

**KELLEY DRYE & WARREN LLP**

A LIMITED LIABILITY PARTNERSHIP

**WASHINGTON HARBOUR, SUITE 400**

**3050 K STREET, NW**

**WASHINGTON, D.C. 20007-5108**

(202) 342-8400

FACSIMILE

(202) 342-8451

www.kelleydrye.com

NEW YORK, NY  
TYSONS CORNER, VA  
CHICAGO, IL  
STAMFORD, CT  
PARSIPPANY, NJ

BRUSSELS, BELGIUM

AFFILIATE OFFICES  
JAKARTA, INDONESIA  
MUMBAI, INDIA

DIRECT LINE: (202) 342-8518

EMAIL: tcohen@kelleydrye.com

December 14, 2009

**VIA ECFS**

Marlene H. Dortch  
Secretary  
Federal Communications Commission  
The Portals  
445 - 12th Street, SW  
Washington, DC 20554

Re: Notice of *Ex Parte* Presentation, *International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act*, GN Docket No. 09-47; *A National Broadband Plan for our Future*, GN Docket 09-51; *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, A National Broadband Plan for Our Future*, GN Docket No. 09-137

Dear Ms. Dortch:

In an *ex parte* presentation in the National Broadband Plan (“NBP”) inquiry filed on November 4, 2009,<sup>1</sup> the Fiber-to-the-Home (“FTTH”) Council set forth a vision to accelerate access to broadband service to all Americans and a series of proposals for the Commission to adopt. In response, Commission staff working on the NBP asked the Council to elaborate on select aspects of this filing. The following responds to that inquiry.

<sup>1</sup> Letter from Thomas Cohen, Counsel, FTTH Council, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket 09-51 (Nov. 4, 2009), available at: <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020244670> (“*FTTH Council November 4th Ex Parte*”).

Marlene H. Dortch  
December 14, 2009  
Page Two

**I. Introduction: A Dual-Track Approach to Accelerate Access to Broadband**

In the NBP, the Commission will provide the country with goals to accelerate broadband deployment and adoption. The Berkman Center draft report, *Next Generation Connectivity*,<sup>2</sup> commissioned by and submitted to the Commission in October 2009, provides a foundation and framework for these goals. The *Berkman Center Report* examined broadband plans in other countries and determined that most adopt a “dual-track approach,” simultaneously seeking to ensure universal access to current generation broadband and to “catalyze high levels of availability and adoption of next- generation capacities.”<sup>3</sup> For instance, the *Report* notes that Finland has established an immediate goal of ubiquitous access to 1 Mbps broadband service by 2010 and a longer term goal of having 100 Mbps connection within 2 kilometers of 99% of premises by 2015 and that Germany has a similar set of objectives: 1 Mbps throughout the country by 2010, and 50 Mbps to 75% of households by 2014.<sup>4</sup>

In its *November 4<sup>th</sup> Ex Parte*, the FTTH Council followed the Berkman Center’s dual-track approach, proposing objectives for wireline broadband service to drive in tandem immediate ubiquitous access to current generation broadband service and greatly increased availability to next-generation broadband service.<sup>5</sup> In response to discussions with staff working on the NBP, the Council has refined its twin objectives as follows:

**Current Generation Ubiquity Goal – Close the Unserved and Adoption Gaps.**

As rapidly as possible, greatly reduce the number of unserved households and substantially increase the adoption rate.

---

<sup>2</sup> *Next Generation Connectivity: A Review of Broadband Internet Transitions and Policy from Around the World*, The Berkman Center for Internet & Society at Harvard University, October, 2009 Draft, available at: [http://www.fcc.gov/stage/pdf/Berkman\\_Center\\_Broadband\\_Study\\_13Oct09.pdf](http://www.fcc.gov/stage/pdf/Berkman_Center_Broadband_Study_13Oct09.pdf). (“*Berkman Center Report*”)

<sup>3</sup> *Id.*, at 17.

<sup>4</sup> *Id.*

<sup>5</sup> The Council also set forth a long term vision for broadband deployment: **Long Term Goal – Rank First Internationally by 2020:** By 2020, the United States should rank first internationally in providing to households and businesses throughout the nation access to competitive, high-performance (including high-speed) broadband service (based upon actual throughput measured at peak periods of demand in both directions -- upstream and downstream -- and with high-quality of service, including minimal latency and jitter).

Marlene H. Dortch  
December 14, 2009  
Page Three

**Next-Generation Access (“NGA”) Goal – Widespread, Competitive Deployment of 50/20 by 2015:** By 2015, in the United States, there should be widespread, competitive access to wireline broadband service that delivers throughput of not less than 50 Mbps downstream and 20 Mbps upstream,<sup>6</sup> as measured by delivered speed offered to all users at peak period of demand, with high-quality of service, including minimal latency and jitter.<sup>7</sup>

In the sections that follow, the Council elaborates on these goals and discusses several policies to implement them.

## **II. Current Generation Ubiquity Goal – Close the Unserved and Adoption Gaps**

In its *Broadband Gaps* presentation to the Commission, the NBP staff provided their estimates of the “Broadband infrastructure availability gap” – approximately 4-10 million housing units with either no or low-tier broadband – and the gap in adoption levels for broadband.<sup>8</sup> The staff also found that current universal service funding is “unlikely to fill gaps due to structural problems.”<sup>9</sup> The Council agrees with this analysis and shares these concerns about filling the gaps. For that reason, the Council, in its *November 4<sup>th</sup> Ex Parte*, proposed the following policies to address these gaps:

- Expand the Rural Utilities Service Broadband Loan/Loan Guarantee Program by providing for new grant funding in addition to low-interest loans and loan guarantees.

---

<sup>6</sup> To provide greater transparency for consumers and other users, the Council’s objective is defined in terms of actual, not marketed, speed. Should the Commission wish to use marketed speeds, according to the calculations of the NBP staff and others (including the *Berkman Center Report* in section 3.5), the capabilities would be 100 Mbps downstream and 40 Mbps upstream.

<sup>7</sup> The Council’s prior Next-Generation objective was: **25/25 TO 100 MILLION BY 2015**. By 2015, in the United States, 100 million households should have competitive access to wireline broadband service that delivers throughput of not less than 25 Mbps upstream and 25 Mbps downstream, as measured by actual speed at peak periods of demand, with high-quality of service, including minimal latency and jitter.

<sup>8</sup> *Broadband Gaps*, Presentation of the National Broadband Plan Staff at the FCC Open Meeting (Nov. 18, 2009) at 8, 19, available at: [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-294708A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-294708A1.pdf)

<sup>9</sup> *Id.*, at 10.

Marlene H. Dortch  
December 14, 2009  
Page Four

- Establish a new broadband universal service fund to complement the existing efforts of the Administration to provide capital and operating funds for broadband service in these areas while the Commission reorients the existing universal service mechanisms to better support broadband.
- Reorient the Lifeline/Link-up Program to provide funding for low-income households subscribing to broadband service.
- Recommend to Congress that additional funding be provided for broadband-related education and training, particularly for school age and elderly households, including through direct grants to anchor institutions, libraries, and community organizations and matching funds for state programs.

The Council adds that the tax incentive proposal discussed below in Section IV. B. also includes incentives for deployment of current generation broadband in unserved and underserved areas. Senator Rockefeller and Representative Eshoo have introduced legislation containing this proposal in current and past Congresses,<sup>10</sup> and it has passed the Senate on several occasions, most recently as part of the American Recovery and Reinvestment Act (“ARRA”).<sup>11</sup>

### **III. Next-Generation Access Goal – Widespread, Competitive Deployment of 50/20 Mbps Wireline Broadband Service by 2015**

#### **A. Introduction**

As discussed at the outset of this filing, the United States (“U.S.”) should join other countries in ensuring there is widespread, competitive availability of next-generation broadband infrastructure. The underlying rationale for such a goal is clear. We are in the midst of a virtuous cycle where consumers are demanding and content providers are supplying a burgeoning amount of video streaming and interactive video communications over the Internet, all of which places enormous stress on broadband network infrastructure. In highlighting a fundamental element of this cycle, Cisco’s most recent *Zettabyte Report* for instance, stated:

#### **Global Video Highlights**

**Internet video is now approximately one-third of all consumer Internet traffic**, not including the amount of video exchanged through P2P file sharing. In

---

<sup>10</sup> See, e.g., H.R. 760, 111<sup>th</sup> Congress.

<sup>11</sup> Public Law 111-5.

Marlene H. Dortch  
December 14, 2009  
Page Five

2010, Internet video will surpass P2P in volume. This will be the first time since 2000 that any application has displaced P2P as the top traffic driver.

**The sum of all forms of video (TV, video on demand, Internet, and P2P) will account for over 91 percent of global consumer traffic by 2013.** Internet video alone will account for over 60 percent of all consumer Internet traffic in 2013.

**In 2013, Internet video will be nearly 700 times the U.S. Internet backbone in 2000.** It would take well over half a million years to watch all the online video that will cross the network each month in 2013. Internet video will generate over 18 exabytes per month in 2013.

**Video communications traffic growth is accelerating.** Though still a small fraction of overall Internet traffic, video over instant messaging and video calling are experiencing high growth. Video communications traffic will increase ten-fold from 2008 to 2013.

**Real-time video is growing in importance.** Internet TV, video communications, and ambient video are all high-growth application categories. By 2013, Internet TV will be over 4 percent of consumer Internet traffic, and ambient video will be 8 percent of consumer Internet traffic. Live TV has gained substantial ground in the past few years: globally, P2P TV is now slightly over 7 percent of overall P2P traffic at over 200 petabytes per month.

**Video-on-demand (VoD) traffic will double every two years through 2013.** The twin trends of on-demand viewing and high-definition video are generating very rapid growth in cable video and IPTV traffic transported over IP in the metro. Consumer IPTV and CATV traffic will grow at a 53 percent CAGR between 2008 and 2013, compared to a CAGR of 40 percent for consumer Internet traffic.<sup>12</sup>

The challenge facing policymakers is to ensure there is not a next-generation broadband gap that will inhibit this growth. That is the genesis of the objectives of Finland, Germany, and other countries detailed in the *Berkman Center Report*, and the U.S. is much in need of a similar objective.

---

<sup>12</sup> *Hyperconnectivity and the Approaching Zettabyte Era*, Cisco (June 9, 2009), available at: [http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI\\_Hyperconnectivity\\_WP.html](http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.html) (“Zettabyte Report”).

Marlene H. Dortch  
December 14, 2009  
Page Six

In implementing this goal, the Commission needs to establish the parameters of next-generation broadband – in terms of performance, availability, and timeframe for deployment. These parameters should be technology-neutral and based on a realistic assessment of network capability and deployment. Based on those criteria, the FTTH Council proposes the goal of 50 Mbps downstream and 20 Mbps upstream by 2015 set forth above. This level of performance reflects several critical criteria:

- Expected consumer demand in 2015;
- The maximum residential broadband capability (based on actual performance) offered on the market today by different providers; and,
- Expected network deployments of present-day maximum capability over the next five years.

Each of these criteria is discussed below.

**B. Expected Demand for Wireline Broadband in 2015: Interactive Video Communication Drives Dramatically Greater Symmetric Bandwidth Requirements**

The NBP Staff in their September presentation to the Commission at its Open Meeting provided a current baseline for consumer demand for broadband capacity, noting, for instance, that enhanced video conferencing for telelearning and HD telemedicine would require 5-10+ Mbps of symmetrical bandwidth and HD streamed video would require 10+ Mbps downstream.<sup>13</sup> The *Zettabyte Report*, as noted above, builds from this baseline and provides the basis underlying exponential growth in user demand over a relatively brief time. The FTTH Council, using the data in these two and many other studies and documents, provided to the Commission in its *November 2<sup>nd</sup> Ex Parte* filing an analysis by CSMG of likely future applications and consumer demand for broadband bandwidth.<sup>14</sup> The following are the key findings in the CSMG report – with significant additional data – supporting the conclusion that consumer demand for bandwidth will exceed 25 Mbps in each direction in just five years:

- **Consumers are at the Forefront of Next-Generation Access Applications**

---

<sup>13</sup> Presentation of the National Broadband Plan Staff at the FCC Open Meeting (Sept. 29 2009) at 23, available at: [http://www.fcc.gov/openmeetings/2009\\_09\\_29-ocm.html](http://www.fcc.gov/openmeetings/2009_09_29-ocm.html).

<sup>14</sup> Letter from Thomas Cohen, Counsel, FTTH Council, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 09-51 (Nov. 2, 2009), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020244293> (“*November 2<sup>nd</sup> Ex Parte*”).

Marlene H. Dortch  
December 14, 2009  
Page Seven

Historically, enterprises adopted broadband before consumers and thus were first users of many of the early applications, such as email and web browsing. However, the typical home broadband connection is now faster than the shared Internet access throughput available to a businesses user. A key factor underlying this trend is that many of the applications described below are fundamentally consumer applications that would not be expected in a business setting. Examples of consumer-driven applications are streaming 3D/HD video on demand, place-shifted 3D/HD video, HD video uploading. Others, such as 3D/HD video conferencing, are natural extensions of applications that are currently gaining significant traction in the business environment. There is evidence that this type of application is already being adopted by consumers. Recent acquisition activity by Cisco,<sup>15</sup> Logitech,<sup>16</sup> and others are signs that major players are gearing up to compete more aggressively in the desktop and consumer video conferencing spaces. Cisco commented, "Within 12-18 months we will have presence in the consumer segment, where every high-definition television could become a TP [telepresence unit]."<sup>17</sup>

- **Applications Enabled by NGA Broadband**

There are a number of applications, detailed in the figure below, that are enabled by NGA broadband.<sup>18</sup> While forward looking, many of these are already in the latter stages of development, or are even being offered today. Given sufficient consumer connectivity, these are medium term rather than long term prospects.

---

<sup>15</sup> Cisco press release, Cisco Increases Offer Price and Extends Acceptance Period for Recommended Offer to Acquire TANDBERG, available at <http://investor.cisco.com/releasedetail.cfm?ReleaseID=424298>.

<sup>16</sup> Logitech press release, Logitech to Acquire LifeSize Communications, available at <http://ir.logitech.com/releasedetail.cfm?ReleaseID=423468>.

<sup>17</sup> Livemint corporate news, Hewlett-Packard, Cisco eyeing consumer-level telepresence, available at: <http://www.livemint.com/2009/08/25222238/HewlettPackard-Cisco-eyeing.html>. In addition, Sony is expected to launch its 3D TV next year and is projecting it will generate \$11 billion from 3D products by 2013 ([www.rttnews.com/Content/BreakiNGANews.aspx?ID=1141351&Category=Breaking%20News&SimRec=1&Node=B1](http://www.rttnews.com/Content/BreakiNGANews.aspx?ID=1141351&Category=Breaking%20News&SimRec=1&Node=B1)).

<sup>18</sup> The focus in this section is on applications developing soon and in the medium term. It is important to note, as projected in the *Zettabyte Report*, that existing and follow-on 2D video applications are causing bandwidth demands to increase dramatically, placing great stress on existing broadband infrastructure.

Marlene H. Dortch  
 December 14, 2009  
 Page Eight

	Description	Example	Requirements
<b>Advanced HD Video</b>	<ul style="list-style-type: none"> <li>Next-gen super high-resolution video:                             <ul style="list-style-type: none"> <li>Quad HD: 3840 x 2160 (2160p)<sup>1</sup></li> <li>Ultra HD: 7680 x 4320 (4320p)<sup>1</sup></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Technical approaches are being defined<sup>2</sup></li> <li>Quad HD hardware in development<sup>3</sup>; currently available in Japan</li> <li>Ultra HD undergoing testing in Japan<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>Real-time and streaming:                             <ul style="list-style-type: none"> <li>Quad HD: <b>64 Mbps</b><sup>1</sup></li> <li>Ultra HD: <b>256 Mbps</b><sup>1</sup></li> </ul> </li> <li>Moderate to high QoS requirements</li> </ul>
<b>3D/HD Video</b>	<ul style="list-style-type: none"> <li>HD stereoscopic video content</li> <li>Requires 3D-enabled content and hardware (TV set, glasses, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Leading CE vendors plan to unveil 3D-capable TV sets beginning in 2010<sup>1</sup></li> <li>Recent 3D movie titles include <i>Toy Story 3</i>, <i>Monsters vs. Aliens</i>, <i>Up</i>, and others</li> </ul>	<ul style="list-style-type: none"> <li>Real-time and streaming 3D video requires <b>32 Mbps</b> per stream<sup>1</sup></li> <li>Moderate to high QoS requirements</li> </ul>
<b>Advanced HD/3D Video</b>	<ul style="list-style-type: none"> <li>Combination of advanced HD (Quad or Ultra) and 3D video formats</li> </ul>	<ul style="list-style-type: none"> <li>Philips and other manufacturers have trialed 3D Quad HD TV sets<sup>4</sup></li> <li>London 2012 Olympics could potentially be shot in 3D and Quad HD<sup>5</sup></li> </ul>	<ul style="list-style-type: none"> <li>Requires 2-4X bandwidth of single Quad/Ultra HD stream<sup>1</sup></li> <li>Potential for <b>256+ Mbps</b> requirement</li> <li>Moderate to high QoS requirements</li> </ul>
<b>Massive Downloads &amp; Uploads</b>	<ul style="list-style-type: none"> <li>Non real-time downloads and uploads of very large files (10+ GB) including images, videos, etc.</li> </ul>	<ul style="list-style-type: none"> <li>GigaPan &amp; Photosynth stitch 100s of photos together (multi-gigapixel images)<sup>1</sup></li> <li>Other types of rich imagery are emerging (satellite, panorama, etc.)<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>12 min HD video can be uploaded in ~10 min with <b>10 Mbps</b></li> <li>Reduced to &lt;10 sec with <b>1 Gbps</b></li> <li>Low QoS required (non real-time)</li> </ul>
<b>Cloud Computing</b>	<ul style="list-style-type: none"> <li>Computing processing power shifted to the network</li> <li>Desktop machine used as thin client</li> </ul>	<ul style="list-style-type: none"> <li>Cloud-based consumer apps emerging (e.g. Google Docs, MS Office 2010)</li> <li>Potential to drive move to thin client computing</li> </ul>	<ul style="list-style-type: none"> <li>Very high QoS required to minimize latency to sustain program performance</li> <li>Current generation bandwidth is sufficient</li> </ul>

**Figure: Applications Enabled by NGA Broadband<sup>19</sup>**

The Yankee Group’s presentation to the FCC workshop on fiber architectures cites several applications for which FTTH would be required by 2015.<sup>20</sup> These include multi-way HD video communications, high-end two-way HD video communications, high-end E-Healthcare, and a high-end “Homeworking Suite”. Based on the bandwidth requirements of these applications and the public benefits achievable from their deployment, CSMG has defined a standard for NGA broadband of 25 Mbps of actual symmetric throughput at peak times with high-quality of service. This analysis is supported by third-party assessments of future consumer bandwidth requirements, and increasing activity in 3D and HD consumer video. These topics are explored further below.

- Third Party Bandwidth Requirement Forecasts: The Rise of 3D/HD Video**

<sup>19</sup> This figure sources information from the ITIF, SMPTE, Engadget, Wired and HDTV Org.

<sup>20</sup> Yankee Group, Future Fiber Architectures and Local Deployment Choices: Architecture Choices and Service Offerings (Nov. 2009), available at [http://www.broadband.gov/docs/ws\\_future\\_fiber/felten.ppt](http://www.broadband.gov/docs/ws_future_fiber/felten.ppt).

Marlene H. Dortch  
December 14, 2009  
Page Nine

Industry vendors and analysts study future bandwidth requirements to assist with product development and business planning. These forecasts support the assessment that very high bandwidth will be required by consumers within the medium term of 2015:

- ✘ Based on an analysis of historical and current growth in bandwidth usage, Heavy Reading concludes that households will need upwards of 100Mbps downstream (actual delivered throughput) by 2015.<sup>21</sup> The study notes that speed requirements are likely to be elevated in the U.S. compared to Europe, due to greater interest in HDTV and a higher average number of TV sets per household.
- ✘ In addition to high bandwidth requirements, HD video provides challenges for high-quality end-user connections. As Cisco points out, carrier-grade IPTV will need an MTBA (Mean Time Between Artifacts) of greater than 2 hours to give no more than one perceivable error during a 2 hour movie.<sup>22</sup>
- ✘ Bain & Co's analysis of the future bandwidth requirements of a typical household implies that multiple HDTV streams (either through multiple TVs, or multi-channel DVR recording) will require 30+ Mbps of download bandwidth (actual throughput), and that requirements of up to 100Mbps will evolve gradually over time.<sup>23</sup>
- ✘ Motorola estimates that peak data rates for high-use customers in the U.S. already regularly reach around 30Mbps. Within seven years, service providers need to plan for this figure to top 100Mbps of actual throughput.<sup>24</sup> The report concludes that "over the top"

---

<sup>21</sup> Heavy Reading, Next Generation Broadband in Europe: The Need for Speed, available at [http://www.heavyreading.com/details.asp?sku\\_id=752&skuitem\\_itemid=734&promo\\_code=&aff\\_code=&next\\_url=%2Fdefault.asp%3F](http://www.heavyreading.com/details.asp?sku_id=752&skuitem_itemid=734&promo_code=&aff_code=&next_url=%2Fdefault.asp%3F).

<sup>22</sup> Cisco, 21<sup>st</sup> Century Broadband, 2008, available at [http://www.broadbanduk.org/component/option,com\\_docman/task,doc\\_download/gid,1018/Itemid,63/](http://www.broadbanduk.org/component/option,com_docman/task,doc_download/gid,1018/Itemid,63/).

<sup>23</sup> Bain & Co, Next Generation Competition (Oct. 2009), available at <http://www.bain.com/bainweb/publications/pdf.asp?id=27331>.

<sup>24</sup> Motorola, Bandwidth Expansion Guide (2008), available at [http://www.motorola.com/staticfiles/Business/ Documents/Event%20Portal/Static%20Files/Bandwidth\\_Expansion\\_Guide.pdf](http://www.motorola.com/staticfiles/Business/ Documents/Event%20Portal/Static%20Files/Bandwidth_Expansion_Guide.pdf).

Marlene H. Dortch  
December 14, 2009  
Page Ten

video content, multi-player online gaming, multi-device households, social networking and videoconferencing will put pressure on both downstream and upstream bandwidths.

Recent progress in 3D video, HD video, and consumer video calling suggest convergence of these technologies in the near to medium term. This section analyzes current trends and available forecasts of the components of a 3D/HD consumer video calling service.

- ✧ Panasonic has announced a suite of 3DHD Home Theatre products, aiming for release in 2010/11.<sup>25</sup> It includes a dual-lens 3D camera, 3D MPEG-4 codec, 3D Blu-ray player and TV. This offering is focused initially on watching movies and sports rather than video calls, but would provide a suitable viewing platform for video-calling and provides evidence of resurgence in 3D. Sony has also announced plans to bring 3D into consumer homes in 2010, in the form of TVs, Blu-ray players, VAIO notebooks and the Playstation 3 games console.<sup>26</sup> Ongoing research into 3D displays includes laser<sup>27</sup> and glasses-free<sup>28</sup> technologies.
- ✧ The Korean regulator recently announced a trial 3D/HD television terrestrial broadcast service, anticipating trial launch in the first half of 2010. Cable operator CJ HelloVision and mobile television operator TU Media are also both planning to begin trial 3D broadcast and video on demand services by the end of 2010.<sup>29</sup> This is an example of application innovation following large-scale deployment of next-generation broadband.

---

<sup>25</sup> Panasonic, Full HD 3D Technology Story, available at <http://www.panasonic.com/3d/explore-the-technology.aspx>.

<sup>26</sup> Sony, Sony Brings 3D Home in 2010, available at <http://www.sony.net/SonyInfo/News/Press/200909/09-099E/>.

<sup>27</sup> HDI Ltd, HDI Ltd. Reveals 3D Projection Display Technology with Greater Than High-Definition Resolution, available at [http://www.hdi3d.com/pdf/HDI%203D%20PR%20w\\_pic.pdf](http://www.hdi3d.com/pdf/HDI%203D%20PR%20w_pic.pdf).

<sup>28</sup> Philips, 42-inch 3D display, available at <http://www.businesssites.philips.com/sites/philipsbs/3dsolutions/3ddisplayproducts/42inch3ddisplay/index.page>.

<sup>29</sup> Korea Times, Trial 3D TV Service to Begin This Year, available at [http://www.koreatimes.co.kr/www/news/biz/2009/11/123\\_56164.html](http://www.koreatimes.co.kr/www/news/biz/2009/11/123_56164.html).

Marlene H. Dortch  
December 14, 2009  
Page Eleven

- ✘ Similar activity is beginning in the West, with test 3D broadcasts run in March and June 2009, and a 3D channel due for launch in the UK by Sky in 2010. While adoption of 3D is being led by digital cinemas, direct-to-home is expected to follow shortly, driven by Hollywood's commitment to 3D and CGI-based 3D gaming. Indeed, Satellite Today sees 3D HD entertainment becoming the next major medium and revenue producer for the broadcasting sector.<sup>30</sup> Gigaom also believes the 3D TV market is set for massive growth over the next three years, forecasting 46 million 3D TV shipments by 2013.<sup>31</sup>
- ✘ Consumer 3D is also gaining traction in home computing and gaming space. Support for 3D video is available today as an option from leading computer hardware vendors and is a featured component of today's leading edge computer games.<sup>32</sup>
- ✘ Consumer HD video calling is also becoming active in the market. Lifesize recently released a consumer HD video calling product, Passport.<sup>33</sup> Being limited by the bandwidth of current generation access technologies, this provides only a 720p, 30fps HD stream. Given sufficient bandwidth and quality of service, this could be expanded to Full HD to make full use of consumer HD TV displays.
- ✘ HD video cameras are also becoming cheaper and increasingly prevalent. Manufacturers, such as Sony<sup>34</sup> and Samsung<sup>35</sup> are

---

<sup>30</sup> Satellite Today, 3D HD: The Next Big Entertainer, Money Maker, available at [http://www.satellitetoday.com/via/cover/3D-HD-The-Next-Big-Entertainer-Money-Maker\\_31804.html](http://www.satellitetoday.com/via/cover/3D-HD-The-Next-Big-Entertainer-Money-Maker_31804.html).

<sup>31</sup> Gigaom, 3DTV Market Analysis: Transition From Cinema to Living Room, available at <http://pro.gigaom.com/2009/10/3dtv-market-analysis/>.

<sup>32</sup> [www.dell.com](http://www.dell.com), [www.nvidia.com](http://www.nvidia.com).

<sup>33</sup> Lifesize press release, LifeSize® Shatters the Boundaries of Video Communications; Brings the Telepresence Experience to Anyone, available at: [http://www.lifesize.com/Home/Company/News\\_and\\_Events/Press\\_Releases/2009/Passport\\_Press\\_Release.aspx](http://www.lifesize.com/Home/Company/News_and_Events/Press_Releases/2009/Passport_Press_Release.aspx).

<sup>34</sup> Sony, Webbie HD Camera, available at: <http://www.sonystyle.com/webapp/wcs/stores/servlet/ProductDisplay?catalogId=10551&storeId=10151&langId=1&productId=8198552921665736688#specifications>.

Marlene H. Dortch  
December 14, 2009  
Page Twelve

building full 1080p HD into compact camcorders, with pricing clearly aimed at the consumer mass market. Flip Mino cameras have been the epitome of the trend towards affordable HD video cameras so the inclusion of WiFi connectivity on personal HD video cameras, such as the Flip MinoHD, is an especially crucial development.<sup>36</sup> Built-in WiFi or other LAN or WAN connectivity will allow consumers' HD video cameras to be used as HD webcams. Cisco's recent acquisition of Pure Digital Technologies,<sup>37</sup> the maker of the Flip Video, opens the possibility of vendor-side convergence of HD video cameras with consumer video calling.

- ⌘ Linking 3D/HD with video calling, a team at the Chinese University of Hong Kong is studying real-time transmission of 3D/HD video.<sup>38</sup> This has application today in professional uses such as architecture review, manufacture design and remote medical diagnosis. Future needs are expected in wider fields including communications/ telepresence, digital entertainment and online gaming.

- **Deployment of Applications versus Networks**

Historically, the deployment of faster broadband has preceded the introduction of bandwidth-intensive applications. In many cases, such applications are not even anticipated until bandwidth to support them becomes widely available. CSMG believes, as indicated on the following chart and discussion elsewhere in its study, it is highly likely that innovative applications development will lead to as-yet undefined applications with significant public benefit.

---

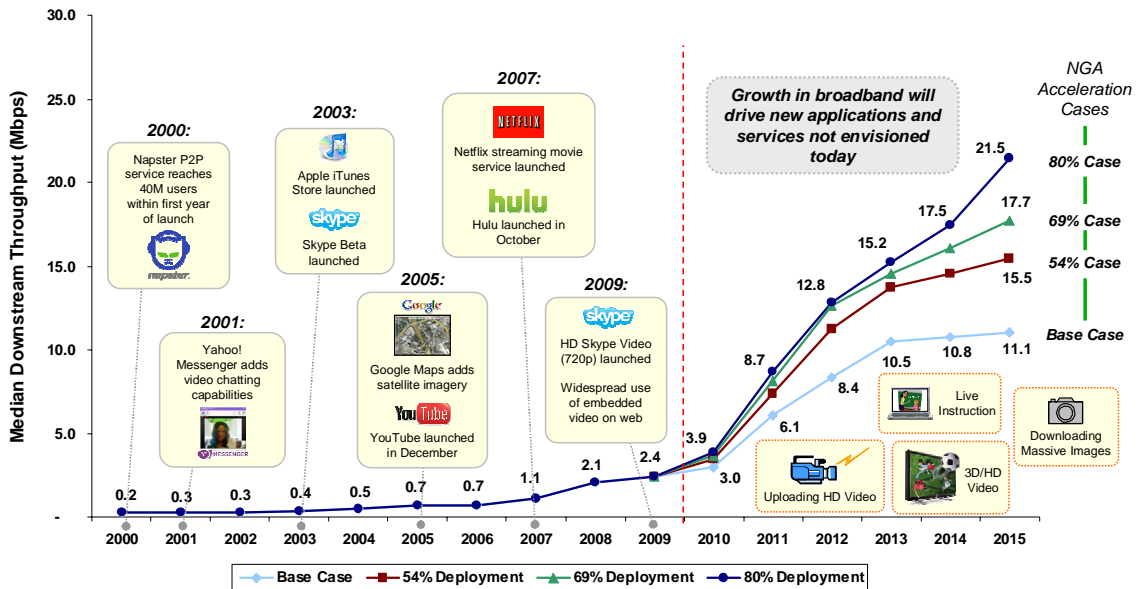
<sup>35</sup> Samsung, HMX-U10, available at [http://www.samsung.com/us/consumer/photography/camcorders/high-definition/HMX-U10RN/XAA/index.idx?pagetype=prd\\_detail](http://www.samsung.com/us/consumer/photography/camcorders/high-definition/HMX-U10RN/XAA/index.idx?pagetype=prd_detail).

<sup>36</sup> Pocket Lint, Next-gen Flip camcorder to boast Wi-Fi, available at <http://www.pocket-lint.com/news/29658/cisco-prepping-wi-fi-enabled-video-camera>.

<sup>37</sup> Cisco press release, Cisco Completes Acquisition of Pure Digital Technologies, Makers of Flip Video™, available at: [http://newsroom.cisco.com/dlls/2009/corp\\_052109.html](http://newsroom.cisco.com/dlls/2009/corp_052109.html).

<sup>38</sup> Real-time Transmission of High Definition (HD) 3D Video and HD Audio in Gigabit-LAN, available at <http://www.ine.cuhk.edu.hk/12/web/shiae/HD3D/>.

Marlene H. Dortch  
 December 14, 2009  
 Page Thirteen



**Figure: Median US Downstream Throughput & Representative Internet Applications, 2000-2015**

User-generated video content is one example of a bandwidth-intensive application that was not foreseen until high-speed consumer connections became available. Prior to the launch of YouTube in 2005, there was little sign of consumer interest in online video sharing, yet the site was serving over 100 million videos per day within a year of its launch.<sup>39</sup> This success was clearly due in part to consumer broadband connections having sufficient bandwidth to upload and download videos in a reasonably short time.

In the wireless market, the high value of specialized mobile applications was not realized until after operators had begun deploying the EDGE and 3G data networks needed to support them. Now that smartphones have access to higher bandwidth connections, these niche applications are becoming a core use of mobile data, and are a central part of wireless advertising (*e.g.*, Apple’s “app for

39

USA Today, July 2006, YouTube serves up 100 million videos a day online, available at: [http://www.usatoday.com/tech/news/2006-07-16-youtube-views\\_x.htm](http://www.usatoday.com/tech/news/2006-07-16-youtube-views_x.htm).

Marlene H. Dortch  
December 14, 2009  
Page Fourteen

that” iPhone ads)<sup>40</sup> and product development strategy (e.g., Microsoft’s move to include a “Windows Marketplace” on its next smartphone operating system).<sup>41</sup>

The dynamic of performance increases driving unforeseen new applications has also repeatedly played out in the personal computing and Internet space. Recent decades saw a number of famously incorrect underestimates of the PC’s potential. In 1977, then Digital Equipment Corporation CEO Ken Olsen hypothesized in a speech that “No one will ever want a computer in their home.”<sup>42</sup>

The applicability of this dynamic to the U.S. wireline broadband market is supported by a recent joint study by the University of Oxford and the University of Oviedo which concludes that, while U.S. consumers have sufficient broadband quality for today’s applications, the country’s networks are not yet ready for future Internet applications.<sup>43</sup>

In sum, the CSMG study extrapolates from known trends and leading edge applications and technology developments to project future broadband applications. The FTTH Council recognizes that some of the CSMG predictions will turn out to be off-the-mark to some greater or lesser extent, and the Commission should keep its focus on the overall trend rather than any individual technology, application, product, or service. From this perspective, based on the history of technology deployment, the Commission should be confident that there will be a wide array of applications that will make use of NGA networks.

---

<sup>40</sup> Apple, iPhone Gallery - TV ads, available at <http://www.apple.com/iphone/gallery/ads/#gift-medium>.

<sup>41</sup> Microsoft, Microsoft Reveals New Windows® Phones With Marketplace and My Phone Services, available at <http://www.microsoft.com/presspass/press/2009/feb09/02-16MWCPR.msp>.

<sup>42</sup> As cited in ITIF, “The Need for Speed”, March 2009 which says of the quote “Mr. Olsen’s quote is frequently cited as having been said in a speech he gave to the Convention of the World Future Society in 1977. Fred Shapiro, the editor of “The Yale Book of Quotations,” who seeks the original source of several well-known computer-related sayings and statements, has been unable to find contemporaneous documentation of this. Mr. Shapiro notes the Olsen quote may be apocryphal.”

<sup>43</sup> University of Oxford and University of Oviedo, *Global Broadband Quality Study Shows Progress, Highlights Broadband Quality Gap*, available at <http://www.sbs.ox.ac.uk/newsandevents/Documents/BQS%202009%20final.doc>.

Marlene H. Dortch  
 December 14, 2009  
 Page Fifteen

**C. Current Maximum Performance Wireline Broadband Offerings of 50-100Mbps Downstream and 20 Mbps Upstream Provide Benchmarks for Next-Generation Access Goal**

In establishing an NGA goal, the Commission should set performance capabilities that can realistically meet expected consumer demands. A conservative approach to determining such capabilities is to rely upon current maximum performance capabilities. Today’s maximum capabilities certainly indicate that a technology exists and is already being sold to consumers. They also reflect the conclusion of a provider that there is likely sufficient demand for the service offering and that such offerings may be needed for competitive advantage. The Commission thus can have greater confidence in an NGA goal based on such actual “maximum” offerings.

In its comments on Public Notice #1,<sup>44</sup> the FTTH Council provided evidence supplied by CSMG about the maximum broadband speeds on the market today from a variety of providers using different network technologies.<sup>45</sup>

**Wireline Broadband Speed Tiers Currently Advertised in the Top 10 U.S. Markets**

<b>Broadband Service Provider</b>	<b>Markets</b>	<b>Maximum Tier</b> (Download/Upload Mbps)
Verizon	New York, Los Angeles Philadelphia	50/ 20
AT&T	Chicago, Houston, Dallas San Antonio, San Diego, San Jose	18/3 <sup>46</sup>

<sup>44</sup> Comments of the Fiber-to-the-Home Council, NBP Public Notice #1 (Aug. 31, 2009), available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=7020037105>.

<sup>45</sup> Verizon is deploying networks using a passive optical network FTTH architecture. Cable operators rely on a hybrid fiber-coax network with DOCSIS 3.0 technology. AT&T is generally deploying Fiber-to-the-Node (“FTTN”) networks using VDSL technology. Since there is a greater degree of sharing of bandwidth the access portion of the network in cable and FTTN networks, advertised speeds are significantly greater (approximately 2 times) than actual speeds. That is not the case of a FTTH network where throughput is greater and sharing is limited, and so, with a FTTH network, the advertised and actual speeds are similar.

<sup>46</sup> AT&T announced on December 9, 2009 that it is launching a 24 Mbps/3 Mbps service in several markets, <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=30203>.

Marlene H. Dortch  
 December 14, 2009  
 Page Sixteen

Comcast	Chicago, Houston, Philadelphia, San Jose	50/10
Time Warner Cable	New York, Los Angeles San Diego, Dallas, San Antonio	15/0.768
Cablevision	New York	101/15
Qwest	Phoenix	5/0.896
Cox Communications	Phoenix	28/2.5

These findings are confirmed in the Columbia Institute for Tele-Information Report, *Broadband in America*, submitted to the Commission one month ago, which found:<sup>47</sup>

<b>Wireline Broadband Service Provider</b>	<b>Maximum Tier</b> (Download/Upload Mbps)
Verizon	50/ 20
AT&T	18/1.5
Comcast	50/10
Time Warner Cable	50/5
Cablevision	101/15
Qwest	7 (40/20 announced)
Cox Communications	30/3 <sup>48</sup>

The *Columbia Report* also examines the coverage of the offerings, and it provides data about the current (or imminent) number of homes that can access these maximum performance capabilities. Verizon's top tier will be made available to approximately 17 million by 2010.

<sup>47</sup> *Broadband in America, Where It Is and Where Is It Going*, R. Atkinson & I. Schultz, Columbia Institute for Tele-Information, Nov. 11, 2009. ("*Columbia Report*")

<sup>48</sup> *Id.*, at Appendix A.

Marlene H. Dortch  
December 14, 2009  
Page Seventeen

AT&T's will pass about 30 million by 2011. Comcast plans to cover around 50 million households by 2010.

Further support for current maximum performance offerings can be found in industry analyst SNL Kagan's recently released data on maximum marketed downstream broadband speeds: FTTx -- 100 Mbps in 2009; DOCSIS: 100 Mbps in 2009.<sup>49</sup>

Finally, the Commission should take into account broadband performance being offered today in other countries. The *Berkman Center Report* identifies networks in Japan that offer services with downstream speeds of 1 Gbps (FTTP), 160 Mbps (HFC/DOCSIS 3.0), and 100 Mbps (DSL). Incumbent telephone providers in several other countries, South Korea, Finland, and France, currently offer 100 Mbps broadband service.<sup>50</sup>

By examining U.S. data, the two "maximum" offerings with the highest performance capabilities are Verizon's 50/20 service and Cablevision's 101/15 service. Because the Verizon offering has a higher upstream speed and is based on actual performance, the FTTH Council believes that offering represents the greater capability currently on the market and should be the NGA objective.<sup>51</sup> However, cable and other FTTx offerings are not that dissimilar, and the Commission should be confident that this performance capability is technologically neutral and can readily be achieved by most other networks.<sup>52</sup>

---

<sup>49</sup> SNL Kagan. "HSD Tiering Projections Through 2013", SNL Kagan (2009) ("*SNL Kagan Broadband Data*").

<sup>50</sup> *Berkman Center Report*, at 48.

<sup>51</sup> The Council expects Verizon will offer and deliver 100 Mbps downstream soon.

<sup>52</sup> HFC/DOCSIS 3.0 Capabilities -- HFC is an extremely capable medium for the deployment of video, data and voice. Downstream capabilities can keep up with user demand for the foreseeable future with upgrade paths (using channel bonding) to achieve greater than 100Mb/s per user. While there is more limited spectrum available for use in the upstream, HFC is capable of ~108Mbps **shared** throughput. This translates to a reasonable maximum of ~ 30Mbps upstream per user for the majority of users and higher rates can be made available to a small subset of customers.

According to information published in the *SNL Kagan Broadband Data*, HFC/DOCSIS 3.0 networks are expected to achieve maximum downstream speeds of between 120-180 Mbps in 2012 and has an upstream capability of 120 Mbps (assuming four channel bonding) and notes that with six channel bonding these speeds increase by 50%.

Marlene H. Dortch  
December 14, 2009  
Page Eighteen

**D. Expected Deployments of Next-Generation Access Networks Will Cover Almost All Cable Subscribers and Many Telephone Subscribers Within Five Years**

Because technologies and products are widely available and because of consumer demand and competitive offerings, broadband providers across the country, in general, regularly adopt and offer new, more capable broadband services. Thus, the Commission can expect maximum capabilities in one network to be relatively rapidly dispersed to other networks – although, as CSMG describes in the *FTTH Council November 2<sup>nd</sup> Ex Parte* and as the staff of the NBP have recognized, there will be gaps. The *Columbia Report* captures this dynamic in the very first sentence of its Executive Summary when it states about future coverage of today’s maximum offerings, “One principal conclusion that can be drawn from this report is that by 2013-4, broadband service providers...expect to offer to about 90% of homes advertised speeds of 50 Mbps.” This finding is based on cable networks’ coverage of 92% of households and DOCSIS 3.0 being available in most all of these systems. As noted above, Verizon will pass 17 million premises next year, and CSMG in its study for the FTTH Council found this amount would double by 2015.<sup>53</sup> In sum, the private sector will drive competitive NGA to a significant percentage of the country by 2015.

**E. The Next-Generation Wireline Access Gap**

The private sector is the primary driver of broadband deployment and services in the U.S., spending many billions of dollars annually to deploy networks that enable more innovative and efficient products and services. A critical reason for this dynamic is competition. Most markets have two broadband suppliers, and many have more. The combination of potential opportunity and loss are powerful motivators, producing substantial benefits for consumers. The government’s role is to ensure markets are competitive by removing barriers and providing targeted incentives.

The preceding discussion of consumer demand for and provider supply of next-generation broadband services demonstrates that the private sector will almost certainly drive NGA broadband services to most households within five years. **But, unfortunately, most**

---

As for FTTN networks using VDSL technology, Professor Emeritus John Cioffi in a November 19, 2009 presentation to the Commission stated that VDSL with Dynamic Spectrum Management can achieve speeds greater than 100 Mbps. Available at: [http://www.broadband.gov/docs/ws\\_future\\_fiber/cioffi.pdf](http://www.broadband.gov/docs/ws_future_fiber/cioffi.pdf).

<sup>53</sup> *FTTH Council November 2<sup>nd</sup> Ex Parte*, at 5.

Marlene H. Dortch  
December 14, 2009  
Page Nineteen

**consumers will not have a choice among NGA providers.** In other words, the competitive dynamic that is so essential to producing affordable services and future innovation will be lacking for many. This is the Next-Generation Access Gap which the Commission needs to address.

CSMG, in its evaluation in the *FTTH Council November 2<sup>nd</sup> Ex Parte* described with greater precision the extent of this gap.<sup>54</sup> If the government does not intervene, only about one-third of households will have access to competitive NGA broadband services by 2015. CSMG then finds that competitive coverage can increase to 54% of households with targeted government programs and to 80% with more extensive government action. Moreover, CSMG demonstrates that the benefits for consumers, particularly by being able to access next-generation content and applications, would be substantial – with the total aggregate annual benefit using conservative assumptions exceeding \$11 billion<sup>55</sup> – that is, this is the government’s annual return on creating programs that will bring competitive NGA broadband to 80% of the country. In the next section, the FTTH Council describes in detail several programs the government should adopt to achieve the objective of bringing widespread, competitive NGA broadband by 2015.

#### **IV. Specific Policy Proposals to Address the Next-Generation Wireline Access Gap**

In the *FTTH Council November 4<sup>th</sup> Ex Parte*, it suggested a range of policy proposals. In the following sections, the Council focuses on three proposals to drive NGA deployments that have been discussed with the NBP staff and have generated a series of follow-up questions. First, the FTTH Council encourages the Commission to adopt a Next-Generation Access Network (“NGAN”) certification program. This program, which is explained below, would provide for the voluntary ranking of service providers’ broadband networks. A NGAN program would heighten competition among service providers, equipment manufacturers, and real estate investment interests, thereby encouraging the accelerated deployment of next-generation broadband networks. Second, the Council joins its next-generation objective with consumer protection goals in proposing a Broadband Internet Star program.<sup>56</sup> This voluntary program would provide consumers with information to make informed choices among broadband services and providers and would spur broadband service providers to improve the speed and capabilities of their networks and the price of their broadband offerings. Finally, the Council elaborates on its tax incentives proposals and addresses specifically how to construct such proposals so they do not provide a windfall for any provider while ensuring their effectiveness.

---

<sup>54</sup> *Id.*, at 9.

<sup>55</sup> *Id.*, at 27.

<sup>56</sup> *FTTH Council November 4<sup>th</sup> Ex Parte*, at 3-4.

Marlene H. Dortch  
December 14, 2009  
Page Twenty

A. Next-Generation Network Certification Program

To provide an incentive for broadband service providers to continuously upgrade their networks to meet consumer needs, the FTTH Council recommends that the Commission adopt a NGAN certification program that would provide for the voluntary ranking of service providers' broadband networks.<sup>57</sup> Under the NGAN program, a service provider, on a service area or franchise area specific basis, could apply to have its broadband network certified as a NGAN.

The NGAN certification process would be administered by the Commission utilizing criteria adjusted from time to time to reflect advances in broadband technology. Specifically, a service provider would apply to the Commission for certification of a particular broadband network, and the Commission would determine whether to grant certification based on whether the network offers a broadband service that delivers the required minimum actual download and upload speeds at peak period for all subscribers to such service. As discussed above, these speeds – 50 Mbps downstream and 20 Mbps upstream – represent realistic widespread next-generation broadband network capabilities.<sup>58</sup> The FTTH Council recommends that the Commission revisit the 50 Mbps/20Mbps standard in three years to determine whether it should be adjusted upward to reflect more advanced next-generation capabilities.<sup>59</sup>

The Energy Star program represents a good example of the benefits that can be derived from a well-planned and executed incentive program along the lines of the NGAN certification proposal. The Energy Star program was established by the U.S. Environmental Protection Agency (“EPA”) in 1992 to reduce energy consumption and greenhouse gas emissions by power plants. An additional objective of the program was to promote energy efficiency products through the use of an Energy Star label, making it easy for consumers and businesses to identify and purchase products, including homes and buildings, with enhanced energy efficiency.<sup>60</sup>

---

<sup>57</sup> The Broadband Internet Star Program, discussed below, would provide for the voluntary ranking of broadband *services* offered to consumers in the U.S.

<sup>58</sup> As noted footnote 6, the Commission, if it wishes to use marketed instead of actual speeds, should establish the NGAN threshold as 100 Mbps downstream and 40 Mbps upstream.

<sup>59</sup> The Commission may wish to utilize the expertise of a technical advisory committee to determine whether the standard should be adjusted and, if so, what the new standard should be. FCC Form 477 can be modified to require the filing by service providers of data that can be used in determining whether adjustments to the standard should be made. The same technical advisory committee can be used for both the Broadband Internet Star program and the NGAN certification program.

<sup>60</sup> The first labels were for computers and monitors, but in 1995 the labeling system was expanded to include residential heating and cooling systems and new homes and now includes more than 40,000 product models in 35 categories.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-One

Since its inception, the program has been adopted by Australia, Canada, Japan, New Zealand, Taiwan, and the European Union.

Under the plan, the EPA identifies the product categories and develops the energy performance requirements a product must meet to qualify for the Energy Star label. Once the EPA has certified that they meet the established criteria, product manufacturers may use the label to identify models that meet the program's energy performance requirements. Manufacturers report data annually that the EPA uses to determine market penetration of the Energy Star products and evaluate the overall effectiveness of the program. The Energy Star program has proven to be extremely popular with businesses and consumers.<sup>61</sup> Besides the benefits of saving energy, consumers have direct financial incentives to buy Energy Star products through the provision of federal tax credits for certain Energy Star products. In addition, the ARRA provided \$300 million to the states for consumer rebates on certain Energy Star appliances. The EPA estimates that the Energy Star program saved approximately \$19 billion in energy costs for American consumers in 2008.<sup>62</sup> The program has increased competition among manufacturers to develop products that operate with lower energy consumption. It also has heightened consumer awareness of energy consumption.

The implementation of a NGAN certification program along the lines of the Energy Star program would result in significantly enhanced broadband competition and accelerate the deployment of next-generation broadband capabilities as network providers seek to gain marketplace advantages over their competitors by improving their broadband offerings and performance. The NGAN program also would spur increased competition among equipment manufacturers as those companies take advantage of the certification awarded to network providers using their equipment to market their network equipment to service providers. Real estate developers and building owners likewise would face increased competition since buildings served by NGAN-certified providers would provide certain developers and owners with marketing advantages over other owners and developers.

---

<sup>61</sup> In 2008, over 2,400 manufacturers were using Energy Star to label to differentiate more than 40,000 individual product models and more than 1,000 retail providers were bringing Energy Star-qualified products to their customers. By the end of 2008, more than 75 percent of the American public could identify the Energy Star label and one in three households knowingly purchased an Energy Star-qualified product.. More than 75 percent of those households created the label as an important factor in their decision. Energy Star: "Energy Star Overview of 2008 Achievements," available at <http://www.energystar.gov/ia/partners/publications/pubdocs/2008%204%20pager%203-12-09.pdf>.

<sup>62</sup> See [http://www.energystar.gov/index.cfm?c=about.ab\\_history](http://www.energystar.gov/index.cfm?c=about.ab_history).

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Two

B. Broadband Internet Star Program

A Broadband Internet Star program would provide for the voluntary ranking of broadband services offered to consumers in the U.S. As such, it would constitute an important consumer information and education tool in addition to serving as an incentive for broadband providers to deploy NGA services. There are several precedents for a type of voluntary consumer-focused incentive program the Broadband Internet Star program would represent. In developing the specifics of such a program for inclusion in the NBP, the Commission can and should draw from successful programs of a similar nature in the U.S. and elsewhere in the world.

The Electronic Product Environmental Assessment Tool (“EPEAT”) is a voluntary incentive program that could assist in developing the framework for a broadband service incentive plan. The EPEAT program was launched in 2006 to provide institutional purchasers with an easy-to-use system to evaluate, compare, and select electronic products based on their environmental attributes. The system currently covers desktop and laptop computers, thin clients, workstations and computer monitors. The EPEAT system grades electronic products according to three tiers of environmental performance – Bronze, Silver and Gold – in 8 environmental performance categories based on the percentage of 28 optional criteria they meet above the 23 baseline criteria.

To be registered under EPEAT, a product must conform to all 23 required criteria.<sup>63</sup> Registered products that meet all 23 required criteria qualify for Bronze status. Products that meet all 23 required criteria plus at least 50% of the optional criteria qualify for Silver status and products that meet all 23 required criteria plus at least 75% of the optional criteria qualify for Gold status. A manufacturer can choose among the 28 optional criteria to boost their total EPEAT score to achieve a higher ranking level.<sup>64</sup> The Green Electronics Council, an independent non-profit organization that operates the EPEAT system, conducts an ongoing verification program to assure the credibility of the EPEAT registry. To maintain the credibility of the system, products regularly are selected from the registry and manufacturer declarations are

---

<sup>63</sup> The EPEAT criteria were developed over several years by a multi-stakeholder team that included industry, government, and non-governmental technical experts. Before a manufacturer can use the EPEAT system to declare their products they must sign an agreement with EPEAT that requires them to be accurate in their declarations and they must pay an annual fee.

<sup>64</sup> Most EPEAT criteria refer to environmental performance characteristics of the specific product and must be declared for each product registered. Some criteria relate to general corporate programs, such as a Corporate Environmental Policy or Environmental Management System. These corporate criteria apply to all of a given manufacturer’s EPEAT-registered products and participating manufacturers declare to these criteria annually.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Three

verified as to their accuracy. If a declaration is found to be inaccurate, the manufacturer must correct it or the product will be removed from the registry. The results of verification are published.

Due to the time-sensitive nature of electronic product development, the EPEAT system was set up to not require a lengthy application, review, and approval process. Instead, EPEAT established a self-verification process like the one already being used by the Energy Star program. Before listing products on EPEAT, manufacturers must sign a formal Memorandum of Understanding (“MOU”) that commits them to provide accurate product and company information and that provides remedies should inaccuracies be discovered. To ensure that self-declarations would be credible, a validation process was developed that includes spot checks and random testing.

There are thousands of EPEAT users, driving environmental improvement in electronics design and delivery through EPEAT purchase requirements. In the U.S., they include federal agencies (*e.g.*, Departments of Defense, Energy and Homeland Security), educational institutions (*e.g.*, Cornell and Yale universities), state governments (*e.g.*, New York State, State of Colorado), municipal governments (*e.g.*, cities of Phoenix, AZ and San Francisco, CA) and private sector interests (*e.g.*, Kaiser Permanente, McKesson, Inc.). As of the EPEAT standard's one-year anniversary, July 2007, over 20 manufacturers had registered more than 600 products and the EPEAT standard has been successfully incorporated into purchasing documents worth more than \$65 billion.

Outside the U.S., the broadband incentive program instituted in Korea could provide an excellent model for the development of a U.S. broadband incentive program. It is generally acknowledged that Korea has achieved great success in the deployment of a nationwide broadband network. Korea is consistently ranked in the top five nations (or administrative regions) in terms of broadband Internet penetration and speed.<sup>65</sup> While a number of factors have influenced Korea's success (*e.g.*, cultural values, socio-economic factors, telecommunications infrastructure), government has played a very significant role. Since the early 1990s, the Korean government has exercised profound influence on and involvement in the development and adoption of information and communication technologies (“ICT”).

One aspect of the government's strategy credited with stimulating ICT deployment is the voluntary Certification Program for Broadband Buildings adopted in 1999, which seeks to induce advanced networks. This program, administered by the Ministry of KCC's National Information Society Agency (“NIA”), certifies the network availability and connection speeds in new multiple dwelling units with more than 20 households and office buildings with more than 3,300 square meters of total floor space. Under this program, there are four ICT certification classes for buildings (Special, 1, 2, and 3) and three Home Networking classes (AA, A, and

---

<sup>65</sup> See, *e.g.*, *Berkman Center Report* at 3.5.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Four

Semi-A).<sup>66</sup> It has been reported that as of July 2008, more than 5,505 buildings (which include 3.2 million households) have been granted ICT certification and that 142,329 households have been granted Home Networking certification.<sup>67</sup>

This certification process gives builders a motivation to enhance the broadband access platform of residential buildings they are constructing, since many individuals want to live in high-capacity cyber apartments. The system also provides builders with a means of differentiating their products in a highly competitive industry. This program works very well in the Korean housing market, where apartments account for half of the total housing.<sup>68</sup>

Using the above examples as a guide, the FTTH Council proposes a Broadband Internet Star program for the United States. We believe such a program – structured in the manner described below – would accelerate broadband competition and investment among network service providers and increase consumer awareness and adoption of broadband services.

Specifically, the FTTH Council recommends that the Commission adopt a voluntary 4-star rating system as described in the following table. The categories described in the table reflect the fact that broadband services are commonly marketed to consumers in tiers. The various tiers of broadband services offered to consumers correspond to differing marketed (and actual) download and upload speeds.

---





<sup>66</sup> There are two steps to certification under this program. Construction companies may apply for pre-certification once construction permission has been obtained. If pre-certification has been granted, formal certification may occur by a prearranged date from completion of construction. If pre-certification has not been obtained, formal certification occurs after installation of the required IT facilities has been completed. *See* “Cyber Building Certification Program in Korea”, Certification Commission, Korea Association of Information and Telecommunication ([www.bxcc.or.kr](http://www.bxcc.or.kr)).

<sup>67</sup> *See* Myung Won, Song, “FTTH & NGN Promotion in Korea” National Information Society Agency (July 23, 2008).

<sup>68</sup> *See* James B. Speta, “Commentary: Policy Levers and Demand Drivers in Korean Broadband Penetration,” *Journal of Korean Law*, Vol. 4, No. 1 (2004), at 11.

Marlene H. Dortch  
 December 14, 2009  
 Page Twenty-Five

**Broadband Internet Star Program – Star Criteria**<sup>69</sup>

Star Rating	Minimum Delivered Download Speed at Peak Period for Offered to All Subscribers	Minimum Delivered Upload Speed at Peak Period Offered to All Subscribers
	1.5 Mbps	768 Kbps
	7 Mbps	3.5 Mbps
	20 Mbps	10 Mbps
	50 Mbps	20 Mbps

Under these criteria, a provider’s service must meet both the specified minimum download and upstream speeds pertaining to a particular star category for the service to qualify for the star pertaining to that category. For example, to qualify for 4 stars, a particular service would have to provide to all subscribers a minimum delivered download speed at peak period of 50 Mbps and a minimum delivered upload speed of 20 Mbps at peak period. The star rating categories under the program should be modified as technology advances and speeds increase. The FTTH Council suggests that the Commission commit to a star rating system review every two years that would result in an adjustment of download and upload speeds in each category as appropriate. The Commission should establish a technical advisory committee to administer this review and recommend adjustments in the rating system to the Commission.

As noted above, the proposed program would be voluntary – service providers would be free to determine whether or not to participate in the program in a particular service area or franchise territory. That said, the Commission will need to adopt a mechanism to collect the data needed to assess whether adjustments to the star categories are necessary. The FTTH Council

---

<sup>69</sup> The performance capabilities in the chart are based on two sources. For the 4-star tier, the speeds are those contained in the NGA benchmark discussed earlier in this filing. For the other three tiers, the speeds are the top downstream speeds for tiers of DSL service (Budget, Standard, and Premium) provided in *SNL Kagan Broadband Data*. The upstream speeds reflect the approximate 2:1 ratio discussed in the *Berkman Center Report* at section 3.5.2.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Six

suggests that the Commission modify its Form 477 to require service providers to file information on the delivered download and upload speeds for their various services.

Like the NGA network certification system, the Broadband Internet Star program would serve the extremely valuable function of informing consumers, providing them with straightforward, easy-to-understand information they could use as the basis for choosing among broadband services and service providers. At the same time, as consumers “voted with their pocketbooks,” broadband service providers would be spurred to improve the speed and capability of their networks and the price of their broadband services.

C. Broadband Internet Tax Incentives

The FTTH Council proposes that the federal government provide tax incentives to accelerate the deployment of next-generation (and, in unserved areas, current generation) broadband infrastructure. At the same time, any incentives should ensure that no provider will receive a windfall. The Council’s proposal builds upon the various types of broadband tax incentives that have been proposed in Congress for several years, including investment tax credits, expensing, and tax credit bonds.<sup>70</sup>

An investment tax credit for broadband authored by Senator Rockefeller (D-WV) was originally included in S. 350, the Senate version of the American Reinvestment and Recovery Act (ARRA), but later stripped out due to concerns that only a small number of companies would benefit, and that they would receive a windfall. It is possible to address both of these concerns, however, by combining aspirational speed requirements with incremental investment limitations.

The discussion that follows describes two possible approaches to broadband tax incentives. Because this filing pertains only to wireline broadband services, the tax incentives discussed below also pertain only to wireline services. The lack of discussion of wireless services is not intended to imply prejudice against wireless broadband. The FTTH Council does not oppose the extension of tax incentives to wireless providers.

To encourage faster service and avoid excessive revenue loss, most tax incentive bills have set speed requirements that are in excess of current service offerings. Some commentators have criticized this aspirational approach, saying companies already offering faster speeds are better positioned to take advantage of such tax incentives. One potential solution is to condition the tax incentive on improvement over previous speed offerings. However, this approach fails to recognize that speeds gradually increase over time anyway, allowing virtually any private sector provider some amount of tax benefit for increases they already were planning to make – i.e., a windfall.

---

<sup>70</sup> See, e.g., S. 350, and H.R.760 111<sup>th</sup> Congress.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Seven

A better approach is to set speed requirements at a level that a) meets the needs of the consumers, b) is aspirational but achievable, and c) is limited to incremental investment over an historic baseline. With this approach, it would be possible for any broadband provider to benefit from a tax incentive to some degree, and for those currently offering slower speeds to gain the greater benefit as they make a greater investment to leap forward in speed.

Limiting the tax benefit to incremental investment is a key protection. Under such a limitation, a broadband provider would receive a tax benefit only for broadband investment which is in excess of the broadband investment the company made in a previous time period. Precedent for an incremental approach already exists in the Research & Development (“R&D”) tax credit. The R&D credit, which is available solely for R&D conducted in the U.S., applies only to the portion of a business taxpayer’s eligible expenses that exceed a calculated base amount of R&D spending determined over the last four years.

The R&D credit has been successful. Economists estimate that every dollar of federal revenue spent on the R&D tax credit generates an additional \$1.3<sup>71</sup> to \$2.9<sup>72</sup> of private R&D investment. Assuming a middle ground between those effects, along with the \$7.9 billion annual federal revenue cost, and an average R&D engineer salary of \$75,423, the credit generates roughly 120,000 jobs a year. Because Congress has come to value this significant impact, Congress has extended the R&D credit an unprecedented 12 times since its enactment in 1981.

This experience is validated by that of other countries. The French R&D credit, which is more generous than its U.S. counterpart, has been estimated to generate private R&D investment three to four times the size of the government expenditure.<sup>73</sup> In 2003, a Japanese government official said the Japanese R&D credit and IT tax relief had created 400,000 jobs and boosted gross domestic product by \$55 billion over three years.<sup>74</sup>

---

<sup>71</sup> *R&D Tax Policy During the Eighties: Success or Failure?*, Bronwyn Hall, NBER Working Paper, No. 4240, Cambridge, MA, 1992.

<sup>72</sup> *A Cross-national Comparison of R&D Expenditure Decisions: Tax Incentives and Financial Constraints*, Kenneth Klassen, Jeffrey Pittman, and Margaret Reed, *Contemporary Accounting Research*, Vol 21, no. 3 (Fall 2004: 639-80).

<sup>73</sup> *The Effect of the R&D Tax Credit in France*, Benoit Mulkey and Jacques Mairesse, EEA-ESEM Conference, Stockholm, Sweden, 2003, available at [www.eea.esem.com/eeaesem/2003/prog/viewpaper](http://www.eea.esem.com/eeaesem/2003/prog/viewpaper).

<sup>74</sup> Interview with Bureau of National Affairs, Aug. 26, 2003, cited in “Rising Above the Gathering Storm,” National Academy of Sciences, 2007, 196.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Eight

A broadband tax incentive could have a positive impact similar to that of the R&D credit. A January 2009 analysis by economic consulting firm Empiris LLC indicates that tax incentives for next-generation broadband deployment would generate private sector investment of roughly \$2 for every dollar of federal revenue foregone. The same analysis indicates these incentives would create 19 jobs for every \$1 million of federal investment – significantly more than the R&D credit.<sup>75</sup> One advantage of using tax incentives to encourage broadband deployment is that, if no eligible investment occurs, the federal government spends nothing.

Including an anti-windfall provision in a broadband tax incentive would be done by limiting the “qualified broadband expenditure” in the legislative language. Defining a qualified expenditure is necessary in any investment tax incentive to avoid abuse. Limiting qualified expenditures to incremental investment provides the anti-windfall protection. The simplest and most effective way to do this is to use a company’s previous-year expenditure as the baseline. In that case, the qualified broadband expenditure would be the excess of current year broadband investment over previous-year broadband investment. The legislative provision would appear similar to the following:

Qualified Broadband Expenditure. The term “qualified broadband expenditure” means that portion of a taxpayer’s broadband expenditures occurring in a calendar year or fiscal year which exceeds the taxpayer’s broadband expenditures in the previous calendar year or fiscal year.

Broadband Expenditure. The term “broadband expenditure” means an expenditure related to equipment used to provide next-generation access speeds to all households and current generation access speeds to unserved households, as well as expenditures for the installation of such equipment.

Two types of broadband tax incentives have been proposed in Congress in recent years. First, a traditional investment tax credit directed at broadband infrastructure. A variation of this provision is accelerated expensing or immediate 100% depreciation. This incentive has been proposed in the last few Congresses by Senator Jay Rockefeller (D-WV).<sup>76</sup> Second, a tax credit bond proposal authored earlier this year by Rep. Anna Eshoo (D-CA) (HR 760, 111<sup>th</sup> Congress.) Under this proposal, the federal government would authorize bonds for sale by broadband providers in order to secure funding for broadband deployment. When the bonds come due, the broadband provider repays the bondholder the principal; the bondholder takes a tax credit for the

---

<sup>75</sup> *Economic Effects of Tax Incentives for Broadband Infrastructure Deployment*, J. Eisenach, H. Singer, J. West, Jan. 2009, available at <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520220547>.

<sup>76</sup> *See, e.g.*, S. 350, Section 1271, 111<sup>th</sup> Congress.

Marlene H. Dortch  
December 14, 2009  
Page Twenty-Nine

interest whenever it is received. Tax credit bonds have been used in the past to help state and local governments fund various infrastructure needs.

A description of these two approaches, with anti-windfall protections, would be as follows.

Investment tax credit/Expensing for broadband deployment

- 20% tax credit or 100% expensing for NGA deployments (50 Mbps downstream/20 Mbps upstream).
- 20% tax credit or 100% expensing for current generation broadband deployments (3 Mbps downstream/1 Mbps upstream) in unserved areas.
- Qualified Broadband Expenditures would be that portion of a taxpayer's broadband expenditures occurring in a calendar year or fiscal year which exceeds the taxpayer's broadband expenditures in the previous calendar year or fiscal year.
- Broadband Expenditures would be expenditures related to equipment providing next-generation access speeds to all households or current generation access speeds to unserved households, as well as expenditures for the installation of such equipment.
- Other safeguards, such as actual deployment of services, offering of services, and delivery to customers at required speeds.
- Incentive would be technology neutral.

Tax credit bonds for broadband deployment

- Broadband providers, in the aggregate, able to borrow up to \$10 billion in tax credit bonds per year to fund NGA broadband service.<sup>77</sup>
- Broadband providers, in the aggregate, able to borrow another \$10 billion in tax credit bonds per year to fund 3 Mbps downstream/1 Mbps upstream current generation broadband service to unserved households.
- Bonds allocated per state on a per capita basis.
- Qualified Broadband Expenditures would be that portion of a taxpayer's broadband expenditures occurring in a calendar year or fiscal year which exceeds the taxpayer's broadband expenditures in the previous calendar year or fiscal year.
- Broadband Expenditures would be expenditures related to equipment providing next-generation access speeds to all households or current generation access speeds to unserved households, as well as expenditures for the installation of such equipment.

---

<sup>77</sup> The FTTH Council also has developed a tax credit bond proposal for public entities providing next-generation broadband service.

Marlene H. Dortch  
December 14, 2009  
Page Thirty

- Other safeguards, such as actual deployment of services, offering of services, and delivery to customers at required speeds.
- Incentive would be technology neutral.

## **V. Conclusion**

With the NBP, the Commission has that rare opportunity to establish a comprehensive vision and policies to drive the expansion of current generation broadband service to all Americans and ensure the widespread, competitive deployment of NGA broadband service by 2015. The FTTH Council has endeavored to provide the Commission with valid, specific, and realistic targets for these objectives and a set of policies to achieve them. It stands ready to provide the Commission with additional support, including data and program details.

Should you wish to discuss this filing further, please contact me.

Sincerely,

Thomas Cohen  
Kelley Drye & Warren LLP  
3050 K Street, NW  
Suite 400  
Washington, DC 20007  
Tel. (202) 342-8518  
Fax. (202) 342-8451  
[tcohen@kelleydrye.com](mailto:tcohen@kelleydrye.com)  
*Counsel for the Fiber-to-the-Home Council*

cc: Blair Levin  
Erik Garr  
Steve Rosenberg