MINISTRY OF COMMUNICATIONS

NATIONAL BROADBAND POLICY
OF BRUNEI DARUSSALAM

ITU

AITI

Brunei Darussalam
National Broadband Policy

2014 - 2017

Please consider the environment before printing this report.

Foreword by His Excellency the Minister of Communications

First of all, I would like to thank the International Telecommunication Union (ITU) for collaborating with Brunei Darussalam in the formulation of the National Broadband Policy.

Back in 2008, the Ministry of Communications issued the National Broadband Blueprint. Among the objectives of the National Broadband Blueprint is to bridge the digital divide in Brunei Darussalam by ensuring the whole population of Brunei Darussalam will be provided with broadband connection at competitive prices and according to industry standards. The National Broadband Blueprint also stated for the deployment of a mix of technologies, including fibre-to-the-home to provide the broadband capacity to satisfy demand for current and most emerging applications and uses.

The National Broadband Policy is a step further from the Blueprint. To formulate the National Broadband Policy, the Ministry of Communications (MOC), Authority for Info-communications Technology of Brunei Darussalam (AITI) and ITU worked in partnership on a fact-finding mission involving interviews with various stakeholders in Brunei Darussalam. This was immediately followed by the National Broadband Workshop on 31st October 2013 where early findings from the interviews as well as regional development on broadband were shared.

The Ministry of Communications welcomes the formulation of the National Broadband Policy. Key enablers of both the smart society and the goals of *Wawasan Brunei 2035* are ubiquitous access to broadband connectivity and widespread use of broadband-enabled services. To that end, this National Broadband Policy sets out the Government's overarching policy initiatives and goals for the development of the broadband sector over the next four years (2014–2017).

With the National Broadband Policy, we wish to address key issues such as access, affordability, quality and usage. Closely related to these issues are content development and positive use of the Internet. Hence, with broadband development and emergence of broadband-powered services, it is hoped to open up more business opportunities for our local industry players and spur more employment opportunities. Broadband development will also provide further avenues for enhancement of skills and expertise.

Hence, the National Broadband Blueprint has identified implementation plan with targets and indicators to be achieved towards a more sustainable broadband-oriented environment. I would like to thank those who have contributed to the development of this National Broadband Policy, both from the Government and private sector. I also like to express our appreciation to the International Telecommunication Union and the Ministry of Science, ICT and Future Planning, Republic of Korea for the assistance they provided to the Ministry of Communications during the development of this policy.

Yang Berhormat Pehin Orang Kaya Hamzah
Pahlawan Dato Seri Setia Awang Haji Abdullah
bin Begawan Mudim Dato Paduka Haji Bakar
Minister of Communications
Brunei Darussalam

Message from the Director of the
ITU Telecommunication Development Bureau (BDT)

I congratulate Brunei Darussalam on the introduction of the National Broadband Policy. The International Telecommunication Union (ITU) Telecommunication Development Bureau (BDT) has been honoured to have been able to assist Brunei Darussalam in the preparation of this important policy statement for the continued development and expansion of broadband and broadband-enabled services.

I commend Brunei Darussalam for its early identification of the central importance of high speed broadband in the digital era, and for its efforts to expand access to, and foster the creation of, practical content for local broadband users.

Given the commitment to the promotion and integration of broadband that has been consistently demonstrated over many years, I am confident that Brunei Darussalam will realise the goals that it has set out in this policy and that its citizens will enjoy the many benefits of greater availability and use of broadband, especially the increased economic growth, access to life-improving services, and social engagement that broadband can bring.

Brahima Sanou

Director
Telecommunication Development Bureau

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Introduction

Broadband is a term used to describe services that provide a high-speed connection to the Internet and to other information services. As the importance of broadband is in the applications and services that it enables, broadband is not defined in terms of a minimum bandwidth. Rather, the definition focuses on the two core concepts of broadband, namely:

- an always-on service that does not need to make a new connection to a server each time a user wants to go online; and

- high-capacity that can carry huge amount of voice, video and data per second.

The importance of broadband to economic development and to the social interactions of citizens is widely recognised. Broadband and broadband-enabled services have the potential to transform the economy of Brunei Darussalam and are already starting to do so. This fact is at the heart of the Ministry of Communications *Strategic Plan 2008 – 2017* and its vision of a smart society that is dynamic, creative, innovative and intelligent. Broadband is also a key component of *Wawasan Brunei 2035* and the realisation of the Government vision for Brunei Darussalam to be recognised by 2035 for the accomplishments of its people, its quality of life, and its dynamic, sustainable economy. Access to better broadband services will provide many benefits for all citizens of Brunei Darussalam, including enhanced access to education, healthcare and other public services. Broadband will also promote greater transparency, responsiveness and accountability as well as cost-effective options for delivery of various government and commercial services. It will also further improve Brunei Darussalam's profile as a digitally-enabled economy, improve its international competitiveness and encourage foreign investment.

Figure 1: Brunei Darussalam's Key Broadband Indicators	2011	2012	Change
Percentage of individuals using the internet	56.0%	60.3%	↑8%
Fixed (wired) broadband subscriptions per 100 inhabitants	5.7	4.8	↓16%
Active mobile broadband subscriptions per 100 inhabitants	6.3	7.6	↑21%
International internet bandwidth (bits/second) per internet users	21,995	39,861	↑81%
Digital natives as a share of total population	n/a	12.1%	n/a
Percentage of households with computer	83.2%	86.9%	↑4%
Percentage of households with internet access	69%	72.4%	↑5%
Percentage of primary schools with internet access	100%	100%	–
Percentage of secondary schools with internet access	100%	100%	–

Source : ITU, Measuring the Information Society (2013)

Brunei Darussalam has envisaged broadband as a necessary utility service comparable to that of electricity or water. Consequently, Brunei Darussalam already has a solid foundation for the broadband era (see Figure 1).
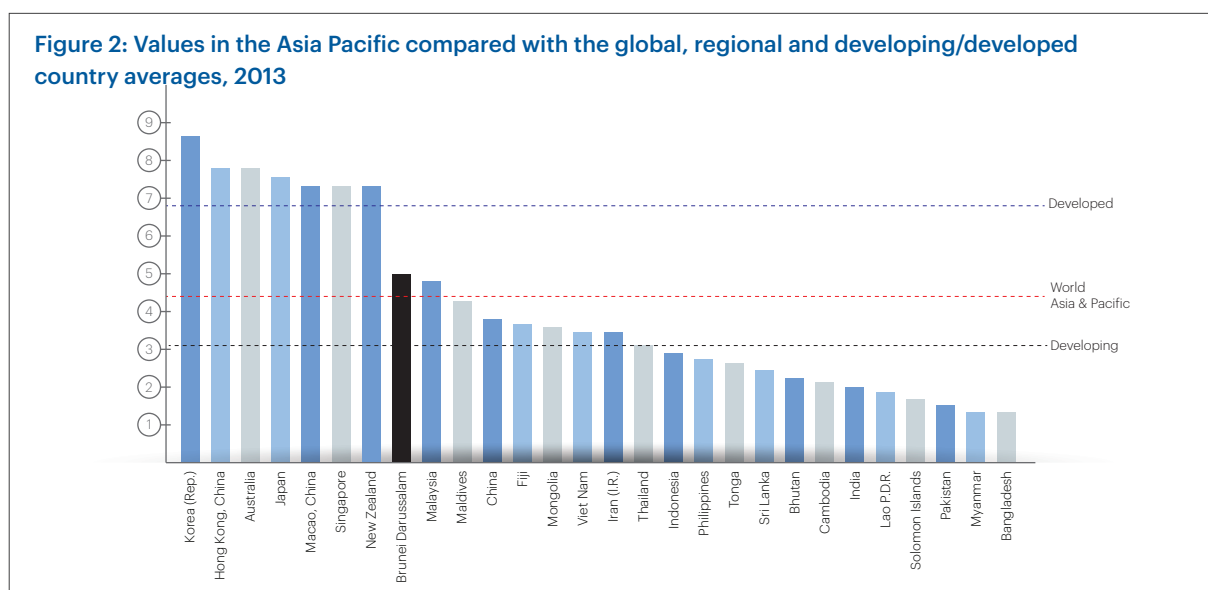
On 15 July 2012, the Government of His Majesty the Sultan and Yang Di-Pertuan of Brunei Darussalam has consented to a budget of BND 230 million to implement a nationwide broadband initiative. In line with the Brunei Darussalam Government vision, Telekom Brunei Berhad (TelBru), has under its own initiative, commenced a phased construction of a fibre-to-the-home (FTTH) broadband network. Today that deployment has the potential of connecting over 41 000 homes in Madang, Gadong and Bandar Seri Begawan. As of January 2014, 15 000 subscribers were connected to the FTTH network and enjoying high speed broadband access.

Brunei Darussalam HSBB (FTTH) Deployment
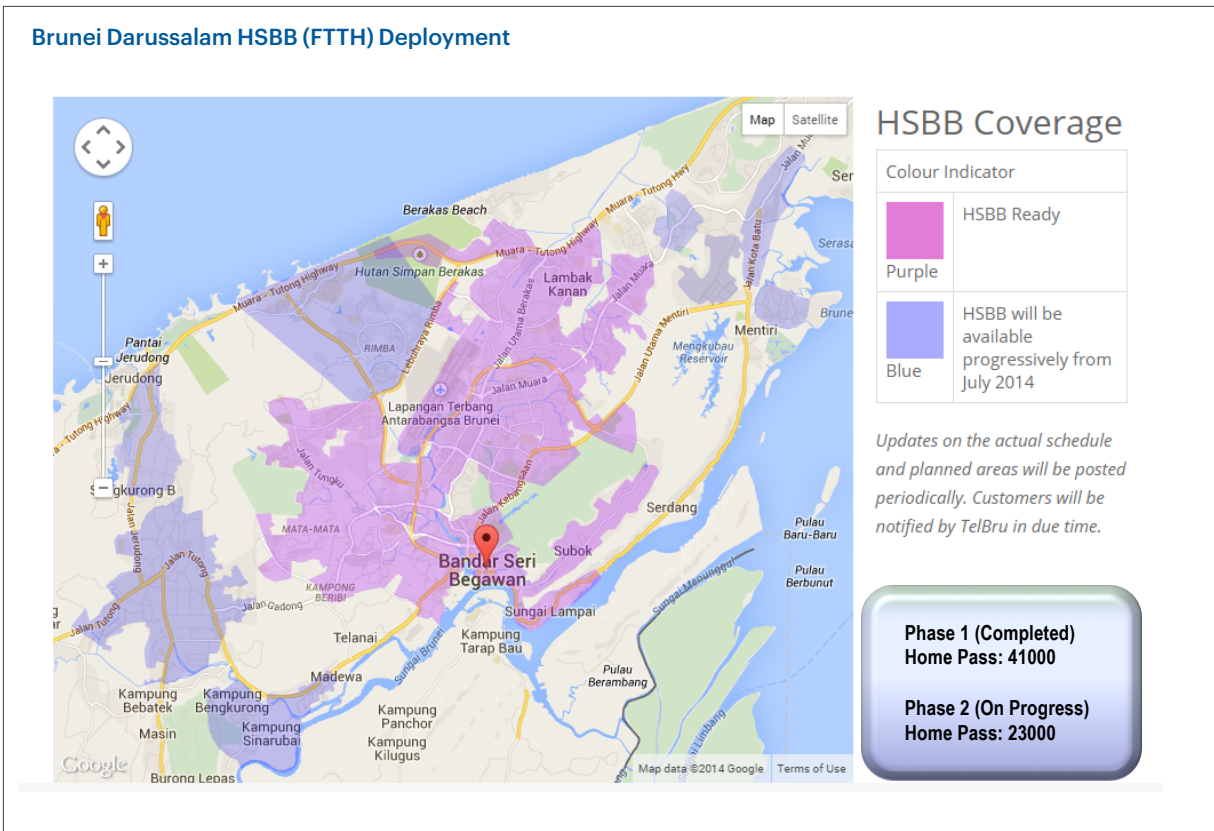
Source : TelBru (2014)

However, there is still much that can, and needs to be done in Brunei Darussalam in order to realize the vision of a smart society. This is evident in the International Telecommunication Union (ITU) ICT Development Index (IDI), which combines measures of ICT access, usage and skills to assess the relative level and evolution of national ICT developments and the development potential of ICTs.

The 2013 IDI ranks Brunei eighth out of 28 countries in the Asia-Pacific region and 58th out of 154 countries globally. The IDI shows that Brunei Darussalam has made annual improvements in key areas such as household penetration of computers, household and per capita penetration of Internet services and mobile broadband, and growth in international Internet bandwidth per user.

Figure 2: Values in the Asia Pacific compared with the global, regional and developing/developed country averages, 2013

However, as shown in table below, despite those annual incremental improvements, Brunei Darussalam's global ranking has fallen by two places, from 56th in 2011 to 58th in 2012.

Figure 3: Brunei Darussalam's Performance on ICT Development Index

	Index Value			Global ranking		
	2011	**2012**	**Change**	**2011**	**2012**	**Change**
IDI	4.93	5.06	↑	56th	58th	↓
Access sub-index	6.35	6.55	↑	42nd	42nd	–
Use sub-index	2.39	2.53	↑	62nd	70th	↓
Skills sub-index	7.08	7.16	↑	76nd	76th	–

This suggests that other countries are reinforcing their existing strengths in the key areas of access, use and skills; or have been doing more than Brunei Darussalam to leapfrog into the broadband era; or are making greater progress than Brunei Darussalam to universalise access and use of broadband and ICTs. It also suggests that Brunei Darussalam's advantage of a high average income is not being fully leveraged upon to advance Brunei Darussalam into the digital economy era and maximise the development potential of ICTs (see Figure 4).

Figure 4: ICT Development Index And Gross National Income Per Capita (2013)
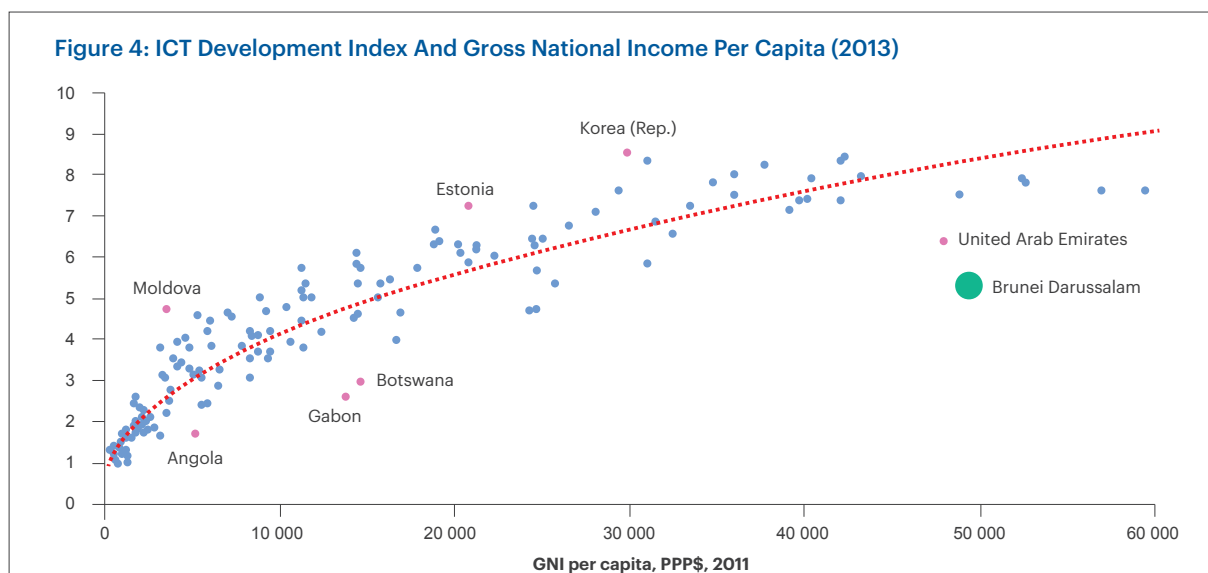
Responding to these issues, the Government will foster the development of an open, vibrant, sustainable and competitive broadband market in Brunei Darussalam through the implementation of a structured programme that combines regulatory and non-regulatory initiatives. This will address key challenges on both the supply-side and demand-side.

Policy initiatives to address both aspects are critical. Whereas supply-side policies tend to focus on promoting the expansion of broadband infrastructure, demand-side policies are needed to ensure affordability, improve digital literacy, encourage adoption and usage. As the forces of supply and demand are closely related, development of the supply-side can help to foster demand for broadband services while development of the demand-side can help to stimulate supply.

Another aspect of the broadband ecosystem that must be taken into consideration is the absorptive capacity of the economy. This refers to the capacity of broadband consumers, including government, businesses and individuals, to understand and apply the potential benefits of broadband-enabled services to their daily activities and in the interests of social and economic development (for example, through the delivery of government services, commerce and education). The factors that determine an economy's absorptive capacity are the macroeconomic environment, the general business environment, the quality of human capital, and the governance structure. As these factors are not specific to the broadband sector, the Government is addressing them through other ministries in the interests of all sectors of the national economy.

In an effort to provide guidance to the industry and the community, the Government plans and goals for broadband over the coming four years are set out in this broadband policy document, which focuses on the three key themes:

- ensuring access to broadband connectivity for all;
- improving the value, quality and affordability of broadband; and
- maximising the adoption and utilisation of broadband.

The focus on these particular areas reflects the Government holistic approach and the need to drive the deployment of the next generation of infrastructure while ensuring that those connected have the desire and skills to access content that is relevant and useful. This is also consistent with the strategic thrusts of the ASEAN ICT Masterplan to enable greater integration with other ASEAN economies and contribute to the recognition of the region as a global ICT hub.

The Government key policy is to ensure the provision of affordable, high-quality and high-speed broadband services to the majority of the population of Brunei Darussalam. These services will support the creation of a connected, well-informed, knowledge-based society, will promote economic growth and will enhance innovation in new industry sectors. The Government will promote free and fair competition and continue its facilitative role by ensuring that the necessary infrastructure of the future is in place.

Ensuring accessibility to broadband connectivity for all

Building a nationwide world-class fibre-to-the-home broadband network will enable all citizens of Brunei Darussalam to access world-class broadband technology. It is an important step towards realising our vision of a smart society and enhancing our international competitiveness.

A key part of the Brunei Darussalam development agenda under *Wawasan Brunei 2035* is a well-developed social and business infrastructure that plays a major role towards increasing the nation's competitiveness and attractiveness as an investment destination. The increased penetration and use of broadband and broadband-enabled services can help to stimulate growth in GDP. Some studies estimate that for every 10 percentage-point increase in broadband penetration per capita, there is an increase in economic growth of almost 1.4 percentage points. Investment in telecommunications infrastructure is particularly beneficial when there is already a substantial network infrastructure in place, as exists in Brunei Darussalam. In countries that already have a high broadband penetration, the estimated annual impact on GDP of deploying fibre-based next generation access networks is estimated to be between 0.08 to 0.20 per cent of GDP. Other research focused on OECD economies has shown that a doubling of broadband speed can increase GDP growth by 0.3 per cent on average.

To maximise the opportunity for economic development through broadband, it is necessary to ensure that all Bruneian homes and businesses have access to high-speed broadband services by 2017. This will be an enabler for increased competitiveness and innovation in many industries and enhanced social and economic interaction, making ICT a key driver for economic growth. This objective is consistent with the strategic thrusts of the ASEAN ICT Master Plan and its desire for the region to become an ICT hub.

While market-led broadband growth is critical to GDP growth, to stimulate the full economic potential of a broadband enabled society requires targeted investment by Government. With the fund of BND 230 million, the Government envisages a broadband sector that is conducive for a more active participation of the industry players. Through policy and regulatory initiatives, the Government hopes to foster a competitive and facilitative environment.

In parallel with the Government initiatives, TelBru has invested BND 65 million to deploy FTTH broadband network in Madang, Gadong, and Bandar Seri Begawan. It is expected that the rollout to these areas will reach 80 per cent of premises by the end of 2014. Further deployment in other areas is currently underway.

Connecting homes to broadband is the ultimate guarantee of access and inclusiveness as it ensures that all Bruneians can access the Internet and make use of broadband-enabled services.

To ensure transparency and the successful delivery of this important project, the Authority for Info-communications Technology Industry (AITI) will oversee the network rollout by TelBru and its contractors, and will track and report publicly on the progress with the rollout on a dedicated website.

Wireless technologies also play an important part of a national broadband infrastructure because of their ease of deployment and their lower cost, which are particularly important in rural areas and in areas with low population densities or low traffic volumes. To ensure that sufficient spectrum resources are available to support the deployment of wireless broadband technologies, AITI will make additional spectrum available in the 700 Mhz and 2.6 Ghz bands.

In the interests of "universalising" broadband, AITI will also review the scope of the universal service regime and consider expanding it to ensure technology neutrality and the inclusion of broadband access.

A special education network

The Ministry of Education together with the E-Government National Centre (EGNC) issued an Expression of Interest (EOI) in 2013 for the development of a broadband network infrastructure specifically for education institutions and providers. The purpose is to allow the entire education sector to access curriculum content / applications and Internet.

One Government Network

The One Government Network (OGN) is a dedicated and secure wide-area-network infrastructure to establish and connect agencies in accessing integrated e-services as well as the Internet from a central gateway. It is based on an end-to-end secured and carrier-grade Metro Ethernet Network using Layer-3 IP-VPN network.

Implementation plan

Policy Objective	*To ensure that all Bruneian homes and business can access a high-speed broadband service by 2017.*	Responsible agency
Targets	A minimum of 10 Mbps (shared) broadband connectivity to each Kampong	MOC / AITI
	Basic broadband services offering headline downstream speed of at least 2 Mbps to be available to 95% of the population by December 2015	MOC / AITI
	High-speed broadband services offering headline downstream speed of at least 20Mbps to be available to 75% of the population by 2017	MOC / AITI
	Additional 90 MHz (2 x 45 MHz FDD) in the 700 MHz spectrum band made available for assignment to broadband service providers by December 2016.	AITI
	Additional 190 MHz (2 x 70 MHz FDD and 50 MHz TDD) in the 2.6 GHz spectrum band made available for assignment to broadband service providers by December 2015.	AITI
	Universal service definitions completed by June 2015.	MOC / AITI
Indicators and measures of progress	Number of Kampongs with (shared) broadband connectivity of at least 10 mbps.	
	Number of homes connected to a basic broadband service of at least 2 Mbps. Number of Kampongs with (shared) broadband connectivity of at least 10 mbps.	
	Number of homes passed by the FTTH network.	
	Number of homes connected to the FTTH network.	
	Proportion of population covered by wireless broadband networks.	

Improving the value, quality and affordability of broadband

The price of broadband access plays a critical role in its diffusion. Entry-level broadband services are widely affordable with a fixed or a pre-paid mobile broadband service costing approximately 2 per cent of average income, and a post-paid mobile broadband service costing about 1 per cent. However, the pricing of fixed broadband services above the entry-level is much less affordable and must come down.

A vibrant and competitive retail market, with service providers competing against each other to provide the most attractive (and profitable) services, is generally the most effective way to lower prices and improve quality of service. To ensure that competition delivers such benefits to all citizens of Brunei Darussalam, it is necessary to have a legal and regulatory framework that ensures a level playing field and promotes the long-term development of effective competition.

To this end, AITI will introduce a competition code of practice for the telecommunication and broadcasting sector. AITI will also reform the licensing arrangements for these sectors to better reflect and accommodate the convergence of services and service providers in a broadband environment.

To facilitate service-based competition in the supply of various communications and content services, AITI will ensure that the FTTH network is available to other licensees and service providers on an open access basis and at cost-oriented wholesale prices. AITI will also introduce appropriate wholesale access requirements for international connectivity and national backhaul infrastructure to remove network bottlenecks.

To address the high costs of international Internet connectivity, AITI will explore the potential to establish Internet peering arrangements at the regional level, consistent with the ASEAN ICT Masterplan, and a local Internet exchange point to ease the flow of Internet traffic.

Whereas the retail prices for mobile broadband services are in line with those charged in neighbouring countries such as Malaysia and Singapore, the retail pricing of fixed broadband services in Brunei Darussalam is greater than its other peers. This high pricing is an impediment to greater adoption and utilization of broadband in Brunei Darussalam. The introduction of ex ante wholesale access regulation by AITI should, in time, lead to greater competition and lower retail prices. However, to improve the affordability of fixed broadband services in the interim, AITI will introduce retail price controls for fixed broadband.

Making computers more affordable

To help improve the affordability of computer devices and further promote the development of ICT skills, the Government has abolished custom taxes on computers and peripherals.

ICT demand aggregation

To address the needs to boost the adoption of ICT within the non-ICT and ICT sectors, AITI will be introducing an ICT adoption programme that will assist the local SMEs to adopt and implement ICT solutions to improve their business operation and productivity.

This programme is to drive sector wide adoption by aggregating demand for ICT through sector projects. Under this initiative, AITI will provide funding for the SMEs in the form of subsidised subscription fees for the businesses to subscribe to packaged solutions ranging from software and training costs for basic, intermediate and sector-specific enterprise solutions.

Implementation plan

Policy Objective	*To ensure that competition delivers benefits to broadband users in the forms of lower prices, better quality, and greater choice*	Responsible agency
Targets	A new competition code of practice for the telecommunications and broadcasting sectors introduced by June 2015	AITI
	A new unified licensing regime is implemented by December 2015	AITI
	Ex ante wholesale access requirements in relation to the FTTH network, international links, and key national backhaul network infrastructure are introduced and in effect by June 2015.	AITI
	Study into the potential establishment of a national internet exchange with local peering arrangements	AITI
	Study into the potential for internet peering with peers within ASEAN completed by June 2015.	MOC / AITI
	Retail price controls introduced in relation to broadband services supplied via the FTTH network introduced by June 2015.	AITI
	The retail price for a residential high-speed broadband service with a headline downstream speed of at least 20 Mbps is less than 3% of average monthly earnings by 2017	MOC
Indicators and measures of progress	Wholesale price of international capacity per MB per month.	
	Wholesale price of national leased line per MB per month.	
	Wholesale price of access to FTTH per MB per month.	
	Retail prices as a percentage of gross national income per capita per month.	
	Number of broadband service providers.	
	Proportion of non-Internet users that cite cost as the reason.	

Maximising adoption and utilisation

> Broadband connectivity is necessary, but not sufficient. It is essential that the Brunei Darussalam rollout of a world-class broadband infrastructure be accompanied by the development of new services and applications that make broadband access to the Internet useful and compelling. This in turn requires skills and capacity development.

The Government intends to universalise broadband and maximise participation by the people of Brunei Darussalam and their contributions to the global digital economy. The interim goal though is to increase broadband penetration to at least 80 per cent of households by 2017, up from its current rate of 31 per cent (for fixed broadband).

The Government of Brunei Darussalam will help industry drive broadband adoption by:

- coordinating and leading initiatives to educate consumers and businesses about the benefits of broadband;

- identifying measures to lower barriers to subscribing to broadband services;

- encouraging the development of local content and applications; and

- increasing awareness about the potential risks of the Internet and identify necessary measures to safeguard the rights and interests of broadband users, in particular children.

In addition to greater broadband access at home, the Government is also keen to encourage use of the Internet and digital information more generally, at work, in school, and in public places. This will require greater emphasis on the development of digital literacy skills. The Ministry of Education has already identified and documented the key competencies that are required in the digital era. Through its e-Hijrah initiative, the Ministry of Education is ensuring that sufficient space is provided in the national education curricula for integrating those competencies into learning and teaching practices. This is consistent with the strategic thrust of ASEAN ICT Masterplan to develop a skilful ICT workforce to support the growth of the ICT sector and the transformation of other sectors in the national and regional economies.

To encourage a more widespread usage of broadband, the Ministry of Communications, through AITI and in cooperation with the relevant stakeholders, has embarked on the ICT Rural Outreach Program (iROP) to expand access to ICTs and training opportunities into rural areas. In addition, further initiatives will be implemented to ensure that people with special needs are able to participate fully in the digital economy.

The creation of digital content and the digitalization of existing information are key to making broadband access useful and compelling. The Government is actively digitalising various government services and information, which is helping people to become familiar with and eventually encouraging them to use ICT.

Closely related to the issue of usage is content. In this regard, the Ministry of Communications is collaborating with other relevant stakeholders in promoting cybersecurity and effective use of social media. A Content Advisory Council (CAC) comprising of various relevant stakeholders, has been formed to oversee regulatory, enforcement and content management issues in Brunei Darussalam. In addition, a Child Online Protection (COP) Framework for Brunei Darussalam was also developed by more than ten stakeholders to address the importance of safeguarding online experience and activities of the young users. The COP Framework, which is now under the purview of the Ministry of Culture, Youth and Sports entails the collaboration of various stakeholders such as the Ministry of Communications, Ministry of Health, Ministry of Education, the Royal Brunei Police Force and the private sector.

In further promoting local content development, AITI is also collaborating with other relevant agencies in implementing various initiatives to encourage creativity and innovation among the local talents. This includes the ANIMASI-iMMerse 3D Animation Challenge and the Brunei ICT Awards which have received positive responses and participation from the public.

As poor quality of service can discourage widespread adoption and use of broadband, AITI will monitor and report publicly on broadband quality of service issues and also introduce regulations that ensure consumers are supplied with the broadband speeds that they are promised by service providers.

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e-Arkib of Brunei Darussalam's history

The creation of digital content and the digitisation of existing information are key to encouraging greater participation in the digital economy. The National Archives of Brunei Darussalam has digitalised its collection of government files, images, maps, building plans, audio-visual recordings and others historic records and created the e-Arkib, available to the public at: www.arkibrunei.gov.bn

Brunei "one stop shop" for eServices

Making locally relevant and useful content and services accessible online is crucial to encourage the adoption and use of broadband services. Many of the services provided by the Government are already provided as eServices via the e-darussalam portal at www.gov.bn, those relating to customs, employment, family and social services, health, housing and utilities, immigration, licences and permits.

Implementation plan

Policy Objective	To maximise the number of Bruneians making use of broadband connections to the internet.	Responsible agency
Targets	At least 80% of households with a broadband service by 2017	AITI
	At least 85% of the population using the internet regularly by 2016	AITI
	At least 4 ICT Rural Outreach Program Centers in Brunei Darussalam by December 2016	AITI
	Strategic plan for the development of greater local content completed by October 2014	AITI
	Broadband quality of service regulations introduced by December 2015	MOC / AITI
Indicators and measures of progress	Number of broadband subscribers.	
	Number of internet users.	
	Broadband penetration of households.	
	Average MB of data use per broadband subscriber.	
	Number of registered users of the different government eService.	
	Proportion of total government services delivered as eServices.	
	Broadband quality of service metrics.	
	Number of broadband quality of service complaints.	

Policy coordination and information sharing

The achievement of the National Broadband Policy will require coordination and cooperation across many stakeholders. In this regards, the Ministry of Communications and AITI will oversee the implementation of the National Broadband Policy, particularly the identified targets to ensure that, implementation occurs in a concerted and complementing manner.

The Brunei Darussalam National ICT Council (BIT Council), which is chaired by the Minister of Communications, with members comprising of representatives from various ministries, private sector as well as the civil society, will serve as a platform for information sharing. The Ministry of Communications and AITI will report the progress of implementation to the BIT Council.

AITI will be responsible for the collection and publication of broadband-related statistics based on the core list of indicators standardized by the International Telecommunication Union Partnership on Measuring ICT for Development. AITI will track developments in broadband infrastructure and access, prices and affordability, and the use of broadband enabled services by individuals, businesses, schools and government departments and publish that information in an annual "State of Broadband" report.

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