirm that Internet content and applications remain generally unregulated under Title I of the Communications Act; identify the Internet connectivity service that is offered as part of wired broadband Internet service as a telecommunications service; and forbear under Section 10 of the Act from applying all provisions of Title II other than the small number that are needed to

"approach", is whether FCC has authority, regardless of whether it chooses to exercise it.

### **Casualties: unhappy entrants**

The Computer inquiries were designed to foster competition between ISPs and it is acknowledged that it reached its goal. Competition flourished and the Internet<sup>41</sup> kept on growing. This accounts for the strong negative reactions of entrants (the CLECs) when faced with the FCC 2005 decision. Of course, this was to be expected and it came as the final step of this long winding road toward the deregulation of broadband. Nevertheless, the decision was a drastic one and the schedule envisaged by the FCC was indeed tight enough to raise such concerns.

The CLECs challenged the decision<sup>42</sup> without much success as the Third Circuit appellate court upheld the FCC decision in August 2006. Most of these companies had to revisit their strategies with the disappearance of the regulated access, especially companies acting as third party for the provision of access (notably to cable companies). For instance, Earthlink, a company offering wireline Internet access tried to build on its customer base to move toward wireless access. Mobile operators not integrated with fixed line companies shared these concerns and they feared increased rates for the special access lines needed for their backhaul<sup>43</sup>. A market they deemed not to be competitive<sup>44</sup>. The provision of high-capacity middle-mile is also key for the deployment of 4G.

---

implement fundamental universal service, competition and market entry, and consumer protection policies." Press release.

<sup>41</sup> For this positive role see the white paper of the BroadNet Alliance, a coalition of national, regional, and local independent ISPs. The white paper showed that the *Computer Inquiry* rules "in large part enabled the rise and amazing success of the online world," by creating conditions that allowed consumers to reach the online providers of their choice. The BroadNet Alliance, *The Importance of a Broad Net: The Significant Role of Internet Service Providers in the Development and Success of the Information Age*, July 2002, at 2.

<sup>42</sup> 3<sup>rd</sup> Circuit, Time Warner Telecom followed by Comptel, Earthlink.

<sup>43</sup> Connecting tails circuits with DS1/3 pipes to the ILECs' wire centres.

<sup>44</sup> In 2009, according to the Special Access Coalition, out of 4 million commercial buildings only 770 000 benefited from competition.

## Rushing to square 2: the impact of this debate

The necessary improvement of data collection became highly consensual. Congress adopted a bill in October 2008. The *Broadband Data Improvement Act* (Mapping Bill)<sup>45</sup> was adopted unanimously<sup>46</sup> (bipartisanship). The legislation requires the FCC to conduct consumer surveys about the availability of broadband and to compare the availability, speeds and price of broadband in the U.S. to 25 other countries. The FCC is also required to publish an annual report and not just "regularly" as under the previous legislation. States would be encouraged to improve broadband and accordingly entitled to receive ad hoc funds (development grant program to create state-wide broadband initiatives).

In March 2008, the FCC approved a new broadband mapping plan that would measure broadband availability by census tract, a geographic area that is typically smaller than a zip code. The new plan will also break out five speed tiers in its upcoming broadband reports, the lowest tier being 200K bps to 768K bps and the fastest tier more than 6M bps.

This very short piece of legislation (6 p.) was indeed the only legislation adopted for telecommunications by the 110<sup>th</sup> Congress. This was a clear sign that a consensus has been reached. The act was also inspired by the Connected Nation<sup>47</sup> model and its experience in the State of Kentucky where within a few years the coverage increased from 65% up to 95%<sup>48</sup>. It did follow Connected Nation's suggested combination of broadband availability mapping, grassroots demand aggregation, extensive research, and efforts to put computers into the hands of disadvantaged communities

---

<sup>45</sup> [http://www.ntia.doc.gov/advisory/onlinesafety/BroadbandData\\_PublicLaw110-385.pdf](http://www.ntia.doc.gov/advisory/onlinesafety/BroadbandData_PublicLaw110-385.pdf)

<sup>46</sup> The bill, authored by Senator Daniel Inouye (D-Hawaii), with language included from a bill by Representative Edward Markey (D-Massachusetts), the chairman of the House Energy and Commerce Subcommittee on Telecommunications and the Internet. Both were very active and prominent members of Congress. E.Markey held hearings on Broadband Access in May 2007. Another representative Boucher (D-VA) detailed a number of plans to help improve broadband penetration in America in June the same year.

<sup>47</sup> "Connected Nation, Inc., a national non-profit, is widely recognized as the nation's model for improving digital inclusion". <http://www.connectednation.org>. See also:

<http://www.connectkentucky.org/>. Other States have followed since such as Illinois, Michigan, Minnesota, Ohio, South Carolina, Tennessee, Texas, ... "In 2004, House Bill 627, the "rural broadband bill," deregulated Kentucky's broadband industry and levelled the playing field for broadband infrastructure providers", ConnectKentucky Report 2005. Reports are available since 2003.

<sup>48</sup> Interview, Verizon.

The industry has generally rallied around the bill. Trade groups like USTelecom, the Telecommunications Industry Association and the Independent Telephone & Telecommunications Alliance applauded, so did Verizon<sup>49</sup>.

The reform of the universal service (US) fund has been around for quite a while and remained a complex, multifaceted issue as it involved not only the funding but also highly complex issues such as interconnection (ICC: intercarrier compensation). A consensus was also building to achieve such a reform, however the consensus did not go much beyond the acknowledgment of this urge, players diverged on how to implement any reform. However, moving toward the inclusion of broadband was one of the consensual areas.

One of the thorny aspects is the fact that the 96 Telecom Act states that service should be provided in low density and high cost areas at "reasonably comparable rates"<sup>50</sup> paving the way for an extension to broadband. Along this interpretation, it would be possible to extend the funds available to broadband networks. Commissioner Copps was backing this option to use the Universal Service Fund to support the build-out of advanced broadband networks. The FCC Chairman Martin advocated as well using the fund to help companies roll out broadband service. In a 2005 consultation document on consumer protection, it was stated in keeping with the law: "rate averaging requirements that ensure charges for consumers in rural areas are not higher than those for consumers in urban areas"<sup>51</sup>.

The Joint Board (federal/ states) set in 2007 by the FCC released recommendations that were used in the 2008 FCC consultation, proposed <sup>52</sup> the introduction of three new funds: provider of the last resort (\$3.2 billion), mobile (1), and broadband (0.3 billion). The last two (explicit funds for non served areas) were supposed to increase progressively while the first one had to decrease.

This left untouched the question of how to create incentives for such a migration as the law appeared to be less flexible than M.Copps figured out:

---

<sup>49</sup> Peter Davidson, Verizon's senior vice president of federal government relations: "This legislation recognizes that fact by creating a roadmap for public-private partnerships between governments, business, labor, educators, consumer groups and other non profit organizations".

<sup>50</sup> Section 254 (g).

<sup>51</sup> "Notice of Proposed Rulemaking on Consumer Protection", 2005.

<sup>52</sup> To cap the high cost zone fund to its 2008 level of 4.5 billions \$,

according to the existing rules (in 2008) a carrier wishing to invest in broadband rather than in circuit switching could not, since the funds were already earmarked for the obsolete technology<sup>53</sup>. Besides, some questioned whether the FCC had authority to use the Universal Service Fund to support the build-out of advanced broadband networks.

The re-allocation of funds is a touchy exercise as it may deprive some companies from the fund they need to survive in non-profitable areas as underlined by the rural carriers. US Telecom suggested differentiated targets such as the supply of a basic broadband service in non served areas and an increase up to 40% of the penetration rate in the areas where service is available.

It also left a major question about the mere size of the funds<sup>54</sup> and about its efficiency as some observers noticed, the FCC (or any other agency) never tried to properly assess the impact of the funds:

"There is no evidence that the US fund going to high costs areas has any influence on anything"<sup>55</sup>.

Economists like Thomas Hazzlet (HAZLETT, 2006) were highly critical about this amount and considered it was nothing but another tax. It certainly needed clarification (policy goals, means to achieve, impact assessment, deadline, ...)

Therefore, some were proposing to decrease not to increase the funds under some kind of sunset clause (10% per year). Even assuming the same level of funding is kept, the question of how to monitor the costs when the penetration was increasing was an open one. This is the reason why some players were advocating options that worked well historically such as grants and loans from the ministry of Agriculture under the Farm Act<sup>56</sup> rather than endless subsidies. There is also room for some intervention from the local authorities even if this is more polemical as often carriers object to what they consider as a distortion of competition based on a transfer (misuse) of public money (local taxes).

---

<sup>53</sup> Interview, Microsoft.

<sup>54</sup> Since 1997, the entity managing the fund, the Universal Service Administrative Company (USAC), allocated around \$30.3 billion.

<sup>55</sup> Interview, Brookings.

<sup>56</sup> The Act must be reviewed every five years.



## ■ "Mission accomplished?": 2010 and the National Broadband Plan

A momentum was building around broadband seen from the two angles (data gathering and subsequent ranking, scope of the universal service) but not without some conflicts between the various aspects of the policies. As explained, the consumer protection dimension was the other side of the deregulatory policies. This indicated that there was a growing collision between social objectives and the deployment of technologies, illustrated not only by the examples of universal service and net neutrality but others like e911 or security<sup>57</sup>. In the above mentioned consultation document on consumer protection, the FCC raised the question: "what non-economic obligations it should impose on service providers regardless of the underlying technologies used (DSL or cable modem services)"<sup>58</sup>.

The policy debate triggered by the two democrat commissioners paved the way for the programme of the presidential candidate Barack Obama. The deployment of next generation broadband was on top of the priorities for telecom of the future president <sup>59</sup>. Their call for a national plan was not lost.

"Barack Obama believes that America should lead the world in broadband penetration and Internet access... "<sup>60</sup>.

The conditions were met for the adoption of a broadband plan, but another important dimension of the debate has to be stressed: the perceived role of wireless broadband. Spectrum was already a priority of the previous administration, the main if not single telecom policy goal. Auctions were held to release large chunks of spectrum for new services<sup>61</sup>. The re-allocation of spectrum was accompanied by other measures. In November 2008, the

<sup>57</sup> Legal tapping of telecommunications under CALEA.

<sup>58</sup> "Notice of Proposed Rulemaking on Consumer Protection", *id.*

<sup>59</sup> However this section of the programme was not particularly developed as telecom did not rank that high on its policy agenda. The same was true of the programme of the republican candidate, John McCain.

<sup>60</sup> Presidential programme, source: AT&T. J. McCain was backing PPP much the same way and proposed helping municipalities to invest. He introduced a "Community Broadband Bill" in the Senate to that end.

<sup>61</sup> In 2006, the Advanced Wireless Services (AWS) spectrum (90 megahertz in the 1710-1755 MHz and 2110-2155 MHz bands - AWS 1) was auctioned, raising \$13.7 billion (\$0.53 per MHz-POP). Then a second time in 2008, auctions were held to re-allocate the digital dividend (62 megahertz in the 700 MHz band). The AWS was held as a success but not the second one, as some of the spectrum was left without buyers. Nevertheless it raised almost \$18.9 billion for the Treasury according to the FCC.

FCC authorised unlicensed access, i.e. "*license exempt*" access to the so-called white spaces of the broadcasting bands allowing access to channel 21 to 51 in the broadcasting spectrum<sup>62</sup>.

Spectrum remained high on the agenda of the new administration and became part of the national broadband plan. Beyond the criticisms, it looks as if the US administration managed to find the means to allocate as much spectrum as possible for new mobile applications. No wonder it appears as a major goal of the National Broadband Plan as the FCC plans freeing up of up to 500 MHz of spectrum for mobile services within the next ten years.

### **Out of the ditch: the 2010 National Broadband Plan (NBP)**

The FCC as well as other agencies (NTIA, US Department of Commerce, US Department of Agriculture)<sup>63</sup> is involved in the implementation of the *American Recovery and Reinvestment Acts' Broadband Initiative*<sup>64</sup> of February 2009 (the so-called Stimulus Package). In conjunction with the Broadband Technology Opportunities Program established by the Act, Congress mandated the FCC in February 17, 2009 to draft a report with a deadline on February 17, 2010.

"The Recovery Act states that the National Broadband Plan shall seek to ensure all people of the United States have access to broadband capability and shall establish benchmarks for meeting that goal"<sup>65</sup>.

To that end the FCC mobilized significant resources, building a high level team. The ad hoc task force (Omnibus Broadband Initiative) under the

---

<sup>62</sup> *In the Matter of Unlicensed Operation in the TV Broadcast Bands Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Second Report and Order and Memorandum Opinion and Order, Adopted: November 4, 2008, released: November 14, 2008.

<sup>63</sup> The FCC must coordinate with the NTIA managing the Broadband Technology Opportunities Program (BTOP) to allocate subsidies (\$ 250 million) and the Department of agriculture (Rural Utility Services) also allocating grants, loans and guarantees (\$2.5 billion). NTIA is in charge of the detailed mapping of the availability of service and capacities (Broadband Mapping).

<sup>64</sup> American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Stat. 115, 516 (2009) (Recovery Act).

<sup>65</sup> <http://www.fcc.gov/recovery/>

direction of its Executive Director, Blair Levin<sup>66</sup> initiated an impressive number of meetings and workshops<sup>67</sup>.

In 2009, in the wake on the momentum created, this initiative was met positively. There was a strong consensus about the quality of the team, and of course for the need to gather reliable data. However reactions diverged from a full support (most of the industry) to a more sceptical reaction especially among economists questioning the need for any centralised plan. The industry held such a promotion of broadband as a win-win approach. Companies like Verizon brought their support. Verizon published its own recommendations in a brochure "Access for All"<sup>68</sup>, as an answer to the April 2009 Notice of Inquiry<sup>69</sup>, "A National Broadband Plan for Our Future", the official launch by the FCC to seek input for the plan. Commissioner M.Copps, acting as interim chairman of the FCC, underlined:

"We begin at last to do what we should have done years ago - make a plan for how the United States becomes the world's broadband beacon"<sup>70</sup>.

The initiative was recognized as very ambitious but the potential outputs, beyond a welcome collection of data, were not as clearly perceived. The Task Force kept rolling and released a first interim report (Status Report) in September 2009. The report highlighted already some key points such as deployment, availability, adoption, spectrum, to be later integrated in the full final report.

When the plan was released it received mixed to good reviews from the general press and more positive reviews from trade press. Broadcasters are described as "big losers" as they are being pressured to share their channel, a result of the priority placed on the availability of spectrum, a pressure softly worded as "expanding incentives and mechanisms to reallocate or repurpose spectrum".

---

<sup>66</sup> A former member of the Reed Hundt's FCC, under the Clinton administration.

<sup>67</sup> See, Press release, FCC Sends National Broadband Plan to Congress. Plan Details Actions for Connecting Consumers, Economy with 21<sup>st</sup> Century Networks. *Connecting America: The National Broadband Plan*, released March 16, 2010.

<sup>68</sup> "Access for All. It's time to Ensure America's Broadband Future", Verizon, June 2009, 23 p. [http://responsability.verizon.com/email/pdf/vz\\_broadband\\_plan\\_overview\\_summary.pdf](http://responsability.verizon.com/email/pdf/vz_broadband_plan_overview_summary.pdf)

<sup>69</sup> "Notice of Inquiry", FCC 08-31, April 8, 2009.

<sup>70</sup> Statement of acting chairman Michael J.Copps, Re: *A National Broadband Plan for Our Future*, GN Docket No. 09-51

Nevertheless, the document is perceived as a "worth reading" document even if it is seen as over-comprehensive (360 p.). Apparently it managed to avoid some of the main pitfalls that would normally accompany such an exercise: as a descriptive plan is not necessarily an action plan. It does suggest some legislative modifications<sup>71</sup>. "Congress should act"<sup>72</sup> to reform USF.

Without getting into details of this voluminous piece of work, we can quote the policy goal of the plan:

"Government can influence the broadband ecosystem in four ways:

- Design policies to ensure robust competition and, as a result maximize consumer welfare, innovation and investment.
- Ensure efficient allocation and management of assets government controls or influences, such as spectrum, poles, and rights-of-way, to encourage network upgrades and competitive entry.
- Reform current universal service mechanisms to support deployment of broadband and voice in high-cost areas; and ensure that low-income Americans can afford broadband; and in addition, support efforts to boost adoption and utilization.
- Reform laws, policies, standards and incentives to maximize the benefits of broadband in sectors government influences significantly, such as public education, health care and government operations".<sup>73</sup>

The plan is blending government interventions and market solutions but looks rather market oriented. The focus is on increasing competition in all segments. However, the role of regulation is ambiguous. On some areas it seems to lean more toward regulation (i.e. "net neutrality") but this is linked to former decisions/ policies as well as to the persistent conflict between economic and social goals identified earlier. This tension between the two goals was likely to surface in such a meaningful policy plan.

As we explained, the FCC has been grappling with the reform of universal service for some time but never managed to do it as a consequence of a rather piece-meal approach. The time appears ripe enough for the NBP to propose a bolder move:

"The FCC should take action to shift up to \$15.5 billion over the next decade from the current High-Cost program to broadband through common-sense reforms"<sup>74</sup>.

---

<sup>71</sup> *I.e.* for the US and ICC reform see "Roadmap for USF/ICF Reform" at 144.

<sup>72</sup> *Id* at 151.

<sup>73</sup> Executive Summary, *Connecting America: The National Broadband Plan*.

A "connect America fund" will be created to that end. This followed (chrono)logically the November 2009 Public Notice<sup>75</sup> on the same topic. The notice was asking questions about the size of the fund, how to finance, how to monitor (*High-Cost Funding Oversight*), the level of fund to allocate to the low income (Lifeline/Link Up) how to transition from narrowband to broadband, the impact on the revenue of the involved carriers, and on competition. A very ambitious goal is now set in the NBP: "A universalization target of 4 Mbps download and 1 Mbps upload is aggressive. It is one of the highest universalization targets of any country in the world."<sup>76</sup>

As expected, one finds a strong focus and commitment for spectrum and mobile broadband.

"Disruptive technology transformations happen once every 10 to 15 years. Mobile broadband represents the convergence of the last two great disruptive technologies - Internet computing and mobile communications - and may be more transformative than either of these previous breakthroughs."<sup>77</sup>

To complement, there is a strong emphasis on unlicensed spectrum, building on the success role of Wi-Fi called "innovative spectrum access models" (white spaces, opportunistic uses, cognitive radio, ...).

Finally, the existing policies were more concerned by the supply side. The demand side did not receive that much attention, however the NBP and related work are much more sensitive toward the issue. Commissioner Mignon Clyburn summed this up nicely in one of her speeches "Not availability, not affordability, but relevance to their lives"<sup>78</sup>. The issue is now further documented in the FCC papers (HORRIGAN, 2010)<sup>79</sup>. In August, 2010, Pew Research Center's Internet & American Life Project released its annual study of broadband adoption. "After several years of double digit

---

<sup>74</sup> *Id* at 136.

<sup>75</sup> *Comment sought on the role of the universal service fund and intercarrier compensation in the national broadband plan*, GN Dockets Nos.09-47, 09-51, 09-137, November 13, 2009.

<sup>76</sup> NBP at 135.

<sup>77</sup> *Id* at 75.

<sup>78</sup> "Broadband Adoption : Travelling the Consumer's Last Mile", speech delivered at the Joint Centre for Political and Economic Studies, Washington, September 21, 2009, at 6.

<sup>79</sup> John Horrigan comes from the well-known research institute Pew Internet and American Life Project that has been providing such surveys for quite some time. See chapter 9 of the NBP. The issue of inclusion is covered in the second part of the report.

growth, broadband adoption slowed dramatically in 2010<sup>80</sup>. Surprisingly, it found that about 45% of people who don't use the Internet now did not think that the government should help them get online. Besides, only 5% of non-users said it should be a top government priority<sup>81</sup>. The report stresses:

"Americans have decidedly mixed views about the problems non-broadband users suffer due to their lack of a high-speed connection."<sup>82</sup>.

## Conclusion

So far our historical account may look like either an unhappy story due to the misunderstanding of the consumers or a happy one as the initial confusion and debate about ranking cleared progressively and yielded a rather substantial piece of public policy.

The lack of apparent support for any government intervention from the public, and the slow down of broadband adoption are bringing other concerns. However this does not disqualify the policies. The "broadband ditch debate" allowed not only various viewpoints to be heard but stimulated the production of several research papers which help documenting the diverse aspects of the issue, bringing more evidence for policy-making. It created a momentum favorable to decision-making as the unanimous adoption of the Mapping bill showed. Within a few years a technical debate about rankings led to ambitious policy objectives.

This does not mean that the diverging views of the state of the broadband market vanished. They are still around but became enlisted in a broader debate where some are still questioning the need for any centralized plan. The tensions identified from the start between the social and the economic goals are not likely to disappear. The balance between the two clearly falls now on the social side of the equation. This in turn leaves pending questions about for instance the amount of public funding requested

---

<sup>80</sup> "Summary of Findings", *Home Broadband 2010*.  
<http://www.pewinternet.org/Reports/2010/Home-Broadband-2010.aspx?r=1>

<sup>81</sup> About 53% of the 2252 adults surveyed by Pew said making broadband more affordable should not be "a major government priority." Of that group, 26% said that the government should not get involved in the issue at all.

<sup>82</sup> "Summary of Findings", *id.*

(if any), the way to allocate these funds and to monitor and assess the implementation.

In a digital world some former policy goals, such as universal service, may remain legitimate but the means to achieve them may have radically changed.

### References

ATKINSON Robert D. (2007): "The Case for a National Broadband Policy", 16 p; ITIF, June.

Connect Kentucky Report 2005

CORREA Daniel K. (2007): "Assessing Broadband in America: OECD and ITIF Broadband Rankings", ITIF, 10 p., April.

CRANDALL Robert W. & Charles L. JACKSON (2001): "The \$500 Billion Opportunity: The Potential Economic Benefit of Widespread Diffusion of Broadband Internet Access", Criterion Economics, 72 p.

EISENACH Jeffrey A. (2008): "Broadband Policy: Does the U.S Have It Right After All", Progress on Point, The Progress & Freedom Foundation, Release 15, September 14, 21 p.

FCC (2010): *Connecting America: The National Broadband Plan*.

FORD George S., Thomas M. KOUTSKY & Lawrence J. SPIWAK (2007): "The Broadband Performance Index: A Policy-Relevant Method of Comparing Broadband Adoption Among Countries", Phoenix Center Policy Paper no. 29, 33 p., July.

GAO - U.S. Government Accountability Office (2006): "Telecommunications: Broadband Deployment Is Extensive throughout the United States, but It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas", Washington, DC: U.S. Government Accountability Office.

HAZLETT Thomas (2006): "Universal Service Telephone Subsidies: What Does \$7 Billion Buy?" June.

HORRIGAN John B.

- (2006): "Home Broadband Adoption 2006", Pew Internet & American Life Project.

- (2010): "Broadband Adoption and Use in America", OBI Working Paper Series no 1.

HUBER Peter W., Michael K. KELLOGG, John THORNE & Evan T. LEO (2005): *Federal Telecommunications Law*, 2<sup>nd</sup> edition, 2005 Cumulative Supplement: Broadband Unbound, Aspen Publishers, New York.

KOLHENBERGER Jim (2007): "Universal Affordable Broadband for All Americans", Benton Foundation, 22 p., September.

MARSDEN, Christopher T. (2010): *Net Neutrality. Towards a Co-regulatory Solution*, Bloomsbury Academic.

<http://www.bloomsburyacademic.com/pdf%20files/NetNeutrality.pdf>

OECD (2006): *Broadband Statistics to December 2006*, OECD broadband statistics portal. [www.oecd.org/sti/ict/broadband](http://www.oecd.org/sti/ict/broadband).

Pew Internet & American Life Project (2010): *Home Broadband Adoption 2010*. <http://www.pewinternet.org/Reports/2010/Home-Broadband-2010.aspx?r=1>