Canadian Media Concentration Research Project – Reply to Interrogatories – CRTC 2015-134, *Review of basic telecommunications services*

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Responses to:

Telus Requests for Information addressed to Canadian Media Concentration Research Project ("Winseck") Winseck (TELUS)02Nov15-1

Prepared by:

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Canadian Media Concentration Research Project. Response to Request Winseck (TELUS)02Nov15-1

Question: Winseck(TELUS)02Nov15-1

Reference: Canadian Media Concentration Research Project – Intervention – Phase 1 of Telecom Notice of Consultation CRTC 2015-134, Rethinking Universal Service for the 21st Century and an All-IP World, *Review of basic telecommunications services,* August 14, 2015. On page 3, paragraph iii of the Recommendations, the following statement appears.

> We strongly encourage the Commission to expand universal basic service to include, at a minimum, high-speed broadband of between 25 and 30 Mbps over the next five years.

a. Please provide a complete list of all jurisdictions that have formally adopted as a legal standard the metric of "high-speed broadband of between 25 and 30 Mbps" as a basic telecommunications service.

b. For all of the jurisdictions listed in (i), please provide the date on which "high-speed broadband of between 25 and 30 Mbps" became a basic telecommunications service.

c. For all of the jurisdictions listed in (i), please provide a paper copy of the formal regulatory decision establishing the metric of high-speed broadband of between 25 and 30 Mbps as a basic telecommunications service or a link (URL = Uniform Resource Locator) to the formal decision.

Response:

From my knowledge, most countries do not legislate specific broadband speed benchmarks. Of the forty-one countries that comprise the European Union (EU) and the Organization for Economic Cooperation and Development (OECD) only eight have legal standards that specifically include universal broadband internet access or service goals: i.e. Belgium, Denmark, Finland, Iceland, Mexico, Spain, Sweden and the United States. Moreover, the standards they set tend to be low and are mostly outdated.

Crucially, however, the absence of a legal standard setting out high-speed broadband policy objectives does not appear to unduly constrain what countries do in practice. In fact, they have plenty of room to pursue meaningful broadband internet access, speed, penetration and other targets by other means. Indeed, the normal practice is to pursue broadband targets as a matter of public policy, back-stopped by the idea that regulators and policy-makers have the legal and political mandate they need to do so. Those other means are typically, although not always, national broadband projects.

The number of national broadband plans worldwide soared from 34 in 2007 to 148 last year (Broadband Commission, 2015, p. 33).[1] The vast majority of the 34 OECD countries "have an overarching national digital strategy", many of which were established or revised in the last two years (OECD, 2015, p. 21). When done well, as we will see, broadband policies set out meaningful and achievable broadband access *and* penetration (adoption) goals, establish specific and/or urgent timelines, and allocate resources fit for the task. We have compiled a list and summary review of such policies and projects in OECD and EU countries in Appendix 1: Broadband Policy Projects, Targets, Timelines, Current Metrics and Budgets in 41 Countries. Appendix 1, Sheets 2, 3 and 4, respectively, also list all of the EC decisions on government support for broadband as well as the amount of funding for such broadband projects by country and by year between 2003 and June of 2015.

Let's take an example to illustrate the point: the United States. In the US, the FCC set the goal in 2015 of ensuring that "***all*** Americans" have access to "*actual* download speeds of at least 25 Mbps and *actual* upload speeds of at least 3 Mbps" (para 3).[2] The FCC did not point to an explicit legal standard to justify its decision but argued that section 706 of the *Telecommunications Act* (which requires it to take steps necessary to ensuring that ***all*** Americans have the "capability . . . to originate and receive high-quality voice, data, graphics, and video services") compelled it to adopt measures such as the speed targets that are designed to help achieve this objective (paras 3-4). This was not a new argument, either, but one that it has relied upon for at least half a decade with no successful legal challenges to the contrary.

The FCC was also emphatic that the targets it adopted are not static but must evolve over time to keep pace with changes in technology, people's needs and market conditions (paras 19-23). To help facilitate this, the Commission does a comprehensive review of broadband internet access, adoption, pricing and use, amongst other things, annually, and an international comparative study every two years.[3] That it does this is not surprising because, as the Broadband Commission (2015) observes, countries that set out national broadband objectives also often set up more robust methods for monitoring and assessing the state of broadband development to help determine whether their goals are being met (p. 33). This is most certainly the case for the US, and it is also the case for Canada and many other EU and OECD countries, as we will see further below. Indeed such things are essential elements of the evolving regulatory architecture.

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[1] A list of jurisdictions that have adopted such plans can be found in Annex 1 of the Broadband Commission's *State of Broadband 2015* report. http://www.broadbandcommission.org/documents/reports/bb-annualreport2015.pdf.

[2] FCC *2015 Broadband Progress Report*. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2015-broadband-progress-report

[3] FCC (2015). *International Broadband Data Report*. https://apps.fcc.gov/edocs_public/attachmatch/DA-15-132A1.docx.

Moreover, the FCC also added a sense of urgency to its efforts by calling for its targets to be met "in a reasonable and timely fashion" (para 4). We can compare this sense of urgency, for example, to countries that have no deadlines at all (e.g. Mexico), or to those that have timelines that are contradictory and confusing (e.g. Canada) or to Australia, where the government has been drastically scaling back the country's formerly ambitious National Broadband Project since 2014 while complacently pushing to have even the watered down targets it has adopted met not quickly, or by a set date, but "as soon as possible" – a phrase that hardly conveys either commitment to the goals or a sense of urgency.[4] Most OECD and EU countries have specific speed targets tied to specific timelines (see Appendix 1). The upshot of this is that the clearer and more stringent the timelines, the less likely broadband policy targets are to be "merely aspirational".

In sum, the FCC example shows that:

1. there is no explicit legal standard in the US setting out a specific speed target but such goals are pursued vigorously all the same;

2. the Commission's authority to adopt broadband policy objectives turns on its interpretation of its mandate under the *Telecommunications Act of 1996*;

3. whatever standards are adopted evolve and change over time;

4. the timing of targets may need to be flexible to deal with contingencies, but a sense of urgency will likely help to ensure that whatever targets are adopted will be met in "timely and reasonable fashion";

5. meaningful targets require robust and routine monitoring and assessment.

The FCC also has several other tools in its policy toolkit to help make affordable broadband adoption a reality including the Connect America Fund and Mobility Fund which aims to help extend 3G and 4 G mobile wireless networks to areas that would otherwise probably not be served. Thus, while the FCC's speed targets do *not* include *adoption (penetration)* goals, the Commission does pursue such objectives through other tools, backed by substantial funding – a point to which we will return below.

The FCC's actions in 2010 served as one touchstone among several referred to by the CRTC when it established the current 5/1 Mbps standard alongside a minimalist definition of basic service in its 2011-291 decision. As in the US, the *Telecommunications Act* in Canada does *not* establish a "legal standard" for broadband speed targets, but its principles offer the CRTC guidance in such

[4] See Turnbull, M., & Cormann, M. (2014). Government Expectations. https://www.communications.gov.au/sites/g/files/net301/f/SOE_Shareholder_Minister_letter.pdf

matters all the same (also see our response to Telus's second question below on this point).

The European Commission's (2010) *Digital Agenda for Europe* is also instructive in relation to the points being made here. Crucially, it underscores the point that while very few countries have "formally adopted as a legal standard the metric of 'high-speed broadband of between 25 and 30 Mbps'", many have developed an integrated set of policy tools to pursue such goals nonetheless.[5] And more to the point, far from being weak second cousins to robust legal standards, the *Digital Agenda* has helped transform institutional arrangements and broadband issues on the ground throughout the 28 members states that make up the EU. It has also influenced broadband policy debates throughout the OECD countries and, indeed, worldwide.

The *Digital Agenda*'s broadband policy standards are more ambitious than those of the FCC. Both the EC and FCC policy targets, in turn, are more ambitious and clear than the minimalist speed targets and contradictory timelines that currently hold sway in Canada.

Three goals constitute the centerpiece of the *Digital Agenda for Europe*:

1. all European will have basic broadband by 2013;
2. all Europeans will have internet *access* above 30 Mbps by 2020;
3. at least half of European households will *subscribe* to internet connections above 100 Mbps by 2020".[6]

The lower of the EC's two speed targets – i.e. 30 Mbps – is slightly higher than the goal adopted by the FCC last year, i.e. the 25/3 Mbps standard, but this is rather inconsequential. The EC's push for 100 Mbps speeds constitutes the larger difference between its goals, on the one hand, and those found in either the US or Canada, on the other. Moreover, the EC explicitly links this target to a specific broadband internet ***penetration*** goal: namely, that at least half of all EU households should actually subscribe to internet services with at least 100 Mbps connections or more. Neither the CRTC nor the FCC take this step. Furthermore, the EC's ambitious *access* and *penetration* goals come with a specific deadline: i.e. 2020.

While the *Digital Agenda* serves as an umbrella broadband policy framework for the EU as a whole, it has also been the impetus for policy actions by countries across the EU. Indeed, its principles, targets and general orientation have been translated into specific national broadband policies by all EU member countries,

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[5] European Commission (2010). *A Digital Agenda for Europe*. COM(2010)245 final. p. 19 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0245&from=EN

[6] European Commission (2010). *A Digital Agenda for Europe -- Pillar IV: Fast and ultra-fast Internet access*. https://ec.europa.eu/digital-agenda/en/our-goals/pillar-iv-fast-and-ultra-fast-internet-access

except Belgium, albeit with crucial differences between them. Combining these initiatives with those of other OECD countries allows us to identify three broad types of "national broadband policy models" based on differences in how each country addresses issues of *access*, *penetration*, *speed*, *funding* and *timelines*, respectively. We can array these three along a continuum from "limited" to "ambitious" "broadband policy models":

1. The first group includes countries that tend to adopt *access* targets but not *penetration* (adoption) goals, speed targets are set at relatively low levels, if included at all, and timelines are missing, contradictory or vague. Many of the countries that fall within this grouping, although not all, are Central European countries, i.e. they are less well-developed economically, but others have eschewed such goals largely because they do not comport with the political priorities of the governments in power. For countries that are weaker economically, their national broadband plans often indicate that they will not likely meet certain *Digital Agenda*'s goals, most notably, the goal of ensuring that at least half of all households subscribe to a broadband service with a minimum capacity of 100 Mbps. Their schedules for achieving the *Digital Agenda* targets also tend to be stretched out across a longer time frame or ambiguous. While some of these countries' targets are still ambitious relative to their stage of economic and political-institutional development, relative to the targets set by the *Digital Agenda* they fall short. Overall, this group of countries includes Australia, Canada,[7] Chile, Croatia, Hungary, Mexico, Norway, Poland, Slovenia, the Slovak Republic, and Turkey (11 countries in total). The EU countries included in the list are mostly those the EC characterizes as 'low performing' countries in terms of meeting the goals of the *Digital Agenda*.[8]

2. The second group consists of countries that largely replicate the EU's *Digital Agenda* goals. They have more demanding speed targets, specific penetration goals, and more concrete timelines than the first group. This group includes Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, France, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Portugal, Romania, Spain, Switzerland, the UK and the US[9] (20 countries in total). The EU countries on the list are mostly those that

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[7] Canada's *speed target* (5 Mbps) is low relative to the US (25 Mbps) and the EU (30 Mbps), it has *no penetration target* whereas at least half of all EU household subscriptions should have speeds of at least 100 Mbps by 2020, and its *time target* is confused and muddled between the CRTC's goal of 2015 and the last Government's shifting deadlines of 2017 and 2019, in contrast to the EC's steady commitment to 2020.

[8] European Commission (nd). *The Digital Economy and Society Index (DESI)*. https://ec.europa.eu/digital-agenda/en/desi

[9] The case for putting the US in this category is a bit ambiguous but I have done so on the grounds of its speed target, the sense of urgency in its timeline, the number of tools available to the FCC to promote universal service (e.g. adoption) and the extent of economic resources committed to meeting such goals.

the EC calls 'medium performing' countries in terms of meeting the goals of the *Digital Agenda*.[10]

3. A third group of countries has aggressive access *and* penetration goals, higher speed targets, and tighter timelines than those set out in the *Digital Agenda*. This group includes Austria, Denmark, Estonia, Finland, Germany, Japan, Korea, Luxembourg and New Zealand (9 countries in total). The EU countries included in the list are mostly those that the EC characterizes as 'high performing' countries in terms of meeting the goals of the *Digital Agenda*.[11]

If broadband policy frameworks were merely aspirational statements – "paper tigers", so to speak – it is likely that whatever differences between countries did exist would be obscured by a one-size-fits all approach. However, in reality, countries have been careful to tailor the general principles and targets of the *Digital Agenda* to fit their own needs and local conditions. As a result, national broadband policy models vary considerably between countries. Given this, there is no one-size-fits-all conclusion that can be applied to broadband policies/plans one way or another. Consequently, it is incorrect to dismiss anything other than a "legal standard" as aspirational because doing so conceals the real effects that broadband policies are having and the variety of approaches that are being used to advance the state-of-the-art in the field.

The *Digital Agenda* and the individual countries' national broadband policies are not just efforts to further universal broadband internet policy aims but part and parcel of wider institutional building efforts within the context of (a) the ongoing shift from the regulated monopoly era of the 20th century to an era of regulated telecommunications competition in the 21st century and (b) the transformation of industrial economies and societies of the past into the digital economies and societies of today. This is about building infrastructures *and* institutions. As hinted at above, far from being mere "paper tigers", that is, exercises in creating clouds of high-minded rhetoric that do more to conceal than reveal the actual state of affairs on the ground, genuine broadband policies typically require a significant step up and improvement in efforts by regulators and policy-makers to monitor, evaluate and report on the levels of broadband development, access, adoption and use within their jurisdiction (Broadband Commission, 2015, p. 33). We have seen this with the FCC, as referred to above; we have also seen this in terms of the CRTC's continuous efforts to improve its monitoring and reporting methods; and it is clear in the EU, where the evolving standards of monitoring, assessment and public reporting mark a huge improvement over past practices.[12]

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[10] European Commission (nd). *The Digital Economy and Society Index (DESI)*. https://ec.europa.eu/digital-agenda/en/desi

[11] European Commission (nd). *The Digital Economy and Society Index (DESI)*. https://ec.europa.eu/digital-agenda/en/desi

[12] See the publicly-available and downloadable data sets assembled by the EC on broadband at its *Digital Agenda—Connectivity* page, https://ec.europa.eu/digital-agenda/en/connectivity.

Ultimately, rather than seeing anything other than formal legal standards as poor substitutes for "real action", we need to move away from the naïve understanding of rhetoric that sees it as mere words divorced from substantive actions that have real world effects. Policy rhetoric, far from just being 'empty words', does carve out a field of vision, while also registering hopes and goals, but more than this it simultaneously reflects and shapes the terrain to which it refers. Indeed, while different institutions and actors contest the objectives and visions entailed by broadband policy statements one way or another, in the end the policy rhetoric they deploy helps to shape the interactions between markets, technology, politics and society that ultimately determines the kind of broadband internet we get.[13]

Perhaps nothing can better illustrate the idea that national broadband policies can lead to enormous resources and energies being mobilized to turn visions into reality than the billions of dollars (or euros) that governments have invested to extend broadband internet to people and areas that have otherwise been not well served by market forces and private enterprise alone. A few examples will help to illustrate the point.

For example, even though the ambitions of the FCC and Australian National Broadband Plans have both been radically reduced, the original funding of $7.2 billion (USD) for the former and the $41.1 billion (CDN) earmarked for the latter have either already been spent (the US case) or are still being spent to support what is left of the original project (Australia).[14] New Zealand's comparatively high level of investment remains ($1.2 billion CDN), but unlike its Australian counterpart the New Zealand government's ultrafast broadband project has been expanded beyond its original ambitious goals. New Zealand's steady rise through the international ranks over the past five years in terms of commonly accepted metrics of broadband internet and mobile wireless access, uptake, speed and price demonstrate that this policy instrument has had its share of successes (OECD, 2015).[15]

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[13] On the idea that rhetoric not only reflects the economic landscape to which it refers but also helps to shape it, and the actions taken by actors and institutions, see, for example, K. Boulder (1956). *The Image: Knowledge in Life and Society*. Ann Arbor, MI: University of Michigan; R. E. Babe (1995). *Communication and the Transformation of Economics*. Boulder, CO: Kluwer; A. O. Hirshman (1991). *The Rhetoric of Reaction: Perversity, Futility, Jeopardy*. Boston, MA: Harvard University.

[14] In the US case, the funding was allocated in the 2009-2010 fiscal year and spent over the following three years. https://www.irs.gov/uac/The-American-Recovery-and-Reinvestment-Act-of-2009:-Information-Center. The amount referred to in this paragraph does not include money from Connect America Fund and Mobility Fund. In Australia, the government has capped equity spending at 29.5B, with a total cost of $41B, as discussed in the 2014 corporate plan. NBN Co Limited (2014). Corporate Plan 2014 - 2017. http://www.nbnco.com.au/content/dam/nbnco2/documents/nbn-co-corporate-plan-2014-17-Nov11.pdf.

[15] Ministry of Business Innovation and Employment (2016). *New Initiatives: Ultrafast Broadband Extension (UFB)*. http://www.mbie.govt.nz/info-services/sectors-industries/technology-communications/fast-broadband/new-initiatives/#ufb. Of course, more is at play than just the

In the European Union, there have been 136 "state-aid for broadband" projects approved by the European Commission since 2004 with a total investment of €21.2 billion ($28.1 billion CDN).[16] Most of these (104 out of 136 as of July 2015) have taken place since 2008. In the years between 2004 and 2008, an average of eight projects per year with an average funding of €26.7 million (or $38.6 million CDN) were given the green light; in the years since then, the number of projects per year has more than doubled and the average funding has soared to €159.2 million per project (or $239.6 million CDN).[17] In other words, nearly all of this state investment (96%) has occurred since 2008, and most of it since the adoption of the *Digital Agenda* in 2010 (92%). The scale of this government investment in the information infrastructure of the 21st century belies the reality that, far from being paper tigers, broadband policies harness much energy and resources to the aims they articulate.

The point here is not to commend or condemn such trends but to indicate that national broadband policies involve far more than statements of aspiration. Of utmost importance is the fact that they involve enormous allocations of capital investment, for better or worse. This fundamental reality along with all of the other institution building activities, better monitoring, assessing and reporting capabilities, the specific or at least urgent time frames that define the best of such policies, among other things, and which have been discussed in this reply to Telus's question, all point to a critical and undeniable point: far more than just 'legal standards' count when it comes to defining and taking the steps needed to achieve universal broadband internet service goals fit for the 21st Century.

Question: Winseck(TELUS)02Nov15-2

Reference: Canadian Media Concentration Research Project – Intervention – Phase 1 of Telecom Notice of Consultation CRTC 2015-134, Rethinking Universal Service for the 21st Century and an All-IP World, *Review of basic telecommunications services,* August 14, 2015. At paragraph 22 of the filing, the following statement appears:

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government's "ultra fast broadand" and "rural broadband initiatives", including greater resolve by the government to ensure the emergence of more competitive telecoms markets and the regulator's willingness to act with conviction and to more firmly hold the line rather than paying blind deference to 'market forces'.

[16] The EC data starts at the end of 2003, but since it only involves one case and without any specified amount of funding, the analysis here starts from 2004. European Commission (2015). *Commission Decisions on State Aid to Broadband*. See Appendix 1, Sheet 2: European Commission Decisions on State Aid to Broadband, 2003-2015 for a complete list of such decisions and a summary of the projects funded and the total amount of funding involved. Sheets 3 and 4 in the same Appendix summarize the funding by country and by year. http://ec.europa.eu/competition/sectors/telecommunications/broadband_decisions.pdf

[17] European Commission (2015). *Commission Decisions on State Aid to Broadband*. http://ec.europa.eu/competition/sectors/telecommunications/broadband_decisions.pdf

> Although some ILECs argued that the Commission was not empowered to include broadband (as part of the BSO),1 the Commission rejected this argument. (parenthetical phrase added, footnote in original).

In support of its contention, the filing refers the reader to paragraph 63 of CRTC 2011-291, which is reproduced below in its entirety:

> In the Commission's view, market forces and targeted government funding will continue to drive the rollout and improvement of broadband Internet access services in rural and remote areas. This approach will give service providers the greatest flexibility to choose technologies and prioritize rollout in a manner that best responds to consumer demand. The Commission will continue to monitor the availability of these services to all Canadians through analysis of data provided by Internet service providers.

The above paragraph does not reference a finding by the CRTC that it has the authority to include broadband as part of the BSO.

The filing also refers the reader to note 33 of CRTC 2011-291, but this note is clearly referring to the Commission's authority to impose an obligation to serve for PES in forborne exchange services, but includes no reference to broadband.

Please provide all references to CRTC decisions that indicate that the Commission has explicitly determined that it has the statutory authority to include broadband as part of the BSO.

Response:

We base our claims on two ideas: first, that in 2011-291 the CRTC did not include broadband internet access in the Basic Service Obligation because it believed that it was premature at that time to do so for the reasons it set out in paragraph 63, i.e. that "market forces and targeted government funding" would do the trick, not because it believed that it *could not* do so.

Second, the Commission explicitly rejected the idea that universal service should be narrowly construed and only "lawfully imposed where there is a monopoly". To be sure, footnote 33 in the 2011-291 decision is *attached* to a paragraph (46) that focuses on PES. However, the CRTC's remarks here are clearly directed at the argument commissioned by Bell Canada in the Ryan Memorandum,[18] among other places, that the concept of universal service is to be construed as applying only to (a) a narrowly defined range of basic services that does *not* include broadband internet and (b) areas of the country "where there is a monopoly".

[18] M.H. Ryan, Memorandum of Opinion to Bell Canada regarding TNC 2010-43 – Obligation to Serve, April 26, 2010.

The Commission explicitly "notes its disagreement" with both claims in footnote 33 in 2011-291 and finds them "unduly narrow". Footnote 33 is replicated in full below to highlight the Commission's claims that it in fact has "broad statutory powers" to achieve "broad policy objectives":

> . . . Certain parties submitted that an obligation to serve can only be lawfully imposed where there is a monopoly. Because there is no monopoly, these parties argued that the Commission does not have the legal authority to impose an obligation to serve in forborne exchanges. The Commission notes its disagreement with this argument. In the Commission's view, it is *unduly narrow*, is *inconsistent with the broad statutory powers granted to the Commission*, *and fails to recognize the broad policy objectives to which the Commission must have regard* (*emphasis added*, CRTC, 2011-191, fn. 33).

This was not a new or novel interpretation of its authority in this regard, either. While I am not a lawyer, there are many regulatory decisions as well as statutory and common law sources that can be identified to flesh out just what the CRTC's authority in this area is.

As far back as 1999, the CRTC was making determinations regarding Internet transmission services vis-à-vis the basic service objective. In Telecom Decision CRTC 99-16, "Telephone service to high cost serving areas," for instance, the Commission included "Individual line local service with touch-tone dialing, provided by a digital switch with capability to connect via low speed data transmission to the Internet at local rates" as the first item to be included in the BSO. (TD 99-16 Para. 24, emphasis added).

The Commission further determined that "the basic service objective is independent of the technology used to provide service, and may change over time as service expectations evolve" (TD 99-16 Para 25).

The CRTC went on to highlight the likelihood of improvement in the state of network connectivity, stating its expectation that "over time, competitive pressures and improvements in network technology will permit basic service to include faster transmission speeds" (TD 99-16, Para 28, emphasis added).

As we are all aware, broadband represents the change that the Commission anticipated. The Commission's earlier expectations were made explicit during the most recent review of the BSO in 2011, where it stated: "While dial-up access was the norm when the basic service objective was created, broadband speeds have become the prevalent means of accessing the Internet" (2011-291, para. 55).

Although the Commission did not at that time determine that broadband ought to be included in the basic service objective, the fact that it was being considered

stands for the proposition that to do so would be within the CRTC's powers. This reading is consistent with Footnote 33 in that decision. The same point applies as well with respect to the current BSO Review.

In addition, the CRTC underlined the broad scope of its authority when it comes to ensuring that Canadians have access to broadband Internet access services in its NorthwesTel Modernization decision (TD 2013-711). As it states in the preamble to that decision,

> The Commission made its determinations with the view to achieving various objectives, including improved broadband Internet services and increased availability of advanced mobile wireless services, so that northern Canadians receive telecommunications services comparable to those available to other Canadians (CRTC, TD 2013-711, p. 1).

If it is not sufficiently apparent from the foregoing that the Commission anticipated a role for broadband within the ambit of the basic service objective from its very inception, and that this continues to be the case in light of its current review, then it is abundantly clear from a reading of the *Telecommunications Act* itself that the CRTC has the authority to consider broadband as part of the basic service obligation.

The Act imposes upon the CRTC an *obligation* to "exercise its powers and perform its duties under this Act and any special Act (a) with a view to implementing the Canadian telecommunications policy objectives and ensuring that Canadian carriers provide telecommunications services and charge rates in accordance with section 27; and (b) in accordance with any orders made by the Governor in Council under section 8 or any standards prescribed by the Minister under section 15" (§47). Of course the substance of section 7 and the Bernier Directive is well known. However, to be explicit, several aspects of section 7 of the *Telecommunications Act* underpin such authority, namely sections 7:

a) to facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions;
b) to render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada;
c) to enhance the efficiency and competitiveness, at the national and international levels, of Canadian telecommunications;
[…]
g) to stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services;
h) to respond to the economic and social requirements of users of telecommunications services

The Commission's general powers with respect to Canadian Carriers and telecommunications services are also found at §32 of the Act, and include the following:

"32 The Commission may, for the purposes of this Part,

a) approve the establishment of classes of telecommunications services and permit different rates to be charged for different classes of service;
b) determine standards in respect of the technical aspects of telecommunications applicable to telecommunications facilities operated by or connected to those of a Canadian carrier;
[…]
g)in the absence of any applicable provision in this Part, determine any matter and make any order relating to the rates, tariffs or telecommunications services of Canadian carriers."

The broad foundations upon which the Commission can and does act with respect to the basic service obligation and other telecommunications policy issues were also addressed in at least two submissions to the 2011-291 proceeding. For instance, Dr. Barbara Cherry cast light on how the obligation to serve was a deep-seated and distinguished principle of common law, regardless of any specifically enumerated statutory powers. Moreover, she also indicated that such authority was independent of whether markets are monopolistic or competitive, or at least that the emphasis placed by some on the existence of a monopoly being a prerequisite was exaggerated and misunderstood. As Cherry observed, the fundamental principle is that those who commit to providing an essential service such as broadband internet access should do so with an eye to providing such services universally and without discrimination.[19]

Similarly, a submission by the Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic (CIPPIC) also concluded that at least three broad sources underpinned the CRTC's authority to bring broadband internet access within the scope of the Basic Service Obligation if it so decided:

1. the relevant sections of the *Telecommunications Act*, most of which have already been presented above;
2. common law obligations that are not limited to monopolistic utilities; and
3. the interplay between the Act and the common law obligation to serve is such that the former is far broader than the latter.

Taken altogether, these powers and the record of regulatory decisions outlined above are befitting of a statutory administrative tribunal tasked with regulating a large and complex industry that deals in technological goods and services. They

[19] Cherry, B. A. (2010). Legal Opinion to PIAC regarding TNC CRTC 2010-43 – Obligation to Serve.

speak directly to Telus' question, that is, they demonstrate the CRTC's broad statutory authority to make determinations on matters such as the status of broadband vis-à-vis the basic service objective.

Question: Winseck(TELUS)02Nov15-3

Reference: Canadian Media Concentration Research Project – Intervention – Phase 1 of Telecom Notice of Consultation CRTC 2015-134, Rethinking Universal Service for the 21st Century and an All-IP World, *Review of basic telecommunications services,* August 14, 2015. At paragraph 76 of the filing, the following statement appears:

> One simple change that we urge the Commission to make is to measure broadband needs in terms of households with multiple devices running.

a. As part of the current BSO, does the CRTC require that POTS be provided in a manner that facilitates simultaneous voice telephone conversations and facsimile transmissions within a given household?

b. Please provide all references to CRTC documents, including decisions, notices and orders, that support the answer provided in part (i).

Response:

No, not that I am aware of.

Question: Winseck(TELUS)02Nov15-4

Reference: Canadian Media Concentration Research Project – Intervention – Phase 1 of Telecom Notice of Consultation CRTC 2015-134, Rethinking Universal Service for the 21st Century and an All-IP World, *Review of basic telecommunications services,* August 14, 2015. At paragraph 78 of the filing, the following statement appears:

> The preamble to CRTC 2015-134 in which the Commission promises to "*examine which telecommunications services Canadians require to participate meaningfully in the digital economy*" raises concerns that the CRTC might be set to lowball broadband Internet uses again. To be sure, enhancing people's ability to participate in the digital economy is an important goal, but it is not one the CRTC should pursue at the expense of "non-economic" activity.

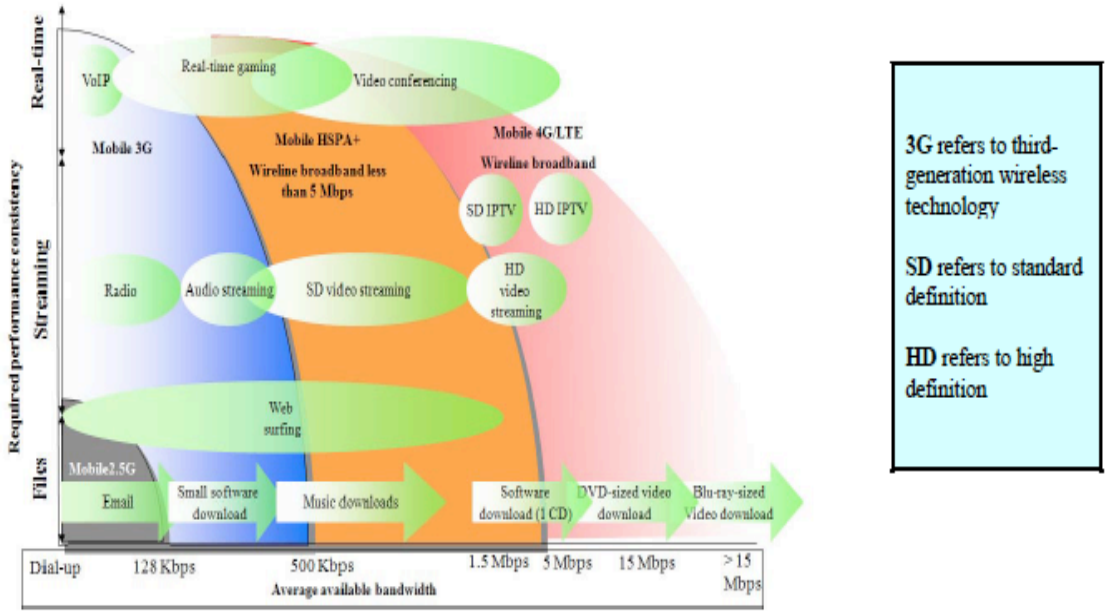
Please describe the broadband applications that are possible with the recommended standard of 25 to 30 Mbps that are not possible with the government's current standard of 5 Mbps.

Response:

As the online activities of Canadians evolve, so too do their requirements for greater bandwidth to support new and innovative digital services. This has long been the case, and dramatically increasing demand for bandwidth (seemingly without abatement) has been concretely and consistently documented by reputable sources, for instance by network equipment manufacturer Cisco's yearly *Visual Networking Index*,[20] and in successive iterations of network service provider Sandvine's *Global Internet Phenomena Report* (free registration required).[21] Indeed, these reports demonstrate that increasing demand for advanced connectivity is a global phenomenon.

A variety of applications are driving this increasing demand. The CRTC's *Communications Monitoring Report* (2015) provides information on the bandwidth requirements of applications, as well as an explanation of its method for determining these requirements (see Figure 1 below).

Figure 1: Popular Internet Applications – Bandwidth Requirements (



Source: CRTC Technology Resource Centre

[20] http://www.cisco.com/c/en/us/solutions/service-provider/visual-networking-index-vni/index.html
[21] Sandvine (2015, Dec). *Global Internet Phenomena: Africa, Middle East, and North America*. https://www.sandvine.com/downloads/general/global-internet-phenomena/2015/global-internet-phenomena-africa-middle-east-and-north-america.pdf

At Appendix 10, the CMR explains that it attempted to simulate the experience that regular consumers would have in accessing these various services and applications. The CRTC noted that "[t]he speed of the network connection on which the services were measured was significantly higher than the maximum observed data rate requirements of any of the services measured" and that its measurements were taken "on a relatively "idle" network without interfering applications or services."[22] The CRTC went on to recognize that the conditions under which it carried out its measurements are ideal, and do not necessarily reflect those that face typical consumers in real life situations. "In a typical consumer scenario," the Commission noted, "the available bandwidth at any given moment can vary due to numerous reasons, including resource sharing between multiple devices on a home network […] Although the end-user's internet connection is one factor in determining the quality and stability of a stream, other factors can include network congestion, server load, network/server latency, and end-user device capability."[23]

Of the applications canvassed by the CRTC's report, video conferencing, SD IPTV, HD IPTV, HD video streaming, software downloads, and video downloads are identified as requiring greater than 5Mbps downstream network bandwidth for "performance consistency."

Video

High definition video streaming is the first and most obvious example of a service that requires bandwidth in excess of the Commission's current basic service requirement of 5Mbps download/1Mbps upload.

Sandvine reports that real-time entertainment (e.g. online video) makes up the lion's share of peak period downstream traffic on North American fixed-access networks (see Figure 2 below).[24] Of this traffic, Netflix ranks #1 as the single highest downstream application (as shown in table 1 below).[25] Netflix itself recommends a speed of 5.0 Mbps for HD quality video, and 25 Mbps for Ultra HD quality streaming.[26]

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[22] CRTC (2015). *Communications Monitoring Report*. Appendix 10.
[23] ibid.
[24] Sandvine (2015). Global Internet Phenomenon, Latin America, North America. https://www.sandvine.com/downloads/general/global-internet-phenomena/2015/global-internet-phenomena-report-latin-america-and-north-america.pdf
[25] ibid.
[26] https://help.netflix.com/en/node/306?ba=GSButtonClick&q=

Figure 2: Peak Period Traffic Composition (North America, Fixed Access)

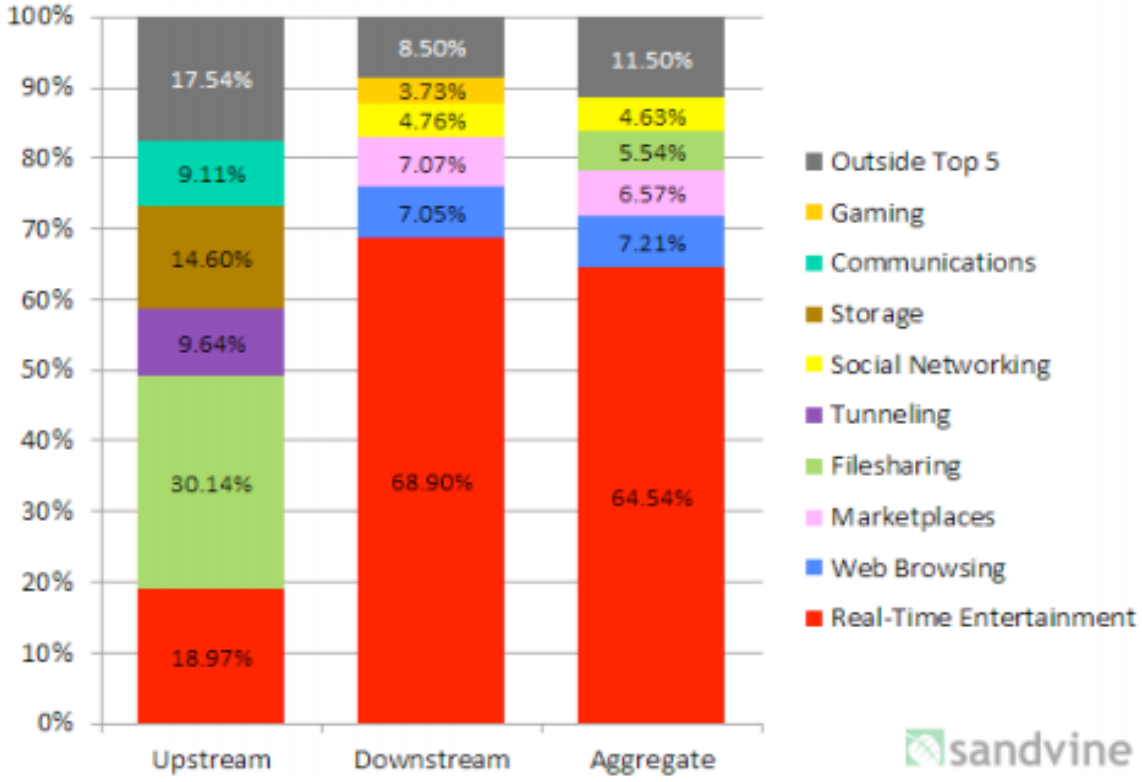

Table 1: Top 10 Peak Period Applications, 2015 (North America, Fixed Access)

	Upstream		Downstream		Aggregate	
Rank	Application	Share	Application	Share	Application	Share
1	BitTorrent	26.83%	Netflix	36.48%	Netflix	33.81%
2	SSL - OTHER	7.11%	YouTube	15.56%	YouTube	14.63%
3	HTTP	6.74%	HTTP	6.02%	HTTP	6.08%
4	Netflix	6.00%	iTunes	3.36%	BitTorrent	4.85%
5	iCloud	5.16%	BitTorrent	2.76%	iTunes	3.12%
6	YouTube	4.72%	Facebook	2.65%	Facebook	2.60%
7	Skype	3.45%	MPEG - OTHER	2.07%	SSL - OTHER	2.30%
8	FaceTime	2.22%	Amazon Video	1.97%	MPEG - OTHER	1.92%
9	Facebook	2.02%	Hulu	1.91%	Amazon Video	1.82%
10	Dropbox	1.83%	SSL - OTHER	1.91%	Hulu	1.77%
		66.07%		74.68%		72.89%

sandvine

Looking to the future, Cisco predicts that 31% of television sets will be 4K TVs by 2019, which require a bitrate of about 18Mbps (double the HD bit rate), neither of

which are supported by the current 5/1 standard (Figure 5).[27] Cisco further predicts that Ultra-High Definition (i.e. 4K) video will account for 21% of global Video on Demand traffic by 2019 (today it accounts for 0.2%). The US Federal Communications Commission (FCC)'s 2015 *Broadband Progress Report* makes similar observations (para. 30).[28]

Other countries outside make much the same case. Thus, as far back as 2009, Sweden's *Broadband Strategy*[29], for example, made the following observations in favour of adopting the EC's *Digital Agenda* goals that were being contemplated at the time as *minimal* set of standards open while needing to remain open to even more ambitious standards if circumstances demanded it:

> . . . The trend is towards increased demand for high speeds in order to be able to make use of more bandwidth-demanding services such as digital media, cloud computing and good-quality video-based communication. There is also ever increasing demand to be able to use several different services side by side. The complexity is in being able to specify how much the need for broadband will increase over the period up to 2020 and how quickly. Opinions differ, and forecasts range from 10 Mbps to 100 Mbps – with the anticipated scope of and demand for interactive services in a 5-10 year perspective playing a significant role. Depending on how demand and services develop over time, the actual need for capacity in 2020 may be either higher or lower. Despite the uncertainties that exist, demand in general may total 100 Mbps in 2020. . . . If the assumptions change, there may therefore be a need to review and revise the strategy and the estimates contained in it during the period up to 2015 and 2020.

Clearly, if there is any expectation that Canadians will be able to continue partaking in the clear trend toward online distribution of video and an ever expanding range of broadband internet uses, maintaining a minimum standard of 5 Mbps download speeds just isn't going to cut it.

Multiplying users, multiplying connections

Canadians households are adopting digital devices in greater numbers, a trend which increases demand for broadband network capacity. Cisco notes that North Americans had an average of 6.1 devices and connections in 2014, and predicts that this number will increase to 11.6 per capita by 2019, representing a 13.5% increase over that period.[30] As the number of connected devices increases, so

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[27] Cisco (2015). "The Zettabye Era: Trends and Analysis." Available at: http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/VNI_Hyperconnectivity_WP.pdf

[28] Insert citation

[29] Government Offices of Sweden (2009) Broadband Strategy for Sweden (2009) http://www.government.se/contentassets/0bce88ee130f4892ac1590fbc242aaa7/broadband-strategy-for-sweden

[30] ibid. Table 2.

too will households' requirements for bandwidth. This has been recognized by the FCC as well, which notes in its *Broadband Progress Report* that "tremendous consumer demand for broadband" is being driven by a litany of factors, and a significant factor driving that increase relates to the fact that "consumers within a household routinely use multiple applications simultaneously" (paras. 28-29), demanding more bandwidth than may be necessary for any single application viewed in isolation.[31]

As noted above, the CRTC has observed that software downloads may require bandwidth in excess of 5 Mbps to achieve consistent performance. It is not difficult to see how this is the case. Modern information and communications technologies increasingly require constant connectivity to function properly, to keep software up to date, and to ensure that users' digital information remains secure from viruses or other forms of malicious intrusion. Consider the frequent and data-intensive updates required by Windows and OS X operating systems. Sandvine recently observed that operating system updates, such as the July 2015 upgrade to Windows 10 and the September 2013 upgrade to iOS 7 can account for a significant range of network traffic on release (between 3-8% for the former and 15% for the latter). If not handled properly, the large files that computer and other device users are required to download can "put tremendous pressure on networks which can make the experience frustrating for subscribers and stressful for network operators," Sandvine observed.[32] Of course, the slower the connection, the greater the frustration.

Functions such as software updates are often pre-arranged, taking place "in the cloud" without user intervention. In other words, in many cases, software downloads and updates may be taking place "in the background" without a user's conscious knowledge, using bandwidth that, as the CRTC observes, may negatively affect other concurrent uses (e.g. VoIP, video conferencing, gaming, video streaming). These types of situations are likely to become more common as machine-to-machine (M2M) or "Internet of Things" applications work their ways into the home.

Adding to the already high amount of household devices making demands on broadband networks, Cisco predicts that global M2M connections will more than triple between 2014 and 2019, from 3.3 billion to 10.5 billion. Of these, Cisco predicts that home applications such as automation, security, surveillance, white goods, and tracking applications will account for 48% of all M2M connections by 2019; global M2M-originated traffic is expected to increase 15 times over the

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[31] FCC *2015 Broadband Progress Report*. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2015-broadband-progress-report

[32] Sandvine (2015, Dec). "Global Internet Phenomena: Africa, Middle East, and North America." Available at: https://www.sandvine.com/downloads/general/global-internet-phenomena/2015/global-internet-phenomena-africa-middle-east-and-north-america.pdf

same period.[33] Although some M2M connections may only require low bandwidth when considered individually (not including video-based services such as home surveillance), taken collectively, the proliferation of devices requiring marginally greater bandwidth can be expected to have a significant aggregate effect on household demand for bandwidth, and it seems highly unlikely that 5Mbps/1Mbps connections will be sufficient to keep up, if it even is today.

Data caps and Speed Limits

In the Canadian fixed broadband market, residential plans are primarily differentiated by speed: lower-speed tiers correspond to lower prices. However, when considering the applications that broadband services can support, one must also take into account the data caps that come attached to those plans. Lower-tier plans also come with lower monthly data caps than more expensive, faster plans, as we observed in our original submission (paras 85-98, and our fourth recommendation). Therefore, when considering which applications can be supported by 5 Mbps service tiers as compared to those that are enabled by 25 Mbps service, the relative data caps are also a relevant factor.

This is a fact that is recognized by most Internet service providers in Canada, which typically provide their customers with guidelines for determining which broadband tiers support their needs. For instance, TELUS recommends different service tiers to its customers based on the following criteria (Figure 3):[34]

Typical uses	Recommended plans
Browsing the web, shopping, banking Emailing (without huge attachments) Viewing some YouTube videos Occasional Skype use (voice only)	TELUS Internet 6 or higher
Video chatting/conferencing Moderate use of streaming audio/video Some online gaming Regular use of social media	TELUS Internet 25 or higher
Heavy use of video streaming Regular online gaming Frequent up/downloading of large files Multiple users on multiple devices	TELUS Internet 50 or 100 Heaviest users should consider upgrading to Unlimited Data Usage

[33] Cisco (2015). "The Zettabye Era: Trends and Analysis." Available at: http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/VNI_Hyperconnectivity_WP.pdf pp. 10-12.

[34] http://www.telus.com/en/ab/support/article/managing-internet-data-usage/?lang=en&prov=ab&INTCMP=TcomInternetUBB

It is clear from the forgoing that TELUS' 6 Mbps service tier is intended only to support a limited functionality, while its next lowest service tier (25Mbps) can support a much wider range of applications. TELUS even recommends that, in order to make fulsome use of online activities such as online gaming, frequent downloading of large files (e.g. software updates, digital game or software downloads), or to support multiple uses, customers should subscribe to 50 or 100 Mbps service tiers.

Question: Winseck(TELUS)02Nov15-5

Reference: Canadian Media Concentration Research Project – Intervention – Phase 1 of Telecom Notice of Consultation CRTC 2015-134, Rethinking Universal Service for the 21st Century and an All-IP World, Review of basic telecommunications services, August 14, 2015. At paragraph 102 of the filing, the following statement appears:

> The use of spectrum policy to raise money for the treasury rather than to promote universal access or universal service is also a concern. . . . In our view, this practice should stop, with revenues raised from spectrum auctions earmarked specifically for the purpose of advancing universal broadband internet service policy aims.

On page 3, paragraph V of the Recommendations, the following statement appears:

> As revenues from POTS continues to decline, the Commission should expand the range of services that contribute to the National Contribution Fund to include retail Internet access revenues, with a general levy on all broadband carriers adopted that is equal to the estimated cost of meeting these new standards.

Please explain why the Recommendations propose an industry-specific tax for funding broadband rather than governmental funds raised from spectrum auctions?

Response:

The proposal to use funds from spectrum auctions and to augment the National Contribution Fund should be seen as two means designed to further a single goal: achieving whatever universal service obligations the Commission decides upon in this proceeding. However, since radio spectrum policy is the purview of Industry Canada and outside the scope of the CRTC's authority, we did not refer to it explicitly in our recommendations. Our recommendations emphasized only those matters that fell squarely within the CRTC's mandate while including other matters such as spectrum policy in the broader discussion of our document.

This does not vitiate our concern in paragraph 102, however, that proceeds from spectrum auctions should be earmarked specifically to furthering universal service aims and other goals of telecommunications policy rather than be used as a general revenue generator for the Treasury for purposes that have little or nothing to do with the goals of telecommunications-internet policy at hand.

This has long been a concern, as para 102 of our original submission observes but which Telus obscures through the use of ellipsis (…) in its question to us on this point. The omitted passage distills the essence of our point on this matter, and thus it is useful reinsert the section which Telus omits here:

> One of the earliest aims of telecoms policy reform worldwide from the 1980s onwards was to tackle the misuse of monopoly PTT services to fund the general treasury versus developing service.[35] This practice was derided as undermining access and affordability and was one of the first steps taken to roll back the PTT monopoly regime in contexts where government ownership reigned, but spectrum auctions are now being used in a very similar way, including by the Government of Canada.

As Eli Noam observed, "Conceived in the original sin of budget politics rather than communications policy, spectrum auctions are doomed to serve as collection tools first and allocation mechanism second".[36] Noam's statement was made in 1998, but similar concerns remain today on account of the large sums raised via spectrum auctions but also because there is little clarity as to where such proceeds are used once collected. Some countries, notably Austria, have specifically earmarked proceeds from spectrum auctions, or a significant portion thereof, to the goal of extending broadband to under- and un-served areas.

As a general consideration, the high cost of acquiring spectrum raises the cost of providing the service and, consequently, the price of communication services. As such, the approach works at cross-purposes with promoting universal service goals.

Using the proceeds of spectrum auctions to fund the general Treasury budget is also inefficient and akin to a tax on communications services whereas the goal of improving adoption levels should be to tax such services as little as possible. However, when other policy goals indicate the value of using a policy tool like spectrum auctions, i.e. efficiently allocating access to a scarce public resource like spectrum, the use of the tool should be limited and as precisely targeted as possible at furthering the specific aims of telecommunications-internet policy rather than to further general policy aims out of the general budget. This also furthers the aim of achieving as much transparency as possible in terms of

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[35] Melody, W. (ed.)(1997). *Telecoms Reform. Principles, Policies and Regulatory Practices*. Lyngby, Denmark: Technical University of Denmark.

[36] Noam, E. (1998). Spectrum Auctions: Yesterday's heresy, today's orthodoxy, tomorrow's anachronimsm. *Journal of law and economics*, *41*, 765-790.

setting the purpose and use of public policy tools. Austria, for instance, took this approach recently when it specifically setting aside half of the proceeds from its most recent spectrum auction (€1 billion) for the purpose of increasing access to next generation access networks, i.e. broadband internet connections with speeds of 30 Mbps or more.

-- END --