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IMPLEMENTATION OF NATIONAL BROADBAND PLANS:

Agreed Regulatory Principles and their Evolution

Abstract

In a number of different *fora* (particularly the OECD and the ITU) governments have adopted a set of principles which are intended to guide the roll-out of national broadband networks. These principles include, but are not limited to, effective competition, technological neutrality, and the existence of an independent telecommunications regulator, to name just three.

The WTO Agreement also contains a set of principles and rules that apply to the supply of services in the telecommunications sector, which also apply to national broadband networks.

Since these principles and rules were adopted in the late 1990s and early to mid 2000s, numerous governments have moved ahead with the conceptualization and implementation (roll-out) of their national broadband plans, with varying degrees of adherence to the principles and rules initially agreed upon.

This paper discusses the underlying context of national broadband plans as well as the various stakeholders and interests involved in their formulation and adoption. It then discusses some of the most important principles that have been agreed shall govern the roll-out of these plans before analyzing how the plans of three governments in particular - Australia, Singapore and the United States - have fared in adhering to these principles. It concludes with a discussion of the possible implications of any deviations from the agreed principles where these may have occurred.

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Table of Abbreviations and Glossary

3G	Third-generation of mobile phone networks which allow high-speed data access as well as voice communication
4G	Fourth generation of cellular wireless standards, successor to 3G
ACCC	Australian Competition and Consumer Commission
ADSL	Asymmetric digital subscriber line: a data communications technology that enables faster data transmission over copper telephone lines than a conventional voice-band modem can provide.
ATM	Asynchronous transfer mode: a standard switching technique designed to unify telecommunication and computer networks
BIS	Department for Business, Innovation and Skills (of the United Kingdom)
CISP	Working Party on Communication, Infrastructures and Services Policy at the OECD previously known as TISP (see below)
DCMS	Department for Culture, Media and Sport (of the United Kingdom)
FCC	Federal Communications Commission (of the United States)
FTTH	Fiber-to-the-Home
GATT	General Agreement on Tariffs and Trade
GATS	General Agreement on Trade in Services (of the WTO)
GPS	Global Positioning System
GSR	Global Symposium for Regulators (within the ITU)
HFC	Hybrid fiber-coaxial: a broadband network which combines optical fiber and coaxial cable
ICT	Information and communications technology
IDA	Infocomm Development Authority of Singapore
Infocomm	Information and communications (Singapore only)
iN2015	Intelligent Nation 2015: a 10-year development plan by the Government of Singapore to help the nation realize the full potential of ICT.
IP	Internet protocol
IPTV	Internet Protocol TV
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
ITU-R	ITU Radiocommunication Sector
ITU-T	ITU Telecommunication Standardization Sector
Mbps	Megabits per second
NBN	National Broadband Network (of Australia)
NBN Co.	NBN Co Limited, a wholly Australian government-owned company
NBP	National Broadband Plan (of the United States of America)
Next Gen NBN	Next Generation Nationwide Broadband Network (of Singapore)
NUS	National University of Singapore
OBI	Omnibus Broadband Initiative: the FCC team responsible for drafting the NBP
OECD	Organization for Economic Cooperation and Development
PTT	Postal, Telegraph and Telephone
RIM	Research in Motion (of Canada)
VDSL2	Very-high-speed digital subscriber line 2: an access technology that exploits the existing infrastructure of copper wires that were originally deployed for traditional telephone service.
TISP	Working Party on Telecommunication and Information Services Policy at the OECD, now replaced by the CISP (see above)
WTO	World Trade Organization

I. FRAMING THE DISCUSSION

1. A Restatement of Accepted Principles

Two overriding trends seem to have characterized Information and communications technology (ICT) markets over the last three decades, both of which can be summarized in one, simple word, namely "change". On the one hand, we have seen continual and rapid technological changes, including but not limited to digitalization of virtually all information and media, the development and wide-scale adoption of new communications technologies such as wireless and the Internet, and convergence between media, information technology and telecommunications platforms and industries.¹ The second trend is that inherent to the dual policies of privatization and liberalization, as governments have moved from being operators of telecommunication networks and suppliers of services over these networks towards being mere regulators of this sector, coming more to rely on private or partially privatized entities to operate these networks and provide these services.² The implementation of privatization and liberalization has been undertaken in the face of governments' general recognition of the fact that these policies were just two of several vital steps needed in order to introduce effective competition to telecommunications markets. At the same time, governments recognized that given the constant and dynamically changing nature of ICT, it was only under a certain degree of competition that network operators and service providers would feel any compunction at all to drive or at least stay abreast of technological developments and to offer the benefits of technological innovations to end-users (businesses and consumers) at prices these end-users could ultimately afford. As one commentator has observed: "[reliance] on market forces forms a big part of the received conventional wisdom about managing the ICT sector and moving towards a broadband future."³

The conventional wisdom thus seems to point towards an array of policy approaches, which, if properly designed and (more importantly) effectively implemented, would generally lend themselves to creating and maintaining an environment of robust competition on ICT markets. These policies include the following:⁴

- Establishing an independent telecoms regulator and ensuring transparency and effective due-process in its decision making mechanisms and any recourse against its decisions;
- Safeguarding against abuses by the former monopoly incumbent or dominant service provider;
- Enforcing cost-based inter-connection;
- Non-discrimination⁵ as an effective principle for licensing procedures, access to networks and the right to offer and supply services;
- Ensuring that licensing regimes and procedures are clear and fair;
- Ensuring that limits on foreign participation are not overly restrictive;
- Mandating access to scarce resources such as spectrum and other network infrastructure.

Moreover, much of this conventional wisdom has been codified and adopted in numerous policy guidelines, codes of best practice, and to some extent, multilaterally binding rules as discussed below (Section II).

¹ See Cave, Majumdar and Vogelsang (2002), at p. 3.

² See Manner (2002), at p. 9.

³ Horton (2011), at p. 2.

⁴ This list largely paraphrased from Manner (2002), at pp. 6-8.

⁵ The term "non-discrimination" in the telecommunications sector has a broader meaning than is otherwise attributed to it in trade policy. In telecoms, "non-discrimination" applies both in the context of foreign versus domestic competitors as well as market incumbents versus new entrants, or those suppliers using established technologies and business models versus those looking to enter or stake out a position on a market with new technologies and business models.

Many of these policy approaches are merely the expression, in the sphere of telecommunications, of what has become more generally accepted as economic orthodoxy for the economy as a whole, namely that market forces and competition, although not always impervious to certain failings, are nevertheless the soundest stewards of economic governance. Be that as it may, this orthodoxy has recently become increasingly subject to challenge by various sovereigns as they seek to re-assert the role of government as owners and to some extent operators of telecommunications networks. This is indeed the underlying focus of the present research paper. As governments have come to appreciate the strength and vitality of market forces, they have also come to recognize the importance of ICT as a strategic asset, and have sought to re-impose themselves more assertively into the mix of owner-regulator-operator. Nor have governments been particularly shy about their motives and ambitions as we shall see below in Section III.⁶

Today, more than ever, information and data are rapidly emerging as both a new asset class⁷, and as a source of raw power.⁸ The networks that carry this information and the suppliers that link end-users to one another over these networks are at the heart of new ideological battles and geopolitical struggles that are being played out between many countries and across various goods and services markets. The outcome of these battles and struggles is by no means certain. Moreover, governments in both developed and developing countries recognize that as the forces of globalization take hold, countries are in relentless and unforgiving competition with each other to establish and retain entire industries, with the prevailing ICT network infrastructure and the ease, reliability and affordability of being connected to it being one of a handful of decisive factors for firms.

2. Defining Broadband

Although this paper is not about broadband *per se*, but rather about national broadband plans, it is nevertheless useful to establish a clear understanding on what technologies we are talking about. Below, I discuss broadband's place in the broader context of policymakers' objectives, before discussing various accepted interpretations of broadband. I end this discussion with some views on why broadband ultimately may or may not matter.

A. Broadband's Place in the Broader Policy Framework

In order to delimit the scope of the present research paper, I define national broadband plan in a relatively narrow sense⁹, meaning a plan to bring high speed Internet connectivity to the entirety (or overwhelming majority) of a country's resident population and businesses¹⁰. Such national broadband plans are typically part of a wider policy framework involving access to digital information transport infrastructure and related services *per se* and which is more often than not itself part of an even wider focus on national economic development or competitiveness¹¹. This is clearly the case in the three national broadband plans discussed in this paper, where such plans form part of a set of wider strategic objectives ranging from moving the nation out of recession and towards economic recovery (the US), bringing the benefits of connectivity to the nation as a whole (Australia) and positioning the country as a world leader in ICT to leverage established and emerging regional and global dominance in a number of other economic sectors (Singapore).

⁶ By way of an example here, the Labour government in Britain under former Prime Minister Gordon Brown stated, when announcing its plan entitled "Digital Britain", that it felt market forces alone would not produce the desired outcomes, arguing "Britain needs an active industrial policy ... leaving everything to the market would leave Britain behind."; see Department for Culture Media & Sport and Department for Business, Innovation and Skills, (2009), at p. 1.

⁷ See World Economic Forum et al. (2011).

⁸ See Brown, Chui, and Manyika (2011) as well as Hansen and Nissenbaum (2009).

⁹ Instead of say a country's plan on the digital economy as a whole.

¹⁰ Usually in excess of 90 percent.

¹¹ See Department for Culture Media & Sport and Department for Business, Innovation and Skills, (2009), at page ii.

B. Differing Interpretations of what Constitutes Broadband

Historically, broadband tended to be defined in terms of how it differed from what had come before it, namely dial-up service. Thus, broadband was an Internet connection that was fast and always on.¹² The United States' National Broadband Plan uses the following definition: "[the] term broadband commonly refers to high-speed Internet access that is always on and faster than the traditional dial-up access."¹³ The International Telecommunication Union defines broadband as "transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0 Megabits per second (Mbps)."¹⁴ Nevertheless, the ITU also notes that, in light of the continually changing nature of the underlying technologies "the definition of broadband also continues to evolve."¹⁵ The OECD, in a 2003 consensus document, defined broadband as "a set of digital communication technologies with the capacity to transmit significant amounts of data at a high rate, supporting the delivery of a range of digital services, some or all of which can occur simultaneously."¹⁶

Various national broadband plans purport to have their own definition of what constitutes "broadband" or "high-speed" Internet access, defined in terms of download (and sometimes upload) speed targets. As we shall see below, the Australian National Broadband Network is relatively ambitious in that it aims to achieve speeds ranging from 12 to 100 Mbps.¹⁷ Hungary's plan seems to have more modest objectives, aiming to achieve speeds of between 2 and 30 Mbps.¹⁸ For the purpose of the analysis provided here, I shall assume a wider definition of broadband, more in line with that of the ITU or OECD than of those countries looking to achieve given performance indicators at the upper or lower end of current technological capacities.

C. Why Broadband Networks (Probably) Matter

As already alluded to above, governments' roll-out of national broadband plans are inevitably linked to the belief that doing so is in the wider national economic interest and will bring benefits that justify the massive infusions of capital investment required to achieve these projects. Singapore's Next Generation Nationwide Broadband Network (Next Gen NBN), a project under a national development policy known as the Intelligent Nation 2015 (iN2015) Master Plan, claims that it "will transform Singapore into an intelligent nation and a global city, powered by info-communications"¹⁹ as well as "reinforce the status of Singapore as an info-communications hub and open new doors to economic opportunities, business growth and social vibrancy."²⁰ The United States' National Broadband Plan makes similarly bold claims in its introduction, stating "[l]ike electricity a century ago, broadband is a foundation for economic growth, job creation, global competitiveness and a better way of life".²¹ In Australia, the government also extols the presumed virtues of its National Broadband Network by claiming it will "support a new wave of digital innovation that will change and improve the way Australians live their lives, receive services and connect with the world" as well as helping to improve the country's productivity.²²

Looking past the hyperbole and the highly optimistic pronouncements of governments, some commentators have pointed out that due to various limitations on the data that has been collected in the

¹² Horton (2011), at p. 16.

¹³ See http://www.broadband.gov/about_broadband.html/ (accessed on Nov. 15, 2011).

¹⁴ See <http://www.itu.int/osg/spu/publications/birthofbroadband/faq.html> (accessed on Nov. 15, 2011).

¹⁵ *Ibid.*

¹⁶ See OECD (2003), at p. 2.

¹⁷ See OECD (2011), at p. 13.

¹⁸ *Ibid.*

¹⁹ The term "info-communications" or simply "infocomm" is the official Singaporean government term for what is elsewhere generally referred to as "ICT".

²⁰ See <http://www.ida.gov.sg/Infrastructure/20090717105113.aspx> (accessed on Nov. 26, 2011).

²¹ FCC (2010), p. XI.

²² See Australian Government "National Broadband Network: Progress update August 2011", available for download at: <http://www.dbcde.gov.au> (accessed on Nov. 15, 2011).

relatively short time that broadband has been introduced, serious difficulties present themselves when it comes to making truly rigorous and evidence-based analysis, and thus coming to scientifically sound conclusions on the basis of this data.²³ Other commentators, in addition to pointing out the weakness of existing empirical evidence purporting to support the many claims of broadband's positive effects, also point to other, more ominous, implications of broadband, namely some "unwanted outcomes " (like further erosion of privacy, exacerbation of skills gaps and thus income inequalities, and increased social marginalization of individuals who already find it hard to interact with their peers due to overuse of the existing opportunities that Internet connectivity affords, like interactive gaming etc).²⁴

Nevertheless, even the casual observer can surmise that the benefits brought about by the revolutionary changes ushered in with the advent of the Internet will only be magnified with the wide-scale adoption of broadband. Information and media will be more readily available and can be accessed faster and more affordably, and this is bound to aggregate the already sizeable productivity gains made since the 1990s due to technological developments in ICT. Of course, no policy exists in a vacuum, and as such, for broadband networks to bring the much touted gains, various flanking policies will need to be in place to ensure such things as freedom of information, free transfer of data, education policies to bridge the digital divide, but also to strengthen protection of privacy, prevention of fraud and enhancing the ability of aggrieved parties to take effective action against those who would misuse the opportunities that broadband brings with it to do harm to their fellow Internet users. Following on from this point, it is also important to remember that broadband in and of itself is merely an enabling technology (albeit a very powerful one), which, when accompanied by the right underlying fundamental factor availabilities and regulatory/policy environments, can produce important spill-over effects or positive externalities in terms of productivity gains, overcoming the tyranny of distance, reducing the cost of services provided directly or indirectly over information networks, as well as many other benefits.

The recent scramble by governments to roll-out broadband network recognizes these benefits but is also a symptom of a perceived need to maintain national competitiveness vis-à-vis other, similarly placed countries. Nobody wants to be behind the curve as the next innovation-based advancements are made in technology and the way people work, live and interact with one another. The battle to stay close to the forefront of network technologies is also driven in part, by national security considerations, which is no surprise given that many of these technologies were originally designed for military applications.²⁵

In sum, it is a fairly uncontroversial statement that broadband matters, although the jury is still out when it comes to quantifying exactly how much it matters and whether this justifies the billions of dollars in public funding governments are pouring into it.²⁶ By doing so, governments are betting that the future will continue to be one where the importance of information - access to it and the ability to send and receive it in ever-growing quantities and at ever-growing speeds and diminishing costs - will continue to grow and that the ability to do so will be an important determinant for economic growth, prosperity and competitiveness.

3. Affected Stakeholders

Many elements of government, the business community, civil society and consumers as a whole are affected by the roll-out of national broadband plans. Below I introduce some of the stakeholders as well as the issues they bring to the discussion.

²³ See for example: Katz (2010), at p. 1, who concedes that "[t]hese challenges notwithstanding, the evidence accrued by research so far is beginning to support the hypothesis that broadband has an important economic impact".

²⁴ See Firth and Mellor (2005).

²⁵ GPS and the Internet being just two (well-known) examples.

²⁶ Interestingly, Goh (2011) reports that the Government of Singapore commissioned the NUS to do its own study of the impact of broadband on productivity, but that the findings are "confidential and classified" which raises the question of why the findings have not been made public.

A. Interest Groups as Stakeholders and their Concerns

Defining the various stakeholder groups affected by the roll-out of a national broadband plan can be relatively complex and generally tends to elude any clear delineating criteria beyond, say, the most fundamental of distinctions, namely that of suppliers versus users. Nevertheless, a perfunctory glimpse at the numerous entities and groups that filed submissions in response to two of the three national plans reviewed here, gives one an indication of which groups perceive themselves as having the most to win or lose from the implementation of such plans. These invariably involve a mix of academic institutions, typically seeking to influence the debate in terms of general efficiency gains for the economy as a whole²⁷; industry associations representing their members who are typically either Internet service providers or suppliers of the technologies and/or infrastructure required for Internet connectivity²⁸; or civil society groups advocating a specific set of concerns, such as freedom of speech or net neutrality²⁹; or yet again businesses or institutions which rely heavily on the Internet for the provision of their services, in industries as diverse as health care, education and distribution services; or finally users representing either a specific geographic region (say, residents of rural or geographically isolated areas)³⁰ or a given demographic constituency (e.g. senior citizens).

B. Government as Stakeholder and its Mandate

Because broadband plans are generally part of a wider policy debate centered around national competitiveness or economic growth, they tend to originate in the executive, either in the Office of the Prime Minister or the equivalent office in presidential systems. But this is not always the case. For example, the United States' National Broadband Plan was the result of a mandate given by Congress to the FCC in 2009, in the context of the Stimulus Package following the 2008 Financial Crisis (I discuss this in more detail below, in Section III). Regardless of where these plans originate, they are ultimately overseen by either the telecoms regulator (as is the case in the United States and South Korea by the Federal Communications Commission and the Korea Communications Commission respectively), or another specialized ministry-level agency, such as the Infocomm Development Authority of Singapore (IDA) or the Department of Broadband, Communications and the Digital Economy in Australia.³¹ It is typically (although not always) this agency that will have to navigate the complex regulatory issues involved with rolling out a national broadband network and ensuring vibrant competition among the suppliers who provide services by means of this infrastructure.

Normally, the main implementing agency will solicit and receive input from various stakeholders when formulating its plan. By way of example, in the process of consultation that it conducted when elaborating the National Broadband Plan, the FCC reports that it issued some 31 public notices (inviting submissions) and received some 23,000 comments.³²

In terms of involvement of other government agencies in the formulation and implementation of a national broadband plan, the telecommunications regulator inevitably plays a key role, but other agencies will also weigh in, particularly those overseeing sectors where the gains are perceived to be greatest, such as health and education, and from those government portfolios where overriding interests prevail, such as defense and the intelligence community. The ministry or department with general

²⁷ See for example the submission by the Centre for Ideas and the Economy of the University of Melbourne, available for download at: <http://cite.org.au/store/catalog/BroadbandNetworkExpertPanel.pdf> (accessed on Nov. 15, 2011).

²⁸ See, for example, the submission by Infrastructure Partnerships Australia, available for download at: <http://www.infrastructure.org.au/DisplayFile.aspx?FileID=292> (accessed on Nov. 15, 2011).

²⁹ See for example the comment submitted to the FCC by the association Media Access Project, available for download at: <http://fjallfoss.fcc.gov/ecfs/document/view?id=6520219774> (accessed on Nov. 15, 2011).

³⁰ See for example the FCC's aggregated comments by consumers from Oklahoma, available for download at: <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021716645> (accessed on Nov. 15, 2011).

³¹ It is worth noting that in the Australian context the Australian Competition and Consumer Commission ACCC also plays a very important role as the regulator of network industries, like telecommunications.

³² See US FCC OBI, (2010) preface.

responsibilities towards the economy as a whole will also be involved in the formulation of the plan. Ultimately, because the economy-wide implications of a national broadband plan are so far-reaching, and because the interests touched upon are so varied, almost every government agency will contribute in one way or another, big or small.

Also important as a government stakeholder is usually parliament or (in the US) Congress, since it will have to approve funding appropriations and enact into law any legislation required to support the planned roll-out. Parliaments can and do play an important oversight role in the context of these plans, ensuring that they are drafted to meet the concerns of the population and other interests more broadly, and that the resources allocated for their attainment are in proportion to the objectives pursued and the outcomes achieved.

Finally, one of the most important policy objectives of national broadband initiatives in large countries with sparsely populated areas is generally to bring hitherto poorly serviced regions and populations into the fold and provide them access to information networks that is equal to or almost at par with that enjoyed in more densely-populated areas. This inevitably involves engagement and participation from regional or local governments in these areas, and their voice will typically carry considerable weight in the process of conceptualizing, designing and implementing a national broadband plan.

In sum, the government is arguably the most important stakeholder in the formulation and adoption of national broadband strategies, since it initiates, conceptualizes, implements and oversees them. The effectiveness of the plan as ultimately implemented, and its responsiveness to the needs of the population it is intended to serve, will nevertheless be a function of the government's ability and willingness to both obtain and process input and feedback from the various constituencies it both serves and must work together with, namely other stakeholders, whether they be end-users, infrastructure or services suppliers, or others.

4. International Cooperation

For the purposes of establishing what principles or constraints may apply to the manner in which national broadband plans are implemented, we turn primarily to three *fora*, namely the International Telecommunication Union already alluded to above, the Organization for Economic Cooperation and Development, and the World Trade Organization.

A. The ITU Framework

The ITU has a very comprehensive framework under which broadband issues are addressed, and as a universal organization (as opposed to the OECD with a much more narrowly defined membership), whose members include not only sovereigns but also communications providers and academic institutions, its approach is also more multi-faceted than that of other institutions, focusing not just on policy issues, but also technology and standards to name just two. The ITU's work on broadband takes place in each of its three sectors, comprising Radiocommunication (ITU-R), Standardization (ITU-T), and Development (ITU-D).³³ In addition, in May 2010, the ITU, in conjunction with UNESCO, established the Broadband Commission for Digital Development with the stated purpose of highlighting the importance of broadband in achieving the Millennium Development Goals.³⁴ Finally, the ITU also has a body known as the Global Symposium for Regulators (GSR), which, since its launch in 2000, has allowed regulators and policymakers from developed and developing countries to come together during annual meetings and discuss some of the most important issues facing the ICT sector. These meetings are attended by representatives from government, the private sector, industry, and consumer organizations.

The work of the Radiocommunication Sector (ITU-R) in the context of broadband focuses on several issues, including identifying, managing and monitoring radio-frequency spectrum in order to ensure that

³³ See <http://www.itu.int/en/broadband/Pages/overview.aspx> (accessed on Nov 24, 2011).

³⁴ See <http://www.itu.int/en/broadband/Pages/broadband-commission.aspx> (accessed on Nov. 24, 2011).

broadband networks can operate without interference from other radio systems.³⁵ It is largely thanks to the work of ITU-R that we have global technical standards for wireless broadband systems, such as 3G and 4G.³⁶ Finally, ITU-R also oversees orbital allocations for satellite broadband systems.³⁷

The Standardization Sector (ITU-T) on the other hand, deals with standards and interoperability for non-wireless modes of communication, primarily in the realm of fiber (such as standards in the context of Fiber-To-The-Home [FTTH]), but also for older networks made of copper wire. Thus, in the context of broadband, ITU-T's original contribution has, among other things, been in the realm of developing standards for ADSL³⁸, which have now evolved into the super-fast "VDSL2"³⁹ standard. Also in the context of broadband, work is currently ongoing in ITU-T on such issues as cloud computing and Internet Protocol TV (IPTV).⁴⁰

The Development Sector (ITU-D) is more of a forum for policy analysis and discussion, whose work focuses on examining, together with both public and private sector ICT organizations, the "vital issues and critical success factors in broadband deployments."⁴¹ ITU-D assists ITU Member States in the design and implementation of national and regional ICT strategies and policies, which are intended to provide a legal and regulatory environment that is conducive to attracting private investment in broadband networks and high-speed services. In order to achieve this, ITU-D "develops various platforms and tools for sharing data, analysis and information on key regulatory issues as well as best practices."⁴² In addition, ITU-D also helps ITU Member States to "mobilize key stakeholders to finance, plan, build and operate broadband infrastructure, particularly where it helps underserved populations in rural areas."⁴³

The majority of the ITU's work in this area of relevance to our analysis arguably consists of the opportunities it provides for information sharing and the establishment of a set of regulatory best practices. Thus it is for example that we have a set of regulatory best practices for the satellite industry⁴⁴ in terms of their participation in rolling out a national broadband network (discussed in more detail in Section II). It is also thanks to the ITU that we have a set of Best Practice Guidelines which emerge on different issues every year from the GSR meetings.⁴⁵

B. The OECD Process

Much of the discussion at the international policy level regarding national broadband plans to date has taken place in the OECD, namely under the auspices of the Working Party on Communication, Infrastructures and Services Policy (CISP), previously known as the Working Party on Telecommunication and Information Services Policy (TISP). All OECD member countries participate in the CISP Working Party, which also involves a number of non-member participants, comprising, in alphabetical order: China, Egypt, Kenya and Uganda.⁴⁶

In its own words, the CISP Working Party reviews policy in the areas of communications and the Internet, and serves as a forum for exchanging experience between participating governments.⁴⁷ It also monitors developments pertaining to information infrastructure.⁴⁸ The lion's share of the Working Party's

³⁵ See <http://www.itu.int/en/broadband/Pages/ITU-R.aspx> (accessed on Nov. 24, 2011).

³⁶ *Ibid.*

³⁷ *Ibid.*

³⁸ As defined in standard ITU G.992.1.

³⁹ As defined in standard ITU-T G.993.2.

⁴⁰ See <http://www.itu.int/en/broadband/Pages/ITU-T.aspx> (accessed on Nov. 24, 2011).

⁴¹ See <http://www.itu.int/en/broadband/Pages/ITU-D.aspx> (accessed on Nov. 24, 2011).

⁴² *Ibid.*

⁴³ *Ibid.*

⁴⁴ See Mehrotra (2011), at pp. 36 *et seq.*

⁴⁵ See <http://www.itu.int/ITU-D/treg/bestpractices.html> (accessed on Nov. 24, 2011).

⁴⁶ See http://www.oecd.org/infobycountry/0,3380,en_2649_34225_1_1_1_1_1,00.html (accessed on Nov. 24, 2011).

⁴⁷ See http://www.oecd.org/about/0,3347,en_2649_34225_1_1_1_1_1,00.html (accessed on Nov. 12, 2011).

⁴⁸ *Ibid.*

attention is on "regulatory reform, the convergence of telecommunication, Internet, cable television and broadcasting networks over fixed and wireless networks."⁴⁹ The Working Party also conducts regular comparisons of prices for communications and Internet services among participating governments, as well as analyzing the socio-economic implications as communication markets continue to evolve. It also carries out analytical work on trade-related issues in telecommunications and information services, and plans international cooperation in these areas accordingly.⁵⁰

As early as 2003, the CISP Working Party drafted an important initial document on the establishment of broadband networks, then being at least contemplated by a large number of OECD member countries. This consensus document, entitled "Broadband Driving Growth: Policy Responses"⁵¹ set out a number of principles which had emerged among participants in the Working Party and which were ultimately taken up by the OECD Council and adopted as a Recommendation in February 2004.⁵² These principles are discussed in greater detail in Section II below. Suffice to say here that the broad thrust of these principles - which are intended to be applied by participating governments as they establish and/or review their policies supporting the development of broadband markets - relates to promoting efficiency and innovation in terms of supply arrangements and to encouraging the effective use of broadband service.⁵³

Since elaborating this set of principles, the work of the CISP Working Party has largely manifested itself in terms of regular meetings/events/conferences, as well as many publications and documents.⁵⁴ These include, by way of example, country surveys/reviews/guides, guidelines, policy briefs, projections/forecasts/outlooks, whereby the vast majority of these publications represent working papers, on topics as diverse as mobile data roaming rates⁵⁵, broadband coverage indicators⁵⁶, and developments in fiber technologies and investment⁵⁷. Arguably one of its most important publications is the biennial OECD Communications Outlook, which summarizes and analyses trends in prices and policies, as well as market developments.⁵⁸

C. The WTO Regime on Telecommunications Services

Rules on trade in services in general, and on telecommunications services in particular were a major component of the so-called Grand Bargain⁵⁹ embodied in the results of the Uruguay Round of multilateral trade negotiations, undertaken under the auspices of the then General Agreement on Tariffs and Trade (GATT), now the WTO. The Annex on Telecommunications to the General Agreement on Trade in Services (GATS) defines "telecommunications" as "the transmission and reception of signals by any electromagnetic means", a definition which without doubt encompasses the flow of data by means of the Internet and thus applies to national broadband networks.

Moreover, in the telecoms negotiations that immediately followed the formal conclusion of the Uruguay Round and which culminated in a series of separate arrangements in 1997 (generally referred to as the Fourth Protocol to the GATS), many WTO Members made a series of market access and national treatment commitments in the telecommunications sector, many of which are applicable to the flow of

⁴⁹ *Ibid.*

⁵⁰ See http://www.oecd.org/about/0,3347,en_2649_34225_1_1_1_1_1,00.html (accessed on Nov. 23, 2011).

⁵¹ See OECD (2003).

⁵² See OECD Council (2004).

⁵³ *Ibid.*, at p. 2.

⁵⁴ See http://www.oecd.org/findDocument/0,3770,en_2649_34225_1_1_1_1_1,00.html (accessed on Nov. 23).

⁵⁵ See http://www.oecd-ilibrary.org/science-and-technology/international-mobile-data-roaming_5kg9zb67l6r3-en (accessed on Nov 23, 2011).

⁵⁶ See http://www.oecd-ilibrary.org/science-and-technology/indicators-of-broadband-coverage_5kml8rfg777l-en (accessed on Nov 23, 2011).

⁵⁷ See http://www.oecd-ilibrary.org/science-and-technology/developments-in-fibre-technologies-and-investment_230526125804 (accessed on Nov. 23, 2011).

⁵⁸ See www.oecd.org/sti/telecom/outlook (accessed on Nov. 23, 2011).

⁵⁹ See Ostry (2000).

data by means of the Internet and thus to national broadband plans. In addition, many of the WTO Members who participated in the post Uruguay Round telecoms negotiations adopted a number of additional commitments on regulatory principles under the so-called Reference Paper, which also apply to the manner in which they chose to regulate any national broadband networks within their sovereign territories.

We examine the scope and substance of these rules and commitments below in Section II. Suffice to say that these rules have already been used in efforts to pry open the telecommunications markets of recalcitrant WTO Members⁶⁰ and they impose very real and relatively "hard-law" obligations on Members in terms of how they choose to regulate access, by service providers, to telecommunications networks such as those addressed under national broadband initiatives.

5. Excursus: Some Important Concepts

The decisions various governments have taken with regard to the roll-out of their national broadband initiatives, to be discussed in more detail in Section III, are motivated by a number of concerns, the most important of which are inevitably the resource constraints they face and the political-economy environments they must govern in. Also important to understanding the underlying dynamics behind governments' policy choices are some very fundamental economic and technical concepts which I explain in brief detail below.

A. External Adoption (Network) Effects and Interconnection

Network effects have been the subject of a substantial body of economic research since the 1970s and 1980s, which posits that the value of a good and/or service depends on the number of other users of the same (or interoperable) good and/or service, and that this value rises as the number of new users also increases.⁶¹ A closely-related concept is that of external adoption effects, subject to which "demand for a network good is a function of both its price, and the expected size of the network"⁶², so that - to give a more modern example - owners of iPhones with the latest operating system (at the time of writing iOS 5) find their iPhones of growing utility the more people upgrade to the new software, because they can video-chat with other users using *Facetime*, (instead of settling for a conventional voice call or using *Skype* video conferencing), and can text-message them using *iMessage* instead of sending a paid SMS or having to download and register for a similar digital network messaging service, such as *WhatsApp*).

Another example of external adoption effects is Indonesia, where this concept explains why Apple has not been as successful at making inroads into the mobile handset market as Research in Motion (RIM) with BlackBerry, because BlackBerry's free Instant Messenger service has been so universally taken up, that it is now very difficult for another handset supplier to displace RIM.⁶³ Put another way, a computer, phone, tablet or any other device for accessing, storing and exchanging information via telecommunications networks is of little value in and of itself. It firstly requires a network to connect to (making it a complementary good or one that only has value as part of a system), and secondly requires other users so that they can interact with one another to exchange information. Only subject to these conditions can the device serve its purpose as an information and communications platform.

⁶⁰ This was the case in the WTO Mexico-Telecoms dispute, discussed in more detail in Section II, and this also happens regularly in the context of WTO accession working parties, where applicants are generally forced to make far-reaching concessions towards opening their telecommunications markets.

⁶¹ See Gandal (2008).

⁶² Katz and Shapiro (1994), at p. 96.

⁶³ See video: "Why Indonesia is BlackBerry nation", in *CBC News: Technology and Science*, posted: Oct. 31, 2011 4:08 PM ET | last updated: Oct. 31, 2011 4:15 PM ET available for download at: <http://www.cbc.ca/news/technology/story/2011/10/31/technology-indonesia-rim-blackberry.html> (accessed Nov. 23, 2011).

Interconnection is a related concept, and emerges once different networks offer the same service to different users, but do not allow these users to connect with one another if they are not on the same network. One of the earlier examples of this phenomenon was the public railway systems of different colonial governments in Australia, which did not use the same sized gauges, so that travelers had to literally change trains at the border of each territory.⁶⁴ In the context of telecommunications networks this phenomenon manifests itself either between local and long-distance networks,⁶⁵ between mobile and wire-line networks, between different wireless network providers, and finally between domestic and foreign carriers.⁶⁶

The importance played by these two concepts in the context of government roll-outs of national broadband plans is obvious. Firstly, the economic utility at the micro level (for end-users) increases with each new connection to the network, and every time new services become available via the network or content is added to the World Wide Web. At the macro level, the "evidence is fairly conclusive that broadband has a positive contribution to GDP and that this contribution is magnified as penetration increases."⁶⁷ In terms of the interconnection debate, governments have to roll-out broadband networks and allow existing network operators to connect to it in a manner which is both fair (in terms of equitable) and does not favor certain network operators over others (non-discrimination).

B. Economies of Scale and Density

Theories on economies and diseconomies of scale are well established in economics and were originally conceptualized in the context of firms' long-run average costs of production.⁶⁸ In the telecommunications context, the same basic rules apply, namely the costs of adding an additional connection (subscriber or customer) to a network diminish with each new customer added. This is due to the comparatively high fixed costs of rolling out a network relative to the low marginal cost of adding new connections. As explained by Nuechterlein and Weiser "it is often cheaper per customer for a carrier to provide service to the one millionth customer than to the one thousandth customer."⁶⁹ Related to the concept of economies of scale is that of population density, since the economics of rolling out a network in a geographically smaller and more densely populated area are more favorable and costs can be recouped faster and more easily than is the case for networks stretching across vast distances of sparsely populated territory. This asymmetry also creates scope for so-called cherry-picking, whereby suppliers serve only the most profitable, densely populated areas. As we shall see below, the economics of geography and population density ultimately played a large role in policymakers' approaches on how to roll out national broadband networks and ensure effective downstream competition on these networks in the case studies analyzed here.

C. Market Failure

Market failures come in various forms and configurations but are generally defined as any situation where markets have not allocated resources efficiently.⁷⁰ One type of market failure is information asymmetries, where the parties to a given transaction have vastly different information with regard to the underlying value of the transaction, resulting in an outcome that is Pareto inefficient. Another type of market failure is concentration of market power in such a way that a single economic actor or small group of economic actors are able to alter market outcomes (normally by setting excessively high prices)

⁶⁴ See undated press release by Australian Rail Track Corporation (ARTC) "The Rise, Decline and Rise of Australia's Railways", available for download at: http://www.artc.com.au/library/agreement_railwayrise.pdf (accessed Dec. 3, 2011).

⁶⁵ See Nuechterlein and Weiser (2007), at pp. 5-7 for a description of this phenomenon on early 20th Century telecommunications markets.

⁶⁶ This was essentially the issue in the WTO *Mexico-Telecoms* case, see Report of the Panel in *Mexico - Measures Affecting Telecommunications Services* (WT/DS204/R), circulated on April 2, 2004.

⁶⁷ Horton, p. 4.

⁶⁸ See Mankiw (2011), at p. 272 *et seq.*

⁶⁹ Nuechterlein and Weiser (2007), at p. 11.

⁷⁰ Mankiw (2011), at p. 12.

in their favor and in a manner which is again sub-optimal in terms of market efficiency. This is probably the most common kind of market failure in the telecommunications context, where former monopoly incumbents flex their market power and abuse their effective dominance over networks to distort competition and achieve market outcomes that make everybody but themselves worse off. Another kind of market failure is constituted by negative externalities, where the actions of one set of economic actors have negative effects which are borne by another set of participants, i.e. those creating these negative effects do not have to pay the true price for causing them. The most commonly cited textbook example of negative externalities is pollution. This last type of market failure tends to play only a subordinate role in the context of telecommunications, but can manifest itself in terms of signal interference when sharing spectrum or slow download speeds when sharing network capacity. Nevertheless concentration of market power and abuse of a dominant position are the more prevalent causes of market failure on telecoms markets and the lion's share of regulatory efforts in this sector are aimed at achieving effective competition in an environment where market power is concentrated in the hands of one or two actors.

D. Infrastructure-based versus Service-based Competition

One important concept inherent to the telecommunications industry is that of infrastructure-based (also known as facilities-based) versus service-based competition. Whereas competition is understood to mean having two or more market actors contesting a given market, i.e. providing telecommunications services to subscribers, this competition can be fought out either over separate networks, with each supplier providing services and connectivity over a network that it owns and operates itself (infrastructure-based competition), or suppliers can compete by providing different services to end-users over the same network (services-based competition). The distinction is important because it affects costs and thus pricing, but it can also have important ramifications for the quality of the services provided, especially if one network is inferior to another (in the case of infrastructure-based competition), or where the access afforded to one supplier over the same network is inferior to that enjoyed by another on the same network (in the case of services-based competition).⁷¹

The distinction is also important for policymakers and regulators, since both forms of competition have their own up-sides, down-sides and trade-offs. Infrastructure-based competition by definition leads to duplication and this might be wasteful, inefficient and thus be associated with an overall welfare loss. Services-based competition on the other hand might require closer and more rigorous oversight by regulators and thus be more costly to administer on any kind of consistent and long-term basis.⁷² Ultimately policymakers will need to decide which inefficiencies are less costly on aggregate (i.e. in terms of both economic cost, as well as political economy and socio-economic terms), and thus "will face a trade-off between competition and returns to scale".⁷³

E. Convergence

Convergence has traditionally been understood in terms of various technologies converging to provide an operating platform upon which an array of services can be supplied that were previously offered via different networks and/or technologies. Convergence is playing an important role redefining the role of networks and the dynamics of markets, since "[h]istorically, different networks were designed and deployed to carry different types of traffic."⁷⁴ Thus it was that fixed-line and mobile telephone networks traditionally carried voice traffic, cable networks carried video and the Internet carried "packet-based data traffic".⁷⁵ Today, thanks to convergence your cable television provider is also your telephone provider and also offers high speed Internet, all over the same network infrastructure (so-called triple

⁷¹ See Bergman (2004) for a thorough discussion of these two modes of competition.

⁷² This all the more so where technologies and thus the overall competitive environment is constantly evolving. This is a phenomenon Bergman (2002) refers to as "pure bureaucracy costs", p. 3.

⁷³ Ibid, at p. 2.

⁷⁴ See Taylor (2010), at p. 47.

⁷⁵ Ibid.

play). Alternatively, with a high-speed Internet connection, a subscriber can surf the World Wide Web, make voice/video calls and watch television and other media programming, all thanks to convergence.

Another way to understand convergence is the process by which different actors, who traditionally operated at one level of the "telecommunications value chain", are now seeking to contest markets at various levels of this value chain, either against one another or against new entrants.⁷⁶ This often involves a process of vertical integration by market actors, so that, by way of example, those who traditionally created content merge with those who supplied access to networks or manufactured equipment (such as the merger of Time Warner with AOL, or the acquisition of Columbia Pictures by Sony). Another example of this kind of convergence is Google, who began its life by providing tools to navigate the enormous amount of information available on the Internet, but then went on to become one of the largest email platforms (challenging traditional suppliers of this service like Yahoo! and MSN), and who is now the market leader in mobile smart-phone operating systems (Android), followed by Apple, which itself began its life as a maker of computer hardware and software, but is now a leading smart-phone manufacturer (iPhone) and digital content retailer (iTunes). Finally, Facebook, originally a social networking site for students at American Ivy League universities, took a tentative step along this road when it evolved from a social network into being a real-time communications platform by means of its *Messenger* application⁷⁷, which can be downloaded to smart phones or tablets, and can also be used via an Internet browser for voice or video conferencing.⁷⁸

As technologies converge and as market participants step up to contest different layers of the telecommunications value chain, this creates additional complexities for regulators seeking to promote effective competition and ensure market outcomes that are in the broader national economic interest. As we shall see below, the different (albeit in some respects remarkably similar) approaches taken by the three government plans analyzed in the case studies performed here, reflect different responses to the complexities posed by convergence and the other economic concepts discussed above.

⁷⁶ See Rieck (2010), at pp. 150-151.

⁷⁷ Google has long done the same with its Gmail Chat and Google Talk applications.

⁷⁸ See also: Singh and Raja (2010), at pp. 9 *et seq.* who talk about three (rather than two) different types of convergence.

II. AGREED REGULATORY PRINCIPLES AND APPLICABLE RULES

We begin by looking at what principles have emerged from the ITU, before comparing them with those upon which consensus has been reached at the OECD. Finally we set out the body of rules applicable under the WTO.

1. Agreed Principles under the ITU Framework

Under the ITU Global Symposium for Regulators (GSR), which has been meeting every year since 2000 to discuss developments as they pertain to the regulation of ICT, a number of best practices guidelines have emerged which contain non-binding guidance to regulators on how to regulate various aspects of ICT markets and how to promote various policy goals such as effective competition, universal access, digital inclusion and others. Below, I focus on three sets of such best practices guidelines which are particularly pertinent to the discussion here. These are 1) Best Practice Guidelines for the Promotion of Low Cost Broadband and Internet Connectivity which were adopted in the context of the 2004 Symposium; 2) a set of emerging regulatory best practices for the satellite industry, which were discussed (but have yet to be adopted) in the context of the 2011 Symposium; and 3) Best Practice Guidelines on Regulatory Approaches to Advance the Deployment of Broadband, Encourage Innovation and Enable Digital Inclusion for All, which were adopted at the 2011 Symposium.

A. *Best Practice Guidelines for the Promotion of Low Cost Broadband*

These guidelines, adopted in 2004,⁷⁹ set out a number of important principles, including the need for an effective and separate regulator, transparency in the regulatory process and the adoption and enforcement of clear rules. They also advocated competition across many areas of the value chain and tackling any bottlenecks on access to essential facilities on a non-discriminatory basis, i.e. without favoring any one operator (notably the former monopoly incumbent) over another, as well as eliminating any unfair market advantage. These guidelines also endorsed technology neutrality and the elimination of unnecessary regulatory burdens, as well as minimizing licensing hurdles. In order to reduce uncertainty and risk for potential investment they encouraged setting out a clear regulatory strategy for the private sector.

B. *Emerging Regulatory Best Practices for the Satellite Industry*

Although not formally adopted at the 2011 GSR, these principles⁸⁰ were submitted for discussion by regulators, and set out universally accepted principles, particularly non-discrimination and transparency. Among other things, they advocate removing limitations on the number of satellite services providers and as well as burdensome authorization conditions for use of foreign satellite systems. They also discourage any obligation for satellite operators to establish a local presence (technical or commercial) in the country where "the satellite's footprint comes down, but where the satellite operator himself does not provide any service on the ground".⁸¹ These principles also advocate the removal of restrictions on foreign ownership as well as requirements that force foreign satellite operators to enter into partnerships with domestic incumbents. Finally, the principles call for licensing procedures to be "efficient, transparent and equitable"⁸² and be applied in the same manner to foreign as they are to domestic operators.

⁷⁹ See http://www.itu.int/ITU-D/treg/bestpractice/2004/best_practice_e.pdf (accessed Dec. 10, 2011).

⁸⁰ Set out in Mehrotra, R. (2011) at p. 32

⁸¹ *Ibid.*

⁸² *Ibid.*

C. Best Practice Guidelines on Advancing the Deployment of Broadband

These guidelines,⁸³ adopted at the 2011 GSR, speak of the need to "balance regulatory certainty with flexibility and liberalization on a global scale"⁸⁴ Adopted after several ITU members had already begun with the large scale roll-out of national broadband initiatives, these principles seem to explicitly recognize a greater role for the state in shaping some of the underlying framework conditions needed for broadband to achieve its many policy objectives. These guidelines expressly note that whereas it is the private sector which will play "the central role" in the development of broadband networks, it also recognizes that market incentives might not always be sufficient so that the state may have to step in to partner with the private sector. These guidelines also seem to recognize and endorse various ways in which governments can support the roll-out and take-up of broadband, including "smart subsidies" (i.e. subsidies that do not distort markets) and "targeted fiscal incentives to providers of broadband networks, services and equipment". Such incentives are listed as just one way in which policymakers and regulators can stimulate private sector investment in the ICT sector, the others being "adopting enabling policies, simplifying licensing regimes, making available more spectrum" and "reducing regulatory obligations". Other areas for engagement by policymakers and regulators include establishing and overseeing an environment which promotes "dynamic digital content creation, dissemination and adoption". These guidelines also advocate channeling investment to public research and development, and recognize the importance of enforcing intellectual property rights.

In many ways however, these guidelines also endorse many of the free-market and competition-friendly policies that have previously been recognized in the telecommunications sector such as open access arrangements (unbundling), the sale or lease of infrastructure in a transparent and non-discriminatory manner, the elimination of barriers to new entrants (whether foreign or domestic), technology neutrality when promoting universal service schemes, making more spectrum available pursuant to "incentive-based, market-driven" approaches, and "[r]educing regulatory burdens and employing the least degree of regulatory intervention". Nevertheless, it is clear to even the casual observer that governments' thinking has evolved over the last decade and particularly over the second half of the 2000s, with regard to what the proper level of government involvement should be in the ICT sector in general and in the roll-out of national broadband plans in particular.

2. Agreed Principles under the OECD Process

A. The 2004 Recommendation and the 2008 Seoul Ministerial

A 2003 consensus document issued by the Directorate for Science, Technology and Industry's Committee for Information, Computer and Communications Policy, entitled "Broadband Driving Growth: Policy Responses"⁸⁵ sets out a number of policy principles to guide broadband development,⁸⁶ which were subsequently endorsed and adopted in a 2004 OECD Council Recommendation.⁸⁷ These policies were essentially the following:⁸⁸

- Effective competition and continued liberalization;
- Encouragement of investment in new infrastructure, content and applications;
- Technological neutrality at the policy and regulatory levels;
- Recognition of the primary role of the private sector;

⁸³ See http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR11/consultation/GSR11_BPG_E.pdf (accessed Dec. 10, 2011).

⁸⁴ *Ibid*, page 1.

⁸⁵ Available for download at: <http://www.oecd.org/dataoecd/18/3/16234106.pdf> (accessed Dec. 10, 2011).

⁸⁶ Page 3.

⁸⁷ Recommendation of the OECD Council on broadband development adopted by the Council at its 1077th Session on 12 February 2004.

⁸⁸ Taken from OECD (2011), p. 8.

- A culture of security to enhance trust in the use of ICTs;
- Both supply-based approaches and demand-based approaches;
- Promotion of access on fair terms, irrespective of location;
- Assessment of market-driven availability and diffusion;
- Regulatory frameworks that balance the interests of suppliers and users; and
- Encouragement of research and development.

These policy guidelines were subsequently augmented at the OECD Ministerial for the Future of the Internet Economy, which took place in Seoul in 2008, and issued a statement advocating measures to "stimulate investment and competition in the development of high capacity information and communication infrastructures and the delivery of Internet-enabled services within and across borders", as well as the broadest possible access to and use of national broadband networks by citizens and more efficient use of radio frequency spectrum.⁸⁹

B. The 2011 Communiqué on Principles for Internet Policy-Making

A 2011 document entitled "OECD Communiqué on Principles for Internet Policy-Making", although not limited to broadband policies specifically, also contains some policy guidelines that OECD members have agreed on, and which, like the 2011 regulatory best practices document of ITU's Global Symposium of Regulators, shows that policymakers' thinking seems to have evolved somewhat since the early days of broadband roll-out in the first half of the 2000s. The Communiqué was adopted under the auspices of a High Level Meeting in June 2011, which included representatives of OECD members, Egypt, and private-sector stakeholders, such as the Business and Industry Advisory Committee to the OECD (BIAC) and the Internet Technical Advisory Committee (ITAC).

In the Communiqué, members emphasized that "in certain cases, public support and investment may be needed to ensure the greatest practical availability of these networks in our countries, in particular in rural and remote areas, and that such public intervention should support market competition and promote private investment initiatives."⁹⁰ The Communiqué also recognizes the important role that governments can play in "stimulating the use of broadband Internet networks in areas such as science, education, health, transportation and smart electricity grids as well as promoting the use of Internet for an ageing society."⁹¹ The Communiqué also recognizes the importance of the "free flow of information and knowledge, the freedom of expression, association and assembly, the protection of individual liberties".⁹²

After the preambular language described above, the principles agreed upon in the Communiqué comprise the following:⁹³

- Promote and protect the global free flow of information;
- Promote the open, distributed and interconnected nature of the Internet;
- Promote investment and competition in high speed networks and services
- Promote and enable the cross-border delivery of services
- Encourage multi-stakeholder co-operation in policy development processes;
- Foster voluntarily developed codes of conduct;
- Develop capacities to bring publicly available, reliable data into the policy-making process;
- Ensure transparency, fair process, and accountability;
- Strengthen consistency and effectiveness in privacy protection at a global level;
- Maximise individual empowerment;
- Promote creativity and innovation;

⁸⁹ *Ibid.*

⁹⁰ OECD (2011b), p. 2.

⁹¹ *Ibid.*

⁹² *Ibid*, p.3

⁹³ *Ibid*, pp. 3-6.

- Limit Internet intermediary liability;
- Encourage co-operation to promote Internet security;
- Give appropriate priority to enforcement efforts.

Even the casual observer will notice that the emphasis within the OECD has shifted (and expanded) considerably as manifested by the change in policy priorities evident between the 2003 principles and those agreed in 2011. Governments seem to have retreated from the somewhat *laissez faire* approach set out in the 2003 principles, to a more interventionist approach in pursuit of a broader array of desired policy outcomes.

3. Applicable Rules under the WTO

Without wanting to delve too deeply or provide too expansive an explanation into the working of the WTO's General Agreement on Trade in Services,⁹⁴ I limit the exposé provided below to the greatest extent possible to those rules which apply to telecommunications services and thus to government roll-outs and subsequent regulation of broadband networks.

A. The General Agreement on Trade in Services (GATS)

The GATS is perhaps best understood as a set of generally applicable provisions, binding upon the WTO membership as a whole, and another set of provisions, the application of which is limited to the extent WTO Members have scheduled specific market-opening and other commitments in specified service sectors. Thus Part II of the GATS, entitled General Obligations and Disciplines, sets out a number of core principles incumbent upon any WTO Member, given the GATS' status as part of the so-called Single Undertaking.⁹⁵ These would include most-favored nation treatment (MFN) under GATS Article II,⁹⁶ transparency under GATS Article III, and some general obligations on domestic regulation - applicable for those sectors where specific commitments have been made - under GATS Article VI. Other such provisions of general application under Part II of the Agreement include those on monopolies and exclusive service suppliers intended to ensure that such suppliers do not undermine a Member's MFN commitments or otherwise abuse their market power (GATS Article VIII), and those on business practices (GATS Article IX), under which Members recognize that certain business practices of service suppliers other than monopoly suppliers may restrain competition, and undertake to consult, on request, with a view to eliminating such practices. As we shall see below, many of the disciplines contained in the GATS Annex on Telecommunications and the Reference Paper, were in one way or another intended to strengthen the general disciplines on non-discrimination, transparency and uncompetitive practices already contained in Part II of the GATS.

Part III of the GATS, entitled Specific Commitments, sets out a number of obligations that Members have a great degree of leeway in configuring in accordance with their specific regulatory environments and willingness to liberalize, namely market access and national treatment. The provisions in Part IV of the GATS entitled Progressive Liberalization and Part V, Institutional Provisions, set out rules aimed respectively at achieving a greater degree of liberalization in services trade than achieved during the Uruguay Round, and, secondly, provisions to aid in the implementation of the GATS at an institutional level (i.e. within the newly established framework of the WTO). In terms of specific commitments in telecommunications under Part III of the GATS, these were largely made only in 1997 under the auspices of the Fourth Protocol to the GATS, since negotiations on basic telecoms continued past the end date of

⁹⁴ In terms of a general introduction to the GATS, the reader is referred to, among many good options, that by Adlung and Mattoo (2008), as well as that commissioned by UNCTAD and written by Debra Steger (2003).

⁹⁵ See, Wolfe (2009) for more on the Single Undertaking.

⁹⁶ Note, however, that unlike with the General Agreement on Tariffs and Trade, exceptions to MFN treatment could be and were scheduled by individual Members under the GATS.

the Uruguay Round of December 1993,⁹⁷ into what were commonly referred to as "overtime negotiations".⁹⁸ I discuss these specific commitments in slightly more detail below under part C of this section.

B. The GATS Annex on Telecommunications

The Annex on Telecommunications, like the GATS more generally, was primarily negotiated at the behest of and in furtherance of the interests of some of the biggest international exporters of services at the time of the Uruguay Round, particularly large financial services corporations such as Travelers Group and Citicorp. The focus of the telecoms negotiations during the Uruguay Round was very much that of a "users' agenda"⁹⁹ and this is reflected in the preamble-like language contained in Paragraph 1 of the Annex on Telecommunications, which speaks of the "dual role" of the telecommunications sector as both "a distinct sector of economic activity and as the underlying transport means for other economic activities...". The Annex on Telecommunications was intended to specifically hold telecoms regulators to a set of rules guaranteeing access to and use of public telecommunications transport networks and services. As one commentator has phrased it, "[the] essence of the Annex is the obligation to ensure that market access commitments are not frustrated by restrictions on access to and use of basic telecom networks and services."¹⁰⁰

The core provisions of the Annex are contained in Paragraph 5 which requires, in subparagraph (a), that a WTO Member must ensure that service suppliers of other Members have access to and use of its public telecommunications transport networks and services on reasonable and non-discriminatory terms and conditions, where the WTO Member in question has made specific commitments in its schedule for the services concerned. Thus, if a WTO Member has made specific commitments with regard to financial services, it must allow financial services suppliers of other Members such access to and use of its public telecoms infrastructure and services so that they may provide the scheduled services. If the service suppliers concerned are themselves providing telecommunications services, and the Member in question has scheduled commitments with respect to these precise services, then it is these service suppliers that must be accorded access to and be allowed use of public telecommunications transport networks and services on reasonable and non-discriminatory terms and conditions.¹⁰¹ This general obligation is fleshed out in more detail in subparagraphs (b) through (f), most notably in subparagraphs (b) and (c) setting out more detailed rules on what such access and use entails.

C. Specific Commitments in Telecommunications

Even at the end of the Uruguay Round negotiations, i.e. before the overtime negotiations on telecommunications, some progress had been achieved in obtaining specific commitments in this sector, most notably in what was known as value-added or enhanced telecommunications services.¹⁰² However, commitments on basic telecommunications services¹⁰³ were achieved as a result of the overtime negotiations which were completed in February 1997. These negotiations culminated in some 69 countries making market access and national treatment commitments in basic and enhanced

⁹⁷ I say "largely" here because negotiations on some so-called "value added services" did take place during the course of the Uruguay Round proper; see Bronckers and Larouche (2005) at p. 992.

⁹⁸ Overtime negotiations also included negotiations on financial services, see Sauvé (2008), at p. 600.

⁹⁹ The term "user" understood here as service suppliers, see Roseman (2003) at p. 85.

¹⁰⁰ Ibid, p. 86.

¹⁰¹ This was indeed one of the issues in dispute in the *Mexico - Telecoms* case; see Report of the Panel in *Mexico - Measures Affecting Telecommunications Services* (WT/DS204/R), circulated on April 2, 2004.

¹⁰² These would include: electronic mail, Voice mail, on-line information and database retrieval, Electronic Data Interchange ("EDI"), enhanced/Value-added facsimile services, code and protocol conversion, On-line information and/or data processing.

¹⁰³ These would include: voice telephony, packet-switched data transmission services, circuit-switched data transmission services, Telex services, telegraph services, facsimile services, private leased circuit services and others.

telecommunications services, as well as in the adoption of the Reference Paper (discussed in part D below).¹⁰⁴

A cursory look at the schedules of the three countries reviewed here reveals that each of the three made relatively liberalizing commitments on telecommunications services under modes 1 and 2, and that with regard to mode 3, each country opted to limit ownership and/or equity shareholdings by non-nationals to varying degrees.¹⁰⁵ More importantly in the context of the analysis undertaken here, each of the three countries reviewed incorporated the Reference Paper into their respective schedule of specific commitments, thereby agreeing to be bound by its provisions, which I discuss immediately below.

D. The Reference Paper

Many commentators seem to agree that even beyond the specific market access commitments obtained during the overtime negotiations on telecoms, the Reference Paper was a remarkable achievement in and of itself.¹⁰⁶ A short document of fewer than three pages, the Reference Paper contains competitive safeguards intended to proscribe abuses by major suppliers (a defined term) of their entrenched position on telecommunications markets, as well as setting out certain interconnection obligations to be enforced where necessary against major suppliers. The Reference Paper, in addition to trying to ensure a level playing field between incumbents and new entrants, also imposes transparency obligations on major suppliers as well as on regulators. Universal service obligations are to be administered in a "transparent, non-discriminatory and competitively neutral manner" which must not be "more burdensome than necessary" to achieve the desired universal service outcome defined by the Member. The Reference Paper also imposes regulatory obligations on those WTO Members which adopted it into their schedules, namely transparency obligations in the context of licensing procedures; the establishment of an independent regulator (independent from the incumbent); and procedures for the allocation of scarce resources such as spectrum or rights of way must be carried out in an "objective, timely, transparent and non-discriminatory manner".

The key provisions on interconnection are contained in Paragraph 2.2 of the Reference Paper and require that interconnection with a major supplier be "ensured at any technically feasible point in the network". In addition such interconnection must be provided under non-discriminatory terms, conditions and rates, as well as in a timely fashion, on terms, conditions and cost-oriented rates that are transparent, reasonable and unbundled.

The provisions of the Reference Paper were also tested in the *Mexico - Telecoms* dispute, where Mexico was found to be in breach of Section 1.1 of the Reference Paper by failing to maintain appropriate measures to prevent the incumbent and major supplier from engaging in anti-competitive practices, and of Section 2.2(b) by failing to ensure that the incumbent provided interconnection to US carriers at cost-oriented rates.¹⁰⁷

E. Summary of WTO Disciplines

To summarize, the WTO rules and disciplines set out above are focused on achieving a degree of competitive neutrality within the telecoms sector, where in most cases foreign market entrants will be competing against established and entrenched incumbents, with varying degrees of historical regulatory proximity to their respective governments. The act of merely scheduling market access and national treatment commitments (as practiced in so many other services sectors), was recognized as being necessary but not sufficient to underwrite the kind of legitimate market access and competitive

¹⁰⁴ Bronckers and Larouche (2005) at p. 995.

¹⁰⁵ For the US, see GATS/SC/90/Suppl.2; for Australia, see GATS/SC/6/Suppl.3; for Singapore, see GATS/SC/76/Suppl.2; all documents dated Apr. 11, 1997, all available for download at www.wto.org/english/tratop_e/serv_e/serv_commitments_e.htm (accessed on Dec. 4, 2011).

¹⁰⁶ See for example Bronckers and Larouche (2005), at p. 999.

¹⁰⁷ See Report of the Panel in *Mexico - Measures Affecting Telecommunications Services* (WT/DS204/R), circulated on April 2, 2004.

neutrality that scheduling commitments in this sector would otherwise achieve.¹⁰⁸ So negotiators agreed on enforceable disciplines to constrain established incumbents as well as to ensure regulators acted in a manner conducive to fostering and maintaining effective market access and competitive neutrality on these markets.

The recognized dynamics of privatization, liberalization, combined with enforceable regulatory disciplines, all designed to ensure effective competition, underlie the commitments WTO Members entered into in the context of telecoms negotiations both during and immediately after the Uruguay Round.

¹⁰⁸ This statement is premised on the notion that market access and national treatment concessions inscribed on a WTO Member's services schedule of specific commitments establish legitimate expectations for service suppliers in other WTO Members to both enter the market in question and contest the market on a level regulatory playing field with domestic service suppliers; see Cottier and Schefer (2000).

F. *Excursus: The WTO Work Program on Electronic Commerce*

The discussion of WTO disciplines would not be complete without mentioning recent developments under the WTO's Work Program on Electronic Commerce. Established by the WTO General Council in September 1998, following the Declaration on Global Electronic Commerce adopted at the Geneva Ministerial Conference in May 1998, the Work Program seeks to clarify existing rules and negotiate new ones on a whole range of trade-related issues as they affect electronic commerce.¹⁰⁹ Like much at the WTO since the launch of the Doha Round in November 2001, progress in the context of this Work Program has been slow, not least because of the laborious institutional structures underlying it, namely that four separate WTO bodies¹¹⁰ are required to deliberate and explore the issues in their own capacities and make intermittent reports on progress to the WTO General Council. Nevertheless, starting in May 2011,¹¹¹ Members seem to have coalesced around an understanding to reinvigorate these talks and around a set of new proposals in particular, probably with a view to achieving a modicum of progress at the Eighth Ministerial Conference, which at the time of writing has just concluded.

One such set of new proposals was circulated by Cuba, Ecuador, Nicaragua, Bolivia and Venezuela on July 14, 2011 under the heading Effective Participation of Developing Countries in Electronic Commerce as a Means to Combat Poverty.¹¹² As its title suggests, the proposal documents the economic costs, to developing countries, of the digital divide, and sets out a number of proposals for the WTO to study the issue in greater detail and issue recommendations for improving developing countries' access to global ICT infrastructure and services.

Another communication, dated July 13, 2011, was circulated by the European Union and the United States and proposed the adoption of a set of "trade-related principles designed to support the expansion of information and communication technology (ICT) networks and services, and enhance the development of electronic commerce".¹¹³ This proposal, the substance of which had been elaborated a few months earlier in the context of the Transatlantic Economic Council (TEC)¹¹⁴, set out ten principles, some of which are already familiar from other *fora*, such as transparency, non-discrimination, efficient use of spectrum, independence of regulators, interconnection and international cooperation. Others, however, push the envelope a little further than has previously been the case, and resemble, to a certain extent the OECD's 2011 basic principles for Internet policy-making, already discussed above, including: open networks, network access and use, and free cross-border information flows. Interestingly, the EU-US principles propose allowing full foreign ownership, which goes beyond what even the US has committed to in its respective GATS schedule.

The Ministerial decision that ultimately ensued from the Eighth Ministerial Conference (WT/L/843, dated December 17, 2011), the text of which had already been set out in draft form in document WT/GC/W/645 dated November 18, 2011, extended the moratorium on customs duties on electronic transmissions until the next Ministerial Conference, but otherwise did little more than recognize the importance of the principles and issues raised in the two communications mentioned above, and instructed the General Council and the other relevant WTO bodies to continue discussions on these matters in an effort to reach a consensus. But for the purpose of the analysis being conducted here, the

¹⁰⁹ For a detailed explanation of and commentary on the Work Program see Wunsch-Vincent (2008).

¹¹⁰ These are the Council on Trade in Goods, the Council on Trade in Services, the TRIPS Council and the Council on Trade and Development.

¹¹¹ See for a summary of the talks and in particular the happenings since May 2011, "Eighth Dedicated Discussion on Electronic Commerce under the Auspices of the General Council on 20 and 28 October, and 9 and 16 November 2011: Summary by the Secretariat of the Issues Raised" of November 29, 2011(WT/GC/W/644).

¹¹² Dated July 14, 2011 (WT/GC/W/635, G/C/W/650, WT/COMTD/W/179).

¹¹³ (S/C/W/338).

¹¹⁴ See European Union-United States Trade Principles for Information and Communication Technology Services, issued on April 4, 2011 by the State Department's Bureau of European and Eurasian Affairs, available at: <http://www.state.gov/p/eur/rt/eu/tec/171020.htm> (accessed on Dec. 19, 2011).

principles enunciated by the joint EU-US proposal can be taken as indicative of the way these issues will likely continue to evolve in the future.

I turn now to an examination of the national broadband initiatives of the three countries under review here in order to assess how they measure up to both the "soft" principles agreed under the ITU and OECD processes, as well as the "hard" disciplines agreed in the framework of the WTO.

III. THREE NATIONAL BROADBAND PLANS IN REVIEW

Below I set out the main constitutive elements of the three broadband initiatives under review, particularly such issues as ownership of the network(s), penetration and performance targets, universal service obligations, planned competitive frameworks and their regulatory implications.

1. Australia

A. Policy Origins

The issue of whether or not Australia needed a national and government-led approach to bringing broadband to the country as a whole had slowly been gathering traction during the early to mid 2000s, but first started to play a major role in the public policy debate at the time of the 2007 national election, where the conservative Liberal-National Coalition government was ousted by Labor after 11 years in power. Prior to winning the election, the Labor opposition at the time, led by Kevin Rudd, had been advocating a comprehensive broadband plan, and this issue is generally credited with playing a significant role in Labor's election victory.¹¹⁵ At the time, genuinely high-speed broadband was largely confined to densely populated areas, with even parts of major cities lacking affordable high-speed Internet access. The push for a ubiquitous and affordable (government-mandated) national broadband solution seems to have come both from consumers as well as businesses. Labor's 2007 election commitment was for a fiber-to-the-node network, to be built in partnership with the private sector with a public contribution of up to A\$4.7 billion. After the competitive tender for that network failed to produce an acceptable bid, the Rudd Government abandoned this approach and in April 2009 announced the far more ambitious fiber-to-the-premises National Broadband Network (NBN). Since then, the NBN has - during the course of another, this time closely-contested national election, and a subsequent implementation study - been subject to only incremental and minor modifications, so that the plan as it stands today is only slightly changed from that announced in April 2009.

In terms of its underlying policy imperative, the Australian initiative seems couched not only in terms of national competitiveness and its over-arching economic desirability, but also in terms of quality of life arguments, as well as general equity considerations between residents of town and country. In one statement outlining its expectations for the NBN, the Government noted that it "recognises that access to affordable, high speed broadband is essential to the way Australians communicate and do business. It will drive productivity, improve education and health service delivery and better connect our cities, regional, rural and remote communities."¹¹⁶

B. Conceptualization and Design

Australia's National Broadband Network envisages bringing 93 percent of Australian premises access to a high-speed fiber network capable of providing broadband speeds of up to 100 Mbps. The remaining 7 percent will be serviced by a combination of next-generation fixed-wireless and satellite technologies, with peak speeds of at least 12 Mbps.¹¹⁷ When deciding on how to achieve these (relatively ambitious) targets, the government opted not to leave matters to the two incumbents already providing high-speed wireline internet access to Australia's more densely populated urban centers, namely Telstra (the former monopoly telecoms operator) and Optus (the second carrier licensed in 1991 to compete with Telstra, now owned by Singapore Telecommunications), but instead opted to take charge of the roll-out itself, by establishing a wholly government-owned company, NBN Co Limited (NBN Co), which was charged to

¹¹⁵ See Sydney Morning Herald "Parties dig in for election on broadband" June 19, 2007, available at: <http://www.smh.com.au/news/technology/parties-dig-in-for-election/2007/06/18/1182019030446.html> (accessed on Dec. 10, 2011).

¹¹⁶ See Australian Government's "Statement of Expectations" of 17 December 2010, available for download at: http://www.dbcde.gov.au/__data/assets/pdf_file/0003/132069/Statement_of_Expectations.pdf (accessed on Dec. 10, 2011).

¹¹⁷ *Ibid.*

design, build and operate the NBN.¹¹⁸ The government's stated intention is to divest itself of NBN Co at some point five years after completion of the NBN.

Originally intended to be completed within eight years, this roll-out period now seems to have been extended somewhat to just under ten years, based on roll-out projections in NBN Co's Corporate Plan, dated December 2010.¹¹⁹ The government has committed itself to ensuring that NBN Co, when implementing the roll-out, prioritizes remote regions of the country currently lacking in high speed Internet access and to ensuring uniform national wholesale prices. In fact, the government has made clear that it intends to extend the universal service obligation into the broadband era.¹²⁰

Originally budgeted at A\$43 billion by the Rudd government when announced, NBN Co now puts the cost of rolling out the network at A\$35.9 billion.¹²¹ These costs will be met by equity injections from shareholders, namely the Australian government, who has pledged A\$27.5 billion to the project, funded through the Building Australia Fund and the issuance of Aussie Infrastructure Bonds (AIBs). These costs will also be met from revenues earned by NBN Co as it starts to provide wholesale layer 2 bitstream services to retail service providers.

C. Implementation

In terms of regulatory arrangements, the NBN is based on the assumption that it will be a monopoly national fixed line network, and that newly laid fiber networks (built after 1 January 2011) for residential and business premises will be Layer 2, and operated on an exclusively wholesale and open-access basis. NBN Co has concluded agreements with Telstra providing that NBN Co may use Telstra infrastructure where suitable (pipes, ducts, etc.), and Telstra will progressively decommission its copper network and existing hybrid fiber-coaxial (HFC) broadband network capability as the NBN roll-out progresses.¹²² A similar agreement has been reached with Optus regarding its HFC network, subject to which Optus, like Telstra shall move towards becoming one of several retail service providers.¹²³ In terms of the envisaged roll out by NBN Co once parts of the NBN become operational, it is to be the provider of the fixed access network (whether by fiber, fixed wireless or satellite) from end-user premises to the point of interconnect. The number of points of interconnect was an issue on which an initial compromise between competitive effects and economies of scale had to be found. Originally, NBN Co proposed locating points of interconnect (POIs) in the mainland capital cities (i.e. Adelaide, Brisbane, Darwin, Melbourne, Perth, and Sydney, to the exclusion of Hobart in Tasmania), with additional POIs to serve as a back-up "for redundancy purposes".¹²⁴ The ACCC, however, having reservations on such a low number for competition policy reasons, advised a considerably larger number, and the Government ultimately decided in favor of 121 POIs, with about two thirds of these to be in urban centers and the rest to be located in rural areas.¹²⁵

¹¹⁸ See Australian Government's "National Broadband Network Progress update August 2011", available for download at: <http://www.dbcde.gov.au> (accessed on Dec. 10, 2011).

¹¹⁹ See NBN Co Corporate Plan of 17 December 2010, available for download at: <http://www.nbnco.com.au/assets/documents/nbn-co-3-year-gbe-corporate-plan-final-17-dec-10.pdf> (accessed on Dec. 10, 2011).

¹²⁰ See Australian Government's "Universal Service Policy in the National Broadband Network Environment" available at: http://www.dbcde.gov.au/_data/assets/pdf_file/0020/136433/Universal_Service_Policy_in_the_National_Broadband_Network_environment.pdf (accessed on Dec. 10, 2011).

¹²¹ See NBN Co Corporate Plan of 17 December 2010 *op cit*, at p. 135.

¹²² See Australian Government's "National Broadband Network Progress update August 2011", *op cit*.

¹²³ See "Optus reaches landmark agreement with NBN Co on HFC network" 23 June 2011, available at: <http://www.optus.com.au/aboutoptus/About+Optus/Media+Centre/Media+Releases/2011/Optus+reaches+landmark+agreement+with+NBN+Co+on+HFC+network> (accessed on Dec 10, 2011).

¹²⁴ Internet Society of Australia (2011), p. 6.

¹²⁵ *Ibid*, p. 7

D. Evaluating Conformity with ITU/OECD Principles and WTO Disciplines

Voon and Mitchell (2011) have done a thorough job of analyzing Australia's plans for a NBN and the country's international trade law obligations particularly under WTO rules. Their analysis focuses on several issues including whether NBN Co.'s decision regarding Points of Interconnect is likely to run afoul of Australia's obligations under the GATS Annex on Telecommunications and the Reference Paper. On this point, they conclude that "Australia must ensure that telecommunications service suppliers of other WTO Members are permitted 'to interconnect private leased or owned circuits with public telecommunications transport networks and services or with circuits leased or owned by another service supplier'" in order to comply with its WTO obligations, particularly the GATS Annex on Telecommunications, Section 5(b)(ii).¹²⁶

Another issue examined by Voon and Mitchell is uniform national wholesale pricing and its inherently anti-competitive effects, including cross-subsidization. However, comparing the situation envisaged by NBN Co. with the situation which prevailed during the *Mexico - Telecoms* case, these authors conclude that because NBN Co. would not be fixing prices together with other major suppliers, but rather setting prices at the wholesale level on a nationwide basis, it is probably safe from challenge before the WTO, at least on the basis of the standard set for anti-competitive behavior in the *Mexico - Telecoms* case. I would add that Paragraph 3 of the Reference Paper also seems to give Members a large degree of latitude in terms of defining their universal service obligation (an issue that was also considered by Voon and Mitchell), and provides that such an obligation will not be regarded as anti-competitive *per se*, provided it is "administered in a transparent, non-discriminatory and competitively neutral manner" and is "not more burdensome than necessary for the kind of universal service defined." Given that uniform national wholesale pricing would be part of a policy to bring universal broadband service to the country as whole, it would not be difficult to find cover for its anti-competitive effects under the language contained in Paragraph 3 of the Reference Paper. This would be true even despite the fact that broadband is not explicitly part of the universal service obligation as it currently stands in Australia, since, as I have pointed out above, the government has made no secret of the fact that it intends to extend the universal service obligation into the age of broadband.¹²⁷

Assessing Australia's plans for a NBN under the guidelines and principles of the ITU and the OECD, I would posit that the following bears mentioning. The Australian plan as envisaged could cause one to question how it measures up against a number of stated principles, namely the idea of competition among various technologies and industry segments, technology neutrality, and the recognition of the primary role of the private sector. To be sure, policymakers in Australia gave up waiting, and probably rightly so, for the ladder of investment to produce a third wireline high speed network or "third pipe" that most Australians could benefit from. In response to this, and in light of the popularity among the electorate of ubiquitous broadband, the Australian Government decided to step in itself and for all intents and purposes, set up a publicly owned fiber-to-the-premises (FTTP) network.

In Section IV below I discuss public versus privately owned network infrastructure; suffice to say here that by investing so heavily in a wireline technology, the Australian government seems to have committed itself unequivocally in favor of one technology and platform, with satellite and fixed wireless only given a role at the margins. Although the strategy was adopted under the rubric of "future proofing" the plan, who can really say, given the pace and nature of change in this sector (as discussed at the very outset of this paper), that Australia will still have a commercially viable and technologically cutting edge broadband network twenty years from now, that would justify, what on current budgetary projections, is the equivalent of a public investment of approximately A\$1,575 for every resident of Australia, of which the government's own equity contribution alone represents approximately A\$1,200?¹²⁸ In sum, the

¹²⁶ Voon and Mitchell (2011), at p. 31.

¹²⁷ See Australian Government, "Universal Service Policy in the National Broadband Network Environment", *op cit*.

¹²⁸ This figure based on the A\$35.9 billion the plan is budgeted at, divided by the latest population figures for Australia, which currently put the number of residents at 22,796,065.

Australian government, with its current plan, has taken what some observers might characterize as a risky and expensive bet on the future importance of wireline technology.

In addition to being relatively cost intensive and potentially over-exposed to the risk of technological redundancy, the heavy emphasis on fiber could be seen by some to be only partially compatible with the principle of technology neutrality and the principle of allowing competition to thrive between various technologies and industry segments. At the Layer 2 segment and below, there will likely be little to no competition to the infrastructure owned and operated by NBN Co, unless wireless technologies evolve to such a point that they can perform as effectively as fiber-based networks, which would allow wireless network operators to contest wholesale and retail markets more vigorously than is likely under current technological conditions.

2. Singapore

A. *Historical and Policy Context*

In line with its consistently high level of national ambition, Singapore is credited as being the first country in the world to have rolled out a national broadband network, entitled Singapore One, which was announced in 1996 and began offering access to commercial broadband as early as 1997. However, based on Asynchronous Transfer Mode (ATM) rather than Internet Protocol (IP) technology, and underwritten by an ownership structure that included the incumbent PTT, the monopoly cable television provider, the telecoms regulator and two ISPs, all in the same consortium, a pronounced lack of competition ensued, together with low-uptake among Internet users in Singapore.¹²⁹ Over the course of the 2000s, Internet uptake improved considerably, with liberalization in 2000 and an open-access policy being adopted in 2002. Today, starting from the mid 2000s, Singapore regularly features close to the top of the international league tables in terms of penetration rates, performance metrics and affordability of broadband access.

The ubiquitous and world-class Next Generation Nationwide Broadband Network (Next Gen NBN) Singapore enjoys today is part of a broader policy framework entitled the Intelligent Nation 2015 Master Plan (iN2015). This strategy has a number of tenets, including establishing what it refers to as an "ultra-high speed, pervasive, intelligent and trusted infocomm infrastructure", developing a globally competitive ICT industry, developing an ICT proficient and globally competitive workforce, and becoming a world leader in transforming "key economic sectors, government and society through more sophisticated and innovative use of infocomm".¹³⁰ With regard to the outcomes being pursued, Singapore frames these not only in terms of improved economic competitiveness and innovation but also as a means to achieve enriched quality of life. As far as the possible applications of this planned ICT up-scaling, Singapore lists the usual purpose areas such as digital media/entertainment, education and learning, health care, as well as other, more context-specific applications in which Singapore is already a regional or world leader, like financial services, manufacturing and logistics, land management and transport as well as tourism, hospitality and retail. As a small, densely-populated island city state, surrounded by much larger and not always sympathetic neighbors like Malaysia and Indonesia, and walking a geopolitical tight-rope between China, the United States and India, Singapore clearly sees further investment in ICT in general and the need to maintain its leadership role in broadband in particular, as part of its future strategy to survive and prosper.

B. *Design and Implementation*

The design of Singapore's strategy in building an island-wide fiber network was to offer competitively priced broadband speeds of up to 100 Mbps, giving users the choice of 3 broadband networks (ADSL, cable and the new fiber network). The objective is to reach 95 percent coverage by the middle of 2012,

¹²⁹ Ang, Zhou, and Jiang (2003), at p. 35.

¹³⁰ See IDA Singapore (2010), preface.

giving residents and business a choice between subscribing to more than "30 fiber-based broadband access plans offered by more than six service providers."¹³¹ It is also worth noting that Singapore is also a leader in wireless technologies, with all three mobile network operators offering 3G services, alongside several dedicated wireless broadband providers.

The Singaporean government announced the plan to sponsor a third major wire line network in 2007 and invited tender bids for two distinct corporate identities in 2007 and 2008. The plan as envisaged, rested on a unique structural blueprint which saw implementation being achieved across three distinct industry layers, namely: 1) the network layer, which consists of the design, building and operation of the passive infrastructure (dark fiber and ducts) to be carried out by the so-called NetCo; 2) the operating layer, where wholesale network services are offered over the active infrastructure (switches and transmission equipment), to be carried out by the OpCo; and finally 3) the layer comprising retail service providers. IDA Singapore characterizes this last layer as "fully competitive [...] covering markets like Internet access and Voice-over-IP telephony."¹³²

IDA issued requests for proposals in December 2007 and April 2008 for the Next Gen NBN NetCo and OpCo respectively. It ultimately selected the OpenNet Consortium¹³³ to design, build and operate the passive infrastructure as the NetCo. The consortium was provided with a S\$750 million grant by the government to pay for the network roll-out. Nucleus Connect, a wholly-owned subsidiary of StarHub, was selected by IDA Singapore to design, build and operate the active network infrastructure.

The two selected companies Nucleus Connect and OpenNet have been working together on the coordinated nationwide roll-out of the network. Since August 2009, residents in Singapore have been receiving letters from OpenNet informing them about the impending installation of fiber to their homes. For its part, Nucleus Connect began offering wholesale services at the end of August 2010. The objective is to have 95 percent of premises connected by the middle of 2012, with a universal service obligation kicking in as of January 2013.

C. Regulatory Issues

As the company charged with building and maintaining the passive network infrastructure, OpenNet will "own and deploy all fiber optic cable and offer wholesale dark fibre to qualifying operators on a non-discriminatory basis."¹³⁴ OpenNet must offer wholesale prices of S\$15 per month for each residential fiber connection, and S\$50 per month for each business connection, to all qualifying operators, including Nucleus Connect. As the builder and operator of the active network infrastructure Nucleus Connect is charged with ensuring service quality and reliability across the network as a whole. It must ensure vis-à-vis retail service providers that prices remain "competitive, transparent and non-discriminatory."¹³⁵ Interestingly, Nucleus Connect will have no exclusivity as the operating company of the active network infrastructure, since OpenNet must also make its dark fiber available to other qualifying operators, who may deploy their own active equipment. Nucleus Connect is also subject to operational separation requirements vis-à-vis StarHub, its parent company, which already has a subscriber base on its own high-speed cable network. Among retail service providers, the principle of open access prevails, whereby these are free to use the Next Generation network or any other network in Singapore.

D. Evaluating Conformity with ITU/OECD Principles and WTO Disciplines

The model opted for by Singapore does, on its face, seem to provide a more competition-friendly environment given the distinction it makes between passive and active network infrastructure and the fact that the company that operates the latter (Nucleus Connect, a subsidiary of the Temasek-linked StarHub) will have no exclusivity as the operating company of this infrastructure. However, the casual

¹³¹ IDA Singapore (2011), at p. 1.

¹³² *Ibid.*

¹³³ Comprising Axia NetMedia, SingTel, Singapore Press Holdings, SP Telecommunications.

¹³⁴ See Goh (2011), at slide 18.

¹³⁵ *Ibid.*, at slide 19.

observer should not overlook the fact that the companies which own the other two network infrastructures, and the two companies awarded the contracts to maintain the passive network infrastructure and operate the active network infrastructure respectively, all form part of a narrow and homogenous group of interlocking companies ultimately owned or controlled to some degree or another by the government of Singapore. Singapore has a fairly unique competitive environment that a number of commentators have characterized as "state capitalism".¹³⁶

The same can be said for the wireless broadband sector, where, except for Pacnet, QMax and iCELL, the principal entities contesting the market, namely StarHub, SingTel and M1, are either majority-owned by the state investment company Temasek or are otherwise subject to a significant degree of control by state-linked enterprises. In short, the ownership structure of the Singaporean ICT sector as a whole would seem to fly in the face of the notion of "competition in as many areas of the value chain as possible" and "recognition of the primary role of the private sector", as well as the notion of "effective competition" since merely having several operators in the market does not in and of itself attest to "effective competition" particularly when they are all potentially subject to control from the same overarching source.

In addition, some commentators might argue that Singapore's predominantly top-down approach might not correspond with one of the best practices agreed by the GSR in 2011, namely the use of "inclusive and wide-ranging public consultation when drafting national plans ... ". The OECD (2011) lists some seven countries that held consultations on their draft national broadband plans¹³⁷ and Singapore is not mentioned (the Australian government also seems to have failed to conduct a comprehensive public consultation before it drafted its first version of the plan). Also worth mentioning in this context is the 2011 OECD Principles for Internet Policy Making, which provide that "[the] collection, validation and public dissemination of objective data to inform Internet policy decisions should be reinforced and used to augment the combined research capacities of governments ... ". By commissioning a NUS study to examine the link between broadband adoption and economic growth, and then keeping the findings of the study classified, some might argue that the Singaporean government may not have manifested a comprehensive commitment to respect the letter or spirit of this principle.

In terms of its compliance with WTO disciplines, as long as the principle of open access effectively prevails in such a way that allows retail service providers to use the Next Generation network or any other network in Singapore on reasonable and non-discriminatory terms Singapore will not need to fear a potential WTO challenge under the Annex on Telecommunications.

Because Singapore as a market already benefits from three wireline networks and six high speed wireless networks, it is unlikely that, barring any currently unforeseen technological developments, any supplier from another WTO Member would have much of a commercial interest in entering the market in order to build and operate its own wireline or wireless infrastructure. Even so, Singapore has reserved the right in its services schedule to issue licenses to additional suppliers and thus automatic entry is not guaranteed under WTO commitments as they presently stand. The same applies for any potential market entrants wishing to engage in purely services-based competition. A commercial case could probably be made that, barring any technological innovations that render the current networks redundant, the Singaporean market for broadband is reaching saturation point at both the wholesale and retail levels.

In light of the unique competitive environment that exists in Singapore (already alluded to above) some WTO Members have raised certain potential compliance issues across various economic sectors. Thus in the 2011 USTR National Trade Estimate Report on Foreign Trade Barriers, one finds a statement to the effect that "[some] sectors, notably telecommunications, media, and financial services, are subject to sector-specific regulatory bodies and competition regulations typically less rigorous than those being

¹³⁶ See by way of an example Ngiam (2006), particularly "State Capitalism and Entrepreneurs" pp. 157-163.

¹³⁷ See OECD (2011), at p. 12. Note that the document fails to list Australia as having conducted such a consultation, probably because this was to a great extent only carried out after the Implementation Study was produced, a fact that was raised by the Australian Senate as it deliberated on legislation to enact the national broadband plan.

implemented under Singapore's general Competition Act."¹³⁸ Singapore will need to ensure that its telecoms regulator (IDA) and its Competition Commission regulate all service suppliers contesting these markets in an even-handed way and in a manner that leaves no doubt as to their independence from established government-linked operators.

3. The United States

A. Policy Context

As it went about formulating a legislative response to the deepest recession the country had experienced in almost 80 years, the United States Congress enacted the American Recovery and Reinvestment Act¹³⁹ in February 2009, hoping to provide a far-reaching and deeply effective stimulus to the US economy as a whole. Part of this stimulus package involved tasking the Federal Communications Commission (FCC) to draw up a national broadband plan and submit it to Congress within one year of the ARRA becoming law. The mandate provided by Congress to the FCC when formulating its plan was "to ensure that all people of the United States have access to broadband capability". In setting out this mandate, Congress placed the emphasis on the efficacy and efficiency of the mechanisms for delivering broadband access, the affordability of such access, and maximizing utilization of broadband infrastructure by the American public.¹⁴⁰ In addition, Congress listed a number of policy areas where it expected broadband to have the most apparent benefits, including "consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes."¹⁴¹

Taking up this mandate, the FCC issued a Notice of Inquiry shortly thereafter and received a reported "23,000 comments totaling about 74,000 pages from more than 700 parties".¹⁴² In addition, the FCC held a large number of public workshops at the FCC and streamed online, which attracted a reported "10,000 in-person or online attendees".¹⁴³ The plan that emerged from this process was extensive and comprehensive, comprising some 360 pages and 17 chapters, with "208 specific recommendations directed to the FCC, to the Executive Branch [...], to Congress, and to nonfederal and nongovernmental entities."¹⁴⁴ In its opening lines, the FCC's plan characterizes broadband as "the great infrastructure challenge of the early 21st century"¹⁴⁵, comparing its importance as an enabling technology to that of electricity at the start of the 20th century. The FCC recognizes the progress that has been made in that some 95 percent of US housing units already have access to fixed broadband and nearly two-thirds of Americans have adopted it at home, but also acknowledges that the United States is lagging behind other industrialized nations. Much like the Australian and Singaporean plans discussed above, the concerns of US legislators and regulators in improving access to broadband is primarily grounded in broader policy concerns of maintaining US competitiveness globally. Although no specific references or links are made in the Plan, historians will no doubt look back and view the National Broadband Plan as another part of the Obama administration's exhortations to "win the future" and seize the so-called "Sputnik moment".¹⁴⁶

¹³⁸ USTR (2011), at p. 323.

¹³⁹ P.L. 111-5, see <http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/content-detail.html> (accessed on Dec. 10, 2011).

¹⁴⁰ SEC. 6001. (k) (2) (A), (B) and (C)

¹⁴¹ SEC. 6001. (k) (2) (D).

¹⁴² Preface to the National Broadband Plan, available for download at: <http://www.broadband.gov/plan/> (accessed on Dec. 10, 2011).

¹⁴³ Ibid.

¹⁴⁴ CRS (2010), summary.

¹⁴⁵ FCC (2010), p. XI.

¹⁴⁶ See Remarks by the President in State of Union Address delivered on January 25, 2011, available at: www.whitehouse.gov/photos-and-video/video/2011/01/26/2011-state-union-address-enhanced-version#transcript (accessed on Dec. 10, 2011).

B. Design and Objectives

The solutions proposed by the FCC and submitted to Congress as the National Broadband Plan differ in many respects from those of Australia and Singapore, and the NBP seems to take a more holistic approach to the issue of high-speed connectivity rather than focusing primarily on networks. In doing so the FCC addresses what it refers to as "the entire broadband ecosystem - networks, devices, content and applications -" and its NBP consists essentially of influencing this ecosystem through four over-arching policy paradigms, namely 1) further fostering the existing competitive environment which pits fixed-line, wireless, retail and wholesale, national and local providers against one another to contest consumer and corporate broadband markets; 2) ensuring more efficient allocation of those resources either owned or influenced by the government, particularly spectrum; 3) ensuring universal access by reconfiguring existing universal service arrangements so that they may apply to broadband, and 4) implementing policies on the user or demand side to ensure maximum uptake in those sectors where broadband stands to have the biggest impact (health care, education, energy and the environment, economic opportunity, government performance and civic engagement, public safety and homeland security).

Accompanying the many recommendations put forward under the four policy paradigms outlined above, the FCC recommends that implementation of the NBP be guided by six over-arching long-term goals, as follows:

1. At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second;
2. The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
3. Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.
4. Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals and government buildings.
5. To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network
6. To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

In terms of its budgetary impact, the FCC estimates that the NBP will be either revenue neutral or revenue positive.¹⁴⁷ It makes this claim on the assumption that auctioning off sizeable amounts of spectrum will generate revenue and because the overwhelming majority of the recommendations made seek to achieve greater government efficiency rather than calling for new outlays of public funds. The FCC foresees the need for government funding in only three implementation areas, namely "public safety, deployment to unserved areas and adoption efforts."¹⁴⁸ The time-frame envisaged by the NBP is to see its goals achieved by 2020, with a number of benchmarks to be accomplished earlier, namely by 2015.

C. The Path to Implementation

In terms of fostering a stronger competitive environment, the FCC's recommendations take a number of approaches, including, among others, improving data collection and analysis as well as publishing the results of these efforts when it comes to penetration, performance and pricing across different broadband markets. It also recommends measures to improve the information available to consumers, a review of wholesale competition rules, freeing-up and allocating more spectrum for unlicensed use, updating rules for wireless backhaul spectrum, and improving the state of competition on the video set-top box market, among others. These efforts all come down to regulatory tweaking to correct information asymmetries and redistribute market power.

¹⁴⁷ FCC (2010), p. XV.

¹⁴⁸ *Ibid.*

Under the auspices of its second over-arching policy thrust, that of ensuring more efficient allocation of those resources either owned or influenced by the government, the FCC recommends more efficient allocation and assignment of spectrum, making 500 megahertz of spectrum newly available, encouraging the repurposing of spectrum, improving transparency for spectrum allocation, as well as - looking beyond spectrum - taking such measures as it can to promote more economic use of infrastructure such as poles, conduits, rooftops and rights-of-way.

In the context of ensuring universal access, the NBP recommends a number of steps, including establishing several new funds (the Connect America Fund (CAF) and a Mobility Fund) and re-allocating resources from the Universal Service Fund (USF) to initiatives to be rolled out under these new funds to support the provision of affordable broadband to unserved areas or demographics. In this context the NBP also envisages broadening the contribution base to the USF. Allowing low-income Americans to use subsidies they receive under existing inclusion programs to pay for broadband and creating a National Digital Literacy Corps also fall under this policy thrust.

D. Evaluating Conformity with ITU/OECD Principles and WTO Disciplines

In terms of relations with its trading partners in the area of internet services or telecommunications, the United States continues to come under fire regarding its restrictions on Internet gambling, which were successfully challenged by Antigua and Barbuda at the WTO and which remain a source of complaint for the EU.¹⁴⁹ It also has received complaints about discriminatory treatment in the context of foreign ownership restrictions and investment regulations.¹⁵⁰ Finally, there also seem to be some concerns about a reduction in competition in the wireline sector, due to market consolidation and the implications of these changes in terms of local connectivity and Internet connectivity services.¹⁵¹

With regard to the NBP and potential conflicts with agreed guidelines and principles, a couple of issues are worth noting. The emerging regulatory best practices for the satellite industry discussed at the 2011 GSR propose that foreign ownership restrictions be avoided entirely, a position that the United States has also endorsed, together with the EU, in the Principles it has advanced under the WTO Work Program on Electronic Commerce, namely allowing full foreign participation in the ICT services sector. This is clearly a position that the United States is still far away from achieving, and which might never actually be realistically attainable if previous efforts by foreign-owned companies to purchase parts of what some perceive to be critical national infrastructure are anything to go by.¹⁵²

Otherwise, the US plan seems to adhere to a large extent to the principles of technological neutrality and recognition of the primary role played by the private sector (I discuss this in more detail in the next Section). However, some commentators might question the plan's inherent commitment to such principles as promoting access on fair terms and at competitive prices to all communities, irrespective of location. I say this because, although the plan's headline target of 100 million homes with affordable access to actual download speeds of 100 megabits per second and upload speeds of 50 megabits per second would cover roughly three quarters of American households, and is thus broadly comparable in aspiration to the Australian and Singaporean targets, the plan commits no public funds to achieving it and leaves its delivery almost entirely to private network operators. The universal service target that the plan does propose to support with public funds is considerably more modest, at actual download speeds of 4 megabits per second and upload speeds of 1 megabit per second. Seen in this light, and compared to the plans of the other countries reviewed here, the US plan might be characterized by some commentators

¹⁴⁹ See http://trade.ec.europa.eu/doclib/docs/2009/june/tradoc_143429.pdf (accessed on Dec. 20, 2011).

¹⁵⁰ See http://madb.europa.eu/madb_barriers/barriers_details.htm?barrier_id=990087&version=6 (accessed on Dec. 20, 2011).

¹⁵¹ http://madb.europa.eu/madb_barriers/barriers_details.htm?barrier_id=060084&version=6 (accessed on Dec. 20, 2011).

¹⁵² One need only recall the political uproar that ensued in 2006 when Dubai-owned DP World acquired a British-based entity that operated a number of US port facilities.

as somewhat lacking in ambition, at least in terms of what it is prepared to guarantee to every community irrespective of location.

With its NBP the FCC appears more than anything else to have sought consensus between supplier and user interests, rather than trying to blaze a trail for a ubiquitous American broadband future. This is not surprising in light of the obvious fiscal constraints and political deadlock the United States is currently facing as a nation. A plan of the scale, boldness and riskiness of that exuded by, say, Australia, is probably not feasible in the prevailing economic and political climate of Washington, as we enter a presidential election year and a congressional agenda increasingly characterized by the inability of both parties to work together to achieve even slight progress on the most minor issues. Sputnik moment or not, there is arguably little appetite in Washington these days for a National Broadband Plan that does anything more than offer to make incremental improvements on the margins of existing policies and frameworks.

IV. DIFFERING POINTS OF DEPARTURE AND REGULATORY APPROACHES

To be sure, the three broadband plans here were developed in three very different political-economy environments, by governments with very different approaches to the balance between collective action and individual interests. Since independence, Singapore has consistently perceived itself as small and vulnerable and its ambitions to be a world leader in the knowledge economy are part of a longer historical pedigree of paranoia about the city-state's place in the world. Australia also has an established history of national and government-funded initiatives aimed at achieving equality across broad segments of society and the country as a whole, whether it be in the area of public health, with Medicare (the national public health insurance scheme) or a commitment to high-quality public education at the primary, secondary and tertiary levels. Australians, although imbued with a characteristic mistrust of authority, do not seem to tie themselves up in as many ideological knots as their American counterparts when it comes to such issues as the proper size and role of government. Thus, a national broadband scheme of the scale and ambition as the one being rolled out in Australia, although being subject to some tough questions as to its costs versus its potential benefits, has not been resisted by the population as a whole on dogmatic grounds.

Below I look at how these differing points of departure have impacted three fundamental questions underlying the conceptualization and roll-out of these plans.

1. Public versus Private Ownership

Both Singapore and Australia have, over the last 20 years or so, moved from a telecommunications sector dominated by a PTT monopoly incumbent to a situation of very limited wireline competition. In the United States, allowing private ownership of telecommunications infrastructure ultimately did little more than allow one company, AT&T to emerge as a single dominant nationwide wireline carrier until the 1970s when it eventually faced a degree of competition from MCI. Repeated efforts by US regulatory authorities to introduce greater competition into telecommunications markets have resulted in a situation which, similar to that in Australia or Singapore, eventually saw only two wireline operators with significant network infrastructure in place, namely the incumbent telephone operator and the incumbent cable broadcast company. The wireless communications sector has, however, seen vigorous competition on most markets, including the three countries reviewed here.

Reasonable people can and do disagree about the inherent characteristics of the communications sector as a natural monopoly. Regardless of where one stands on this issue, even the casual observer will note that this is an area of economic activity that necessitates big up-front investments, disrupting established customer relationships, and a fairly high degree of regulatory sophistication just in order to be able to enter the market, let alone remain profitable over the minimum period of time that would allow one to recoup these costs. This is, in sum, a market that lends itself predominantly to actors with a certain degree of economic power. Given also the implications of network effects in this sector, and the so-called "tipping point" phenomenon, market power can accumulate very rapidly into the hands of a very small number of actors. In light of the economic realities which impose themselves on this sector, some commentators have argued that in addition to ensuring vibrant competition, the government's role could also extend to building the essential infrastructure needed to provide these services.

The notion of public versus private ownership essentially boils down to whether one sees high speed internet connectivity, and thus broadband, as more of a utility, a kind of public good, or as more of a service, to be provided by private operators. Of course, most regulatory approaches attribute broadband the qualities of both a utility and a service. In both the Singaporean and Australian models, the central importance of broadband as an enabling technology in both the social and economic spheres is recognized, and the respective governments have shown their willingness to make the necessary outlays to ensure that the infrastructure is available. But both approaches also recognize the role of competition in the provision of connectivity services, and in their own way, allow for varying degrees of such competition in either the wholesale or retail markets.

The US approach, although extolling the importance of broadband, calling it the "great infrastructure challenge of the early 21st century"¹⁵³ and comparing its importance to electricity in the last century, seems to fall short in terms of making a commensurate government commitment to support the roll-out of this essential infrastructure. The comparison to electricity is telling, since the NBP seems to offer nothing in scale to the program of Rural Electrification that was initiated in the 1930s under the New Deal. As discussed above, the kind of consensus needed to roll-out a New-Deal-like national broadband plan similar in scale to that being carried out in Australia is probably lacking in the present political, economic and fiscal climate in the United States. In addition, an almost religious-like fervor in the primacy of private enterprise and free markets and the degree to which all policymakers and regulators seem to have succumbed to the same degree of cognitive capture by these ideologies will probably ensure that unlike for electricity or water mains, there will never be a publicly owned national broadband infrastructure in the United States.

2. Facilities-based versus Services-based Competition

At least in respect of wireline infrastructure, facilities-based competition never really materialized beyond a duopoly in the three countries reviewed, neither with regard to telecommunications, for which the concept was first designed, nor with regard to Internet services to which the policy was later applied. The costs of building out the necessary infrastructure are too high, and the positions of incumbent providers are simply too entrenched for new entrants to be willing to take the risks inherent to such a large infrastructure investment. This all the more so in the face of rapidly changing technology and constantly evolving consumer tastes, which since the mid 2000s at least have been consistently gravitating towards greater device mobility and thus wireless capabilities. The incumbents, operating with either an established telephone or television broadcast infrastructure ultimately carried the day and divided up the market between themselves in what became a classic case of duopoly.¹⁵⁴

Facilities based competition in wireless broadband has typically fared marginally better than the duopoly structures that ultimately emerged in wireline broadband, due to lower roll-out costs and policies by governments that favored the establishment of at least two and in many cases three national wireless infrastructures, i.e. operators offering 3G data services over a mobile phone plan. This is certainly the case in the three countries reviewed here as well as in most other OECD countries. However, some commentators have pointed out the limitations wireless technology is subject to in terms of coverage and speeds, and would argue that it is not a genuine substitute to wireline broadband (a position that the NBP seems to contest).

Services-based competition seems to have fared only slightly better on most markets, which perhaps explains the great lengths the national broadband plans of both Australia and Singapore have gone to in order to distinguish between wholesale and retail internet services, with policies to promote more vigorous competition at the retail level (via services-based competition), while recognizing the more utilities-based and natural monopoly forces at work in the wholesale market. In the US the approach to services-based competition seems to have been more hostile, either because of entrenched opposition by network owners successfully pleading their cause either before the FCC or in the courts, or because of reluctance on the part of the FCC to move beyond a light-touch approach to regulating downstream competition and intervening in the business models of established network owners.

Be that as it may, the eventual success of the approaches being pioneered in Singapore and Australia is something that will likely only be apparent in four to five years from now. In these two countries, their respective governments seem to have largely abandoned any once-held hope that facilities-based

¹⁵³ Executive Summary to the National Broadband Plan, available at: <http://www.broadband.gov/plan/> (accessed on Dec. 10, 2011).

¹⁵⁴ Referred to by some commentators as the "cable-phone duopoly"; see submission on behalf of Free Press (2009), at p. 45.

competition would deliver next-generation wireline networks on its own, and are staking their countries' broadband futures on the hope that with the right regulatory framework allowing market conditions to prevail, services-based competition will flourish.

3. Industrial Policy versus *Laissez Faire*

Despite massive legislative and regulatory interventions across various markets¹⁵⁵, the US has always expressed an aversion to industrial policy *per se*, with the underlying vigor of such expressions varying only by degrees depending on the political party effectively in control of the Executive at any given time. Recent statements by Democratic President Obama (cited above) show that at least in certain policy circles, there is a recognition that some kind of massive policy intervention is probably necessary to stop or at least slow a steady process of relative decline to emerging powers such as China and Brazil. To be fair, this story is not as much about America's decline as it is about the respective rise of other powers, as they emerge from decades or even centuries of relative backwardness and wide-scale poverty. The mandate to produce the NBP was entrusted to the FCC as part of a broader political focus on leading the American economy on a path to recovery by means of reinvestment in the nation's infrastructure. Since its submission to Congress, the narrative of relative national decline and the need to restore competitiveness has only grown stronger as the economy lurches only very slowly along its path to eventual recovery. As such, the NBP can undoubtedly be characterized as a piece of industrial policy, or at least that was the legislative intent when entrusting the mandate to the FCC.

What emerged from the FCC, as discussed above, seems to fall far short of such a policy, for various reasons. The FCC's NBP, seems to shy away from advocating any kind of massive policy interventions to restore America's position as a leader in broadband. Instead, it addresses the issue in terms of "ecosystem" considerations, and proposes small-scale interventions to improve regulatory frameworks as they apply to various parts of this ecosystem. The FCC's approach undoubtedly does justice to the inherently uncertain nature of technological change in this sector, and probably correctly identifies the greatest and most important area of future broadband growth as that which will connect portable devices. The importance of wireless broadband will only grow as smart phones become more powerful, cheaper, more widely-used, and as tablets inevitably replace computers as both recreational and working devices. With its more cautious and less interventionist proposals, the FCC has taken a relatively *laissez faire* approach to being given what in effect amounts to an industrial policy mandate.

The Singaporean and Australian governments have not been shy in both recognizing the importance of broadband as a tool of industrial policy (or national economic competitiveness as it is now called) and in taking relatively interventionist steps to ensure the perceived policy outcomes they wish to attain, namely nationwide, affordable, ubiquitous broadband coverage are indeed achieved. There is not much *laissez faire* in either approach, except to say that the arrangements contemplated for downstream competition at the retail level still leaves the ultimate outcome largely open to market forces. Singapore, as discussed, perceives itself to be in a constant struggle for its own national survival and is always looking for the next strategic investment to make in order to secure its future. Its broadband policy must be appreciated in this context. Australia's approach is only slightly different. On the one hand, Australia has always had the benefit of relying on commodities, either from the agricultural or, more recently, the mining sectors to ensure a healthy balance of trade and a relatively prosperous economy. However, since probably the 1980s or 90s, and arguably in combination with its decision to encourage immigration from and open up to trade with Asia, the awareness has been growing in Australia, that the country finds itself in the middle of one of the fastest growing and most competitive regions in the world, and that it must force itself to be able to compete. This relatively newfound urgency to be competitive is arguably the

¹⁵⁵ Examples would include subsidies for the production of corn and ethanol, a military industrial complex that provides financing frameworks that allow Boeing to compete with an equally massively subsidized Airbus, repeated efforts to save an ailing domestic auto industry, a civil aviation sector that, for all intents and purposes has been on one form of government life support for the better part of ten years, and many others.

most compelling piece of policy context in which to explain the country's national broadband plan, and its willingness to embrace such an expansive and expensive new piece of industrial policy.

V. SUMMARY OF FINDINGS AND CONCLUSIONS

1. Whither the Washington Telecoms Consensus?

A comparison of the language that emerged from the best practices and policy guidelines under the ITU and OECD documents from the early 2000s and those that emerged in 2011, shows that governments' thinking has moved beyond the purely pro-competition and deregulatory approaches to a recognition that, because of its fundamental socio-economic importance, intervention is necessary to ensure optimal and equitable policy outcomes for users and consumers of broadband networks and for the entire economy-wide infrastructures and processes that rely on them. Thus we see language that favors limited and targeted interventions in favor of universal access and maximizing take-up.

In addition to this, we also see the concerns of other industry players and interest groups reflected in many of these more recent policy documents, such as copyright, privacy, free-flow of data, digital literacy and others. As national broadband plans take up their place as an integral part of countries' overall economic strategies, governments see the need to become more, and not less involved in the telecommunications sector. The Washington Telecoms Consensus is not dead, but it has been recast and is now subject to certain other policy imperatives.

2. Connectivity and Competitiveness

The emergence of the Internet and the easy and instant access we enjoy to information on a variety of devices today, means that connectivity is a key component of both our ability to be productive as well as our personal happiness. There is probably no way to overestimate the importance ubiquitous, fast, and affordable access to information networks will continue to play in our work and private lives. Some countries seem to have recognized this to the point where they seem willing to pay any price to ensure they optimize connectivity in order to maximize competitiveness.

3. The Future of Broadband

The future of high speed Internet access seems assured. What is still being debated is what form such access will take, whether wireline, wireless, or even satellite. Also certain is that technology and consumer preferences will continue to evolve in unpredicted ways. This requires policy approaches that are flexible, and which allow sufficient space for market forces to do what they do best. Over-investing in one technology to the detriment of others may seem a risky policy choice to make. But under-investing in existing and proven technologies is an approach that is equally fraught with its own downside risks. In sum, there is no single best policy or set of policy choices available to governments, other than to make the necessary investments in today's technology while leaving sufficient scope for tomorrow's technology to emerge as well. This is a very tough policy balancing act to walk, and thus it comes as no surprise that governments adopt such different approaches in their attempts to get it right. After all, a lot is at stake.

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