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Report on APEC Workshop on Universal Access to Broadband Services

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REPORT ON APEC WORKSHOP ON UNIVERSAL ACCESS TO BROADBAND SERVICES

I. INTRODUCTION

In 2000, the member economies of the Asia-Pacific Economic Cooperation (APEC) committed to becoming knowledge-based societies through the Brunei Declaration of APEC economic leaders. The goal of the Brunei Declaration is to provide universal Internet access to all people and communities in urban and rural communities throughout APEC by 2010. In order to attain this goal, APEC economies developed and implemented policies and initiatives designed to be effective in their respective economic, social and political contexts to ensure universal access. Tripling the number of people with Internet access by 2005 was set as the interim goal of the declaration.

Seeing the success of the initiatives implemented by the economies towards attaining the Brunei 2000 goal of universal access, the Ministers during the 7th APEC Ministerial Meeting on the Telecommunications and Information Industry (TELMIN7) in Bangkok in 2008 encouraged the economies to extend their efforts towards providing universal access to broadband. The Ministers believed that the goal of the Bangkok Declaration in 2008 – universal access to broadband – is crucial to the social and economic futures of the economies. They recognized that bridging the digital divide, through a guaranteed universal access to Information and Communication Technology (ICT) infrastructure and services, is crucial to the future social and economic prosperity of the economies.

Following the declarations made during TELMIN7, the Philippine economy proposed to hold a Workshop on Universal Access to Broadband Services (Workshop). The Workshop was organized in order to gauge how the APEC economies were progressing towards achieving the Brunei 2010 goal of universal Internet access, and identify the programs implemented by the economies including the success these programs have achieved. It was held in Singapore on 13-14 April 2008 before the 39th Meeting of the Asia-Pacific Economic Cooperation Telecommunications and Information (APECTEL) Working Group. It brought together experts in the field of telecommunications particularly in broadband as well as government officials overseeing the implementation of their economy's policies, regulations and programs related to providing for universal access to broadband services.

The Workshop aimed to identify key issues on the implementation of universal access to broadband services and create a venue for APEC member-economies to discuss concepts and share current practices, methods and experiences in implementing ICT for development projects. The Workshop also sought to craft strategies that may be helpful in achieving the Bangkok 2015 goal of promoting universal access to broadband services. Finally, the Workshop intended to discuss various definitions of universal access to broadband and the state of broadband penetration in APEC. Workshop presentations and discussions were focused on policy issues as well as best practices.

II. WORKSHOP OBJECTIVES

The objectives of the Workshop are:

- To examine the progress of APEC economies towards the attainment of the Brunei 2010 Vision of universal Internet access;
- To come up with a strategy to achieve the Bangkok 2015 goal, which encourages intensified efforts to support universal service strategies that are appropriate to each economy;
- To identify key issues and possible approaches in the implementation of Universal access to broadband services through presentations and discussions on best practices in pursuing the abovementioned goals; and
- To generate recommendations on APECTEL's next steps or plan of action with specific milestones for the next several TEL meetings leading to TELMIN8 in relation to the achievement of Brunei and Bangkok vision.

III. DAY ONE PROCEEDINGS: Discussions on Policy

The discussion was about the various broadband policies of APEC member economies. It focused on Public-Private Partnerships (PPP) in the provision of universal access to broadband; the role of local governments in implementing projects related to universal access to broadband; as well as demand-side strategies (e.g. hardware, capacity-building, development/use of local applications and tools) to ensure rapid and widespread broadband uptake.

A. WORKSHOP OVERVIEW

State of Play of Broadband in APEC

Emmanuel C. Lallana, Ph. D., Chief Executive, Ideacorp, Inc.

The present state of broadband in the APEC region, the key issues faced by the economies, and the possible future steps for the region were discussed. Several issues facing the state of broadband in APEC were highlighted while the lacking common definition of broadband in each economy was cited. Although the speed of the connection is the usual standard in defining broadband, consideration should also be given to the standards of quality of service, interoperability, ease of upgrading and security to assure reliability and usability across states when formulating a definition of broadband.

The impact of broadband to the economy is an important factor in crafting policies and implementing programs on broadband since it was estimated that an increase in 10% of broadband penetration leads to GDP growth of 0.1 – 1.4% which is equivalent to the creation of \$300-420 billion and 10 – 14 million jobs.

The average Internet penetration in the region is 42.28% in 2007 (figure to be updated). Of the 20 APEC economies, there were only eight (8) economies that achieved the Brunei 2010 midpoint goal of trebling the Internet penetration by 2005. The table below lists these economies as well as their current Internet penetration ranking within APEC. The region had a rather low broadband penetration. The average broadband penetration in APEC (2007) is at 11.88% with Korea having the highest penetration in the region.

ECONOMY	INTERNET PENETRATION RANKING IN APEC (2007)
Brunei	11
Peru	13
Mexico	14
Russia	15
Thailand	16
Vietnam	17
China	18
Indonesia	20

Table 1: APEC economies that trebled their Internet Penetration in 2005 and current ranking based on ITU figures.

Matters not directly concerning policy should also be considered as they affect broadband penetration rates. These concern demographic variables such as age and education; economic variables such as per capita income; and supply variables such as urbanization. As an example, the matter of tripling Internet access within APEC by 2005, non-policy variables were the reason bigger economies had a difficult time improving their broadband penetration rate as opposed to smaller more densely populated economies.

Studies have shown that nations with robust national broadband strategies fare better. These economies prioritized the rollout of broadband, coordinated implementation across agencies, invested resources behind the strategy, and promoted the supply and demand of broadband. It should be noted that effective policies address the various technologies, programs, training and support that must accompany network infrastructure. These policies go beyond developing network infrastructure. There should also be widespread and top-level support when crafting and implementing policies.

An effective policy framework should be characterized as something being clear, forward-looking and having attainable goals. It should also be able to stimulate both the demand and supply side through high-speed broadband investment and high-speed broadband adoption and use. Policy assessment and accountability mechanisms should also be present.

Another measure that can encourage the deployment of broadband is the introduction of financial incentives such as tax policies aimed at encouraging investments, infrastructure funding, and the presence of universal service fund (USF) or universal service obligation (USO) for broadband and broadband related initiatives of non-ICT agencies.

Regarding the demand-side, regulatory measures that were identified as important for broadband success were competition and unbundling of regulations. Intermodal competition between separate physical networks is also a factor towards success in broadband deployment. Competition should be encouraged to achieve faster broadband uptake.

Supply-side issues are concerned with initiatives that encourage broadband usage and digital literacy. These involve new applications and providing more public content online, improving eGovernment services, and supporting telework, telemedicine and eLearning initiatives. The role of local (sub-national) governments is important because they are closer to the communities and should be, ideally, involved in designing broadband strategies. The role of the community was also emphasized in the promotion of broadband as evidence by community-based initiatives employing community organizers going around the community and convincing people of the importance of broadband, thus created demand for it.

Studying the broadband strategies of the top 10 economies, in terms of broadband penetration as ranked by the International Telecommunication Union (ITU), the components of these effective broadband policies and strategies were focused on:

- Market competition, transparency and confidence;
- Multi-platform access (mobile, fixed, wireless, satellite technologies);
- Open and interoperable public standards;
- Convergence;
- Public and private infrastructure investment;
- Enhanced connectivity of government offices, schools, hospitals, public health centers;
- National, regional and local ICT policies;
- Regular policy review, strategy monitoring, market assessment;
- Pricing and consumer protection; and
- Stimulating demand for broadband services.

The online services offered by these economies include eGovernment, eCommerce and eHealth services and various services that use ICT to catalyze economic growth. ICT-related research and development, production of content and improvement of security were also supported. Digital inclusion was a focal point of these broadband policies with programs aimed at extending broadband services to unserved and underserved areas, providing access to online services to PWDs and the elderly, introducing ICT in the educational system, ICT-based education and skills development and cultural content.

Wireless broadband is a key issue and emerging issue prominent in developing economies. In order to use wireless broadband effectively policy options concerning spectrum availability, infrastructure/spectrum sharing, coverage obligations, industry structure, and spectrum/license fees have to be reviewed.

Several economies have introduced stimulus packages as a response to the current economic downturn. The stimulus package could be an occasion for governments to include broadband (and other digital) infrastructure in their respective packages since it has a greater positive impact on jobs, productivity and innovation. The inclusion of broadband infrastructure in stimulus packages spurs significant job creation in the short run. It also offers superior job creation benefits because of the ‘network multiplier effect’ and leads to higher productivity, increased competitiveness, and improved quality of life in the moderate long term.

B. EXPERT PRESENTATIONS

Thoughts on ICT Deployment

Gerry Greeve, Director, Intel World Ahead Program

The goals of the projects that Intel has been implementing in developing markets were similar to the targets of both WSIS and Bangkok 2015. Six (6) criteria are identified as essential in bridging the digital divide, namely: affordable clients that deliver adequate capability; training and aids to learn how to use the clients; applications and usage models that work; investment and commitment; affordable, reliable and adequate networks; and secure financial transactions.

There has not been significant movement between economies in the upper ICT levels and low ICT levels to bridge the digital divide. Something should be done to prevent the acceleration of the divergence between now and 2015 because more powerful networks and more powerful and more ubiquitous compute capability will become available in the market.

Computer prices are set to go below US\$300, and this could go lower if taxes and import duties were included. The availability of netbooks and notebooks will drive the demand for broadband since these fit into a spectrum of entry level users - people who need occasional access to the Internet or first-time students. Studies show that the market desire to have US\$300 computers is the key attribute to the success of low cost computers. The difference in computer prices in the United States and other economies are due to taxes not the technology.

Since learning how to use the computer is viral in nature, the age of teaching people how to use the computer is nearly over. Moreover, information and services have become available online (Health, eGov, Enterprise, CSCs, SME, University, Family, School). In a MICUS Study for the European Commission on the Impact of Broadband on Growth and Productivity, it was found 40% of individuals obtained IT skills through learning by doing, another 40% learned informally through the assistance of colleagues, relatives, and friends and the rest learned through formal education.

Intel has been working with governments in developing applications that are useful in development economies. The emerging market usage models it is using are developing and maturing. An example of which is the “Rural Clinical Assistant” Medical Notebook Program of Intel and China Intel. It is directed

towards and will be deployed as initial solution to 800,000 clinics and hospitals in China.

www.skool.com is another Intel project in over 30 countries, 10 languages and with 4 million visitors each year. It is free technology and is a popular secondary school portal that has 250 modules for math and science. The key learnings in this aspect are that Private ownership and investment are critical in deploying ICT. It was found that there is a connection between a robust broadband network and personal computers. The National and State Province Leadership should organize and drive the process and mobilize remote eGovernment/utility service.

Governments are stepping up with their investment and support stimulus packages. Columbia makes use of its Universal Service Fund in order to reach the goal of having 42% of their primary and secondary schools connected by the end of 2009, increase the provision of broadband connectivity to schools by 50% per year eventually covering its entire 45,000 primary and secondary schools and 22,000 government offices.

In India, its USO scheme for provision of broadband connectivity in rural and remote areas will be deployed by mid-2010. It will provide PC device rebate, low connectivity cost per month. Wireless broadband growth will convince new PC and notebook users that 3G is not broadband for data but an interim connectivity solution.

At present, the deployed 3G networks are already overloading. These networks are not going to be able to provide the capability needed by small and medium businesses, schools, hospitals and clinics to be connected to the Internet.

It was reported on the Cisco Forecast Mobile Data that the stress that smartphones, notebooks and netbooks will bring to the networks is 13GB per month. This scenario is in the context of the forecasted average usage in the next five (5) years for people around the world. Globally, mobile data traffic will double every year through 2013 and increase 66 times between 2008 and 2013. Almost 64 percent of the world's mobile traffic will be video by 2013. Mobile video has the highest growth rate of any application category. The growth of mobile broadband handsets with higher than 3G speeds and laptop aircards will drive over 80 percent of global mobile traffic by 2013.

ECONOMY	TELCO(S)	LAUNCHED	PROBABLE
Australia	Unwired	yes	
Chile	Telmex, VTR, Entel	yes	
Chinese Taipei	VMAX		yes
Indonesia	Tbd		
Japan	UQ	yes	
Korea	KT	yes	
Malaysia	Packet-1, YTL	yes	
Mexico	MVSNet	yes	
Peru	eMax, Telmex	yes	
Philippines	Smart, Globe		yes

ECONOMY	TELCO(S)	LAUNCHED	PROBABLE
Russia	Comstar, Scartel	yes	
Singapore	Qmax	yes	
Thailand	Tbd		yes
USA	Clear	yes	
Vietnam	Tbd		

Table 2: Wireless Broadband Deployment in APECTEL Economies

If the digital divide is to be bridged, 4G networks are needed. There are already 39 countries with significant WiMAX deployment. If by 2009, 4G networks are not built and the licenses in the spectrum allocation auction are not awarded, the digital divide will increase. This is why telecommunications companies (telecoms) need to have the licenses needed to deploy 4G and be able to bring access to areas of society lacking Internet connection.

If the economies are serious about bringing the benefits of ICT to the economies then public and measurable goals must be set in order to take the 14 countries in the Pacific Rim in the lower half of the ITU IDI ranking and bring them closer to the second quartile.

Affordable Universal Access to Broadband using the mainstream Mobile Technologies

Michael Bjarhov, Head of Government and Industry Relations – Asia Pacific, Ericsson

In the current financial turmoil, investments in Broadband access have become a government priority. With or without stimulus programs, investments in these networks will create employment and combat the downturn. In the long run, improved access to information, for individuals as well as enterprises, will increase the country's economic growth.

Worldwide, there are a lot of fixed broadband networks especially in developing countries where the main growth seen ahead is wireless. It is anticipated that mobile broadband will make up 80% of global broadband subscriptions by 2013.

The global build out of GSM networks is still ongoing with almost 4 billion users to date. These networks are the foundation for the evolution from GSM/EDGE via WCDMA/HSPA to LTE driven by the "Third Generation Partnership Program" (3GPP). This evolution provides economies of scale where incremental introduction of new capabilities based on standardized cost-efficient subscription machine is facilitated. These networks are prepared for an evolution giving very affordable mobile broadband solutions. These upgrades also provide operators with opportunities for incremental revenues. Modern 3G networks give excellent user experiences and are building on the everywhere access given by the 2G networks.

The limited growth seen in mobile broadband in Asia can be attributed to slow licensing of spectrum for 3G. Harmonized spectrum is a key mass-market enabler. Licenses must be made available in the 3G spectrum in order to expand mobile broadband networks and reach high penetration goals. The subscription growth will also create economy of scale and lower the cost of 3G devices. Administrations and regulators should license spectrum in a way that stimulates investment and competition.

Since 3G networks have the same capacity and spectral efficiency as WiMAX, they will be able to cope with additional traffic without having to build a separate network. The availability of affordable broadband services will be affected more by the capacity of the license recipients, which is a commercial rather than a technological issue. On the device side there are now more than 1000 different 3G/HSPA devices in place worldwide and new networks supports speeds as high as 21 Mbps.

The availability of affordable mobile devices enables more subscribers to utilize the Internet. In developing countries, most users have their first Internet experience over a handheld device but PC will be important in schools, enterprises and government institutions. Although most people are able to use the PC with minimal instructions, ICT-training or tutorials in order to appreciate and utilize the functionality of available applications will always be needed.

The history of a particular technology path should be considered when investing in it. It has taken 15 years to build mobile networks with worldwide coverage whereof 90% is using GSM/EDGE technology. These networks are now in areas where building infrastructure initially was thought unrealistic. Even in very poor and rural areas, there have been sustainable services created. Step-by-step mobile networks have turned less attractive remote areas into profitable, sustainable areas with services based on voice and text.

Universal Broadband Access

*Jayesh Easwaramony, Director, ICT Practice
Frost & Sullivan Asia Pacific*

There are three key gaps that need to be overcome in order to achieve universal access to Internet/broadband service namely: Desirability gap, Affordability gap and Availability gap. The availability gap can be overcome once networks have been set-up and wireless networks are being deployed. The affordability gap is being addressed through by lowering the cost of entry by providing cheaper notebooks and cheaper services. The more critical gap is improving desirability. Questions such as do all people really need access to the Internet and what applications and services prompt them to go to the Internet are the critical issues seen in many markets.

There is now a virtuous cycle in the provision of wireless broadband involving economics, services, adoption and technology. The economics are vital. The prices of smartphones became lower after China and India embraced 3G. It is estimated that by 2010, smartphones will have overtaken PCs and will have a

scale that mimics the PC universe. In the next three years, smartphones will become an Internet-capable force already as ubiquitous as a music-enabled phone that will provide an opportunity to give an Internet experience to subscribers.

Pricing plans for wireless broadband have also become more affordable in the past two years with prepaid wireless broadband packages being made available to consumers as well as having laptop and netbook subsidies in place. It is seen that in the next three years the ideal price points for laptops and netbooks will be reached.

An ecosystem of having on hand applications and services that any developer can provide is also present. The development of jobs involving applications and the ability to use an office application on the phone is also getting easier. However, the content ecosystem and the service delivery process are aspects that can be improved upon. Both the service portfolio and application portfolio will expand with the involvement of developers. Once a capable phone, an affordable pricing plan and access to richer service portfolio are in place, the data service automatically improves. This type of service generation will also happen and will improve the technology.

3G or HSPA is a mature technology with more than 200 deployments and at the same time there is minor consolidation happening within networks resulting in a stronger focus on fewer areas and mobile broadband will give impetus to this.

With factors put together, the virtuous cycle will accelerate an adoption cycle that combines both supply and demand factors. 3G and wireless broadband may increase the broadband penetration but the available devices also have to be considered. The number of applications will have to be multiplied if the 4 billion potential users will access the Internet.

According to a study conducted by Frost & Sullivan regarding the desirability of the Internet, both Internet and non-Internet users had similar perceptions of the Internet with almost all respondents strongly agreeing that the Internet has brought more benefits than harm to their personal life and society.

Internet users have a strong perception of the benefits of the Internet as a tool for learning that can access knowledge and current affairs as well as a timesaving method. However, 45-50% of non-Internet users feel that they can survive without the Internet. A challenge that needs to be addressed is the group of people who have used the Internet but did not see the need to keep using it. The applications and services need to be improved in order to suit them. Nearly half of non-Internet users have responded that they will never use the Internet at all.

Issues concerning spectrum licensing, USO funds usage, disjointed platforms and trust in governments need to be addressed.

There have been few countries that have used the convergent licensing model especially those who are classified as developing. They are purely technology neutral and willing to extend wireless. Spectrum re-farming also needs to be reintroduced at some stage. This is the critical challenge we see from the

wireless side. The usage of USO funds has to perform within better frameworks and if possible, move towards true private-public partnerships. There have also been disjointed platforms in terms of providing universal access. Among the different catchphrases are: One laptop per child, Digital divide, ICT opportunity index, and Internet for the next billion. There is also the issue of trust in government where the question of whether to spend funds poverty alleviation and providing food or on the provision of broadband access which generates employment.

Most governments are not sure of how effective the rural Internet initiatives are since there has been no successful business cum implementation model that has emerged to prove that the economic benefits are the result of Internet penetration in rural markets. Governments still need to be shown successful business models that will drive Internet usage and clearly show the value that increased usage of Internet gives to the. These successes need to be highlighted and used to influence the government policies on broadband for rural economies especially those in Asia and Africa. Moreover, models based on different rural set-ups need to be created. Although, the mass adoption of Internet means that it has to reach and be able to impact the vast majority of rural population in developing economies, it may be impractical to look at rural markets as one segment as there may be variances involved in the different rural segments and their need for Internet services.

The role of the Internet in an Agriculture-driven economy may involve providing information regarding various elements (weather, irrigation options, seeds, fertilizers, pesticides, etc.) during pre-harvest season and pricing information about the rates for the harvest in nearest trading houses during post-harvest season. In an industry-driven economy, the Internet can improve the quality of life through better connectivity with the outside world. Finally, in a services-driven economy, it can promote the services such as tourism as well as help improve service quality levels. The Internet can also support health and education through telemedicine and remote education programs. However, Internet use is impeded by the user's illiteracy and unawareness, the lack of associated utilities such as electricity.

C. ECONOMY PRESENTATIONS

Australian Broadband Guarantee: Equitable Access to Broadband

Richard Brown, Director, Regional Cooperation

Department of Broadband Communications and the Digital Economy

Australia faced the problem of lacking equitable access to broadband. Its ADSL services were generally available in metro areas but not in regional rural and remote locations. Providing broadband services to its regional, rural and remote areas presented challenges to both government and service providers. Several options were open to Government to address these challenges - directly fund infrastructure deployments, provide customer rebates or vouchers or provide a technology specific solution.

The Government chose to create a program-based model, which it called the Australian Broadband Guarantee (Guarantee). This model is an incentive-based approach that identifies areas where the broadband market is failing and makes a targeted intervention. The Guarantee is demand driven. Since it has a budget cap, it gives preference to the most cost-effective service solutions and is thus technology-neutral. The broadband services are supplied through Internet service providers, and consequently, the program focuses on the viability and sustainability of providers. It also has mandated standards, consumer protections and continual review to match changes in the market.

This model was chosen because it was deemed to be an efficient, effective, appropriate response to a complex policy challenge. It also focuses on fixing market failure without negative side effects. Furthermore, it encourages competitive outcomes.

There have been over 300,000 connections subsidized through the Australian Broadband Guarantee. It has provided the industry with competition and its consumers with a choice through the various providers and technologies available. The Guarantee also provided services that have kept pace with those offered in the wider broadband market. It has also offered customer support tools and services to its clients.

The success of the Australian Broadband Guarantee can be attributed to the Department of Broadband, Communications and the Digital Economy's understanding of the dynamics of the industry. It was also able to respond to various market developments, consumer needs and expectations. The Australian Broadband Guarantee has also allowed the market to choose the most efficient and effective solutions for the challenges presented by providing broadband services. The presence of skilled and experienced administration teams, and sophisticated support and compliance systems also contributed to its success.

The Australian Broadband Guarantee is a policy commitment made to ensure that Australians have equitable access to high quality broadband. It recognizes social and economic benefits of providing equitable broadband access and services. It is a model that has proven its flexibility in responding to policy opportunities, technology developments and consumer expectations.

Policy and practices of universal broadband services in Chinese Taipei

*Po-Cho (Paul) Liang, Senior Engineer, Planning Department
National Communications Commission*

Universal Telecommunications Services in Chinese Taipei were established in 2001. The National Communications Commission (NCC) designates telecommunication operators to provide universal telecommunications services in rural/uneconomical areas and telecommunication operators share the deficit of universal service providers by ratio of their individual annual turnover to the total revenue they received as a whole.

The NCC has the authority to designate universal service providers; appraise their plans for deployment and the corresponding net costs; audit the costs of universal services; examine quality of service; and manage the obligation of providers and cost sharing of universal services.

Falling under the scope of Universal Telecommunications Services are Universal Voice telephone services and Universal data services. Universal Voice telephone services provide telephone services in uneconomical areas and uneconomical public telephone services. Universal data services, on the other hand, provide data communication access in uneconomical areas and preferential leased circuit rentals for high schools, elementary schools and public libraries.

After integrating data communication access into Universal Services, the NCC designated type-1 telecommunication operators to provide universal service of data communication access to certain villages according to the requirement of the economy-undeveloped areas in 2007. It was also through this that the projects Broadband in Villages, Telephone in all Households, and Public Telephones in Tribes were implemented.

In the Broadband in Villages project, broadband networks were constructed in 46 designated villages. Upon completion, broadband coverage in all villages reached 100 percent. The network provides Internet connection with speeds of over 2Mbps to 9 percent of households in the villages.

Aside from reducing the digital divide, the Broadband in Villages project has also developed eco-tourism, enhanced agricultural development, increased job opportunities, and encouraged young villagers to return to their hometowns. Another positive effect of the project was the development of tribal economies through the promotion of local culture, language, food, cultural landscape, handmade crafts, tourist resources, guesthouses, and agricultural products of tribes through Internet marketing. Moreover, Broadband in Villages does not only provide broadband connection to the people it also simultaneously supplies local telephone, public telephone, MOD service and mobile phone services. The provision of broadband also promoted eLearning through indigenous language learning, distance learning and distance tutoring. Furthermore, the administrative efficiency in tribes was enhanced with the added ability of the local government to connect to national government websites.

Chinese Taipei also implemented the Broadband in Tribes Project in 2008 that enables broadband networks to spread from villages to tribes and lins (the smallest administrative unit in Chinese Taipei). Upon completion, its beneficiaries are 100 or more tribes that were previously without broadband connection. This project is an extension of the policy in effect for Broadband in Villages.

Under the project, the construction of broadband networks for 50 tribes was accomplished at the end of 2008. It sought to expand and encourage the participation of industries in universal services through corporate social responsibility. The project shall be completed in 2010.

The Broadband in Tribes project introduces the broadband network to each village and tribe in Chinese Taipei and as a result further decreases the digital divide between urban and rural areas and allows for equality in services of broadband network. The project also stimulates tribal economies and in effect maintains the human resources of three generations in tribes. The network also caters to local requirements through government policy and leadership and satisfies the requirements of civilians for cable TV, as some tribes were in previously inaccessible areas.

In order to mitigate the challenges of constructing broadband networks in remote areas, the NCC encouraged industries to use the following:

1. Microwave links as the transmission backbone network;
2. 2.4 G or 5.7G ISM Band spread spectrum microwave as the local loop to end users to ensure quality; and
3. Wireless microwave system in remote areas with frequency usage fees deducted by 90%.

Furthermore, the Ministry of Economic Affairs is promoting the M-Taiwan experimental network project that aims to provide broadband network services through WiMAX in remote areas.

The arrival of wireless technology facilitated the development of mobile learning and after school tutoring applications. Distance tutoring in Nantou County began to develop when Chunghwa Telecom cooperated with National Chi Nan University to promote the application platform for wireless distance learning. Students are now able to log in to courses available on the interactive distance-learning platform and receive tutoring from tutors at National Chi Nan University.

Upon the introduction of broadband in remote areas, the NCC recognized availability, affordability, usability and sustainability as matters of key importance. It identified initiatives to address these matters that various sectors are undertaking. For example, telecoms, being universal service providers, are providing preferential access charge for low-income households. The NCC is helping solicit new or used computers. Also, Chunghwa Telecom Foundation established 25 digital eNeighborhood information-learning centers in Chinese Taipei.

Some government-led follow-up initiatives include:

1. Providing low-income students with free computers and network;
2. Opening 160 digital opportunity centers and 56 tribal library and information stations to help with digital learning and applications in cooperation with the Council for Indigenous Peoples;

3. Encouraging universities and colleges to form volunteer groups to help in digital opportunity centers and tribal library and information stations;
4. Promoting shared wireless network environment in campuses;
5. Promoting distant tutoring in remote areas;
6. Offering free lending of computers by libraries and providing wireless broadband networks in public places for civilians; and
7. Establishing 143 mobile medical service spots in remote areas.

The Chinese Taipei experience illustrates that effectively reducing the digital divide requires partnership among different stakeholders – government, telcos, public welfare groups, and community development associations – in order to address the issues of availability, affordability, usability and sustainability.

For its part, the NCC will continue working on the following projects:

1. Telephone in Every Household;
2. Public Telephone in Tribes;
3. Broadband in Tribes;
4. FTTB in Every School;
5. Cable TV in Every Village; and
6. Mobile Phone in Every Village.

In order to refine the universal service mechanism, NCC is studying the value of the non-financial benefits received by universal service providers such as reputation and brand recognition.

UNITED STATES: Framework for Ubiquitous Broadband

Robert Pepper, Ph.D., Vice President, Global Technology Policy, Cisco

There are five classifications of Internet ubiquity – Proto-Internet, the Early days, Familiarization, Extensive and Intensive.

The state of economies belonging to the Proto-Internet stage is characterized by low Internet use with less than one in 20 people having experienced the Internet by 2007. Most of the population is rural, and this low level of urbanization keeps the Internet usage from growing rapidly. The number of Internet users makes up less than one-sixth of the population although the Internet usage is growing fast.

In the stage of Familiarization, less than one-quarter of the households have their own Internet connection. Internet use is growing and has been used by about one-third of people. Most urban businesses are also connected.

In the Extensive stage, close to half of the population is already using the Internet but only one-third of the households, on average, have their own connections. This is the stage where countries get prepare for “network as the platform” opportunities.

The Intensive stage occurs when over half of the households and virtually all businesses have broadband connection and most people use the Internet. It is also seen when countries start to take advantage of “network as the platform” opportunities.

Of the 157 countries worldwide, there are 45 countries in the Proto-Internet stage. Countries belonging in the Early days stage number to 32. There are 39 countries in the Familiarization phase, 18 countries in the Extensive stage and 23 countries in the Intensive phase.

There are different services being offered which have different bandwidth and latency requirements therefore applications drive the need for broadband quality. The ecosystem and infrastructure of ICT have to be mapped in order to be able to determine the course of the development of broadband.

One of the elements of an ICT ecosystem that need to be examined is ICT Policy-Regulation which concern laws relating to ICT and the burden of government regulation. The second aspect of an ecosystem that should be considered is Market and Competition which involves the Quality of competition in the ISP sector, the Intensity of local competition and the Capacity for Innovation. Finally, the Business climate should be studied. Involved in this aspect are the Procedures to start a business and enforce a contract as well as the Efficiency of the legal framework.

In terms of Infrastructure, ICT Skills should be evaluated. This includes the availability of scientists, engineers and specialized training services as well as the quality of math and science education. Domestic networks also need to be looked into, in particular the number of personal computers, Internet hosts, mobile telephones, telephone lines and electricity production. International access should also be studied in terms of the Internet bandwidth available.

The role of Government in achieving ubiquity was identified through the economic and social goals of public policy. In terms of economics, increase in GDP, jobs, productivity, investment and innovation are the benchmarks. Social goals comprise of inclusion, diversity, culture, social cohesion, public safety and citizenship.

In order to close the gap for digital inclusion, Government should act as capitalist. It should provide stimulus to the market as well as pre-commercial research and development. It should also have policies in place that address digital inclusion.

There should be a diagnosis of the context and benchmarking of targets in developing a strategy for broadband. It is against the diagnosis and the benchmarks that the strategy should be assessed and formulated. There should also be a framework against which the current situation is evaluated in order to identify the priorities for action. Lastly, best practices should be matched with the identified priorities to ensure success.

Six components comprise a framework of a Net Strategy. These keystones are:

1. Policies and regulations;
2. Competition and market structure;
3. Public and private infrastructure investment;
4. Government operating expenditures;
5. Skills for ICT; and
6. Applications and content.

The question that needs to be asked with regards to policies and regulations is whether the institutional framework has evolved from the traditional fixed telephony-based model to one that enables convergence around IP and permits entry and efficient use of assets.

For competition and market structure, what needs to be determined is whether the number of players, their technology platforms and market shares foster competition with regards to service innovation and responsiveness to potential demand.

In terms of Public and Private Infrastructure Investment, the question that is being asked is whether there are ICT infrastructure bottlenecks that critically affect the breadth and depth and speed of ICT adoption. Another question is regarding the adequacy of the incentives and the public/private balance of investment.

Regarding the operating expenditures of Government, it should be established whether the eGovernment practices are contributing to both operational efficiency and citizen interaction online. It should also verify whether government procurement is used to promote national ICT development.

The level of skill of ICT users, including among schoolteachers, should be ascertained in order to find whether it is supporting the use of Internet by business and individuals. It should also reveal whether there are specialist ICT skills developing in line with technology and potential.

Finally, for applications and content, what needs to be answered is whether the business environment and innovation culture is at the level where demand and ICT entrepreneurship drive application and development.

Once a National Framework has been drafted, its components can be applied at City level. This will be concerned mainly with the ICT Environment. However, in cities and provinces, a more specific focus should be given on services and operations. Specific action areas identified for provinces and cities that correspond to each Net Strategy Framework component follow.

1. ICT/Market Competition
 - a. SP Market Structure/Competition
 - b. Platform diversity/differentiation
2. ICT Policy/Regulations
 - a. Ease of entry for infrastructure
 - b. Ease of entry for applications
3. Applications and content
 - a. Business innovation environment
 - b. ICT entrepreneurship/clusters
4. Government Operating Expenditures
 - a. eGovernment and government ICT pioneering
 - b. Demand aggregation/eProcurement
5. Skills for ICT
 - a. Individuals, Teachers, Small and Medium Enterprises (SMEs), IT literacy
 - b. Technical and advanced capabilities
6. Infrastructure investment
 - a. Core network
 - b. Access network
 - c. IP device availability
 - d. Ease of investment
7. Public-Private Partnership for Growth
 - a. Government role
 - i. Leadership: set concrete goals
 - ii. Fair, transparent, competitive framework/market structure
 - iii. Policies/actions to close gaps – supply and demand
 - iv. Create/support demand creating services
 - b. Private sector role
 - i. Invest/build capacity
 - ii. Operate networks
 - iii. Create demand generating applications
 - iv. Respond to competition and consumer demand
 - v. Innovate

D. BREAKOUT SESSION

The Workshop participants were asked to discuss the role that societal factors played in shaping their broadband policy in terms of geography, income distribution and age distribution.

The discussions revealed that although Internet penetration may be high, broadband penetration is still low even if Governments have targeted broadband penetration cover for all towns and 50% of population by 2015 as set by WSIS. Governments should also make use of economic and social inclusion drivers to influence broadband service policy and look into public-private partnerships.

Geographically, mountainous areas are an obstacle not just for fast deployment of broadband but also providing or obtaining electricity. There should also be an allocation in any economic stimulus that will target provision of broadband in unserved/underserved areas. Local service providers should also be allowed to lease lines from telcos to be able to provide broadband service in rural areas.

Regarding income, people's ability to afford broadband technology should be improved or else it would be difficult for people in the low income group to get broadband connection. An area with a small population density, may present a difficult economic scale for providing broadband services in that area and the price for services may be high due to heavy investment but alternatives to wired connections are available.

People from all ages are able to access broadband, especially the under-25 age group. The problem of having to bridge the digital divide between urban and rural areas may decrease as the new generation grows up however, government intervention is needed to realize this by helping make society understand the benefits of this technology in order to increase take-up. There is a need for socialization and training for basic ICT literacy and skills of potential users. The creation of content should be encouraged. There should be a push for symmetric digital services to facilitate uploading of user-created content and the creation of appropriate content to fill the needs of the people in rural areas.

The challenges identified were the difficulty of reaching remote regions in deploying both infrastructure and services; the limited access to broadband that low-income municipalities will have; and the need to push further existing programs to upgrade the ICT skills of teachers.

It was pointed out that Government initiatives and efforts that promote broadband access are crucial to attaining the goals of the Bangkok declaration and WSIS by 2015. Furthermore, there should be an existing national broadband strategy prior to broadband deployment in the entire country. Universal Service Obligation/Fund should be considered as a possible solution in the provision of universal broadband access and must impact in the development of new areas.

Government should mandate private operators to broaden the reach of their services and prioritize unserved areas. Up to date information on new areas should be made available to private sector for deployment services. Government should also impose requirements on licenses aiming to cover certain numbers of

remote areas should be in place. It should also introduce incentives for investors in going in new areas as well as amend laws to reduce taxes for telecoms serving in local areas. There should also be transparency in formulating policies and stable rules in order for these policy directives to help regulators guide the telecoms in the provision of universal broadband services and telecoms can plan ahead and they can go to new areas that can generate return. Government should also spearhead efforts in developing applications and content.

Telecoms and the private sector should partner with schools and the Education Ministry in providing broadband for the education sector and partner with local government units by giving opportunity to people to access eGovernment services.

In terms of services, eGovernment should be encouraged at the local government level in order to develop eServices and increase demand. Wireless broadband access should be optimized as an alternative to wireline. There should also be effort made in providing ICT training to people in underserved areas. This will generate demand for services and further the development of content and applications relevant to users in new.

It was suggested that local and national governments encourage telecoms/private sectors to go into the unserved/underserved areas by providing incentives or subsidies – cross subsidies, fiscal subsidies to lower income groups/communities, tax incentives – USO/USP funding, or direct government investments. They should also support the creation of councils in order to promote the benefits of ICT and broadband. The easing of bureaucratic processes for telecoms is needed in order to rollout services in particular local governments. It may also put limits in competition and network duplication. Overall, a good policy and regulatory regime to stimulate deployment of Broadband is needed.

Public access points/ Community-based Internet centers should be set-up in order to create awareness and encourage development of broadband. Provision of broadband facilities should be continued in areas where people converge - government buildings marketplaces, hospitals, and schools - and provide incentives or subsidy to encourage telecoms to invest in these areas. There should be private sector and Government partnership to conduct awareness campaigns and promote the benefits of broadband.

IV. DAY TWO PROCEEDINGS: Discussions on Practices

The second day of the workshop was dedicated to a discussion of best practices in attaining universal access to broadband. Topics for discussions included rural broadband initiatives, wireless cities projects, telemedicine and other projects aimed at delivering enhanced public services through broadband infrastructure. The discussions during the second day of the workshop were expected to identify projects that can be further developed by APEC for possible implementation.

A. EXPERT PRESENTATION

Broadbanding the next billion customers: A challenge for operators and regulators

Samba Natarajan, Partner, McKinsey and Company

The provision of access to broadband will boost a country's socio-economic development as it potentially will create over 10 million jobs and an additional GDP of US\$ 300-420 billion. It was found in their study that there is a correlation between countries' ICT readiness and their economic competitiveness where increasing a country's economic readiness also increases its Global Competitive Index. In an analysis of the direct and indirect of broadband, a positive impact on economic growth was seen especially regarding developing countries. If broadband penetration in developing countries were to be brought up to Western European levels, this action would potentially create US\$ 300-420 billion GDP and 10-14 million jobs.

Key trends are pointing towards a large demand for broadband coming from sizeable emerging markets. It is projected that emerging markets will provide 240 million new users of broadband.

In the least developed markets, there were barriers identified that limit usage of mobile data. These are low household income; only 20% of the market make use of GPRS-enabled handsets; PC penetration only 6% in households; and promotion of data services making up only 1% marketing expenses. However, some operators have managed to grow data revenues by leveraging their 2.5G networks by focusing on key barriers and bottlenecks essential to monetize on the existing 2.5G infrastructures, before investment in the next generation networks.

In light of the different contexts of developed and emerging markets, government and regulators in emerging markets should look at broadband through a different lens. It should be noted that there are massive differences in broadband infrastructure between the two markets that is seen in the level of population/territorial coverage of the fixed and mobile broadband networks. There is also disparity in household income resulting in significantly lower affordability levels in emerging markets. The level of PC penetration also affects broadband penetration since the lack of availability of PCs is a serious barrier for widespread Internet use. In most emerging markets, the competition is usually among a small number of service providers and a strong, but ineffective incumbent. The level of PC literacy in emerging markets is rated as medium to low and is often limited to few social groups.

What these factors mean for emerging markets is that governments should support PC literacy and broadband penetration in order for the significant positive impact on performance of economy to take effect. Governments and regulators should also ensure maximum speed and coverage of broadband rollout making use of the whole spectrum of technologies.

An additional 2 billion broadband users could be served by 2012. Most of these users will be served by mobile broadband with fixed broadband being able

to serve only about a third. In this scenario, fixed technologies will continue to offer higher connection speeds than mobile but mobile will suffice for key applications.

There are three main barriers identified as preventing the further build-out of fixed-line infrastructure, particularly in developing countries. These include poor existing infrastructure where there is poor penetration of the copper line; copper theft; inadequate copper infrastructure; and poor electricity infrastructure limiting PC usage. Further rollout is also seen as cumbersome and expensive. In terms of laying out infrastructure, physical digging for new rollout is costly. Obtaining right of way licensing is often complex and expensive. There are also unpenetrated areas that have typically lower density and are poorly planned which result in complex engineering and longer loop lengths. High operating expenses are accumulated by the higher field force requirements of rollout and the maintenance of copper. Meanwhile, mobile networks are likely to achieve significant penetration in the coming years.

Due to scale and technology-led advances, large-scale mobile broadband coverage has become feasible. Economics has been relatively resilient to population density. Areas with low population density can now be covered by larger cell radius or lower frequencies. Costs are also being rapidly reduced driven by greater scale – there are now 3.9 billion subscribers globally today against 2.5 billion in 2005 – and fewer competing technologies. There are also more spectrums available, as 3G spectrum licensing spreads globally, with majority completed within the next year and digital dividend spectrum will be allowed further expansion. Networks costs have also become electronics-driven with much of the economics steered by Moore’s and Cooper’s Laws. Spectral efficiency is also expected to increase in coming years with better antenna technology. With these developments, mobile broadband will become the only affordable solution for rural areas in emerging/developing economies with moderate throughput.

Another aspect of the agenda is the challenge concerning the creation of a business case for broadband. Operators may be able to use four levers to avoid difficulties in capacity and margin and create a sustainable business model.

A country’s socio-economic structure, topology and market characteristics influence level and speed of broadband adoption. The drivers of a broadband business case include population density, population size, income level, market structures and base of competition.

Smart pricing involves the application of customer lifeline management levers to maximize revenue for investments, including customer segmentation, differential tariffs, bundles, etc. Product pricing design must be influenced by the specifics of customer segments in order to balance demand simulation and profitability.

Behavior shaping happens when insights from consumer behavior and timing are leveraged to promote data-light applications and move heavy data usage outside of peak hours. Operators should proactively accelerate the adoption of handset applications that have been proven to work elsewhere such as email,

mobile payments, social networking and user-generated content, and dating and matrimonial services. Focus should also be on few applications with highest potential and actively push these services (pre-installation, marcom, free trials). Revenue sharing models or increased data traffic should also be sought.

In terms of the device strategy used, operators can shape their handheld device portfolio as well as their pricing to reach different segments of data users while considering the network capacity. Adequate portfolio of devices and financing options can help reduce the entry barrier for poorer subscribers to mobile broadband. Introduction of low-cost devices, flexible financing options for handsets and alternative ownership models are encouraged in order to gain penetration in poor markets. Operators can also optimize the upgrading of their network by deciding on different capacity augmentation options (e.g. new spectrum, LTE, femtocells) based on the cost per MB delivered.

Finally, policy makers have a substantial role to play in accelerating the adoption of broadband and supporting the industry to catalyze their efforts. Public support for broadband in certain regions should be evaluated against its external benefits and inherent economics.

One element that favors supportive roles include social benefits to be gained beyond users' willingness to pay such as the positive externalities of broadband usage (healthcare applications, education); spillover effects into other industries (network effects, content providers); and social inclusion of poorer population (higher reach of government services).

Another factor is the infrastructure-based industries economics. There is an inverse relationship between the average revenue per user (ARPU) that goes higher with lower penetration, and penetration that tends to be lower with higher ARPU. Also to be considered is the minimum revenue threshold needed for a positive business case as well as the network economics of broadband that increases utility per user with rising penetration.

Policy makers also have several options to facilitate the rollout of broadband. They can spectrum available in the low-band spectrum to reduce base station cost. They can also ensure allocation of sufficient contiguous spectrum (10-12 MHz), monitor and manage usage of optimized allocation and guarantee the neutrality of technology to ensure innovation.

Regulators can also promote infrastructure sharing (tower/backhaul) to reduce network cost. Allowing spectrum sharing/national data roaming can increase efficiency and reduce operational costs. Investment requirements can be driven down through passive network sharing, partial active network sharing or full active network sharing.

In terms of coverage obligations, policy makers can provide incentives for rollout, encourage public-private partnerships or grant separate licenses for rural areas to drive coverage, provide public funding for remote areas to achieve sufficient coverage.

Broadband deployment can be promoted through potential regulatory concessions or offering other incentives such as the reduction of spectrum fees for higher rollout, allowing cross-subsidization to fund rollout, issuing rural only licenses and providing public funding.

Regulators can also ensure an economically viable number of players in the market. It can allow industry consolidation that does not distort the market, it can awarding a large number of licenses does not necessarily lead to higher penetration coverage; economies of scale and industry structure effects on revenues and costs may lead to higher penetration with fewer operators.

They can also charge minimal spectrum/license fees to ensure affordability. Licenses can be awarded based on coverage, partially substituting or replacing financial criteria. License fees dramatically increase the ARPU required to break even and divert economic resources away from operators. A trade-off of license income and fees for rollout commitments may also be considered.

B. ECONOMY PRESENTATIONS

CANADA: Measuring the Broadband Footprint – The CRTC Experience

Stephen Delaney, Director, Industry Analysis

Canadian Radio-television and Telecommunications Commission

The presentation outlined the practices, efforts of the CRTC and the results of its broadband measurement which was implemented for the purpose of knowing the extent of broadband deployment resulting from market forces and aimed at addressing shortfalls where it may not be economically feasible to deploy it. The data collected by the CRTC to measure Canada's broadband footprint come from the Internet service providers (ISPs) – supply side, and supplemented with data from the consumers – demand side.

In order to minimize the regulatory burden on the industry, the CRTC collects data from facilities-based ISPs. However, the data being gathered are only those required for policy making. These policy-relevant data are what these companies already use internally. To make the data collection more efficient, the data from ISPs already use standard and generally accepted geographic definitions such as postal codes and Statistics Canada census blocks. The CRTC is also coordinating and cooperating with other federal departments and agencies and provincial departments in collecting data for the broadband footprint.

There is also a conduct of annual consumer behaviour surveys which address specific issues. The agency uses syndicated consumer reports. Furthermore, the CRTC also makes use of publicly available information such as those from ISP websites to identify the services they are offering.

The broadband footprint measures the availability of broadband by technology. This aspect identifies competitive presence in the market. It also identifies the availability of Broadband by speed or capacity deployed and the potential applications for the varying speeds.

The broadband footprint also gathers information regarding subscribers. Details such as the number of subscribers by the internet technology as well as the speed and capacity of the service they subscribe to are collected. As noted above, consumer surveys are also performed to address various issues such as why households do not subscribe to the internet.

The CRTC obtains the information needed to measure Canada's broadband footprint through an annual survey of service providers to obtain mapping details of both wireline and wireless serviced areas. The survey also collects the location of broadband enabled facilities such as the central offices and remotes of telephone companies and the cable headends of cable companies. The data is needed to estimate the served areas when mapping details are not available. The service provider survey also considers the availability of residential Internet access pricing plans as well as the number of internet subscribers by technology (Geographic basis) and speed/plan (National level).

The data for the determination of the broadband footprint is supplemented from consumer surveys. These surveys look into specific issues regarding internet service such as pricing and speed. It also helps the CRTC in assessing why households don't subscribe to the internet.

The data gathered is analyzed in order to identify the following information:

1. The location of broadband enabled facilities on the map;
2. Areas with potential broadband internet service; and
3. Internet subscriber data by postal code.

Areas that encompass both broadband enabled facilities and subscribers were considered served. Recently, with the availability of improved data from the facilities-based ISPs, subscriber data by postal code is no longer required. Areas containing broadband enabled facilities are considered served.

Canada's size, geography and climate as well as its population density contribute challenges in providing broadband to its people. However, the broadband footprint already includes 93% of Canadian households.

In terms of differentiation of technologies used in the different areas of Canada, it was found that areas with higher population subscribe to DSL/cable modem internet with over 85% of Canadian households have a choice between DSL and Cable modem. Urban centers and higher cost serving areas make use of fixed wireless internet. Satellite technology is used to connect more remote areas in Canada to the internet.

Broadband in rural areas of Canada lag behind urban coverage. Moreover, rural communities generally have lower speeds than urban communities. The lag in the coverage in rural communities may be attributed to the price as installation

cost and monthly charges for services are higher in rural areas. The quality of service is also detrimental since the speeds are generally lower in rural areas. Furthermore, younger individuals who embrace the internet tend to migrate to urban areas.

Nationwide Broadband: Strategy for Japan

*Atsushi Ozu, Director for Broadband Promotion
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Japan had the lowest ADSL price and the fastest ADSL speed in 2006. The economy also has the highest Broadband Quality Score (BQS) which measures the actual download and upload throughput and latency, with different weights matching current and future application requirements. The services in Japan also lead in quality to handle next generation Internet applications.

The success of Japan's broadband expansion is due to several factors. First were the clear mid/long-term vision/policy targets set by government. The MIC also introduced competition measures such as rules on unbundling and co-location. There was also demand driven factor such as the market expansion due to increase in broadband contents. Other factors were the introduction of a monthly flat rate; affordable price packages introduced by competitors. The investment in optical fiber network by NTT gave way to FTTH expansion resulting in an access network opticalization ratio of 89% in 2007 from 43% in 2000.

Japanese Government aims to eliminate all of its Broadband Zero Areas through its New IT reform strategy, implemented in 2006, and Digital Divide Elimination Strategy, implemented in 2008. As of September 2008, the ratio of households covered for broadband is about 98.6%, and the number of households located in areas where broadband service is not available is about 0.74 million.

The MIC used the Broadband Availability Map and classified broadband service provision into five types that define the role sharing between public and private sectors for broadband service provision.

The MIC also introduced promotional measures both for local governments and for telecom operators to support nationwide broadband deployment.

For local governments, the actions launched include the Local Information and Communications Infrastructure Development Grants (ICT Grant) that helps local government build broadband facilities to address the digital divide. Another is the local intranet infrastructure facility development promotion grants which helps local government to build broadband or ultra-high-speed local public networks that connect public facilities such as schools, libraries, and municipal offices. Local governments are also allowed to use special allocation tax or to issue local government bonds for their policy needs. These schemes may be used to build broadband facilities, such as optical fiber and DSL.

Telecom operators are also given assistance by government. From a fund established to build broadband facilities, the National Institute of Information and Communications Technology (NICT) is able to guarantee 80% of a loan made by a private telecoms operator. The government also introduced tax breaks such as the accelerated tax depreciation (national tax) and the reduction of tax bases for fixed assets taxes (local tax).

Universal Access to Broadband in China

*Men Rujing, China Academy of Telecommunication Research
Ministry of Industry and Information Technology*

China's Rural Informatization in the Village Access Project is aimed at providing all villages in the economy with a telephone and all towns with Internet access. The project was deployed in order to bridge the digital divide and improve the economic development of rural areas.

The Project had three phases. The first phase aimed to provide telecom access to villages. The second phase sought to increase rural telephone density. The last phase is aimed at promoting rural informatization.

Most towns in China already have broadband Internet. These connections also extend to key administrative villages. The towns and some villages were connected by fiber though wireless technology like GSM, CDMA and 3G were also used.

An Integrated Rural Information Service Platform is in place in 10 provinces. The platform is a single portal that uses user IP authentication and security. It also collects information and integrates agricultural applications. In effect, the platform is able to unify user access through a single portal; integrate current public service platform resources; and form an integrated rural information service platform.

The Chinese economy also deployed the Broadband terminal subsidies scheme. Since December 2008, mobile phones and PCs, priced 13% lower than in cities, were made available to the countryside. The price of mobile phones was pegged less than CNY 1,000 and computer prices were set no more than CNY 3,500. There were hundreds of mobile phone types and nearly 200 types of PCs included in the scheme, among which were Nokia, LG, Samsung, Haier, ZTE, Brid and Hicense. This was seen as a measure to resolve the bottleneck problem of broadband access and help the manufacturers deal with the global financial crisis. The scheme was deemed effective due to its suitability to the local environment.

As a result of these programs, 98% of towns have Internet access and 95% of towns have broadband access. Already, twenty seven (27) provinces have achieved the target of providing Internet access to all towns and 19 provinces have providing Internet access to all administrative villages.

There are now 1,600 local government units with web presence. There have also been 2,000 town information messengers trained for free. The total number of Internet users in China is now at 300 million. Rural Internet users make up 87 million of this total. Rural Internet user growth rate is 60%.

The Internet has become the most popular communication tool other than mobile communication for farmers. There is a marked change in the lifestyle of farmers since these programs have been in effect. Farmers now share product information through the Internet. They also use the Internet as a means to look for employment. Farmers made up 18% of the total number of those who looked for jobs over the Internet in 2008.

Providing universal access to broadband in the Philippines

*Alfredo Carrera, First Vice President for Regulatory Strategy and Support
Philippine Long Distance Company*

The Philippine economy presentation focused on efforts of the private sector to support national policy direction towards providing universal access to broadband in all areas of the country.

The Philippine Long Distance Telephone Co. (PLDT) in particular is currently in the midst of an extensive expansion program covering the deployment of its New Generation Network (NGN) to allow the company to serve the entire Philippines with broadband technology over the next few years. Catering to both wired and wireless broadband access networks with its nationwide fiber optic transmission infrastructure, the PLDT Group continues to be fervent in its vision to provide affordable and high speed Internet access as a basic communications service not only in urban areas but even in the remote areas of the country.

As part of its overall broadband access strategy, PLDT complements the massive infrastructure rollout initiative with the offering of cost-effective products and services that address particular market and customer service requirements. Affordable and innovative technology bundles (PC + broadband) are offered. Solutions for shared access models are likewise provided with the availability of access devices with wireless routers. The concerted efforts of the PLDT Group towards spreading broadband had generated significant growth in both wired and wireless broadband customer base.

Integral to the overall strategy of PLDT to make broadband service available to more customers in the country is the network support extended to over 4000 Internet cafes nationwide. The company considers this an effective way to make broadband access easily available and more affordable to the public.

Recognizing its relevance, PLDT has included broadband access initiatives as part of its Corporate Social Responsibility (CSR) program. PLDT has been supporting digital literacy in public schools and has partnered with many schools by providing PCs and wireless broadband at a discount to schools in far-flung areas. It has also embarked on content provision for communities by pioneering the Community Billboard program used in over 100 communities by

local government units and other organizations. This is an info board program that can be accessed via web and SMS which communities themselves customize based on their daily info specifications.

In the future, PLDT aims at continuous deployment of broadband facilities to reach more rural areas. The company intends to upgrade existing access network to support growing broadband traffic, as well as explore new technologies such as WiMAX; HSPA+ and LTE. Future plans also include the upgrade of existing transmission networks by converting SDH/PDH network to IP-based facilities for higher capacity and faster and more reliable transmission.

C. PLENARY WORKSHOP DISCUSSION

The plenary considered metrics that may be used in the definition of universal access. It was deliberated whether penetration will be measured per household, which is the measurement used in Canada or if the number of subscribers/users will measure penetration, as prescribed by the ITU.

It was also discussed how the shared access points will be measured whether in terms of the number of access points in the smallest administrative unit (village/kampong/barangay), the number of Internet cafes present or other measurement units like the number of minutes one must walk until an Internet or broadband access is found.

It was also suggested that the shared access be measured by the specific sectors that they serve: small and medium businesses, schools and universities, health centers, clinics and clinicians, rural and agrarian communities, and government services to citizens.

It was thought that if universal access was measured by coverage then the issue will no longer be a supply problem and governments can then focus on narrowing the gap between supply (coverage) and demand (uptake).

Regarding suggestions for future projects that the APEC can implement, it was put forward that, initially, past APECTEL projects be reviewed in order to avoid duplication. Proposals for future projects were:

1. A study on network provisioning of rural areas to include VoIP;
2. A study examining the promotion of partnerships between operators, local entrepreneurs and local government units through sharing of best practices and implementation of incentive schemes;
3. A study identifying future plans of operators in terms of expanding their network coverage and complementing the plans of the private sector with projects that are identified as essential to uptake such as training and content development among others;

4. A study concerning the integration of wireless and wired networks and IPv4 and IPv6 and identifying the way forward;
5. A study examining the effectiveness of the implementation of Universal Service Obligations/Universal Service Funds of APEC economies on the provision of Internet and broadband access;
6. A study examining how governments promote Internet and broadband access such as the WiFi cities and the impact of these projects in the uptake of broadband services;
7. The creation of a venue enabling the sharing of best practices in content regulation in terms of enforcing policies and identifying the responsibilities of government, operators, parents and other stakeholders; and
8. A project on developing applications to promote access in the community such as applications for rural health centers.

V. WORKSHOP RECOMMENDATIONS

In summary, the following were recommended that:

1. The DSG should consider adopting population coverage as the metric in measuring the goals for Brunei 2010 and Bangkok 2015;
2. The metrics to be used have to measure the gap between the supply and demand of Internet and broadband connections, the number or users in Community Access Points including those established and used for specific sectors - schools, libraries, health centers, agrarian centers, etc.; and
3. The DSG should encourage member economies to propose projects that have been suggested in the workshop.

VI. CONCLUSIONS

Progress towards the attainment of the Brunei 2010 Vision of Universal Internet Access. (For this section, please refer to Annex I for the complete information on Universal Access to Internet and Broadband Services in APEC.)

Rank	2007 - 2009	
	Economy	% Internet Penetration (users/100 inhabitants)
1	New Zealand (2008)	80.5
2	Australia (2008)	79.4
3	Korea (2008)	77.1
4	Japan (2009)	75.30
5	United States (2008)	73.2

6	Canada (2007)	73
7	Singapore (2007)	68
8	Chinese Taipei (2007)	66.4
9	Hong Kong (2008)	59
10	Malaysia (2008)	56.63
11	Chile (2007)	50.9
12	Brunei (2007)	46.2
13	Russia (2008)	27
14	Peru (2008)	24.8
15	Vietnam (2008)	24.2
16	China (2008)	22.6
17	Mexico (2008)	21.7
18	Thailand (2007)	21
19	Philippines (2007)	14.6
20	Indonesia (2008)	10.5
21	Papua New Guinea (2007)	1.83

Internet penetration rankings among APEC using updated figures from economies.

Internet metrics used by economies.

- **Geographic coverage.** There are five economies that have data on geographic coverage: Chinese Taipei, Korea, Malaysia, Peru and the Philippines. Chinese Taipei and Korea measured geographic coverage in terms of % of land area with Internet access while the data from Malaysia, Peru and the Philippines described the number of local administrative divisions with Internet access. The Philippines has data for Internet geographic coverage only.
- **Population coverage.** Australia, Chinese Taipei, Hong Kong, Korea and New Zealand have data % population coverage of both Internet and broadband services.
- **Number of subscribers.** Twelve (12) economies measure the number of broadband subscribers (Brunei, Canada, China, Indonesia, Japan, Malaysia, Philippines, Russia, Singapore, Thailand, United States, and Vietnam). There are at least eight (8) economies that measure both Internet and broadband subscribers (Australia, Chile, Chinese Taipei, Hong Kong, Korea, Mexico, New Zealand, and Peru). At present, there is no data from Papua New Guinea regarding this metric.
- **Number of users.** Seventeen (17) economies measure the number of Internet users (Brunei, Canada, China, Chinese Taipei, Hong Kong, Indonesia, Japan, Malaysia, Mexico, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Thailand, United States and Vietnam). Korea and New Zealand have figures for the number of users of Internet and broadband. Australia and Chile have no official data on the number of Internet users.

- **Other: Number of households.** Australia and Hong Kong measure the number of households with Internet and broadband services. While Japan measures the number of households with broadband subscriptions.

In terms of measuring Internet, most economies measure it using the number of users. In all there are 19 economies measuring the number of Internet users. There are 20 economies that measure the extent of broadband penetration in terms of broadband subscribers. There are five economies that measure Internet and broadband by geographic coverage. However, this figure is split further since the manner by which the geographic coverage is measured differs. There are also five economies that measure the population coverage of Internet and broadband. All of these economies measure population coverage by % of population with Internet/broadband access. There are only three economies that measure Internet/broadband penetration by households and only two measure both Internet users and broadband subscribers.

- **Broadband definition.** There are at least five (5) economies that measure broadband with speeds of 256kbps upwards – Australia, Chile, Canada, New Zealand and the Philippines. Chile has no official definition of broadband but makes use of this speed in computing its data.

Trebling Internet access by 2005. Using the 2005 ITU data, the economies that have managed to triple the number of people with Internet access are the following:

1. Brunei;
2. Peru;
3. Mexico;
4. Russia;
5. Thailand;
6. Vietnam;
7. China; and
8. Indonesia

Other economies already have high Internet penetration that it was difficult to treble the number of people with access to the Internet in five years. However, there has been steady increase in the number of people with access to the Internet across all economies after 2005 and this can be seen as a sign that economies are actively working towards the goal of universal Internet access by 2010.

Universal Internet access by 2010. With less than a year to go, there are only 11 economies where more than half of the population has Internet access.

1. 50.90 – Chile (2007);
2. 56.63 – Malaysia (2008);
3. 59.00 – Hong Kong (2008);
4. 66.4 – Chinese Taipei (2007);
5. 68.0 – Singapore (2007);
6. 73.0 – Canada (2007);

7. 73.2 – United States (2008);
8. 75.3 – Japan (2009);
9. 77.1 – Korea (2008);
10. 79.4 – Australia (2008); and
11. 80.5 – New Zealand.

New Zealand has 80% of its population using the Internet. There are five economies that nearly or already have 75% of their population using the Internet: Australia, United States, Japan, Korea and Canada. In all, there are already 11 economies with more than half of their populations using the Internet with another one near the 50% mark. There is a big gap between the percentage of users between the Brunei (12th) and Russia (13th). The economies coming after Russia are those whose Internet users have not reached 25% of their respective populations.

The six economies with more than 70% of their population using the Internet – New Zealand, Australia, Korea, Japan, United States and Canada - are developed countries and are major economies. Looking at their policies regarding the provision of Internet/broadband services, these economies (with the exception of the United States) have established their broadband policies and programs as between 1997 (Australia) and 2002 (New Zealand). They already have their USO/USF programs in place with clear direction regarding the use of the funds. Their USOs/USFs are periodically evaluated and assessed against the needs of the consumers and the prevailing market environment. They also promote competition within the market among the incumbent telecoms and its competitors. Canada is the only economy among the six that made use of telecenters in order to provide Internet/broadband access to far flung areas. Japan and Korea also have forward-looking policies their respective government agencies have formulated long-term plans regarding their networks and are investing accordingly.

Meanwhile, the economies that have less than 25% of their population using the Internet belong to developing economies. Mexico the deployment of its USO/USF program, *eMexico*, in 2002, two years after the declaration of the Brunei 2010 goals. However, it has achieved the goal of trebling its Internet users by 2005 and is now embarking on its Interconnection plan. Thailand, another economy that trebled its users in 2005, has recently launched its Second ICT Master Plan, which will take effect from 2009 to 2013. Peru introduced its broadband development guide in 2007. Vietnam implemented its Internet Development Plan from 2001-2005 and has been implementing the formation of the National Information Infrastructure since 2004. Indonesia established a National ICT Board in 2006 and revised its USO in 2008. The USO divided the economy into 11 USO zones in which 32,000 common access points will be built. The Philippines has yet to amend its service area scheme which is a program targeted primarily for increased telephone penetration in the country.

Of the eight, China, Indonesia, Mexico, Peru, Thailand and Vietnam have USO/USF programs in place and these are administered by their respective regulators. The promotion of Internet use by way of community-based common access points is widely used by most of these economies.

Strategies to achieve the Bangkok 2015 goal.

The recommended strategies suggested to achieve the Bangkok 2015 goal of universal broadband services are based on suggestions made during the plenary workshop discussions.

1. A study on network provisioning of rural areas to include VoIP;
2. A study examining the promotion of partnerships between operators, local entrepreneurs and local government units through sharing of best practices and implementation of incentive schemes;
3. A study identifying future plans of operators in terms of expanding their network coverage and complementing the plans of the private sector with projects that are identified as essential to uptake such as training and content development among others;
4. A study concerning the integration of wireless and wired networks and IPv4 and IPv6 and identifying the way forward;
5. A study examining the effectiveness of the implementation of Universal Service Obligations/Universal Service Funds of APEC economies on the provision of Internet and broadband access;
6. A study examining how governments promote Internet and broadband access such as the WiFi cities and the impact of these projects in the uptake of broadband services;
7. The creation of a venue enabling the sharing of best practices in content regulation in terms of enforcing policies and identifying the responsibilities of government, operators, parents and other stakeholders; and
8. A project on developing applications to promote access in the community such as applications for rural health centers.

Issues and possible approaches in implementing Universal access to broadband services.

There are several APEC economies that have yet to craft a National ICT Strategy. APEC economies should have a national ICT strategy/framework to ensure universal access to Internet/broadband services. Having a national strategy will give a unified implementation of projects and the economy's USO or USF. Economies should also ensure that the roles and goals of their regulators are clear since they are the ones implementing the government's programs. It is the duty of the regulators to identify which areas in the economy are still unserved or underserved in order to map out the effective implementation of the national ICT strategy and improve accessibility to Internet/broadband services. Governments

should take into account whether these unserved areas have provisions for electricity and address these if they have none.

There were six (6) components that should be present in a Net Strategy (based on the presentation of the US economy).

1. **Policies and regulations.** This component ensures that the institutional framework has evolved to one that enables convergence around IP and permits entry and efficient use of assets.
2. **Competition and market structure.** This component checks whether the number of players, their technology platforms and market shares foster competition regarding service innovation and responsiveness to potential demand.
3. **Public and private infrastructure investment.** This component evaluates whether ICT infrastructure bottlenecks are critically affecting the breadth, depth, and speed of ICT adoption, whether there are adequate incentives for the private sector to undertake these investments, and whether the investments between public and private sector are balanced.
4. **Government operating expenditures.** This component checks whether eGovernment practices are contributing to government's operational efficiency and citizen interaction online. It also verifies if government procurement is used to promote national ICT development.
5. **Skills for ICT.** This component studies whether the ICT skill levels of ICT users should be ascertained in order to find whether it is supporting the use of Internet by business and individuals. This should reveal if there are specialist ICT skills developing in line with technology and potential.
6. **Applications and content.** This components looks at the business environment and innovation culture and at where the level of demand and ICT entrepreneurship drive application and development.

Governments should ensure the buy in of consumers prior to the implementation of its national ICT strategy. There have been several reports cited throughout the workshop that say that investing in ICT will improve the economy and this has to be appreciated by the consumers. The social benefits to be gained beyond users' willingness to pay such as the positive externalities of broadband usage (healthcare applications, education); spillover effects into other industries (network effects, content providers); and social inclusion of poorer population (higher reach of government services) should be highlighted.

Addressing the issue of accessibility is vital in the attainment of universal access to Internet/broadband services. Governments should identify the role of the telcos in the USO or USF programs. They should provide them

with incentives to build networks that will service those in unserved and underserved areas. This will enable telecoms to provide services needed in these areas. The provision of mobile broadband and/or wireless broadband by telecoms in developing countries should be encouraged through incentives or partnership with government.

Making the means by which people are able to go on the Internet more affordable should be addressed. There should also be programs targeted towards providing affordable gadgets – netbooks, notebooks, smartphones, and connectivity. This will ensure that people who have yet to use the Internet will not be deterred by the price of the products and services and will be encouraged by its affordability.

In order to push its *Village Access Project*, which aims at providing all villages with a telephone and all towns with Internet access, China deployed the Broadband terminal subsidies scheme. Since December 2008, mobile phones and PCs, priced 13% lower than in cities, were made available to the countryside. The price of mobile phones was pegged less than CNY 1,000 and computer prices were set no more than CNY 3,500. This was seen as a measure to resolve the bottleneck problem of broadband access and help the manufacturers deal with the global financial crisis. The scheme was deemed effective due to its suitability to the local environment. However, despite the affordability of gadgets and availability of Internet/broadband services, it is still not assured whether people will choose to use these services.

The same success was seen with the *Australian Broadband Guarantee*, from a broadband subscription point of view. The program saw 300,000 additional broadband subscribers through the program. The *Australian Broadband Guarantee* identifies areas where the broadband market is failing and makes a targeted intervention. The broadband services are supplied through Internet service providers. The program focuses on the viability and sustainability of providers and mandates standards, consumer protections and continual review to match changes in the market.

It is important that the people who are being targeted to use the Internet want to use the Internet and appreciate it as a tool that raises their quality of life. The desirability of using the Internet should be raised through the development of applications and production of content relevant to the users. This is what the study of Frost and Sullivan showed. Therefore, government services should be made available on the Internet, while other products and services available should be relevant to users and easily integrated in their routine. The farmers in China that have benefited from the *Village Access Program*, used the Internet to share product information. They have also used the Internet to look for employment.

In light of the different contexts of developed and emerging markets, government and regulators in emerging markets should look at broadband through a different lens. It should be noted that there are massive differences in broadband infrastructure between the two markets that is seen in the level of population/territorial coverage of the fixed and mobile broadband networks. There

is also disparity in household income resulting in significantly lower affordability levels in emerging markets. The level of PC penetration also affects broadband penetration since the lack of availability of PCs is a serious barrier for widespread Internet use. In most emerging markets, the competition is usually among a small number of service providers and a strong, but ineffective incumbent. The level of PC literacy in emerging markets is rated as medium to low and is often limited to few social groups.

What these factors mean for emerging markets is that governments should support PC literacy and broadband penetration in order for the significant positive impact on performance of economy to take effect. Governments and regulators should also ensure maximum speed and coverage of broadband rollout making use of the whole spectrum of technologies.

The role of government in the success of universal access to Internet/broadband services is vital. Its vision should be defined at the onset. Government should set clear policy targets as well as introduce measures that encourage competition. As well as invest in the expansion of networks or offer incentives to telecoms for doing so.

Japan's MIC included its local government and telecom operators in various programs that support it's the economy's nationwide broadband deployment. It introduced the Local Information and Communications Infrastructure Development Grants that help local government build broadband facilities. It also launched the local intranet infrastructure facility development promotion grant aimed at connecting public facilities though broadband or ultra-high-speed local public networks. Local governments are also allowed to use special allocation tax or to issue local government bonds that may be used to build broadband facilities, such as optical fiber and DSL. The NICT also guarantees 80% of a loan made by a private telecoms operator among other incentives introduced by government.

In order to facilitate the rollout of broadband, policy makers can make available the low-band spectrum to reduce base station cost, ensure allocation of sufficient contiguous spectrum, monitor and manage usage of optimized allocation and guarantee the neutrality of technology to ensure innovation. They may also promote infrastructure sharing (tower/backhaul) to reduce network cost.

In terms of coverage obligations, policy makers can provide incentives for rollout, encourage public-private partnerships or grant separate licenses for rural areas to drive coverage, provide public funding for remote areas to achieve sufficient coverage.

The role of Government was also reiterated by the recommendations during the breakout session of the workshop. From a regulatory point of view it was suggested that government also be transparent in formulating policies to help regulators guide the telecoms in providing universal broadband services, so that telecoms can plan ahead and they can go to new areas that can generate return. Government should also spearhead efforts in developing applications and content.

In terms of services, eGovernment should be encouraged at the local government level in order to develop eServices and increase demand. Wireless broadband access should be optimized as an alternative to wireline. There should also be effort made in providing ICT training to people in underserved areas. This will generate demand for services and further the development of content and applications relevant to users in new.

It was suggested that local and national governments encourage telecoms/private sectors to go into the unserved/underserved areas by providing incentives or subsidies. They should also support the creation of councils in order to promote the benefits of ICT and broadband. The easing of bureaucratic processes for telecoms is needed in order to rollout services in particular local governments. It may also put limits in competition and network duplication. Overall, a good policy and regulatory regime to stimulate deployment of Broadband is needed.

Public access points/ Community-based Internet centers should be set-up in order to create awareness and encourage development of broadband. Provision of broadband facilities should be continued in areas where people converge - government buildings marketplaces, hospitals, and schools - and provide incentives or subsidy to encourage telecoms to invest in these areas. There should be private sector and Government partnership to conduct awareness campaigns and promote the benefits of broadband.

The private sector has an important role to play in achieving the universal access to Internet/broadband services. This has been seen in the implementation of the USOs of the various economies. Chinese Taipei has engaged the private sector, as has the Australian Broadband Guarantee. Competition against the incumbent has also brought the price of services down, as illustrated by Japan.

The Japanese Government, as part of its program to eliminate Broadband Zero areas, also makes use of the Broadband Availability Map where it classified broadband service provision into five types defining the role sharing between public and private sectors in providing broadband service.

Telecoms and the private sector should partner with schools and the Education Ministry in providing broadband for the education sector and partner with local government units by giving opportunity to people to access eGovernment services.

In the Philippines, PLDT looks at the market is one of the forces that dictate the direction in which it will take in terms of developing the services it provides its consumers. As a result of competition, the company is undertaking an extensive expansion program covering the deployment of its New Generation Network (NGN) to allow the company to serve the entire Philippines with broadband technology over the next few years. PLDT also has broadband access initiatives as part of its Corporate Social Responsibility (CSR) program where it supports digital literacy in public schools and has partnered with many schools by providing PCs and wireless broadband at a discount to schools in far-flung areas.

It has also embarked on content provision for communities by pioneering the Community Billboard program used in over 100 communities by local government units and other organizations.

Generate recommendations on APECTEL's next steps or plan of action.

1. A common APEC metric for broadband and Internet penetration as well as a definition for broadband in order to be able to have regional data that will be comparable should be crafted. This would enable APEC to identify and measure the progress of the various economies from a common baseline. It is recommended that the metric used for Internet and broadband measurement be that of population coverage - the number of users per 100 inhabitants - for comparability and consistency of data. Based on the matrices filled out by the economies, it was learned that most of the economies measured Internet penetration by the number of users while most of them measured broadband by the number of subscribers.

In order to measure the universality of access and take into account the users of shared devices, data on users and subscribers should be disaggregated from the base in order to determine the number of users. However, there should be a formula to determine the uniqueness of users should also be determined.

It is also recommended that APEC economies should agree on a formula that will enable the conversion of the number of broadband users into the number of broadband subscribers in order to arrive at in order to arrive at common and comparable data on Internet and broadband users in APEC.

2. Encourage the crafting of a national broadband strategy for economies that have yet to formulate theirs. The framework should be able to stimulate both demand and supply sides. As well as policy assessment and accountability mechanisms. (policies and regulation, competition and market structure, public and private infrastructure investment, government operating expenditures, skills for ICT, applications and content). This will unify the platforms in terms of providing universal access.
3. The speedy licensing spectrum for 3G/4G in order to expand broadband networks and reach high penetration goals should be implemented. Policy makers can make spectrum available in the low-band spectrum to reduce base station cost. They can ensure allocation of sufficient contiguous spectrum (10-12 MHz), monitor and manage usage of optimized allocation and guarantee the neutrality of technology to ensure innovation. They can promote infrastructure sharing (tower/backhaul) to reduce network cost, increase efficiency and reduce operational costs and charge minimal spectrum/license fees

to ensure affordability. Licenses can be awarded based on coverage, partially substituting or replacing financial criteria.

4. New regulatory framework granting separate licenses for rural areas to drive coverage, provide public funding for remote areas to achieve sufficient coverage, reduction of spectrum fees for higher rollout, allowing cross-subsidization to fund rollout, issuing rural only licenses and providing public funding.
5. Incentives should be put in place for the deployment of broadband and distribution/price of laptops, PCs, mobile phones and other ICT-related gadgets to make them more affordable to more people.
6. Government should encourage public-private partnerships.
7. Government should encourage the production of applications, content and services that will promote the use of the Internet. The same should be done for programs aimed at addressing ICT literacy.
8. During the plenary discussion, there were sectors in society that were identified as key areas in broadband development: small and medium businesses/entrepreneurs, schools, health centers, rural communities and government services. There were also five (5) areas of ICT where these sectors need to be developed: clients, content, training, network and secure transactions. Looking through APECTEL's completed projects and workshop topics, these key areas, were not given focus although there were projects that presumably included them. Most of these projects were not specifically targeted to these identified areas.

VII. NEXT STEPS

During the workshop, there were five (5) areas of focus identified in need of further development of Internet and broadband services, namely:

1. Clients, users, and stakeholders;
2. Training;
3. Applications and content;
4. Network; and
5. Secure transactions.

By plotting the projects and workshops undertaken by APEC since the declaration of the Brunei 2010 goals by the areas needing improvement against five (5) sectors identified as needing Internet and broadband support – government services, small and medium businesses/enterprises, rural communities, schools, and health - will identify the direction of APEC in achieving the Brunei 2010 goals and that of Bangkok 2015 to a certain extent. (Please refer to Annex 2 for the complete information regarding APEC activities in these areas.)

There were many workshops and projects that concerned government services. For clients, there were several that tackled the issue of eGovernance, even establishing a research on eGovernance. Regarding the findings of the research being conducted on eGovernance are there any economies that have taken these and applied it to their programs? There was a several training workshops conducted, however these workshops were on several topics such as development of eGovernment, telecommunications trade rules, and cybersecurity and when divided among these three topics, there is not much depth on the trainings provided, at least not on the topics on hand. There were also no trainings related to the other sectors that need further development in order to attain universal Internet or broadband services. Although projects for applications and content on government services are lacking there are many projects that fall under network development and secure transactions. The region has studied and is studying various networks in depth in order to learn how to maximize the use of these networks as well as the positive and negative aspects of their use. Security-wise, APECTEL has tackled various issues from raising awareness and training for cybersecurity for existing and emerging technologies, protecting data, products and services. It has also crafted a regional strategy on cybersecurity and established CERTs.

Several projects and workshops concerning small and medium businesses (SMBs) and small and medium enterprises (SMEs) were conducted. Most were focused on the clients where they tackled issues on eBusiness, eCommerce and showcased best practices for SMEs. However, there were only two SME-related trainings conducted. There were no projects or workshops that tackled the development of applications for SMBs/SMEs. The entries for content development are too general to really be considered as directed solely towards production of content for the SMB/SME sector. The same can be said for the entries for network. For secure transactions, the workshops conducted provided overviews regarding security over the Internet. However, there were no projects or workshops conducted under the secure transactions for SMEs/SMBs.

There are several projects and workshops that tackled rural communities. However, projects and workshops on training, applications, content and secure transactions concerning rural communities are lacking.

There are few programs directed towards schools that have been undertaken. Distance learning is the focus of workshops on network and regarding clients. There are no projects that deal with security of school records, content, training, application development.

Aside from introducing the use of ICT in health care and the use of electronic disease surveillance, there are no other programs or workshops that have been done related to health.

Based on these tables, APEC has had projects and workshops that, generally, concern all five sectors. However, workshops and projects specifically focused on the development of Internet and broadband schools, health centers and rural community sectors lacking.

APECTEL needs projects that will address developing applications and producing content for government services, SMEs/SMBs, schools, health centers and rural communities. It also needs to focus on projects directed towards clients, training, network and security for schools, health centers and rural communities as these have received less attention.

Recommended studies from the workshop that fall under these criteria are:

1. A study on network provisioning of rural areas to include VoIP;
2. A study examining the promotion of partnerships between operators, local entrepreneurs and local government units through sharing of best practices and implementation of incentive schemes;
3. A study examining the effectiveness of the implementation of Universal Service Obligations/Universal Service Funds of APEC economies on the provision of Internet and broadband access;
4. The creation of a venue enabling the sharing of best practices in content regulation in terms of enforcing policies and identifying the responsibilities of government, operators, parents and other stakeholders; and
5. A project on developing applications to promote access in the community such as applications for rural health centers.

There have been APECTEL workshops on bridging the digital divide, universal Internet services, and universal broadband services. Based on the discussions presented by the experts, the organization may also consider looking into the progress of wireless broadband and its effect on universal Internet/broadband access and services, and to a lesser degree, the strategies employed by economies regarding regulation, distribution and licensing of spectrum.

**ANNEX I:
UNIVERSAL ACCESS TO INTERNET AND BROADBAND SERVICES OF
APEC ECONOMIES**

***Ranking of Economies in terms of Internet Penetration for years 2000, 2005
and latest data received from economies (2007-2009)***

Ran	2000	2005	Latest
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k	Economy	%	Economy	%	Economy	%
1	New Zealand	48.0	Korea	72.8	New Zealand (2008)	80.5
2	Australia	47	United States	69	Australia (2008)	79.4
3	United States	43.64	Canada	68	Korea (2008)	77.1
4	Canada	42.27	Japan	66.80	Japan (2009)	75.30
5	Korea	40.7	New Zealand	64	United States (2008)	73.2
6	Japan	37.10	Australia	63	Canada (2007)	73
7	Singapore	32.36	Singapore	61	Singapore (2007)	68
8	Chinese Taipei	28.1	Chinese Taipei	58.01	Chinese Taipei (2007)	66.4
9	Hong Kong	27.95	Hong Kong	50.08	Hong Kong (2008)	59
10	Malaysia	21.64	Malaysia	49.18	Malaysia (2008)	56.63
11	Chile	16.46	Brunei	36.1	Chile (2007)	50.9
12	Brunei	9.0	Chile	21.55	Brunei (2007)	46.2
13	Mexico	5.05	Mexico	18.17	Russia (2008)	27
14	Thailand	3.74	Peru	16.45	Peru (2008)	24.8
15	Peru	3.08	Thailand	15.43	Vietnam (2008)	24.2
16	Philippines	2.03	Russia	15.22	China (2008)	22.6
17	Russia	1.98	Vietnam	12.72	Mexico (2008)	21.7
18	China	1.77	China	8.5	Thailand (2007)	21
19	Indonesia	0.91	Philippines	5.56	Philippines (2007)	14.6
20	Vietnam	0.25	Indonesia	3.54	Indonesia (2008)	10.5
21	Papua New Guinea	--	Papua New Guinea	1.78	Papua New Guinea (2007)	1.83

AUSTRALIA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	No official data available.	No official data available.
<i>Population Coverage</i>	As of June 30, 2008 <ul style="list-style-type: none"> • Dial-up – 100% • Satellite – 100% • Mobile wireless – 98.8% (Source: ACMA)¹ • 86.8% of Australian businesses had internet access in 2007-08 (Source: ABS)² 	As of June 30, 2008 <ul style="list-style-type: none"> • ADSL – 91% of population • HFC cable – 2.6 million premises • Satellite – 100% of population • Wireless – select metropolitan and regional areas • Mobile broadband – 98.8% of population (Source: ACMA)³
<i>Number of Subscribers</i>	7,996,000 (Dec 2008, ABS Cat. No. 8153.0)	6,678,000 (Dec 2008, ABS Cat. No. 8153.0)
<i>Number of Users</i>	No official figures in this category International Telecommunications Union (ITU) reports 15.17 million	No official figures in this category

¹ Source: ACMA Communications Report 2007-08, Key Indicators, p2

www.acma.gov.au/webwr/assets/main/lib310777/key_indicators_0708_comms_report.pdf

² Source: ABS, Cat No. 8166.0 Summary of IT Use and Innovation in Australian Business, 2007-08

www.abs.gov.au/AUSSTATS/abs@nsf/Lookup/8166.0Main+Features|2007-08?OpenDocument

³ Source: ACMA Communications Report 2007-08, Key Indicators, p2

www.acma.gov.au/webwr/assets/main/lib310777/key_indicators_0708_comms_report.pdf

	internet users in 2008 (Source: ITU) ⁴ This equates to 71.98 Internet users per 100 inhabitants	
<i>Others</i>	% Households with access to the internet (2007-08) - 67% (Source: ABS) ⁵	% Households with broadband access to the internet (2007-08) - 52% (Source: ABS) ⁶
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000 [^]	47.00	
2005*	63.00	
2008	79.40 ⁷	23.29
UNIVERSAL SERVICE FUND PROVISIONS	The USO is funded by the telecommunications industry. ⁸ The Australian Government has allocated funding for the period 2008-2012 to fund the Australian Broadband Guarantee (ABG).	
SERVICES/ACCESS PROVIDED	The Universal Service Obligation (USO) covers standard telephone services and payphones. The USO does not include broadband access. The ABG provides all Australian residential and small business premises with access to broadband services that reasonably compare to broadband services available in metropolitan areas. ⁹	
UNIVERSAL SERVICE PROVIDER	Telstra is currently the sole Universal Service Provider (USP). Telstra, as the primary USP, is required to have a policy statement and marketing plan approved by the Australian Communications and Media Authority (ACMA), which set out how it will fulfill the USO. Competing USPs may apply to ACMA for approval. The Qualification is based on technical experience, competence, financial standing and other matters that the Minister and ACMA consider relevant. ¹⁰ Carriers seeking to become a competing USP may apply to the ACMA. Qualification based on technical experience, competence, financial standing and other matters the Minister considers relevant. ¹¹	
TELECENTER PRESENCE		
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	Australia's national statistical agency has defined Broadband as an 'always on' internet connection with an access speed equal to or greater than 256 kbps ¹² .	

⁴ Source: International Telecommunications Union (ITU) ICT statistics database www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx#

⁵ Source: ABS, Cat no 8146.0

www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/8146.0Main%20Features!2007-08?opendocument&tabname=Summary&prodno=8146.0&issue=2007-08&num=8view=

⁶ Source: ABS, Cat no 8146.0

www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/8146.0Main%20Features!2007-08?opendocument&tabname=Summary&prodno=8146.0&issue=2007-08&num=8view=

⁷ Ibid.

⁸ Australian Communications and Media Authority (n.d.) *Funding of the USO and DDSO*. Retrieved February 25, 2009, from Australian Communications and Media Authority website:

http://www.acma.gov.au/WEB/STANDARD/pc=PC_2483

⁹ Communicaton with the Department of Broadband, Communications and the Digital Economy.

¹⁰ Department of Broadband, Communications and the Digital Economy, *The Universal Service Obligation (USO)*, Retrieved 4 March 2009. Refer

http://www.dbcde.gov.au/communications_for_consumers/telephone_services/fixed_telephone_services/industry_issues_policies_and_legislation/the_universal_service_obligation_uso

¹¹ Ibid.

BROADBAND POLICIES AND PROJECTS¹²	<ul style="list-style-type: none"> • <i>Networking the Nation Program (1997 – 2004)</i> • <i>ICT Incubators Program (2000 – 2005)</i> • <i>Advanced Networks Program (2000 – 2007)</i> • <i>Building on IT Strengths (BITS) (2000 – 2008)</i> • <i>ICT Centre of Excellence Program – National ICT Australia – (NICTA) (2001 – 2011)</i> • <i>Digital Content Fund (2002)</i> • <i>National Communications Fund (2002 – 2005)</i> • <i>National Broadband Strategy (2004)</i> <ul style="list-style-type: none"> ○ <i>Higher Bandwidth Incentive Scheme (HiBIS) (2004 – 2008)</i> ○ <i>Connect Australia (2005)</i> ○ <i>Broadband Connect (2008 – 2012)</i> ○ <i>Clever Networks (2006 – 2010)</i> ○ <i>Backing Indigenous Ability (2006 – 2010)</i> ○ <i>Mobile Connect (2006 – 2009)</i> ○ <i>Satellite Phone Subsidy Scheme (2002 – 2009)</i> • <i>Broadband Blueprint (2007): The Australian Government will undertake a range of activities to stimulate broadband availability.</i> • <i>NetAlert Program (2007 – 2010)</i> • <i>Australian Broadband Guarantee (2008 – 2012)</i> • <i>Cyber-safety Plan (2008 – 2012)</i> • <i>Regional Backbone Blackspots Program (2009)</i> • <i>Digital Regions Initiative (2009 - 2013)</i> • <i>National Broadband Network (2009 – 2017): A new company that will invest up to \$43 billion over eight years to build and operate a wholesale-only, open access National Broadband Network.</i>
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BRUNEI DARUSSALAM

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		11,181 (2007) ¹³
<i>Number of Users</i>	176,029 (2007) ¹⁴	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000 [^]	9.00	No data available
2005 [*]	36.10	8.12
2007 ⁺	46.20 ¹⁵	11.18

¹² ABS Glossary of terms for Innovation, Information and Communications Technology

¹³ Accessed from <http://www.internetworldstats.com/asia.htm#bn> on 30 July 2009.

¹⁴ Ibid.

¹⁵ Ibid.

UNIVERSAL SERVICE FUND PROVISIONS	
SERVICES/ACCESS PROVIDED	Government deployed the National Information Infrastructure resulting in 95% telephone household penetration. ¹⁶
UNIVERSAL SERVICE PROVIDER	
TELECENTER PRESENCE	No.
NUMBER OF TELECENTERS	
BROADBAND DEFINITION	ADSL: 256Kbps to 1Mbps ¹⁷
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Jabatan Telekom Brunei Darussalam (JTB) introduced eSpeed broadband Internet service (2000) • Nationwide Broadband Network (RaGAM 21) (2001) • National Broadband Blueprint (NBB) (2009) • Wireless Broadband Access (WBA) (2009)

CANADA*

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		7,675,533 (2006) ¹⁸
<i>Number of Users</i>	23,999,500 (2008) ¹⁹	
<i>Others</i>		Broadband footprint tracking
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	42.27	
2005[*]	68.00	
2007+	73.00	27.60

¹⁶ 1997 Brunei Policy and Regulatory Report to APEC accessed from <http://www.apectelwg.org/> on 30 July 2009.

¹⁷ Accessed from <http://www.brunet.bn/> on 30 July 2009.

¹⁸ Accessed from <http://www.internetworldstats.com/america.htm> on 30 July 2009.

¹⁹ Ibid.

UNIVERSAL SERVICE FUND PROVISIONS	All telecom service providers pay a percentage of eligible revenues (rate is set at 1.03% in 2007). CRTC sets the rate while a third party administrator distributes funds. Transferable per line subsidy is paid to carriers in high-cost areas. ²⁰
SERVICES/ACCESS PROVIDED	Voice telephony, emergency services, message relay, privacy protection, phone directory, long distance network, and digital data access to local rates, operator services. ²¹
UNIVERSAL SERVICE PROVIDER	Any carrier willing to provide service is eligible for subsidy – this includes wireless carriers who choose to operate as local exchange carriers and meet the basic local service requirements. ²²
TELECENTER PRESENCE	Yes
NUMBER OF TELECENTERS	Community Access Program: 3,741 ²³
BROADBAND DEFINITION	The legal definition of broadband in Canada is 1.5Mbps. ²⁴
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Provision of high-speed broadband Internet services by 2004 (2001) • National Broadband Task Force was established to advise the Government of Canada on how best to achieve the provision of high-speed broadband Internet services (2001) • Broadband for Rural Development Pilot Program (2002) • National Satellite Initiative (2003)

CHILE

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	No official data available.	No official data available.
<i>Population Coverage</i>	No official data available.	No official data available.
<i>Number of Subscribers</i>	1,439,009 (2008) ²⁵	1,427,178 (2008) ²⁶
<i>Number of Users</i>	8,368,719 (2008) ²⁷ Unofficial data. SUBTEL does not manage information regarding users. ²⁸	No data available. SUBTEL does not manage information regarding users.

²⁰ Accessed from

http://www.apectel35.org.ph/index.php?option=com_docman&task=doc_download&gid=105&Itemid=38 on 30 July 2009.

²¹ Accessed from www.aptsec.org/meetings/2005/ICT-WB/docs/SEM-21-USO%20in%20Asia%20Pacific%20Countries.doc on 30 July 2009.

²² Ibid.

²³ Accessed from <http://www.ic.gc.ca/eic/site/cap-pac.nsf/eng/home> on 25 March 2009.

²⁴ From Canada's economy presentation, *Measuring the Broadband Footprint – The CRTC Experience*, given on April 2009 during the 39th APECTEL.

²⁵ Communication with the Office of the Undersecretariat of Telecommunications (SUBTEL) on 02 September 2009.

²⁶ Ibid,

²⁷ Accessed from Internet World Stats website <http://www.internetworldstats.com/south.htm> on 30 July 2009.

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000 [^]	16.46	
2005 [*]	21.55	
2007 ⁺	50.9 ²⁹	
2008	8.54 ³⁰	8.47 ³¹
UNIVERSAL SERVICE FUND PROVISIONS	The Telecommunications Development Fund (TDF) offers supply-side subsidies to private companies to provide public telephones or call centers, community information telecenters, local radio broadcasting telecommunications services and any other telecommunications services that can benefit the community. Subsidies are allocated through competitive tenders. ³²	
SERVICES/ACCESS PROVIDED	Rural public telephones, telecenters, Internet for rural schools, broadband infrastructure. ³³	
UNIVERSAL SERVICE PROVIDER	In Chile there is no USO imposed to any operator. The Telecommunications Development Fund (TDF) is 100% public financed.	
TELECENTER PRESENCE	Yes	
NUMBER OF TELECENTERS	<i>Infocentros</i> : 776 ³⁴	
BROADBAND DEFINITION	There is no official definition of broadband services. For statistical purposes, it is defined as any service from 256Kbps or up. ³⁵	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> Digital Infrastructure for Competitiveness and Innovation (2008) 	

CHINA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	Data not being collected. ³⁶	Data not being collected. ³⁷
<i>Population Coverage</i>	Data not being collected. ³⁸	Data not being collected. ³⁹
<i>Number of Subscribers</i>	Data not being collected. ⁴⁰	83,420,000 (2008) ⁴¹
<i>Number of Users</i>	298,000,000 (2008) ⁴²	No data available

²⁸ Communication with the Office of the Undersecretariat of Telecommunications (SUBTEL) on 02 September 2009.

²⁹ Accessed from Internet World Stats website <http://www.internetworldstats.com/south.htm> on 30 July 2009.

³⁰ Ibid.

³¹ Communication with the Office of the Undersecretariat of Telecommunications (SUBTEL) on 02 September 2009.

³² Ibid.

³³ Ibid.

³⁴ Accessed from <http://www.estrategiadigital.gob.cl> on 25 March 2009.

³⁵ Communication with the Office of the Undersecretariat of Telecommunications (SUBTEL) on 02 September 2009.

³⁶ Communication with the Chinese Academy of Telecommunication Research, Ministry of Industry and Information Technology 18 August 2009.

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	1.77	
2005[*]	8.50	2.87
2008	22.6 (2008) ⁴³	6.3
UNIVERSAL SERVICE FUND PROVISIONS	The procedures for the administration of the compensation for the costs of making telecommunication services universally available shall be formulated by the State Council's department in charge of the information industry in concert with the State Council's financial department and the department in charge of pricing, and after approval by the State Council, be published for implementation. ⁴⁴	
SERVICES/ACCESS PROVIDED	Public data transmission and basic voice communications services. ⁴⁵	
UNIVERSAL SERVICE PROVIDER	The State Council's department in charge of the information industry may determine which telecommunications business operators shall assume specific obligations in respect of the universal availability of telecommunications services by designating such operators or by inviting tenders.	
TELECENTER PRESENCE		
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	Broadband definition is from 256Kbps or up. ⁴⁶	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • National Development Strategy on Informatization for 2006-2010 • Village Access Project 	

CHINESE TAIPEI

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	99% ⁴⁷	99% ⁴⁸
<i>Population Coverage</i>	23,037,031 (2008) ⁴⁹	23,069,345 (2009) ⁵⁰
<i>Number of Subscribers</i>	20,830,000 (2008) ⁵¹	7,444,096 (2009) ⁵²
<i>Number of Users</i>	15,140,000 (2008) ⁵³	No data available. ⁵⁴

⁴² Accessed from Internet World Stats website <http://www.internetworldstats.com/asia.htm#cn> on 25 March 2009.

⁴³ Ibid.

⁴⁴ Accessed from [Telecommunications Regulations of People's Republic of China](http://tradeinservices.mofcom.gov.cn/en/b/2000-09-25/18619.shtml) (<http://tradeinservices.mofcom.gov.cn/en/b/2000-09-25/18619.shtml>) on 25 March 2009.

⁴⁵ Ibid.

⁴⁶ Communication with the Chinese Academy of Telecommunication Research, Ministry of Industry and Information Technology 18 August 2009.

⁴⁷ Communication with the National Communications Commission on 25 August 2009.

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Ibid.

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	28 ⁵⁵	1.2 ⁵⁶
2005*	58 ⁵⁷	19.1 ⁵⁸
2007	64.4 ⁵⁹	26.1 ⁶⁰
2008		
UNIVERSAL SERVICE FUND PROVISIONS	<p>A fund dedicated to telecommunications universal services has been established for achieving the goals of universal services. The losses and necessary management expenses arising from the universal services shall be shared and paid out to the said fund by the telecommunications enterprises publicly designated by the NCC. The NCC shall enact regulations governing the identification of scope and service areas, the selection of providers of the universal services, and the matters with respect to the accounting and allocation of losses incurred therefore.⁶¹</p> <p>A special fund has been established of which thirty percent is used for the promotion of cable TV universal service, particularly through the subsidizing of the deployment of cable TV networks in un-served areas. Each year, cable TV system operators shall set aside one percent of their annual operating revenues to contribute to the fund.⁶²</p>	
SERVICES/ACCESS PROVIDED	<ul style="list-style-type: none"> • Universal Voice Telephone Services:⁶³ <ul style="list-style-type: none"> ○ Telephone services in uneconomical areas ○ Uneconomical public telephone services • Universal Data Services:⁶⁴ <ul style="list-style-type: none"> ○ Data communication access in uneconomical areas ○ Preferential leased circuit rentals for high schools, elementary schools, and public libraries • Cable TV Service in un-served areas.⁶⁵ 	
UNIVERSAL SERVICE PROVIDER	<p>The net universal service costs and the necessary administration costs of telecommunications universal service shall be shared among contributing parties in accordance with “Telecommunications Universal Service Regulations”. Universal service contributing parties shall include Type I telecommunications service and the Type II telecommunications service designated by the competent authority (NCC).⁶⁶</p> <p>Type I telecommunications enterprise refers to an enterprise that installs telecommunications line facilities and equipment in order to provide telecommunications services. A Type II telecommunications enterprise</p>	

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

⁶³ Information from the Chinese Taipei Economy Presentation in the Universal Access to Broadband Workshop last April 2009.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Communication with the National Communications Commission on 25 August 2009.

	refers to a telecommunications enterprise other than Type I telecommunications enterprises. ⁶⁷
	Cable TV system operators provide universal service for cable TV. ⁶⁸
TELECENTER PRESENCE	The “Digital Opportunity Center” (DOC) in rural area provides ICT usage and training for people without a fee. ⁶⁹
NUMBER OF TELECENTERS	168 ⁷⁰
BROADBAND DEFINITION	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Continued implementation of the National Information Infrastructure (NII) and establishment of fiber-optic network and high-speed backbone network (1997) • National Information and Communication Initiative (NICI) Blueprint: eSociety (2001) • Amendments to the Telecommunications Act (2002) • National Development Plan: Challenge 2008 (2002) • e-Taiwan: Broadband for Villages (2005) • m-Taiwan: Broadband duct construction (2005) • Taiwan WiMAX Development Blueprint (2005) • Universal Service (2007) • Broadband for Tribes (2008) • Public Access to Wireless Broadband Access Business (2009)

HONG KONG

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	Data not available ⁷¹	Data not available ⁷²
<i>Population Coverage</i>	99% ⁷³	95% ⁷⁴
<i>Number of Subscribers</i>	2,932,708 (2009) ⁷⁵	1,962,514 (2009) ⁷⁶

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Communication with the Office of Telecommunications Authority (OFTA) on 18 August 2009.

⁷² Ibid.

⁷³ Ibid. Accurate figures are not available. Only estimated coverage of mobile internet access are provided:

Population coverage of narrowband mobile internet (2.5G) : >99%; Population coverage of broadband mobile internet (3G/3.5G): >95%

⁷⁴ Ibid.

⁷⁵ Accessed from http://www.ofta.gov.hk/en/datastat/eng_cus_isp.pdf

<i>Number of Users</i>	4,123,900 (2008) ⁷⁷	Data not available. The Census and Statistics Department of HKSAR government does not include the broadband users in their annual survey and OFTA does not keep track of such data either. ⁷⁸
<i>Others: Household coverage</i>	100% ⁷⁹	97% ⁸⁰
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	27.83 ⁸¹	6.67 ⁸²
2005[*]	51.23 ⁸³	24.11 ⁸⁴
2008	59.00 ⁸⁵	27.8 ⁸⁶
UNIVERSAL SERVICE FUND PROVISIONS	The net cost of USO is funded by universal service contribution (USC) paid by each operator. The USC is calculated on the basis of IDD traffic minutes delivered by the operator prior to May 2009 and on the basis of telephone numbers allocated to the operator after May 2009. ⁸⁷	
SERVICES/ACCESS PROVIDED	USO in Hong Kong covers “basic service” which includes public switched telephone service but does not include broadband service. ⁸⁸	
UNIVERSAL SERVICE PROVIDER	The obligation is only imposed on PCCW-HKT Telephone Limited and Hong Kong Telecommunications (HKT) Limited, the incumbent local fixed carrier licensee. ⁸⁹	
TELECENTER PRESENCE	No	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	Broadband service in Hong Kong refers to high-speed data transmission service with downloading speed of 1Mbps or above. ⁹⁰ In Hong Kong, some Internet service providers offer broadband services with speed up to 1000 Mbps.	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Digital 21 IT Strategy (1998): Liberalization of telecommunications sector for both fixed and wireless access • Digital 21 Strategy (2004): Broadband infrastructure and wireless access • Digital Strategy 21 (2008): Building an inclusive, knowledge-based society 	

⁷⁶ Ibid.

⁷⁷ Survey data sourced from the Census and Statistics Department of HKSAR Government www.censtatd.gov.hk . Only persons aged 10 and over are covered in the survey.

⁷⁸ Communication with the Office of Telecommunications Authority (OFTA) on 18 August 2009.

⁷⁹ Ibid. For narrowband Internet access (i.e. dial-up Internet access), the coverage of households should be the same as telephone lines, (i.e. close to 100%)

⁸⁰ Ibid.

⁸¹ Ibid.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Accessed from <http://www.ofta.gov.hk/en/tas/ftn/ta980114.pdf>.

⁹⁰ Accessed from http://www.ofta.gov.hk/en/datastat/eng_cus_isp.pdf (Note 5)

INDONESIA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>	10.4% ⁹¹	
<i>Number of Subscribers</i>		294,500 (2009) ⁹²
<i>Number of Users</i>	25,000,000 (2008) ⁹³	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	0.91	

⁹¹ Accessed from Internet World Stats Website <http://www.internetworldstats.com/asia.htm#id> on 30 August 2009.

⁹² Ibid.

⁹³ Ibid.

2005*	3.54	
2008	10.5 ⁹⁴	0.11
UNIVERSAL SERVICE FUND PROVISIONS	Telecommunication operators contribute 0.75% of their gross revenues to the fund. The fund will be used for establishing telecommunications access to all unserved and underserved villages throughout Indonesia. There is also state budget allocation and local government contribution to the provision. ⁹⁵	
SERVICES/ACCESS PROVIDED	Provide basic telephone services to rural areas. ⁹⁶	
UNIVERSAL SERVICE PROVIDER		
TELECENTER PRESENCE	Yes.	
NUMBER OF TELECENTERS	APW Komitel: 27,460 ⁹⁷	
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Least-Cost Subsidy for Universal Service Obligation (2006) • New Policy on Internet and ICT (2006) <ul style="list-style-type: none"> ○ Establish a new ICT national board ○ Implement a submarine fiber optic backbone ring ○ Develop domestic backbone infrastructure ○ Deploy Broadband Wireless Access for last mile access • Indonesian ICT Initiatives (2006) <ul style="list-style-type: none"> ○ Technology Information Kiosks (WARINTEK) ○ Information Kiosk (WARSI) ○ Internet Kiosk (WARNET) directory ○ Indonesian Community Electronic Information Network (JIMIE) ○ Community Telecenter (BIM) ○ Women and Community Telecenter (WCTC) • Community Access Points Universal Service Obligation (2008) covers 32,000 villages divided into 11 USO zones 	

JAPAN

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	No official data available. ⁹⁸	No official data available. ⁹⁹
<i>Population Coverage</i>	No official data available. ¹⁰⁰	No official data available. ¹⁰¹
<i>Number of Subscribers</i>	No official data available.. ¹⁰²	30,331,551(2009) ¹⁰³

⁹⁴ Ibid.

⁹⁵ 2006 Indonesia Policy and Regulatory Report to APEC. Refer <http://www.apectelwg.org/>

⁹⁶ Ibid.

⁹⁷ Accessed from <http://www.apwkomitel.org> on 20 March 2009.

⁹⁸ Communication with the Office of the Ministry of Internal Affairs and Communications on 01 September 2009.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Communication with the Office of the Ministry of Internal Affairs and Communications on 25 August 2009.

<i>Number of Users</i>	94,000,000 (2008) ¹⁰⁴	No official data available.. ¹⁰⁵
<i>Others: Households</i>		98.6% ¹⁰⁶
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	37.10 ¹⁰⁷	No data available. ¹⁰⁸
2005*	70.80 ¹⁰⁹	No data available. ¹¹⁰
2008	75.30 (2009) ¹¹¹	22.15 ¹¹²
UNIVERSAL SERVICE FUND PROVISIONS	Contribution to USF is allocated on the number of phone numbers of each interconnecting telecommunications carriers, etc. (capitalized over 1 billion yen). ¹¹³	
SERVICES/ACCESS PROVIDED	Fundamental access to subscriber line, payphones and emergency services. ¹¹⁴	
UNIVERSAL SERVICE PROVIDER	Non-exclusive approach. All carriers to publish accounting and interconnection tariff and to fulfill regulated coverage. ¹¹⁵	
TELECENTER PRESENCE	No	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	ADSL: 50.5 Mbps; FTTH/FTTB: 160 Mbps (maximum) ¹¹⁶	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> - e-Japan Strategy (2001) - Establishment of an ultra high-speed network infrastructure and competition policies - Facilitation of electronic commerce - Realization of electronic government - Nurturing high-quality human resources - u-Japan Strategy (2006) - Development of Ubiquitous Networks - Advanced Usage of ICT - Upgrading Enabling Environment 	

¹⁰⁴ Accessed from Internet World Stats website <http://www.internetworldstats.com/asia.htm#jp> on 20 March 2009.

¹⁰⁵ Communication with the Office of the Ministry of Internal Affairs and Communications on 25 August 2009.

¹⁰⁶ Presentation of Mr. Atsushi Ozu during the Workshop on Universal Access to Broadband Service, APECTEL 39, 13-14 April 2009.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

¹¹⁰ Ibid.

¹¹¹ Ibid.

¹¹² Ibid.

¹¹³ Accessed from <http://www.aptsec.org/meetings/2005/ICT-WB/docs/SEM-21-USO%20in%20Asia%20Pacific%20Countries.doc>

¹¹⁴ Ibid.

¹¹⁵ Communication with the Office of the Ministry of Internal Affairs and Communications on 25 August 2009.

¹¹⁶ Ibid.

KOREA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	100% ¹¹⁷	99% ¹¹⁸
<i>Population Coverage</i>	70% ¹¹⁹	70% ¹²⁰
<i>Number of Subscribers</i>	15,474,931 ¹²¹	15,474,931 (2008) ¹²²
<i>Number of Users</i>	36,794,800 (2008) ¹²³	36,794,800 ¹²⁴

¹¹⁷ Communication with the Korea Communication Commission on 19 August 2009.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

¹²⁰ Ibid. Accurate figures are not available. Only estimated coverage of mobile internet access are provided.

¹²¹ Ibid.

¹²² Ibid. Accurate figures are not available. Only estimated coverage of mobile internet access are provided.

¹²³ Ibid.

¹²⁴ Ibid.

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	44.7 ¹²⁵	8.2 ¹²⁶
2005*	72.8 ¹²⁷	25.3 ¹²⁸
2008	77.1 ¹²⁹	31.8 ¹³⁰
UNIVERSAL SERVICE FUND PROVISIONS	Facility-based service providers bear the loss reserve in proportion to their allotted sales. Service providers concerned pay for tariff discounts (Virtual Fund Method) ¹³¹	
SERVICES/ACCESS PROVIDED	Fixed-line services (local phone, payphone, maritime wireless phone, island communication); emergency communication services and discount phone services ¹³²	
UNIVERSAL SERVICE PROVIDER	Appointed operators ¹³³ <ul style="list-style-type: none"> • Fixed-line services: KT • Discount phone services: KT, SKT, LGT, SKBB, LG Dacom, SK Telink, etc. 	
TELECENTER PRESENCE	No	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	There is no official definition for broadband. However, broadband services with speeds of 10Mbps to 100Mbps are widely provided through xDSL, HFC and FTTx are available. ¹³⁴	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Promotion of WiBro services (2005) • Cable TV Broadcasters granted telecom operator licenses to provide internet access services for fair competition, and reinforce protection of users in the broadband market (2006) • Establishment of Korean Communications Commission to promote and create a competitive market environment and foster user benefits by stimulating digital convergence between broadcasting and telecommunications (2008) • Mid and long-term development plans for communications network – nation’s vision and goal for network advancement to promote broadband digital convergence services including IPTV (2009) 	

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Ibid.

¹²⁹ Ibid.

¹³⁰ Ibid.

¹³¹ Ibid.

¹³² Ibid.

¹³³ Ibid.

¹³⁴ Ibid.

MALAYSIA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	Coverage to all 16 states ¹³⁵	Coverage to all 16 states ¹³⁶
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		1,714,000 (2008) ¹³⁷ (Fixed and mobile subscriptions)
<i>Number of Users</i>	15,868,000 (2008) ¹³⁸	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	21.64	-

¹³⁵ Communication with Malaysian Communications and Multimedia Commission on 25 August 2009.

¹³⁶ Ibid.

¹³⁷ Ibid.

¹³⁸ Ibid.

2005*	49.18	-
2008	56.63 ¹³⁹	6.12 ¹⁴⁰
UNIVERSAL SERVICE FUND PROVISIONS	The Communications and Multimedia Act 1998 (CMA1998) came into effect on 1 April 1999. From then, Malaysia embarked on a new approach in providing universal access to selected rural and remote underserved areas nationwide. Pursuant to the CMA 1998, the USP Regulations were gazetted on 17 October 2002 outlining the implementation process and procedures. Section 204 of the CMA1998 established a USP Fund which is managed by the Malaysian Communications and Multimedia Commission (SKMM) for the purpose of implementing network facilities, network services, and applications services in rural and remote underserved areas and communities. ¹⁴¹	
SERVICES/ACCESS PROVIDED	Broadband Internet and Public Cellular, PSTN ¹⁴²	
UNIVERSAL SERVICE PROVIDER	The Government administers/ manages the full USP program/ funding as per the USP regulations and allows implementation to be done by the successful bidder(s) [or universal service provider]. ¹⁴³	
TELECENTER PRESENCE	Yes	
NUMBER OF TELECENTERS	174 Community Broadband Centres; ¹⁴⁴ 105 Community Broadband Libraries; ¹⁴⁵ 49 Pusat Internet Desa; 39 Medan Info Desa; 58 Community Access Networks; 78 Community Literacy Centers ¹⁴⁶	
BROADBAND DEFINITION	Any service beyond the scope of existing PSTN/ISDN and 2G cellular networks with data rates that exceed the normal voice related speed (56kbps for PSTN, 64 kbps for ISDN0 and can support the delivery of interactive multimedia. ¹⁴⁷	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • MyICMS 886 Strategy (2006-2010): <ul style="list-style-type: none"> ○ High Speed Broadband Service encompasses both last mile wireline and wireless access services. ○ Universal Service Provision • Broadband Initiatives (2008): <ul style="list-style-type: none"> ○ Klang Valley Broadband Push (KVBP) ○ e-KL Project ○ Wireless Library Project ○ U-Library Project ○ e-School Project ○ Connected Municipalities ○ Mobile Broadband Putrajaya-Shah Alam Highway • High Speed Broadband (HSBB) project 	

¹³⁹ Ibid.

¹⁴⁰ Ibid.

¹⁴¹ Ibid. Refer to http://www.skmm.gov.my/what_we_do/usp/usp.asp

¹⁴² Ibid.

¹⁴³ Ibid.

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

¹⁴⁶ Accessed from http://www.skmm.gov.my/what_we_do/usp/usp.asp

¹⁴⁷ Accessed from http://www.skmm.gov.my/what_we_do/spectrum/SRSP/BWA-%20802.16-WiMAX-a.pdf

MEXICO

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>	8,273,091 (2008) ¹⁴⁸	7,604,629 (2008) ¹⁴⁹
<i>Number of Users</i>	22,339,790 (2008) ¹⁵⁰	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	5.1	0.11
2005*	17.2	1.84
2008	21.7 ¹⁵¹	7.10 ¹⁵²

¹⁴⁸ Communication with the Comisión Federal de Telecomunicaciones on 20 August 2009.

¹⁴⁹ Ibid.

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

UNIVERSAL SERVICE FUND PROVISIONS	eMexico Trust Fund ¹⁵³
SERVICES/ACCESS PROVIDED	Telephone, Internet access ¹⁵⁴
UNIVERSAL SERVICE PROVIDER	eMexico is implemented by the Ministry of Communications and Transport. ¹⁵⁵
TELECENTER PRESENCE	Yes
NUMBER OF TELECENTERS	Digital Community Centers: 8,790 ¹⁵⁶
BROADBAND DEFINITION	ADSL: From 512 Kbps to 4Mbps; Cable: From 300 Kbps to 1.5Mbps ¹⁵⁷
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> eMexico Project (2002): The eMexico Project is a broad project on the general adoption of digital technologies. This project considers the general public and the establishment of a link between citizens and governmental offices. Also, the project identified some key drivers, i.e. connectivity, digital content, and information systems. Master Interconnection Plan (2009): Interconnection of public telecommunications networks, enables development of new players and telecommunications services. It promotes fair competition and non-discriminatory treatment among telecom players, which benefits the entire telecommunications sector directly.

NEW ZEALAND

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	No data available. Not being measured. ¹⁵⁸	No data available. Not being measured. ¹⁵⁹
<i>Population Coverage</i>	100% ¹⁶⁰	93% fixed; 100% satellite ¹⁶¹
<i>Number of Subscribers</i>	1,196,182 (2008) ¹⁶²	801,689 (2008) ¹⁶³
<i>Number of Users</i>	3,360,000 (2008) ¹⁶⁴	683,500 (2007) ¹⁶⁵

¹⁵² Ibid.

¹⁵³ Accessed from <http://www.sct.gob.mx/coordinacion-de-la-sociedad-de-la-informacion-y-el-conocimiento/el-sistema-nacional-e-mexico/>

¹⁵⁴ Ibid.

¹⁵⁵ Ibid.

¹⁵⁶ Accessed from Anuario estadístico 2007; Secretaría de Comunicaciones y Transportes: <http://dgp.sct.gob.mx/index.php?id=550>

¹⁵⁷ Communication with the Comisión Federal de Telecomunicaciones on 20 August 2009

¹⁵⁸ Communication with Ministry of Economic Development on 13 August 2009.

¹⁵⁹ Ibid.

¹⁶⁰ Ibid.

¹⁶¹ Ibid.

¹⁶² Ibid.

¹⁶³ Ibid.

¹⁶⁴ Accessed from Internet World Stats website <http://www.internetworldstats.com/pacific.htm> on 20 March 2009

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	48.00	N/A ¹⁶⁶
2005[*]	64.00	9.12 ¹⁶⁷
2008	80.5 ¹⁶⁸	20.41
UNIVERSAL SERVICE FUND PROVISIONS	A Telecommunications Service Obligations (TSO) instrument may specify the total amount payable by all telecoms and the TSO provider. ¹⁶⁹	
SERVICES/ACCESS PROVIDED	<p>The TSO commits Telecom New Zealand (Telecom) to:¹⁷⁰</p> <ul style="list-style-type: none"> • Not increasing in real terms the standard line rental provided that the overall profitability of Telecom's fixed business is not unreasonably impaired; • The standard line rental for customers in rural areas being no higher than the standard line rental for customers in urban areas; • Local telephone service being as widely available as it was in December 2001; • 99% of residential telephone lines being capable of supporting a connect speed of at least 9.6 kbps; • A range of specific service quality standards; and • Emergency call service and a directory listing are available free of charge as part of standard residential telephone service. 	
UNIVERSAL SERVICE PROVIDER	Telecom New Zealand ¹⁷¹	
TELECENTER PRESENCE	No ¹⁷²	
NUMBER OF TELECENTERS	---	
BROADBAND DEFINITION	At least 256 kbps downstream ¹⁷³	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Initiative to deploy broadband technology throughout New Zealand (2002) • New Zealand Digital Strategy (2005) • Broadband Challenge established to support the implementation of the Digital Strategy (2005) • Review of TSO (2008) • New Zealand Digital Strategy 2.0 (2008) <ul style="list-style-type: none"> ○ Provide a national vision for New Zealand's digital development; ○ Highlight opportunities and challenges in the digital world; ○ Call to action for stakeholders to rise to the challenges 	

¹⁶⁵ Ibid.

¹⁶⁶ Communication with Ministry of Economic Development on 13 August 2009.

¹⁶⁷ Ibid.

¹⁶⁸ Accessed from Internet World Stats website <http://www.internetworldstats.com/pacific.htm> on 20 March 2009

¹⁶⁹ Accessed from www.peoplesnetworknz.org.nz

¹⁷⁰ Communication with Ministry of Economic Development on 13 August 2009.

¹⁷¹ Ibid.

¹⁷² Ibid.

¹⁷³ Ibid.

	<p>and opportunities presented by the digital world;</p> <ul style="list-style-type: none"> ○ Articulate the government's role in digital development;' and ○ Outline key government actions in support of digital development. <ul style="list-style-type: none"> ● Broadband Investment Fund (2009): Government to contribute to broadband investment to accelerate rollout of ultra-fast broadband to 75% of New Zealanders.
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PAPUA NEW GUINEA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>	1.9% ¹⁷⁴	
<i>Number of Subscribers</i>		
<i>Number of Users</i>	115,000 (2009) ¹⁷⁵	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^		
2005*	1.78	
2007+	1.83	
UNIVERSAL SERVICE		

¹⁷⁴ Accessed from Internet World Stats website <http://www.internetworldstats.com/pacific.htm> on 30 August 2009.

¹⁷⁵ Ibid.

FUND PROVISIONS	
SERVICES/ACCESS PROVIDED	
UNIVERSAL SERVICE PROVIDER	
TELECENTER PRESENCE	
NUMBER OF TELECENTERS	
BROADBAND DEFINITION	
BROADBAND POLICIES AND PROJECTS[#]	

PERU

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	1,358 districts (2008) ¹⁷⁶	898 districts (2008) ¹⁷⁷
<i>Population Coverage</i>	24.8% of population ¹⁷⁸	
<i>Number of Subscribers</i>	728,897 (2008) ¹⁷⁹ (Includes broadband, dial-up and other internet subscribers with transmission rates of less than 64Kbps.)	725,563 (2008) ¹⁸⁰
<i>Number of Users</i>	7,128,348 (2008) ¹⁸¹	No data available ¹⁸²
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000[^]	3.08	No data available ¹⁸³
2005[*]	16.45	No data available ¹⁸⁴
2008	24.8 ¹⁸⁵	2.5 ¹⁸⁶
UNIVERSAL SERVICE FUND PROVISIONS	FITEL collects 1% on gross operating revenues of telecommunications companies in order to fund rural service expansion through a direct and transparent subsidy. ¹⁸⁷	
SERVICES/ACCESS PROVIDED	Public payphones, community telecenters ¹⁸⁸	

¹⁷⁶ Communication with Ministry of Transportation and Communication

¹⁷⁷ Ibid.

¹⁷⁸ Ibid.

¹⁷⁹ Ibid.

¹⁸⁰ Ibid. Estimated with ENAHO – INEI.

¹⁸¹ Ibid.

¹⁸² Ibid.

¹⁸³ Ibid.

¹⁸⁴ Ibid.

¹⁸⁵ Ibid.

¹⁸⁶ Ibid.

¹⁸⁷ Ibid.

¹⁸⁸ Accessed from <http://www.osiptel.gob.pe/OsiptelDocs/Temporal%20PDF/fitel.pdf> on 20 March 2009.

UNIVERSAL SERVICE PROVIDER	FITEL intervention consisted of a one-time subsidy to telecommunications service providers to develop communications networks in rural areas determined by the government. The companies will participate for subsidy in an auction overseen by Proinversion, a Peruvian Investment Promotion Agency. ¹⁸⁹
TELECENTER PRESENCE	Yes ¹⁹⁰
NUMBER OF TELECENTERS	GTH Broadband Internet Subscribers: 1,337 ¹⁹¹
BROADBAND DEFINITION	
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Broadband development guidelines (2007) • Measures for installing optical fiber into pipes and vaults (2008) • Telecommunications public services development promotion in rural areas (2008) • Fund of Investment in Telecommunications (FITEL) projects (2009) <ul style="list-style-type: none"> ○ Rural Broadband Service – San Gaban- Puerto Maldonado Project ○ ICT for Rio Apurimac and Ene Valleys – VRAE Project • Proinversion has recently concluded a bidding process for assignment of 2.5GHz band for providing public telecommunications services nationwide.

PHILIPPINES

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>	146 provinces	
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		1,141,990 (2008) ¹⁹²
<i>Number of Users</i>	24,000,000 (2009) ¹⁹³	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)

¹⁸⁹ Ibid.

¹⁹⁰ Communication with Ministry of Transportation and Communication

¹⁹¹ Ibid.

¹⁹² National Telecommunications Commission

¹⁹³ Accessed from Internet World Stats website on 30 August 2009

2000^	2.03	
2005*	5.56	
2007+	14.6 ¹⁹⁴	0.56
UNIVERSAL SERVICE FUND PROVISIONS	The law provides that the cross subsidy shall come from interconnection charges paid by national long distance telephone service operators, international long distance telephone service operators, cellular mobile telephone service operators. ¹⁹⁵	
SERVICES/ACCESS PROVIDED	Basic telephone and telegraph service, internet (under the CeC program) ¹⁹⁶	
UNIVERSAL SERVICE PROVIDER	EO109 was promulgated in 1993 mandating all international long distance telephone service providers and mobile telephone service providers to install at least 300,000 and 400,000 local exchange lines in unserved and underserved areas respectively. ¹⁹⁷	
TELECENTER PRESENCE	Yes	
NUMBER OF TELECENTERS	<i>Community eCenters: 755</i> ¹⁹⁸	
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS[#]		

RUSSIA

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		4,000,000 (2008) ¹⁹⁹
<i>Number of Users</i>	38,000,000 (2008) ²⁰⁰	

¹⁹⁴ Ibid.

¹⁹⁵ Presentation of Dir. Edgardo Cabarios of the National Telecommunications Commission on January 2009.

¹⁹⁶ Ibid.

¹⁹⁷ Ibid.

¹⁹⁸ Accessed from www.philcecnet.ph

¹⁹⁹ Accessed from Internet World Stats website <http://www.internetworldstats.com/europa2.htm> 20 March 2009.

²⁰⁰ Ibid.

<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	1.98	
2005*	15.22	
2008	27 (2008) ²⁰¹	2.81 ²⁰²
UNIVERSAL SERVICE FUND PROVISIONS		
SERVICES/ACCESS PROVIDED		
UNIVERSAL SERVICE PROVIDER		
TELECENTER PRESENCE		
NUMBER OF TELECENTERS		
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS		

SINGAPORE

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		1,003,100 (2009) ²⁰³

²⁰¹ Ibid.

²⁰² Ibid.

²⁰³ Accessed from Internet World Stats website <http://www.internetworldstats.com/asia.htm> on 30 August 2009.

<i>Number of Users</i>	3,104,900 (2008) ²⁰⁴	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	32.36	---
2005*	61.00	---
2007+	68.00	20.18
UNIVERSAL SERVICE FUND PROVISIONS		
SERVICES/ACCESS PROVIDED	Fundamental services. In addition, may include aeronautical maritime, meteorological, governmental, defense or other proposals. ²⁰⁵	
UNIVERSAL SERVICE PROVIDER	Operator is determined under the Minister's authority. ²⁰⁶	
TELECENTER PRESENCE	No.	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Infocomm 21 (Fostering an eLifestyle and Bridging the Digital Divide): (2000) recommends strategic investment in fiber access networks and pervasive broadband access for all Singaporeans. • Next Generation National Infocomm Infrastructure (2006) ; Has two components, a wired broadband network that will deliver ultra-high broadband speeds from 100Mbps to 1Gbps to all homes, offices, and schools and a wireless broadband network that will offer pervasive connectivity around Singapore. 	

THAILAND

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>		
<i>Number of Subscribers</i>		913,000 (2008) ²⁰⁷

²⁰⁴ Ibid.

²⁰⁵ Accessed from www.aptsec.org/meetings/2005/ICT-WB/docs/SEM-21-USO%20in%20Asia%20Pacific%20Countries.doc

²⁰⁶ Ibid.

²⁰⁷ Accessed from Internet World Stats website <http://www.internetworldstats.com/asia.htm> on 20 March 2009.

<i>Number of Users</i>	13,416,000 (2008) ²⁰⁸	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	3.74	
2005*	15.43	
2007+	21.00	1.43
UNIVERSAL SERVICE FUND PROVISIONS	The National Telecommunications Commission (NTC) shall have the power to prescribe such that the licensee shall allocate a certain portion of his or her income from the supply of the telecommunications service of the Telecommunications Development for Public Benefit Fund. ²⁰⁹	
SERVICES/ACCESS PROVIDED	Access to basic telecommunications: public phones, payphones, POTS, and low-speed Internet. ²¹⁰	
UNIVERSAL SERVICE PROVIDER	NTC has imposed universal service obligations to CAT Telecom and TOT. ²¹¹	
TELECENTER PRESENCE	Yes.	
NUMBER OF TELECENTERS	Telecenters: 100 ²¹² ; CATNET: 1,100 ²¹³ ; OTEC: 11 ²¹⁴ ; iCommunity: 9 ²¹⁵	
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Broadband services based on ATM technology (1997) • The National IT Policy Framework (IT 2010) (2001) • The TOT IP Network provides VoIP, Internet Access and serves the Public Internet Program. (2002) • Rural Wireless Broadband Access Initiative (RWBA) (2002) • Broadband Internet Access via IPSTAR (2003) • TNET is launched as TOT's prototype Internet café (2003) • Provision of low-cost ADSL services (2004) • Buddy Broadband launched. (2005) • Broadband IP Network Expansion Project (2006) • The Second Thailand Information and Communication Technology Master Plan (2009-2013) (2009) • Telecommunication Master Plan <ul style="list-style-type: none"> ○ Third-Generation Mobile Licensing ○ Broadband Wireless Access • Bridging Digital Divide Strategic Plan (2008-2010) (2009) • Accessibility Projects • Government Information Network (GIN) <ul style="list-style-type: none"> ○ Expansion of Broadband IP Network ○ Expansion of ADSL 	

²⁰⁸ Ibid.

²⁰⁹ Accessed from <http://www.pustral-ugm.org/tau/download/workshop/Day1Group2-Thailand.pdf>

²¹⁰ Ibid.

²¹¹ Ibid.

²¹² Accessed from http://www.thaitelecentrecommunities.org/thai/files/Mo-Dynamic_Telecenters_in_Thailand_-_Nanotel-1%5B1%5D%5B1%5D.pdf

²¹³ Thailand Voluntary Reports and Policy and Regulatory Updates submitted by the economies to APECTEL WG, accessed at: <http://www.apectelwg.org/>

²¹⁴ Ibid.

²¹⁵ Ibid.

	<ul style="list-style-type: none"> ○ Replacement of SPC switching with NGN ○ WiMAX Trial ● Second National ICT Master Plan (2009-2013)²¹⁶ <ul style="list-style-type: none"> ○ Vision. Smart Thailand. ○ Mission. Develop ICT human resources in both quality and quantity; develop high speed ICT networks; develop good governance frameworks for ICT governance. ○ Objectives. Increase ICT human resource numbers and capability; create good governance in ICT; support manufacturing; empower communities and individuals; empowering businesses and the ICT industry. ○ Goals. 50 percent of the population know of; have access to; and can create information in a manner that is with discretion, aware, just and moral; thus leading to benefits for education, work and everyday life; Raise Thailand into the top 25 percent of countries according to the networked readiness index; Increase the share of ICT industries to 15 percent of GDP.
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UNITED STATES OF AMERICA

PENETRATION METRIC	INTERNET	BROADBAND
- Geographic Coverage		
- Population Coverage	74.1% penetration ²¹⁷	
- Number of Subscribers		79,014,100 (2009) ²¹⁸
- Number of Users	227,636,000 (2009) ²¹⁹	

²¹⁶ Accessed from <http://www.techpost.asia/2009/08/second-national-ict-master-plan-2552.html> on 30 August 2009.

²¹⁷ Accessed from Internet World Stats website <http://www.internetworldstats.com/america.htm#us> on 30 August 2009.

²¹⁸ Ibid.

²¹⁹ Ibid.

- Others		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	43.64	
2005*	69.00	
2007+	73.2 (2008, Nielsen) ²²⁰	23.94
UNIVERSAL SERVICE FUND PROVISIONS	Telecommunications companies must pay a contribution factor to the Universal Service Fund. The contribution factor changes four times a year and is increased or decreased based on the needs of the universal service programs. ²²¹	
SERVICES/ACCESS PROVIDED	Voice-grade access to PSTN with access to services including single party, emergency, operator, directory and long distance. ²²²	
UNIVERSAL SERVICE PROVIDER	Competitive bidding to choose from among two or more mutually exclusive applications for an initial license. ²²³	
TELECENTER PRESENCE	No	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION	The FCC currently gathers information within “speed tiers” in which providers categorize the maximum speeds of connections offered to customers. The lowest of these tiers includes connections with information transfer rates that exceed 200kbps in both directions and are less than 2.5Mbps in the faster direction. The next tier includes connections with information transfer rates that exceed 200kbps in both directions and are greater than or equal to 2.5Mbps and less than 10.0Mbps in the faster direction. The FCC will now gather data in a number of transfer speed categories applicable to both download and upload service speeds. Specifically, the reporting tiers are: (1) greater than 200kbps but less than 768kbps; (2) equal to or greater than 768kbps but less than 1.5Mbps; (3) equal to or greater than 1.5Mbps but less than 3.0Mbps; (4) equal to or greater than 3.0Mbps but less than 6.0Mbps; (5) equal to or greater than 6.0Mbps but less than 10Mbps; (6) equal to or greater than 10Mbps but less than 25Mbps; (7) equal to or greater than 25Mbps but less than 100Mbps; and (8) greater than or equal to 100Mbps. ²²⁴	
BROADBAND POLICIES AND PROJECTS[#]	Telecommunications companies must pay a contribution factor to the Universal Service Fund. The contribution factor changes four times a year and is increased or decreased based on the needs of the universal service programs. ²²⁵	

²²⁰ Ibid.

²²¹ Accessed from http://www.fcc.gov/wcb/tapd/universal_service/welcome.html

²²² Accessed from <http://www.aptsec.org/meetings/2005/ICT-WB/docs/SEM-21-USO%20in%20Asia%20Pacific%20Countries.doc>

²²³ Accessed from http://www.fcc.gov/wcb/tapd/universal_service/welcome.html

²²⁴ Accessed from http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-89A1.pdf

²²⁵ Accessed from [®] http://www.fcc.gov/wcb/tapd/universal_service/welcome.html

VIETNAM

PENETRATION METRIC	INTERNET	BROADBAND
<i>Geographic Coverage</i>		
<i>Population Coverage</i>	25.14% ²²⁶	
<i>Number of Subscribers</i>		2,587,716 (2009) ²²⁷
<i>Number of Users</i>	21,571,409 (2009) ²²⁸	
<i>Others</i>		
PENETRATION RATE	INTERNET (users/100 inhabitants)	BROADBAND (subscribers/100 inhabitants)
2000^	0.25	

²²⁶ Accessed from VNNIC website <http://www.thongkeinternet.vn/jsp/trangchu/index.jsp> on 30 August 2009.

²²⁷ Ibid.

²²⁸ Ibid.

2005*	12.72	
2007+		1.48
2008	24.2 ²²⁹	
UNIVERSAL SERVICE FUND PROVISIONS	Telecoms are required to pay USO through interconnection charges or contribution to USF. ²³⁰	
SERVICES/ACCESS PROVIDED		
UNIVERSAL SERVICE PROVIDER		
TELECENTER PRESENCE	No.	
NUMBER OF TELECENTERS		
BROADBAND DEFINITION		
BROADBAND POLICIES AND PROJECTS[#]	<ul style="list-style-type: none"> • Post and Telecommunication Development Strategy until 2010 (2004) <ul style="list-style-type: none"> ○ Develop the National Information Infrastructure (NII) with advanced technology. The NII should have high capacity, high service quality, nationwide coverage. ○ By 2010, the telephone/Internet penetration rate should reach the average rate of the region. • Internet Development Plan for the period 2001-2005 Programs: <ul style="list-style-type: none"> ○ Internet to school program (primary and secondary schools) ○ Village Centre of Culture and ICT (providing internet connection) ○ Internet for Communities 	

*Figures in this column accessed at: http://www.itu.int/ITU-D/icteye/Reporting/ShowReportFrame.aspx?ReportName=/WTI/InformationTechnologyPublic&RP_intYear=2000&RP_intLanguageID=1 unless specified otherwise.

^Figures in this column accessed at: http://www.itu.int/ITU-D/icteye/Reporting/ShowReportFrame.aspx?ReportName=/WTI/InformationTechnologyPublic&RP_intYear=2005&RP_intLanguageID=1 unless specified otherwise.

+Figures in this column accessed at: http://www.itu.int/ITU-D/icteye/Reporting/ShowReportFrame.aspx?ReportName=/WTI/InformationTechnologyPublic&RP_intYear=2007&RP_intLanguageID=1 unless specified otherwise.

The information from this entry were taken from Voluntary Reports and Policy and Regulatory Updates submitted by the economies to APECTEL WG, accessed at: <http://www.apectelwg.org/> unless specified otherwise.

²²⁹ Ibid.

²³⁰ Accessed from 2002 Vietnam Policy and Regulatory Report to APEC <http://www.apectelwg.org/>

**ANNEX II:
APEC PROJECTS RELATED TO IDENTIFIED AREAS OF SUPPORT FOR
INTERNET/BROADBAND SERVICES**

Government services

GOVERNMENT SERVICES	
CLIENTS/ USERS/ STAKEHOLDERS	<ul style="list-style-type: none"> • Workshop on eGovernance • Workshop on Investment Competition • Workshop on Cyber Security • eUniversity for HRD in eGovernment • APEC eGovernment Research Center • Supportive Policy/Regulatory Elements to Encourage Broadband Investment & Use: Leveraging Limited Resources
TRAINING	<ul style="list-style-type: none"> • GCIO Training Model and Networking for eGovernment Development • Capacity Building on Telecommunications Trade Rules and Regulatory Disciplines • Workshop on Value of Cyber Security Exercises

GOVERNMENT SERVICES	
	<ul style="list-style-type: none"> • PKI/eAuthentication Training Program • CERT Awareness Raising and Capacity Building Project • Interconnection Training
APPLICATIONS/ CONTENT	<ul style="list-style-type: none"> • Content Promotion Workshop
NETWORK	<ul style="list-style-type: none"> • Implementation of WTO Agreement on Basic Telecommunications Project • Broadband Workshop: broadband FWA System and Its Applications • Flow-based Internet Traffic Measurement and Analysis • Test TEL 1- Optimal Topology of Testbeds and Simplified Commercial Networks in APEC Region • Grid Initiative • Submarine Cable Protection Information Sharing Workshop • APII IPv6 R&D Testbed Project • Toward Realization of Broadband Mobile Communications • Monitoring Telecommunications Quality Services Workshop • Universal Service Workshop • Interconnection Workshop • Leased Line Seminar • Wi-Fi Connectivity • Flow-based Internet Traffic Measurement and Analysis
SECURE TRANSACTIONS	<ul style="list-style-type: none"> • Cybersecurity Awareness Raising Workshop • Value Cyber Security Exercises • Judge and Prosecutor Cybercrime Capacity building Project • Information Security Certifications Assessment Guide • VoIP Security Guidelines • PKI/eAuthentication Training Program • Bi-lateral Cybercrime Legislative Drafting Workshops • Joint Cyber Security Awareness Raising Project • Workshop on Malware • The Security Implications of Emerging Technologies • Application Security Issues We Face • Wireless Security • ICT Products Services Security Workshop • Examination of the Security Implications of Emerging Technologies • Workshop on Building confidence toward the trusted ICT society with ICT products and services • Workshop on Cyber Security • The Role of Government in Ensuring Trust and Confidence among End Users • Workshop on Network Security • Trusted Computing/Digital Rights Management • Examination of the Security Implications of Emerging Technologies • International PKI Training Program • Symposium on Spam and Related Threats • NSP-SEC=Sharing information with APECTEL economies service providers on what they can do to protect their users and networks • Measurement in the Cyber Environment of APEC Economies • Symposium on Spam and Related Threats • Wireless Security Workshop • Strengthening Effective Response Capabilities among APEC Economies • CIO Training Model and Network for eGovernment • Workshop on eGovernment

GOVERNMENT SERVICES	
	<ul style="list-style-type: none"> • Symposium on ebXML for Paperless Trading and Collaborative e-Business • Incident Response and Forensics Workshop • eMail Practices for a Culture of Security • APEC Cybersecurity Strategy • Computer Emergency Response Team Workshop • Virtual Environments for Manufacturing and Technology Project • Electronic Authentication: Issues Relating to Its Selection • Cyber Security in GBDe: Global Business Dialogue on Electronic Commerce • Electronic Authentication in a Multi-Format/ Multi-Protocol Environment

SMALL AND MEDIUM BUSINESSES AND ENTERPRISES (SMBs/SMEs)	
CL	<ul style="list-style-type: none"> • eBusiness for SMEs • Strategies for Rural SMEs in APEC • Rural Banking Inclusion • APEC Business eCommerce Dialogue • eCommerce Law Workshop <ul style="list-style-type: none"> • Digital Divide Workshop • Best Practice for SMEs in the APEC Region • Small and Medium Enterprises IT Workshop • ISMS Guidance, Implementation, Awareness for SMEs and SchoolsNet • Workshop on Building confidence toward the trusted ICT society with ICT products and services • Workshop on Investment Competition • Workshop on Universal Access to Broadband Services • Improving Website Accessibility in the APEC Region
TRAINING	<ol style="list-style-type: none"> 6. AOEMA eCommerce Awareness Seminars 7. Electronic Commerce Capacity Building Project <ul style="list-style-type: none"> • Workshop on Building confidence toward the trusted ICT society with ICT products and services
APPLICATIONS/ CONTENT	<ul style="list-style-type: none"> • Content Promotion Workshop • Improving Website Accessibility in the APEC Region • Workshop on Building confidence toward the trusted ICT society with ICT products and services
NETWORK	<ul style="list-style-type: none"> • Workshop on Interconnection • APEC TEL GRID Workshop • Wi-Fi Connectivity • Broadband Workshop
SECURE TRANSACTIONS	<ul style="list-style-type: none"> • Cyber Security in GBDe: Global Business Dialogue on Electronic Commerce • Workshop on Building confidence toward the trusted ICT society with ICT products and services • Workshop on Malware • ISMS for SMEs -Study and Experience • SPAM Workshop proposal • eClean and Secure APEC • APEC Telematics Strategy Security • SME Internet Safety Training Program • ASEAN Ecommerce Project • Cybersecurity Tool Proposal • CSIRT Workshop

RURAL COMMUNITIES	
CLIENTS/ USERS/ STAKEHOLDERS	<ul style="list-style-type: none"> • Rural Banking Inclusion • APEC Telecenter Workshop • Seminar on Using ICT for Rural Community Capacity Building • Broadband for Rural and Indigenous Communities Workshop • Smart Community Project
TRAINING	<ul style="list-style-type: none"> • Seminar on Using ICT for Rural Community Capacity Building
APPLICATIONS/ CONTENT	<ul style="list-style-type: none"> • Rural Banking Inclusion • Content Promotion Workshop
NETWORK	<ul style="list-style-type: none"> • Rural Connectivity for Economic and Social Benefit • Workshop on Interconnection • Broadband for Rural and Indigenous Communities Workshop
SECURE TRANSACTIONS	<ul style="list-style-type: none"> • Workshop on Malware

Schools

SCHOOLS	
CLIENTS/ USERS/ STAKEHOLDERS	<ul style="list-style-type: none"> • ISMS Guidance, Implementation, Awareness for SMEs and SchoolsNet • Distance Learning Project on Telecommunications Technology • eUniversity for HRD in eGovernment
TRAINING	<ul style="list-style-type: none"> •
APPLICATIONS/ CONTENT	<ul style="list-style-type: none"> • Content Promotion Workshop
NETWORK	<ul style="list-style-type: none"> • National Research and Education Network in Latino America and Peru • Access Grid for Distance Learning
SECURE TRANSACTIONS	<ul style="list-style-type: none"> • Workshop on Malware

Health centers

HEALTH CENTERS	
CLIENTS/ USERS/ STAKEHOLDERS	<ul style="list-style-type: none"> • Information and Communications Technologies (ICT) used in Health Care
TRAINING	<ul style="list-style-type: none"> •
APPLICATIONS/ CONTENT	<ul style="list-style-type: none"> • Alerta: Electronic Disease Surveillance for rapid Detection of potential outbreaks in rural settings • Content Promotion Workshop
NETWORK	
SECURE TRANSACTIONS	<ul style="list-style-type: none"> • Workshop on Malware

Report on the Workshop on Universal Access to Broadband Services

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Workshop Objectives

- To examine the progress of APEC economies towards the attainment of the Brunei 2010 Vision of universal Internet access;
- To come up with a strategy to achieve the Bangkok 2015 goal, which encourages intensified efforts to support universal service strategies that are appropriate to each economy;
- To identify key issues and possible approaches in the implementation of Universal access to broadband services through presentations and discussions on best practices in pursuing the abovementioned goals; and
- To generate recommendations on APECTEL's next steps or plan of action with specific milestones for the next several TEL meetings leading to TELMIN8 in relation to the achievement of Brunei and Bangkok vision.

Day One: Presentations on Policy

- **Workshop Overview**
 - *State of Play of Broadband in APEC*, Emmanuel C. Lallana, Ph. D., Ideacorp
- **Expert Presentations**
 - *Thoughts on ICT Deployment*, Gerry Greeve, Intel World Ahead Program
 - *Affordable Universal Access to Broadband using the mainstream Mobile Technologies*, Michael Bjarhov, Ericsson
 - *Universal Broadband Access*, Jayesh Easwaramony, Frost & Sullivan Asia Pacific
- **Economy Presentations**
 - *Australian Broadband Guarantee: Equitable Access to Broadband*, Richard Brown, Dept. of Broadband Communications and the Digital Economy
 - *Policy and Practices of Universal Broadband Services in Chinese Taipei*, Po-Cho (Paul) Liang, National Communications Commission
 - *Framework for Ubiquitous Broadband*, Robert Pepper, Ph. D., Cisco

Day 1: Summary of Discussions

- Broadband is not just about speed. **Broadband is multi-dimensional.**
- Broadband has economic as well as social benefits. **Public policy goal is to deploy broadband widely to harness these benefits.**
- Policy Matters. **Economies with robust national broadband policy fare better than those without.**

Day 1: Summary of Discussions

- Wireless broadband will play a key role in Universal Access strategy of developing economies.
- Actions to hasten deployment of wireless broadband
 - Issue licenses. Opportunity cost in not using spectrum bands.
 - Low bandwidth leads to lower access charges
 - Make big/huge chunks/bands of spectrum available. 10 mhz will not do.
 - Encourage competition
- **Taxes are disincentive and counter-productive.**
- Schemes to deploy broadband in unserved areas:
 - Incentives-based schemes (Australia)
 - Use USF/USO (Broadband to Villages/Tribes - Chinese Taipei)

Day 1: Summary of Discussions

- **Regulators should MANDATE OUTCOMES, not means to outcomes.**
- **Public & Measurable goals:**
 - % of schools with BB, teacher pc training, very widespread pc proliferation in schools, local education ISV growth
 - Secure financial transactions via Internet & cell phones
 - % of SMBs in towns with > 2000 pax with AFFORDABLE & RELIABLE broadband;
 - Tax relief for broadband and ICT;
 - Shared broadband and PC access within 1 hour walk for all;
 - % of public health centers/ medical clinics with broadband & PCs;
 - Internet portal information and service for medicine, agriculture, eGovernment;
 - True measurement of access (uptime, cost, consistent speed).

Day 1: Summary of Discussions

- **Develop Projects in the following areas:**
 - Affordable clients that deliver adequate capability;
 - Training and aids to learn how to use the clients;
 - Applications and usage models that work;
 - Investment and commitment;
 - Affordable, reliable and adequate networks;
 - Secure financial transactions.

Day Two: Presentations on Practices

- **Expert Presentations**
 - *Broadbanding the next billion customers: A challenge for operators and regulators*, Samba Natarajan, McKinsey and Company
- **Economy Presentations**
 - *Measuring the Broadband Footprint – The CRTC Experience*, Stephen Delaney, Canadian Radio-television and Telecommunications Commission
 - *Nationwide Broadband: Strategy for Japan*, Atsushi Ozu, Ministry of Internal Affairs and Communications
 - *Universal Access to Broadband in China*, Men Rujing, Ministry of Industry and Information Technology
 - *Providing universal access to broadband in the Philippines*, Alfredo Carrera, Philippine Long Distance Telephone Co.

Day 2: Summary of Discussions

- **Public and Measurable Goals (cont.):**
 - % of SMBs in towns with > 2000 pax with AFFORDABLE & RELIABLE broadband;
 - Tax relief for broadband and ICT;
 - Shared broadband and PC access within 1 hour walk for all;
 - % of public health centers/ medical clinics with broadband & PCs;
 - Internet portal information and service for medicine, agriculture, eGovernment;
 - True measurement of access (uptime, cost, consistent speed).

Day 2: Summary of Discussions

- **Metrics**
 - **Defining universal access**
 - **Penetration?**
 - Household (Canada)
 - Subscribers/users (ITU)
- **Metrics (cont.):**
 - **Shared access points?**
 - Access points in each village/ *kampung/ barangay*
 - Internet cafes
 - Other? – X number of hours of walking until you find access to internet/broadband

Workshop Conclusions

Progress towards Universal Internet Access

- *Internet Metrics Used by Economies*
 - **Geographic Coverage**
 - % of land area with Internet Access (Chinese Taipei, Korea)
 - Local administrative divisions (Malaysia, Peru, Philippines)
 - **Population Coverage**
 - % population coverage of Internet and/or broadband services (Australia, Chinese Taipei, Hong Kong, Korea, New Zealand)
 - **Number of Subscribers**
 - **Broadband only** (Brunei, Canada, China, Indonesia, Japan, Malaysia, Philippines, Russia, Singapore, Thailand, United States, Vietnam)
 - **Internet and broadband** (Australia, Chile, Chinese Taipei, Hong Kong, Korea, Mexico, New Zealand, Peru)

Progress towards Universal Internet Access

- **Internet Metrics Used by Economies**
 - **Number of Users**
 - **Internet users only** (Brunei, Canada, China, Chinese Taipei, Hong Kong, Indonesia, Japan, Malaysia, Mexico, Papua New Guinea, Peru, Philippines, Russia, Singapore, Thailand, United States, Vietnam)
 - **Internet and broadband users** (Korea, New Zealand)
 - **No official data** (Australia, Chile)
 - **Other: Number of Households**
 - **Broadband only** (Japan)
 - **Internet and broadband** (Australia, Hong Kong)
 - **Broadband definition**
 - **256 kbps or up** (Australia, Chile, Canada, New Zealand, Philippines)

Internet penetration rate rankings in APEC

Latest Figures			
	Economy	Year	Internet Penetration Rate (users/100 inhabitants)
70% Internet Penetration rate and up			
1	New Zealand	2008	80.5
2	Australia	2008	79.4
3	Korea	2008	77.1
4	Japan	2009	75.30
5	United States	2007	73.2
6	Canada	2007	73
26 – 69% Internet penetration rate			
7	Singapore	2007	68
8	Chinese Taipei	2007	66.4
9	Hong Kong	2008	59
10	Malaysia	2008	56.63
11	Chile	2007	50.9
12	Brunei	2007	46.2
13	Russia	2008	27
25% Internet penetration rate and below			
14	Peru	2008	24.8
15	Vietnam	2008	24.2
16	China	2008	22.6
17	Mexico	2008	21.7
18	Thailand	2007	21
19	Philippines	2007	14.6
20	Indonesia	2008	10.5
21	Papua New Guinea	2007	1.83

Progress towards Brunei 2010 goals

- **Tripling Internet Access by 2005**
 - 8 economies (Brunei, Peru, Mexico, Russia, Thailand, Vietnam, China, Indonesia)
- **Universal Internet Access by 2010**
 - 11 economies with more than 50% internet penetration rate

	Latest Figures		
	Economy	Year	Internet Penetration Rate (users/100 inhabitants)
1	New Zealand	2008	80.5
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6	Canada	2007	73
7	Singapore	2007	68
8	Chinese Taipei	2007	66.4
9	Hong Kong	2008	59
10	Malaysia	2008	56.63
11	Chile	2007	50.9

Strategies to Achieve Bangkok 2015 goal

- A study on network provisioning of rural areas to include VoIP;
- A study examining the promotion of partnerships between operators, local entrepreneurs and local government units through sharing of best practices and implementation of incentive schemes;
- A study identifying future plans of operators in terms of expanding their network coverage and complementing the plans of the private sector with projects that are identified as essential to uptake such as training and content development among others;
- A study concerning the integration of wireless and wired networks and IPv4 and IPv6 and identifying the way forward;

Strategies to Achieve Bangkok 2015 goal

- A study examining the effectiveness of the implementation of Universal Service Obligations/Universal Service Funds of APEC economies on the provision of Internet and broadband access;
- A study examining how governments promote Internet and broadband access such as the WiFi cities and the impact of these projects in the uptake of broadband services;
- The creation of a venue enabling the sharing of best practices in content regulation in terms of enforcing policies and identifying the responsibilities of government, operators, parents and other stakeholders; and
- A project on developing applications to promote access in the community such as applications for rural health centers.

Issues and approaches in implementing Universal Access to broadband services

- **Crafting of *National ICT strategy* for economies that have none** should be encouraged. The strategy should address:
 - Policies and regulations;
 - Competition and market structure;
 - Public and private infrastructure investment;
 - Government operating expenditures;
 - Skills for ICT; and
 - Applications and content
- The ***Accessibility*** of Internet and broadband services should be addressed.

Issues and approaches in implementing Universal Access to broadband services

- The **Affordability** of Internet and broadband services access and gadgets that serve as means of access to the Internet should be explored.
- The **Desirability** of Internet use and services should be emphasized.
- The **Role and vision of Government** in achieving universal access to Internet/broadband services should be defined.
- The **cooperation of the private sector** in achieving universal access to Internet/broadband services should be explored.

Recommendations

- **Set a Common APEC metric for Internet and broadband penetration**
 - Formula for converting broadband subscribers into broadband users
- **Set a Common APEC definition for broadband**
- **Set a Universal Internet Access point** to determine success of Brunei 2010 goal of Universal Internet Access.
- Encourage economies without a national broadband strategy to formulate one.
- **Expedite the distribution of 3G and 4G licensing**

Recommendations

- **Provide incentives for deployment of broadband and the distribution of gadgets**
- **Encourage public-private partnerships**
- **Encourage production of applications, content, and services.**

Recommendations

- **Encourage projects within APEC directed towards key areas in broadband development:**
 - Small and medium businesses/enterprises
 - Schools
 - Health centers
 - Rural communities
 - Government services
- **Encourage the development of the following sectors in the previously identified key areas:**
 - Clients/users/stakeholders
 - Applications and content
 - Training
 - Network
 - Secure transactions

Next Steps

- Encourage the implementation of projects that will address developing applications and content for government services, SMEs/SMBs, schools, health centers and rural communities
- Encourage the implementation of projects that focus on clients/users/stakeholders, training, network and security of schools, health centers and rural communities.
- Recommended studies from the workshop that fall under these criteria:
 - Conduct a study on network provisioning of rural areas to include VoIP;
 - Conduct a study examining the promotion of partnerships between operators, local entrepreneurs and local government units through sharing of best practices and implementation of service schemes;

Next Steps

- Recommended studies from the workshop that fall under these criteria (cont.):
 - Conduct a study examining the effectiveness of the implementation of USO/USF of APEC economies on the provision of Internet and broadband access
 - Create venue enabling the sharing of best practices in content regulation in terms of enforcing policies and identifying responsibilities of government, operators, parents, and other stakeholders
 - Develop applications to promote access in the community