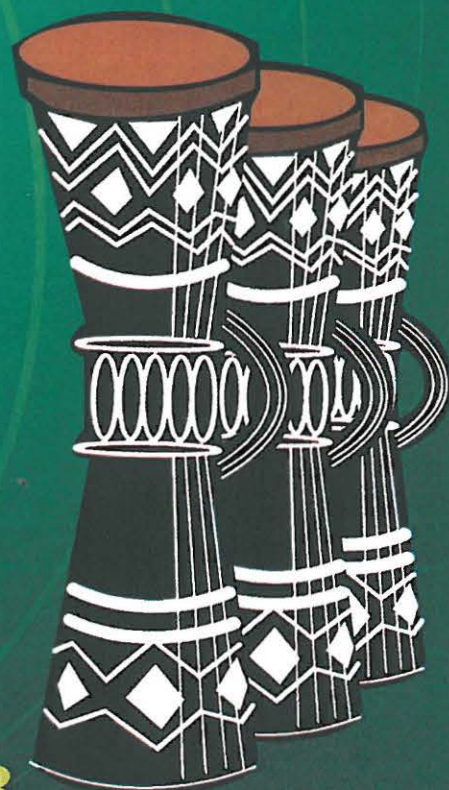
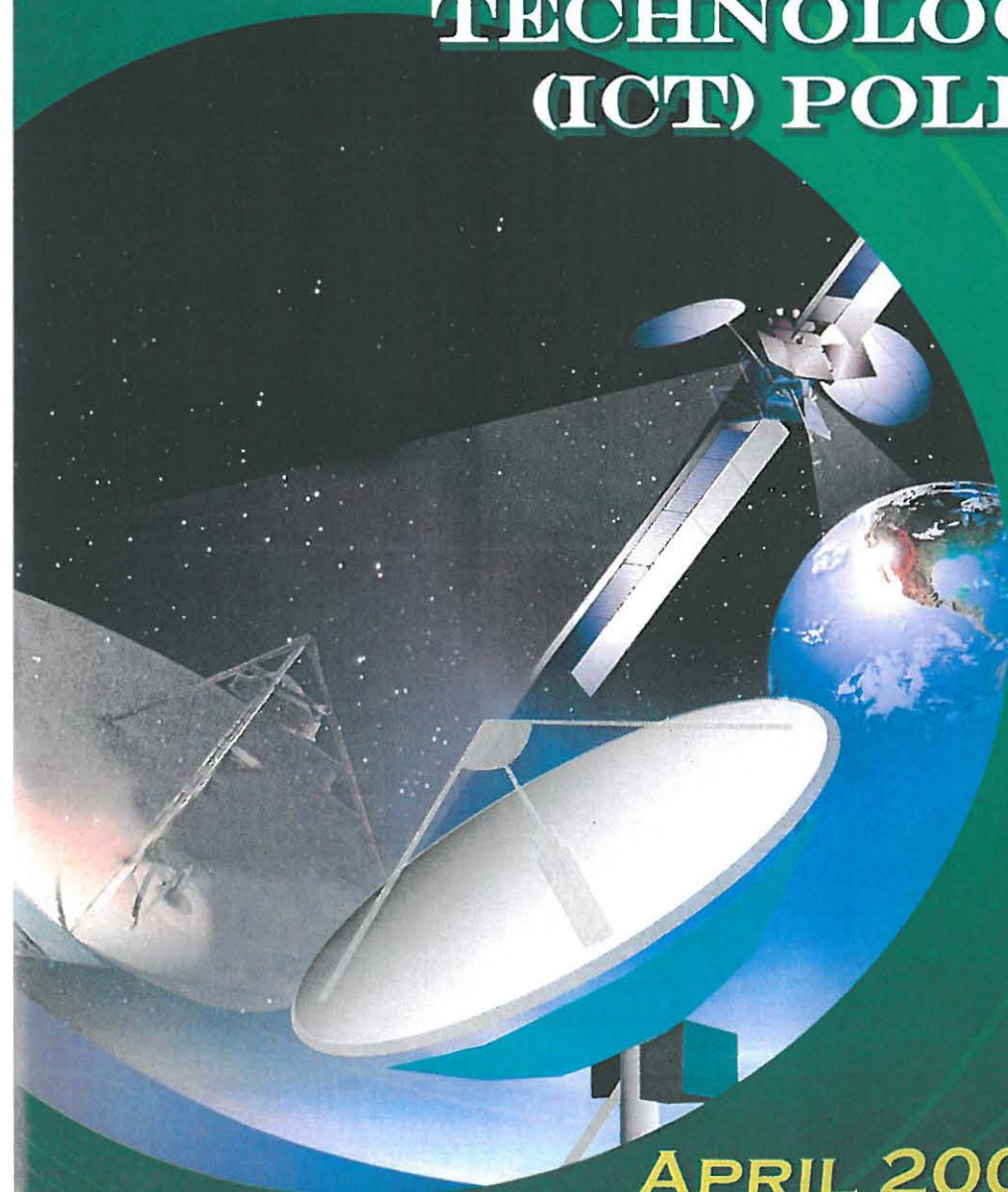




DEPARTMENT OF COMMUNICATION & INFORMATION

NATIONAL INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) POLICY



APRIL 2008



DEPARTMENT OF COMMUNICATION & INFORMATION

**NATIONAL
INFORMATION &
COMMUNICATION
TECHNOLOGY
(ICT)
POLICY**

APRIL 2008

Table of Content

FOREWORD BY THE MINISTER	1
PART ONE – PNG's NATIONAL ICT POLICY	2
1. Background	2
2. Early ICT policy efforts	2
3. Introduction of mobile competition	3
4. ICT Policy decisions in 2007	4
4.1 ICT Policy 2007 – Indefinite network monopoly	4
4.2 Refinements to ICT Policy 2007	4
5. The need for a revised National ICT Policy	5
5.1 Greater reliance on competition	5
5.2 Transform Telikom PNG without unduly restricting competition	6
5.3 Partial implementation of 2005 mobile competition policy	7
6. National ICT Policy 2008	7
6.1 Key objectives	7
6.2 Vision – bridging the digital divide	8
6.3 Mission	9
6.4 Guiding principles	9
PART TWO – AREAS OF FOCUS	10
1. Access to telecommunications services	10
1.1 Introduction	10
1.2 Policy objectives	11
1.3 Strategies – community service obligations and competition	11
2. Effective and sustainable competition	14
2.1 Two key national interest objectives	14
2.2 Benefits of competition	14
2.3 Open competition the aim	15
2.4 Transformation of Telikom PNG	16
2.5 The need for a staged transition to open competition	17
2.6 Policy objectives	19
3. Role of government in ICT and development	20
3.1 Introduction	20
3.2 Policy objectives	21
3.3 Strategies	21
4. Phase 1: the transitional period	24
4.1 Retain existing industry structure	24
4.2 One General Carrier – Telikom PNG	25
4.3 Reserved rights	25
4.4 Licensed mobile carriers	26
4.5 Transform Telikom PNG	26
4.6 Promote efficient development of backbone network	27
4.7 Private networks	28
4.8 Interconnection	28
4.9 Mandate and functions of regulators	29
4.10 Consideration of CSO regime	29
4.11 Timing of phase 1 and review	30
5. Phase 2 – the introduction of open competition	30
6. Use of the internet	31

6.1	Introduction	31
6.2	Policy objectives	32
6.3	Strategies	32
7.	Educating the nation	35
7.1	Introduction	35
7.2	Policy objectives	36
7.3	Strategies	36
8.	Security and specific regulation	36
8.1	Introduction	36
8.2	Policy objectives	38
8.3	Strategies	39



Hon. Patrick Tammur MP
Minister for Communication
and Information

FOREWORD BY THE MINISTER

In the past ten years, the use of Information and Communications Technology has transformed the world by providing opportunities for businesses, opening access to the global marketplace, delivering a wealth of information, enhancing social interaction and enabling greater community participation.

The people of Papua New Guinea have much to gain from increased participation in the Information and Communications revolution. Many of the challenges faced by PNG society today, be it the economy, our geographical isolation and in areas such as education and health can be largely overcome through the increased use of efficient Information and Communications Technology.

Failure to adopt the many advancement in ICT will only result in the worsening of the digital divide between us and the rest of the world. We must get our act together now and bridge this digital divide.

The opportunities are boundless.

The single most important requirement to enable ICT is in getting the ICT policy and regulatory framework and Telecommunication Infrastructure right. With this in mind, this document details the PNG Government's objectives for Information and Communications Technology, and sets out a strategic framework for meeting those objectives by placing the subject of competition in the supply of telecommunications services as a central feature.

With a workable strategy in place to address necessary ICT reforms, we are continuing to map out the detail of the policy in this document. Our aim is to formulate the details of a strong ICT policy framework encompassing all key aspects of effective ICT sector reform. The outcome of this more detailed process leading to open competition is expected to be completed by March 2009.

In the meantime and on the issue of competition in the supply of telecommunication services, the PNG Government proposes to a staged introduction of open competition in Phase 2.

This staged move to open competition will build on existing market structures and infrastructure and see the efficient development of network infrastructure across the country leading to greater access to telecommunications to the benefit of PNG residents both in rural and urban areas.

New entrant competitors bring vibrant competition to the benefit of consumers and they also bring competitive discipline upon the State-owned Telikom PNG. In this way the staged introduction of open competition will aid in transforming Telikom PNG into a more efficient company capable of competing on its merits against new and efficient entrants.

This policy sets out appropriate and achievable goals against the background of the reality that is Papua New Guinea today. The strategies aim to provide market structures and a regulatory framework to encourage effective and sustainable competition so as to achieve realistic improvements in ICT capabilities. In turn this will enable all the people of Papua New Guinea, including those in rural areas, to enjoy the social and economic benefits of the Information and Communication Age.

The Government is committed to translate these objectives into action. Towards this, priority programs will be established for the Government to take the lead in adopting ICT within the framework of the National ICT Policy. Key amongst this will be the *Integrated Government Information System (IGIS)* - the platform for e-Government and Governance. All this and more will be covered during the review of the National ICT Policy Document.

We look forward to working with other key stakeholders in PNG, to grasp the opportunities of the information economy for the benefit of all its' people.

Hon. Patrick Tammur MP
Minister for Communication and Information

PART ONE – PNG's NATIONAL ICT POLICY

1. BACKGROUND

The term "ICT" stands for Information and Communication Technology and includes hardware, systems and processes for creating, storing, managing and sharing information. Some elements of ICT have progressed so quickly that they have changed the lives of people dramatically. Some striking examples are the internet, mobile communication technologies, and innovations in broadcasting.

Widespread development of ICT in Papua New Guinea has been hampered by a significant shortcoming in the capabilities and availability of appropriate telecommunications services from Telikom PNG. This situation has resulted from a lack of ongoing investment and maintenance of the network infrastructure over the past decade and the absence of incentives to secure operating and management efficiencies.

The current fixed telecommunications network has serious capacity and reliability limitations. As a result, voice service quality is poor and high speed broadband cannot be supported, seriously impeding business development. The internet services that are available are slow, unreliable and expensive. Geographic coverage is extremely limited, existing only in larger population centres. The fixed telephony network currently has a total of approximately 65,000 lines, 65% of which are business lines, which means that residential subscribers account for only one third of the fixed line customer base. Consequently, PNG has one of the lowest telephony penetration rates in the world. Charges are generally high and, consequently, affordability is low for most citizens.

While Telikom PNG has experienced increased subscriber numbers in recent months and Digicel says that it has attracted up to 500,000 subscribers to its mobile network since it commenced operation in 2007, the current situation is that fixed and mobile teledensity and internet penetration remain extremely low by international standards and broadband services are not available on the fixed network.

A number of Internet Service Providers have built competitive wireless access networks which allow customers to connect independently of the fixed network. However, limitations on the overall capacity from the country to the Internet and the rest of the world results in a service that cannot be relied upon for any business critical applications. Further, the cost of wireless internet puts it beyond the reach of most of the population.

The lack of transmission capacity both nationally and internationally has also hindered the adoption of the Internet, both as an information source and as a tool for business, education, health and personal communications. Telikom PNG has recently taken steps to add international capacity through the redeployment of the decommissioned Pac Rim West cable system, although further works are required.

2. EARLY ICT POLICY EFFORTS

In October of 1978, the genesis of a process leading to a coherent national policy on information and communication technologies (ICT) commenced. Since then, a structured national policy has begun to emerge, under the mandate of the then

Secretary to the Department of Information and Communication in November 1992. This resulted in the National Policy on Information Communication of Papua New Guinea, which was tabled in Parliament by the then Minister for Information and Communication Services, the Hon. Martin P Thompson LLB MP.

In June 2006 the National Executive Council (**NEC**) approved the development of an Integrated Government Information System (**IGIS**) to govern the use of information services in PNG government departments (NEC 124/2006). The IGIS decision is aligned to the focus within the Medium Term Development Strategy (2005-2010) on the use of ICT to bridge the digital divide, and improving government service delivery.

The Draft National Information Communication Technology Policy Framework (the **draft Framework**) was approved by the NEC in 2005. In response to the draft Framework, an Inter-agency ICT Taskforce was established under National Executive Council Decision No. 280/2005, to take steps to formulate a National ICT Policy (the **ICT Taskforce**).

Under the Terms of Reference of the ICT Taskforce, a Strategic Technical Advisory Team, reporting to the Acting Secretary for the then Department of State Enterprises and Information (subsequently the Department of Public Enterprises Information and Development Co-operation), was to develop a policy in consultation with the relevant stakeholders, which would be consistent with the National Government's Medium Term Development Strategy and Millennium Development Goals.

3. INTRODUCTION OF MOBILE COMPETITION

In November 2005, the Government approved a policy to introduce competition in the mobile telephone sector (the **2005 mobile competition policy**). Under this policy, 2 new mobile licences were to be issued with a view to introducing network based mobile competition by March 2007. The Independent Consumer and Competition Commission (**ICCC**), as economic regulator with responsibilities in the ICT sector, was principally charged with responsibility to implement the 2005 mobile competition policy.

At the time of approving the 2005 mobile competition policy the Government also recognised the need for a broader ICT policy framework to be established. This was to be achieved with the establishment of the ICT Taskforce.

While the national ICT Policy was being developed the ICCC continued to implement the 2005 mobile competition policy and during 2006 it conducted a competitive tender process for the 2 new mobile licences that were to be issued. In September 2006, the ICCC announced the results of the tender process and in March 2007 issued licences to Digicel (PNG) Limited (**Digicel**) and Green Communications Limited (**Greencom**).

The continued implementation of the 2005 mobile competition policy has been complex and shrouded in legal uncertainty due largely to legal disputes between Telikom PNG and the ICCC and uncertainty as to the legal scope of the mobile carrier operations.

While legal disputes continued, Digicel was permitted to commence operations and did so in July 2007.

However, Digicel's facilities were not at that time connected to Telikom PNG's network.

Accordingly, while consumers immediately enjoyed some of the benefits of mobile competition, they were also disadvantaged by the absence of interconnection. Digicel customers could not call either Telikom PNG fixed line or mobile customers – and vice versa. This situation has continued for many months as commercial and technical negotiations are pursued.

As a temporary measure, again linked to the absence of interconnection, the ICCG granted to Digicel a temporary consent to carry international communications using its own international gateway, until connection to the Telikom PNG gateway was achieved. International gateway rights were not included as part of the Government's 2005 mobile competition policy, the assumption being that they would remain with Telikom PNG as the only licensed general carrier, at least until October 2007.

4. ICT POLICY DECISIONS IN 2007

4.1 ICT POLICY 2007 – INDEFINITE NETWORK MONOPOLY

On 21 June 2007, the Government approved the National Information & Communications Policy 2007 and Papua New Guinea Telecommunications Deregulation Blueprint as Government Policy (the **ICT Policy 2007**).

The ICT Policy 2007 moved the focus of ICT sector reform away from network-based mobile competition. Rather the new policy focussed upon identified deficiencies in network infrastructure and incorporated as a central feature the development of a state of the art ICT infrastructure network as the backbone of the PNG's ICT sector.

The substantial infrastructure development work was proposed to be undertaken by a significantly reformed Telikom PNG that was to be vertically split into a NetCo (the network owner/operator) and a ServCo (the retail service provider). So as to permit Telikom PNG to undertake this large scale infrastructure development, the ICT Policy 2007 provided that Telikom PNG would be the sole owner and operator of telecommunications networks (mobile and fixed) in PNG for an indefinite and unspecified period – i.e. Telikom PNG would retain its network monopoly.

In this environment competition was to be permitted in all sectors (not just mobile) but only on a resale basis. The newly formed NetCo would be the wholesaler of telecommunications services (utilising its network as sole network operator) to resale competitors.

Under this policy, the previous mobile competition model would have been abandoned and licences changed accordingly.

The ICT Policy 2007 was not implemented.

4.2 REFINEMENTS TO ICT POLICY 2007

Further policy refinements were made in October 2007 (NEC Decision No. NG13/2007). This policy decision contemplated a staged introduction of open

competition to the ICT sector together with a focussed effort to transform Telikom PNG as the incumbent operator.

By this policy refinement, key elements of the ICT Policy 2007 were abandoned, specifically the following were removed from Government Policy:

- the proposal for the operational separation of Telikom PNG into a NetCo/ServCo model.
- the indefinite network monopoly to NetCo; and
- the limitation that competition be restricted indefinitely to a resale-based model.

Under this staged approach, the period of network monopoly for Telikom PNG and the period in which only resale-based competition would operate were to apply only during the transitional Phase 1 period. With the Phase 2 move to open competition these limitations on competition would be removed.

5. THE NEED FOR A REVISED NATIONAL ICT POLICY

The introduction of competition is typically a carefully planned process using credible timetables which are set by policy makers. That said, very few countries, if any, get it right first time. As a result, in virtually all countries, the process of telecommunications reform has seen substantial "fine tuning" of policy, legislation and regulation as experience is gained and the consequences of earlier reforms become apparent. PNG is no exception to this rule and has no reason to be shy about learning from experience and adjusting policy accordingly.

It has been apparent since the issuing of the ICT Policy 2007 that refinements to that policy are required. In essence this is for 3 reasons:

- First, ICT policy should reflect a greater reliance upon competition as a means to secure the infrastructure development. The development of competition should be accompanied by improvements to the effectiveness of mechanisms aimed at ensuring universal service, including in areas where competitive provision is unlikely to be viable on a strictly commercial basis.
- Second, the need to secure the national interest objective to transform Telikom PNG by relying on approaches that are more accommodating of and reliant upon competition than those contemplated in the ICT Policy 2007; and
- Finally, the fact that network-based competition has already been partially implemented (in the mobile sector) with substantial network investment by one of the proposed new mobile carriers (Digicel).

These issues are discussed in more detail below.

5.1 GREATER RELIANCE ON COMPETITION

ICT policy should reflect a greater reliance upon competition as a means to secure the infrastructure development needed to expand the reach of telecommunications services across the country.

The central feature of the ICT Policy 2007 of a state-owned network monopoly and competition limited to resale-based competitor operations, is not a model that

fully captures the ability of a truly competitive environment to achieve necessary ICT sector reform.

Of course, competition alone is not sufficient to ensure service is available throughout PNG, as many areas would not be commercially attractive to competitive operators. As a result, greater reliance on competition needs to be accompanied by effective and efficient means of providing universal service.

5.2 TRANSFORM TELIKOM PNG WITHOUT UNDULY RESTRICTING COMPETITION

It is a legitimate national interest objective to provide for the transformation of Telikom PNG, the incumbent State-owned enterprise.

One of the gaps in the mobile competition policy of 2005 was detailed analysis of how Telikom PNG (with all of its operational and infrastructure legacy issues) could survive against well-funded, efficient mobile competitors. The assumption was that an increased subscriber base achieved through the introduction of mobile competition, combined with interconnection revenues, would secure the future viability of Telikom PNG.

However, this assumption is fraught with difficulty when the full extent of Telikom PNG's challenges are understood.

For reasons discussed further below¹, transformation of Telikom PNG as the incumbent operator is critical to achieving the Government's objectives.

The original ICT Policy 2007 sought to address the legitimate concern to transform Telikom PNG by winding back the mobile competition model and underpinning the new NetCo with a network monopoly. The main difficulty with this policy was that it completely abandoned the benefits that open competition can deliver.

As important as Telikom's transformation efforts are, they should not be at the expense of competition.

On the contrary, transformational change of, and future stability for, Telikom PNG can sit alongside a staged introduction of open competition. Telikom PNG should not be unduly or indefinitely protected from the discipline of competition. Reform options for Telikom PNG can be pursued during a transitional Phase 1 period where limited competition "holidays" continue over the fixed line network and international gateway, while full competition in the mobiles sector continues. This represents an appropriate and less restrictive approach to ICT sector reform than that envisaged by the ICT Policy 2007 and the October 2007 refinements. It is also consistent with the approach adopted in many other countries, developed and developing alike, where the transition to competition has been phased.

The principal mechanisms that the Government will pursue to aid the transformation process is the pursuit of external partnership/joint venture participation in Telikom PNG. These efforts will be pursued by the Minister for Public Enterprise and the Independent Public Business Corporation (IPBC).

¹ on page 16

Telikom PNG will ultimately need to stand against competitors across all parts of its business. Initially, this will be in the mobile sector – a process that began with the implementation of the 2005 mobile competition policy and Digicel's entry into PNG. In the longer term a transformed Telikom PNG will operate in a fully competitive environment that delivers the benefits of competition.

5.3 PARTIAL IMPLEMENTATION OF 2005 MOBILE COMPETITION POLICY

Finally, the fact that network-based competition has already been partially implemented (in the mobile sector) with substantial network investment by one of the proposed new mobile carriers (Digicel) means that any effort to revert to a network monopoly is unlikely to serve the public interest and is also likely to be shrouded in legal complexity and potential dispute.

These consequences are not conducive to achieving the Government's objectives for ICT reform.

6. NATIONAL ICT POLICY 2008

In light of the above background the National ICT Policy 2008 is the culmination of the Government's efforts in reforming the ICT sector in Papua New Guinea. It builds upon the work undertaken in preparing the ICT Policy 2007, but refines that policy, having regard to subsequent developments in the market and the Government's broader policy objectives.

The National ICT Policy 2008 sets out appropriate and achievable goals against the backdrop of the reality that is Papua New Guinea today. The keystone of this work will be the firm adherence to reform driven by the combination of staged introduction of competition and transformational change of the incumbent Telikom PNG so as to secure significant changes to life in Papua New Guinea.

6.1 KEY OBJECTIVES

The Government's ICT policy has 7 key objectives.

First and foremost, the overarching objective of Government is to secure the social & economic benefits of an efficient ICT sector. These benefits can be obtained in such areas as education, health, national security, justice, agriculture, government administration and e-commerce. Increased access to information and communications technology has transformed many parts of the world and helped many developing economies.

Second, Papua New Guinea must have an efficient ICT infrastructure as the backbone of ICT policy with the use of technology appropriate to circumstances of PNG. This will require substantial investment to refurbish the existing network, extend its availability across the country, allow new networks to develop and increase technical capabilities to support high-speed broadband.

Third, the Government aims to substantially increase access to basic telecommunications services across PNG with service to be available at affordable prices. By reforming the ICT sector the Government intends to make telecommunications services available to ever more Papua New Guineans.

Fourth, it is critical to have a transformed and efficient Telikom PNG. The Government's staged introduction of open competition is aimed at achieving this

transformation, in combination with other efforts to improve Telikom PNG's operational capabilities.

Fifth, PNG will enjoy effective and sustainable competition to deliver market discipline and economic benefits. This competition will be built upon a clear and achievable ICT policy with a path to take PNG from the existing environment to competitive markets. There will be appropriate and clearly defined powers and functions of independent but accountable regulators. There will also be an effective scheme for ensuring universal service, and specifically, for ensuring that the benefits of modern telecommunications are progressively made available on a truly national basis.

Sixth, the Government seeks improved international capacity and connectivity to help PNG to truly become part of the international community.

Finally, the Government aims to secure the benefits that can flow from increased availability and use of the Internet.

6.2 VISION – BRIDGING THE DIGITAL DIVIDE

In PNG, the digital divide is exacerbated by geography. Rural locations have little or no access to ICT. This situation is less tolerable because most of the inhabitants of PNG live in the rural areas making up to 85% of the entire population of the country. In urban locations, where access is more prevalent, the quality of available ICT is often very poor.

The partial implementation of the 2005 mobile competition policy has already seen some improvements in the availability of telecommunications services. However, this should only be seen as the beginning of what can and should ultimately be achieved.

One of the key factors compounding the digital divide in PNG has been the absence of a National ICT policy framework that is necessary to create an enabling environment and to assist PNG to deploy, harness and exploit ICT for socio-economic development.

Looking to the near future, the Government can envisage a Papua New Guinea where:

- the processes for work, commerce, health, education and training, social interaction and government are assisted by information and communications technologies;
- all Papua New Guinean's are able to take part in the opportunities of the electronic age, by bringing the information economy into their homes;
- all Papua New Guinean's, particularly those outside the major population centres, have access to communications, information, government services such as health and education, entertainment and culture, goods and services from around the country and the world, as a consequence of high quality, easily accessible and affordable ICT;
- the education and training systems which aid the development of its citizens can confidently take advantage of the benefits of ICT while at the same time harnessing the learning of all social and cultural societies in PNG and the world;

- investment, job creation and export within the information economy make a growing impact on the whole PNG economy, generating revenue, jobs, economic efficiencies and increased wealth for all Papua New Guinean's.
- the burden of distance is lessened for the people of PNG because of better access to ICT and where the reduced isolation promotes the indigenous culture of PNG to wider audiences.

6.3 MISSION

With the above matters in mind, the Government's mission is:

To bring about realistic, significant and beneficial change to the people of Papua New Guinea through efficient use of ICT with services supplied in competitive markets.

6.4 GUIDING PRINCIPLES

The principles which guide the National ICT Policy 2008 are:

- improving the lives of ordinary Papua New Guineans, in accordance with the National Directive Principles of the National Constitution, which stipulates that there must be equity in participation and benefit in the development of Papua New Guinea;
- facilitating equity of access to ICT by all citizens;
- overcoming the impediments to ICT development to enable PNG to achieve the levels of national development, reflecting the aspirations of its people;
- encouraging the establishment of industry structures for the ICT sector which work most efficiently and effectively; and
- establishing political and administrative institutions and processes which facilitate ICT objectives most efficiently and effectively.

PART TWO – AREAS OF FOCUS

1. ACCESS TO TELECOMMUNICATIONS SERVICES

1.1 INTRODUCTION

PNG is a remote country. 85% of its citizens live in rural areas. It has limited financial resources, yet it is abundant with economic opportunities.

There are currently very low levels of access to telecommunications services in PNG, particularly in rural areas. Precise data is not available and previous reports that have considered current levels of access were made prior to the introduction of mobile competition from July 2007.

Even allowing for the absence of precise figures, the following are unfortunate features of the current situation concerning access to telecommunications service in PNG:

- the level of access to telecommunications services across PNG is very low by world standards with the extent of mobile penetration (2% in 2006) being lower than most countries in the world, including countries with a lower GDP than PNG;
- the level of access in rural areas is much lower again than PNG's national average;
- the majority of the census units in PNG have no access to services at all;
- the fixed PSTN network can be accessed only from 87 districts.

Despite the low level of access, potential demand for telecommunication services is high.

Increasing access to telecommunications services is, a central national interest objective of the National ICT Policy 2008. The phased introduction of open competition initially in the mobile sector and subsequently across all sectors represents a substantial structural change to the sector in Papua New Guinea. These reforms are expected to provide a framework for improving access to telecommunications services across the country. This will be accompanied by a review of the current universal service mechanisms aimed at ensuring that effective instruments are in place for securing service availability on a truly national basis.

Access to ICT facilities is rarely equitably provided in rural regions anywhere in the world. In developed nations such as Australia and New Zealand, rural services often suffer from connectivity issues and/or a lack of effective competition causing a pricing imbalance. A similar, but far more stark, situation exists in PNG.

Rural citizens are disadvantaged for a number of reasons. Connectivity is difficult because of geographical remoteness and because it is economically unviable to supply services in remote areas. This causes follow on effects, such as educational difficulties and a lack of basic information in relation to health, employment and market information.



As an essential service, the supply of power and telecommunications form part of the social and economic fabric of a country. When these services cannot be supplied or fail to be maintained, disruption occurs to the development of the country which can, over time, severely effect the maturity of its people, investment and world recognition.

1.2 POLICY OBJECTIVES

The Government's policy is to increase access to telecommunications services in rural areas across Papua New Guinea.

1.3 STRATEGIES – COMMUNITY SERVICE OBLIGATIONS AND COMPETITION

(a) Phased introduction of open competition

The phased introduction of open competition initially in the mobile sector and subsequently across all sectors represents a substantial structural change to the ICT sector in Papua New Guinea. These reforms, together with the transformation of Telikom PNG into a viable and efficient competitor, are expected to provide a framework for improving access to telecommunications services across the country.

(b) Mobile mandatory roll out obligations

The mobile licences issued by the ICCC incorporates mandatory roll out obligations for the mobile carriers which are aimed at progressively extending access to mobile services over an approximately 5 year period. The structure of these obligations (which apply to each of the mobile carriers, including Telikom PNG) is summarised in the following table.

Table 1: Summary of mandatory roll out obligations in mobile carrier licences

Region	Towns	Network coverage requirement
Main centres	8 Towns: Port Moresby, Lae, Mount Hagen, Goroka, Madang, Wewak, Kimbe and Kokopo	Latter of 15 months from licence commencement or by 30 September 2008. No licence breach if a 60% coverage is achieved 90% of the time within the initial period and the carrier extends its network coverage to the required standard within an additional 15 month period. Each carrier is to provide network coverage through its own facilities (with or without the use of another carriers facilities as well).

Region	Towns	Network coverage requirement
Mid-sized centres	14 towns: Kiunga, Daru, Kerema, Alotau, Popondetta, Mendi, Wabag, Kundiawa, Kainantu, Wau, Vaimo, Lorengau, Kavieng and Buka	<p>Latter of 2 years from licence commencement or by 30 June 2009.</p> <p>No licence breach if network coverage provided through at least one base station within the town for 90% of the time within the initial period and the carrier extends its network coverage to the required standard within an additional 2 year period (whether by installing additional base stations or otherwise).</p> <p>Each carrier is to provide network coverage through its own facilities (with or without the use of another carriers facilities as well).</p>
Administrative District Centres	87 centres	<p>Latter of 3 years from licence commencement or by 30 June 2010.</p> <p>No licence breach if network coverage provided through at least one base station within the centre for 90% of the time within the initial period and the carrier extends its network coverage to the required standard within an additional 2 year period (whether by installing additional base stations or otherwise).</p> <p>Each carrier is to provide network coverage either through its own facilities or in cooperation with another mobile carrier or carriers using those other carriers facilities.</p>
Small populations centres	120 locations	<p>Latter of 5 years from licence commencement or by 30 June 2012.</p> <p>No licence breach if network coverage provided through at least one base station within the locality for 90% of the time, by the stipulated date.</p> <p>Each carrier is to provide network coverage either through its own facilities or in cooperation with another mobile carrier or carriers using those other carriers facilities.</p>

The terms of the mobile licences make specific provision for carriers to share and use each others' facilities on terms that are subject to approval by the ICCC. The licence terms also make provision for sharing the burden of providing network access in remote and low use locations with the ICCC retaining a role in approving such inter-carrier reciprocal arrangements on stated principles. How these provisions will apply in practise has not yet been tested.

(c) **Community Service Obligation regime**

During Phase 1, the Minister for Communication and Information will also consider the desirability of developing a Community Service Obligation (CSO) regime to apply in the telecommunications sector in PNG.

The primary objective of such a regime would be to provide a strong funding basis to aid in the development of telecommunications networks and the provision of telecommunication services to residents in rural centres in PNG.

Subject to the outcome of the Minister's review (and consideration by the NEC) any such CSO regime should be introduced as part of the Phase 2 reforms.

There are numerous alternative models to consider for a CSO regime.²

One possible model for such a CSO regime is set out in a draft report provided to the Minister for Communication and Information by consultants commissioned by the World Bank.³

For instance one model that can be considered involves the establishment of a Rural Communications Fund (RCF) to receive and allocate funds to specific projects to improve telecommunications services in rural areas using a competitive bidding process.

Who administers the RCF will be important. One approach would be for the fund to be administered by a Trust which could be primarily funded by:

- contributions from industry (i.e. from licence fees and revenue linked contributions or levies);
- Government contributions; and
- international and domestic donors.

Under such a model all licensed general and mobile carriers would be required to contribute to the RCF. If such a scheme was implemented, licences would have to be varied to ensure this happens. Standard service contracts for specific CSO projects would be offered to bidders on a competitive basis. These standard contracts would cover the provision of defined services for a defined term, with clear roll-out, interconnection and quality requirements.

Such a model is one approach which can be considered in the study of the desirability of developing a CSO regime that is to be undertaken by the Minister for Communication and Information during Phase 1.

(d) Radio Spectrum Allocation

The allocation and management of spectrum for government, public, and private use is a function that is performed and co-ordinated by the Papua New Guinea Telecommunications Authority (Pangtel). There are currently a number of Telikom PNG and private wireless links, operating in licensed and class licensed spectrum, as well as a number of licensed satellite links. Point to point and point to multipoint links such as these will continue to be used to provide connectivity within the network, and to locations not adequately served by alternative technologies.

Due to the topography of PNG, wireless is a key technology to cost effective delivery of services in the future. There are emerging broadband wireless

² Previously sections 129-145 of the *Telecommunications Act* previously incorporated a CSO regime which provided for the established of a rural development fund. These provisions were repealed in 2002.

³ This draft report, prepared by InterConnect Communications entitled: Papua New Guinea Rural Connectivity Study is dated June 2007. The conclusions of this report can also be taken into account by the Minister in his review.

standards that can not only provide high speed fixed line replacement services today, but are being developed to support fourth generation (4G) style broadband mobile services in the future.

Appropriate spectrum (2 Ghz, 3.5Ghz and 700 MHz bands), which are necessary for effective delivery of these services, will be reserved by the Government, and allocated for public broadband wireless services.

(e) Telecentres as digital opportunity centres

Telecentres are a useful delivery mechanism for ICT services to rural and regional areas. A Telecentre is more than an Internet café. It is a place for voice, fax, email, web and any other service that can be delivered by a telecommunications link. It exploits convergence in computer and telephone technologies, making investment in telecommunication more attractive.

Telecentres can deliver e-learning and e-health initiatives to a rural or regional area and, in doing so, make it more cost effective. Telecentres should not become publicly subsidised access hubs. On the contrary, they should be entrepreneurially run with a view to making profits from providing e-access to a community.

The Government will encourage design and construction of Telecentres in partnership with organisations with a national network of offices, (for example, Post PNG or District Treasuries) in appropriate rural or regional areas to demonstrate their use and benefits.

2. EFFECTIVE AND SUSTAINABLE COMPETITION

2.1 TWO KEY NATIONAL INTEREST OBJECTIVES

The primary national interest objective for the Government is the staged introduction of effective and sustainable competition to deliver market discipline and economic benefits.

The second, but equally critical, national interest objective is a transformed and efficient Telikom PNG.

Telikom PNG is an important and strong state owned enterprise. But it needs to improve its management and operational practices and service levels to business consumers and the general public. Government policy seeks to achieve, under the auspices of the Minister for Public Enterprises and the Independent Public Business Corporation, the comprehensive transformation of Telikom PNG into a robust and sustainable business.

This will be achieved by allowing time for the transformation to take place – but not at the expense of competition.

2.2 BENEFITS OF COMPETITION

The introduction of competition between telecommunication providers is a powerful enabler of development. Extensive studies, especially of developing countries, show that:

- countries with effective and competitive services sectors grow up to 1.5 percentage points faster than other countries;
- reliable telecommunications systems underpin the development of new markets; and
- these new markets, and efficiency gains in existing markets, have the potential to be a major source of economic growth.

2.3 OPEN COMPETITION THE AIM

The ultimate aim of Government is to introduce open competition in all ICT sectors.

Open competition means that there are no restrictions on the form of competition that can take place. Under open competition, the structure of the ICT sector in PNG would be characterised by a range of different service providers.

1. At the one extreme, service providers may compete solely on the basis of their own network infrastructure. They could fully bypass Telikom PNG's network to provide end-to-end services to consumers, interconnecting with other networks as required. Given the relatively small size of the PNG market, it is unlikely that open competition would support more than one (in addition to Telikom PNG) full facilities-based provider.
2. At the other extreme, service providers may compete solely on the basis of resale-based competition. These competitors would rely on Telikom PNG (or possibly on other wholesale providers) for end-to-end network services, but would provide their own retailing functions such as advertising, billing and customer service.
3. In between these extremes, are service providers that would purchase some network components from Telikom PNG (or other wholesale providers) and combine these with their own network infrastructure (such as long-distance and international transmission) and retailing functions to provide end-to-end services to all consumers on interconnected networks.

Open competition provides the best means of delivering benefits to consumers over the long-term by driving:

- innovation, differentiation and choice;
- efficient investment and production practices; and
- improvements in service quality and/or lower prices.

Alternatives to this are unlikely to be acceptable to PNG consumers, who have already experienced some of the benefits that competition can deliver. Neither would alternatives be acceptable to the wider international community, where multilateral liberalisation through forums such as APEC and the WTO will put PNG under increasing pressure to open its telecommunications sector to competition.

In most other jurisdictions it has been recognised that open competition is the best means of delivering benefits to consumers over the longer-term and this is reflected in the telecommunications policies of most developed economies and in the objectives and requirements of most economic and trading groups including APEC, the OECD and the WTO.

A benefit of open competition is that it avoids the difficulties inherent in trying to define and police boundary points between areas that are open to competition

and areas that are not. This has already proved contentious in the case of the mobile licenses in PNG, and has also been a major source of regulatory difficulty in other jurisdictions.

2.4 TRANSFORMATION OF TELIKOM PNG

It is critical to the success of the ICT sector in PNG that Telikom PNG is transformed into an efficient company, possibly in collaboration with a private sector partner (in a Public Private Partnership (PPP) type structure), capable of competing on its merits against new and efficient entrants. This is important for the following reasons.

1. Under open competition, Telikom PNG's networks will need to provide the essential building blocks for the majority of services provided to consumers. In the absence of an efficient incumbent network, new entrants into the market will have the incentive to inefficiently duplicate infrastructure rather than utilising the incumbent's networks, either in whole or in part.⁴
2. In the absence of an efficient incumbent network, new entry will be limited to providers with sufficient capital to completely bypass the incumbent network operator, thereby limiting the degree of competition that would otherwise prevail. In the extreme, if open competition is introduced while Telikom PNG is in its current state, then a new entrant could undermine the financial viability of Telikom PNG and reinstate a network monopoly in PNG.⁵
3. An efficient and effective incumbent is required to meet the Government's social policy and national security objectives, particularly increasing the geographic reach of the telecommunications network to rural areas of PNG. Under open competition, Telikom PNG will have the incentive to divert resources to protecting its customer base from competitors at the expense of meeting the Government's objectives. In the extreme, as noted above, a new entrant could reinstate a monopoly in PNG following the failure of Telikom PNG. Such a network would most likely be owned and operated by foreigners with little interest in meeting PNG's social policy and security needs.

Government efforts to transform Telikom PNG (through PPP or joint venture options) will be undermined if open competition is introduced too early with potential external investors and managers likely to be deterred.⁶ PPP type collaborations may assist Telikom PNG to access the expertise and funds

⁴ This has been the situation in Bangladesh, which has seen the fixed network incumbent completely bypassed by mobile operators due to the poor performance and reach of the fixed network. As a consequence of this bypass there has been a limitation on the development of internet services in Bangladesh, as the higher bandwidth platforms that can be developed over fixed network infrastructure are simply not possible to deploy over the mobile networks, which are largely voice oriented and circuit switched.

⁵ To a large extent this characterises the situation in Indonesia where the fixed line incumbent was not subject to significant transformation and, as a result, lags behind the mobiles sector. Even in the mobiles sector, transformation of the incumbent has been limited and this is reflected in the need for Telkom to partner with SingTel in its mobile subsidiary, Telkomsel. While Telkomsel has successfully established itself as a market leader, as a practical matter, Telkom does not control Telkomsel's day to day operations.

⁶ In Samoa, a successful privatisation process has commenced in tandem with the transformation of SamoaTel, under which the Samoan Government has appointed a new management team to oversee the transformation program in order to maximise the revenue from the sale process.

required to further develop the fixed network for the provision of next generation services.

2.5 THE NEED FOR A STAGED TRANSITION TO OPEN COMPETITION

In various debates concerning the 2005 mobile competition policy it has been suggested that the introduction of mobile competition will benefit Telikom PNG as a result of increased subscriber base and interconnection revenues. In those circumstances, it has been suggested, no additional protections are required for Telikom PNG.

While there is an immediate attraction to such arguments, they fail to grasp the extent of transformational change required for Telikom PNG. The mere fact of the growth of competing mobile providers will not address the difficulties faced by Telikom PNG.

To use an appropriate analogy, there is obviously some truth to the saying that "a rising tide lifts all ships": but the rising tide does not help those that are leaking badly – it accelerates their collapse. Unfortunately, and in consequence of factors both internal within Telikom PNG as well as external factors, the depth of Telikom PNG's challenges require more than market discipline and increased customer numbers to correct.

Experience in many developing countries shows that if the fixed network is not reformed in a timely way, the emergence of an aggressive mobile competitor undermines its viability, both through the diversion of revenues and through the loss of skilled personnel that are in limited supply. So a fundamental question becomes how that reform process can be made to work.

This is not a question of protecting Telikom PNG from change but rather of ensuring that change does happen and happens to the benefit of the people of PNG. The key to this is to address fundamental management and operational issues as well as the need for substantial investment to enhance the Telikom PNG network.

If Telikom PNG is to have and be accountable for meeting clear performance targets, it must also have the human and financial resources required for those targets to be met. Bringing to the different parts of Telikom PNG's operations the benefits of experienced overseas management can be crucial in this respect.

There is, in other words, a strong synergy between setting new goals for Telikom PNG, and securing for Telikom PNG commercial arrangements with experienced players that can deliver on those goals and have clear incentives to do so. Putting these structures in place is an important priority in the current policy process.

At the same time, durable and effective competition will not emerge and persist unless important deficiencies in the current regulatory arrangements are addressed. Those arrangements are largely based on 1991 Australian telecommunications legislation and have many of the problems of that legislation.

There are, for example, uncertainties and unnecessary complexities in the licensing regime, which translate into conflicts over who may do what. Additionally, the interconnection arrangements are not properly specified, which has contributed to the difficulties being experienced in securing interconnection

arrangements to date. Finally, the mechanisms for ensuring community service obligations are met need to be reviewed if they are to function effectively.

The need for a staged introduction to open competition is not unique to PNG and indeed is the common approach taken in many countries, both developing and developed alike.⁷

All of these issues need to be resolved in a way that provides a more stable and less litigious environment in which market participants can invest and operate. That environment should have a clearer demarcation between policy – which is the function of government, directly accountable to the people – and regulation, which is the implementation of rules that embody policy. That distinction has not been as clear as it could be in PNG, with the regulator effectively making policy decisions. At the same time, the rules need to be clearer and more predictable, perhaps especially so with respect to interconnection. It would, for example, be undesirable were interconnection arrangements to be held up for long periods of time by arcane, ultimately unhelpful, disputes about purely hypothetical cost models. Rather, a practical and pragmatic approach is needed.

In devising solutions to this issue and to the others inherent in telecommunications reform, there is a wealth of international experience that PNG can draw on. Countries as diverse as Samoa, Sri Lanka, Chile and Kenya have successfully transformed their incumbent operator into a competitive and effective participant in the telecommunications market – often starting from a very poor base. Equally, where success in that transformation has been achieved, it has been complemented by a careful process of setting clear “rules of the game” for ICT policy and regulation. There is no reason why PNG should not be able to also succeed in these respects.

The immediate introduction of open competition would risk undermining the financial viability of Telikom PNG as:

- new entrants target low cost areas and high-value customers;
- new entrants provide higher quality and new services;
- new entrants under-cut Telikom PNG's pricing due to greater efficiency and more limited geographic scope;
- Telikom PNG is left with high cost, low value customers and stranded assets;
- Telikom PNG's ability to secure funding for network upgrades will be undermined;
- Telikom PNG finds itself unable to secure or retain trained staff; and

⁷ By way of example, the need for staged introduction of competition is recognised in a 2004 report by the World Bank *Competition in International Voice Communications*. While advocating the move from incumbent monopoly to open competition for the international gateway, this report acknowledges that the transition from monopoly to open competition needs to be preceded by a range of actions. In fact the report contends that these preconditions are as important as those required to achieve overall sector reform. The necessary preconditions identified by the World Bank report include an interconnection regime with internationally accepted principles, reformation of the incumbent to allow it to adjust its business strategy and practices to effectively face competition, the importance of developing a CSO regime and establishing a strong and fair regulatory regime. These are all relevant issues for PNG's transition to open competition.

- Telikom PNG will be unable to transform itself quickly enough to compete effectively

These risks do not mean that open competition, and its associated benefits, should be abandoned with reversion to a full network monopoly (as was proposed by the ICT Policy 2007).

Rather, they mean that the introduction of competition needs to be undertaken in a staged and carefully managed way in order to provide Telikom PNG with sufficient time to transform itself into a company capable of competing with efficient network entrants and to ensure that a properly designed CSO mechanism and interconnection regime can be introduced at the same time as open competition.

Failure to undertake such a staged and managed transition would:

- harm, potentially fatally, the viability of Telikom PNG and hence its ability to deliver key public policy objectives; and
- increase the risk of one of the entrants becoming dominant in the market, in a manner quite inconsistent with the policy objective of sustainable, effective competition.

For these reasons the National ICT Policy 2008 favours a staged introduction to open competition with transitional competition “holidays” to Telikom PNG continuing during Phase 1. As discussed in more detail below, during this transitional period Telikom PNG will be exposed to full network-based competition in the mobile sector but will enjoy some protection by the continuation of its existing reserved rights over the fixed line network and the international gateway.

These protections will be limited to Phase 1 with open competition being the key objective for Phase 2.

2.6 POLICY OBJECTIVES

The Government's policy is for the staged introduction of effective and sustainable competition to deliver market discipline and economic benefits.

At the same time, the Government recognises that an efficient and viable incumbent and network is critical to achieving the objectives of ICT reform. This means that Telikom PNG must be transformed with upgraded technical capability and increased geographic scope of its network, strengthened management and transformed operational practices.

A Government Policy which retains a staged approach to open competition, while allowing for the transformation of Telikom PNG without reverting to a network monopoly during the transition phase, provides a solid basis to ultimately achieve all of the Government's objectives in the longer term, while:

- allowing Telikom PNG the opportunity to transform itself (under the auspices of the Minister for Public Enterprises and the IPBC and, where appropriate with the assistance of external investors) to be a viable and efficient competitor upon the introduction of open competition; and
- responding to public concern by avoiding the need to revert to a Telikom PNG network monopoly during the transition period.

By this proposal, the basic structure of the market does not change during Phase 1. Government and public concern about the previously proposed extension of Telikom PNG's network monopoly (and the potential acquisition of Digicel network rights) are addressed.

Of course, real and tangible benefits to business and private consumers must be achieved in the short to medium term. The short-run objectives that would be met during the reformulated Phase 1 would remain as identified in previous policy statements, namely to:

1. increase the geographic reach of Telikom PNG's networks (whether this be fixed, wireless or a hybrid) to meet target availability;
2. upgrade Telikom PNG's network to meet minimum service quality standards and to accommodate broadband services, at least in urban centres, schools and hospitals;
3. increase penetration of voice and internet to target levels;
4. ensure the financial viability of Telikom PNG; and
5. transform Telikom PNG into an efficient firm capable of competing effectively with new entrants in Phase 2.

In addition, the revised policy will:

6. avoid the disruption associated with the reversion to a network monopoly;
7. allow consumers to continue to receive all the benefits of competition in the mobile telecommunications sector, with the continued operation of Digicel as a mobile carrier; and
8. provide greater certainty over network interconnection arrangements.

The longer-term objectives that would be achieved with the introduction of open competition remain unchanged, and include to:

- encourage efficient investment in telecommunications infrastructure, both by Telikom PNG and competitors;
- encourage efficient operating practices and service innovation;
- further increase network reach and penetration; and
- deliver improved service quality and/or lower prices to consumers.

3. ROLE OF GOVERNMENT IN ICT AND DEVELOPMENT

3.1 INTRODUCTION

The PNG Government has a key role in fostering the development of ICT strategies which will provide the framework for the delivery of ICT policy objectives.

This National ICT Policy 2008 sets out the Government's objectives and strategic framework for meeting those objectives moving forward.

Effective implementation of Government Policy for the telecommunications sector is dependent upon the relevant government departments and regulators operating effectively. Regulators must have both independence and autonomy but must also be accountable and adopt transparent regulatory processes that enhance rather than detract from business certainty. Government depends upon

regulators, acting consistently with Government Policy and the law, to effectively administer and regulate the telecommunications sector.

The Government's ICT strategies foster economic growth, increased foreign investment and a growth in exports. The benefits of a well defined ICT Policy implemented through an ICT strategic plan also has direct benefits for government in that the ICT sector can offer products and services across all sectors of government which, in turn, enables government to increase frontline service delivery to the community.

3.2 POLICY OBJECTIVES

The Government's policy is to ensure:

1. that Government departments and instrumentalities engage in co-ordinated activities aimed at furthering the objectives of this ICT policy and do not act in a manner which will hinder or obstruct the objectives of this ICT policy;
2. the effective and timely implementation of its policies in respect of the ICT sector, including this National ICT Policy 2008; and
3. the appropriate enforcement of the regulatory regime by regulators which are independent but accountable, with clearly defined mandates, functions and powers.

3.3 STRATEGIES

(a) Mandate and functions of regulators

The two regulatory agencies, the ICCC and PANGTEL, are critically important to the success of the regulated telecommunications sector. The role of regulators, including the scope of their mandate, functions and powers, is an important matter for the Government to consider in the implementation of its National ICT Policy. This must include considerations of independence and autonomy, but must also include transparency and accountability.

For example, the ICCC has played a key role in shaping the ICT sector to date, including by the way in which it has issued and varied licences and interpreted and applied the *Telecommunications Act* and the steps it has taken to implement the 2005 mobile competition policy. These experiences have shown that current ICCC powers can allow the ICCC to make decisions that may have serious policy implications.

Accordingly, the initiatives being taken by the Government under this National ICT Policy 2008 (including its efforts to clarify and strengthen the regulatory regime) will not be effective in achieving the Government's objectives unless there is appropriate enforcement of the regime by a regulator or regulators with clearly defined mandate(s) and powers.

As part of NEC 188/2007, the NEC approved as Government Policy that licensing powers currently given by the Telecommunications Act to the ICCC be transferred to the relevant Minister acting on the advice of the then proposed ICT Licensing Committee (which would comprise representatives of PANGTEL, the ICCC, and an independent member).

As an interim measure NG 13/2007 proposed that licensing powers be transferred to the Minister pending the full implementation of Phase 1.

Neither of these proposals has been implemented.

Papua New Guinea is currently one of the very few countries in the world which vests licensing powers in the hands of a multi-sector regulator that also has very broad regulatory and enforcement functions.

Therefore the Minister for Communication and Information will consider whether licensing powers should remain with the ICCC. For example, licensing functions could be:

- administered directly by a Minister and the Communications Ministry, where they bear directly on issues of policy;
- vested in a specialist telecommunications regulatory authority;
- transferred from the ICCC to PANGTEL as the specialist technical regulator in the telecommunications sector; or
- vested in an independent licensing body established for the specific purpose of telecommunication licensing.

This broader review of the mandate to each of the telecommunications regulators (ICCC and PANGTEL) can be undertaken during Phase 1 with any appropriate amendments implemented prior to the commencement of open competition in Phase 2. Those amendments will be aimed at securing more efficient regulatory arrangements and will consider:

- the desirability of a distinction between the policy making function of the National Government and the implementation of those rules through transparent regulatory processes and appropriate levels of regulator accountability;
- clarification of areas of potential overlap between the two regulators; and
- the ICCC's continued role and powers in respect of issuing, varying, enforcing and revoking telecommunications licences.

(b) Department of Communication and Information

The Department of Communication and Information is responsible for administration of government policy in the telecommunications sector.

Specifically, under the National ICT Policy 2008, the Department of Communication and Information will assist the Minister for Communication and Information in:

1. overseeing the implementation of Phase 1 of the National ICT Policy 2008;
2. considering the desirability of developing a CSO regime to apply in the telecommunications sector in PNG;
3. undertaking a review of regulatory structures and processes, including the mandate to each of the telecommunications regulators (ICCC and PANGTEL);
4. (with the Minister for Public Enterprise) overseeing the formulation of necessary legislation for the effective implementation of Phase 1 of the National ICT Policy 2008; and

5. undertaking a review of the operation of competition in the ICT sector, with a view to recommending a timetable for the introduction of open competition into the ICT sector and the transition to Phase 2. This review is to be undertaken by no later than 1 March 2009.

(c) Independent Public Business Corporation

The IPBC is the government body responsible for the management of public enterprises and was established under the *Independent Public Business Corporation Act 2002*. The IPBC is the successor to the previous Privatisation Commission .

IPBC is trustee to the General Business Trust to which a range of state assets including shareholdings in listed and unlisted commercial entities, agri-business, commercial and state properties. The State is the sole beneficiary. All State owned enterprises are also vested with the General Business Trust.

The IPBC track record is exceptional particularly recently in terms of building asset strength and restoring profitability to state owned enterprises. The IPBC will assist the Minister for Public Enterprises in:

1. overseeing (with the Minister for Communication and Information) the formulation of necessary legislation for the effective implementation of Phase 1 of the National ICT Policy 2008;
2. advancing Telikom PNG's transformation program, consistent with Phase 1 of the National ICT Policy 2008.

(d) Independent Consumer and Competition Commission

The ICCC was created under the *Independent Consumer and Competition Commission Act of 2002*. The ICCC is an important economic regulator charged with a number of functions and powers consistent with the objective of the ICCC Act, to enhance the welfare of the people of PNG by:

1. promotion of competition, fair trading and the protection of consumers' interests, and the promotion of economic efficiency in industry structure, investment and business conduct; and
2. protection of the long term interests of the people of Papua New Guinea with regard to the price, quality and reliability of any significant goods and services.

In addition to its general powers under the ICCC Act, the ICCC is also currently given specific powers under the *Telecommunications Act* as the relevant economic regulator responsible for a number of functions under the regulated telecommunications industry. These responsibilities currently include:

- economic monitoring, control, inspection and regulation of the telecommunications industry;
- performing licensing functions including issuing carrier licences (but only in accordance with Government Policy) and varying and revoking carrier licences;
- considering tariffs given by carriers to the ICCC and, where they do not comply with the regulatory provisions, disallowing such tariffs;
- acting as arbitrator in disputes on the terms and conditions of interconnection;

- implementing Government Policy for the telecommunications industry;
- investigating possible contraventions of the *Telecommunications Act*, a licence or a Code of Practice;
- enforcing conditions of a carrier licence, including by giving a carrier directions and initiating court proceedings;
- in consultation with PANGTEL, establishing performance standards for carriers and monitoring compliance with those standards;
- advising the Minister in the formulation of national telecommunications policies;
- developing guidelines for carriers on keeping of accounts and cost allocation manuals;
- responding to consumer complaints.

(e) PANGTEL

PANGTEL is the PNG Radiocommunication and Telecommunication Technical Authority.

PANGTEL is currently responsible for:

1. developing policies for technical standards;
2. representing PNG with accredited international telecommunications bodies (in consultation with ICCC);
3. approving and certifying telecommunications equipment for customer use;
4. managing telecommunications numbering resources; and
5. spectrum management and licensing.

As the technical regulator for the ICT sector in PNG, PANGTEL also plays an important role in the regulatory regime. As noted above, the Government will undertake a broader review of the mandate to each of the telecommunications regulators (ICCC and PANGTEL) during Phase 1 with any appropriate amendments implemented prior to the commencement of open competition in Phase 2. Those amendments will be aimed at securing more efficient regulatory arrangements.

4. PHASE 1: THE TRANSITIONAL PERIOD

The key elements of the Phase 1 transitional period to open competition are summarised as follows.

4.1 RETAIN EXISTING INDUSTRY STRUCTURE

During phase 1, the basic structure of the telecommunications sector will remain.

- Telikom PNG will continue as the general carrier and a mobile carrier with competing network mobile competitors.
- PNG consumers will continue to enjoy the benefits of mobile competition which commenced with Digicel's entry under the 2005 mobile competition policy.

No new general carrier or mobile carrier licences will be issued during Phase 1. The potential for additional competition will be part of the Phase 2 move to open competition.

4.2 ONE GENERAL CARRIER – TELIKOM PNG

Telikom PNG will continue to operate as the only general carrier and as a mobile carrier under its existing licences.

4.3 RESERVED RIGHTS

As the only holder of a general carrier licence, Telikom PNG will continue to have the rights over the fixed line network and the international gateway reserved to it under Part V of the *Telecommunications Act*. Amendments to the legislation will clarify the scope of the respective rights of general and mobile carriers so as to avoid the uncertainty that has arisen in the implementation of the 2005 mobile competition policy.

No general carrier rights will be granted to mobile carriers in respect of the fixed line network or the international gateway during Phase 1.

In respect of the international gateway there has been legal uncertainty created by recent approaches to construction of the respective rights of general carriers and mobile carriers.⁸ It was never intended under the 2005 mobile competition policy that these rights or other general carrier reserved rights,⁹ would be granted to the new mobile carriers. Those rights were to remain with Telikom PNG at least until October 2007¹⁰ and any subsequent change was to be a matter of Government Policy.

In considering the desirability of retaining, in this initial stage of liberalisation, Telikom's exclusivity in respect of international gateway services, the Government has taken account of the following factors:

1. Such exclusivity has been the basis of policy as set out for some time now, so confirming and ensuring exclusivity in no way alters expectations that may reasonably be held by the private sector;

⁸ As a matter of statutory construction, the ICCC has approached the current legislative framework in a way that excludes international gateway rights from those rights reserved to general carriers by the *Telecommunications Act*. The ICCC has taken the view that it has the power to regulate access to international gateway rights by licence provisions. This is contrary to Government intentions and expectations as to what is provided by, and what is the intention of, the existing statutory framework.

⁹ Section 45 of the *Telecommunications Act* (reserved line links) and section 46 (rights to supply telecommunications services using satellite-based or microwave facilities) give to general carriers certain reserved rights, including certain rights relating to international links and services. ICCC has taken the view that these rights do not include the international gateway rights. While this is contrary to the Government intention, clause 2.4 of the Digicel licence requires that Digicel use an international gateway operated by a general carrier, unless the ICCC consents to Digicel using its own or another gateway. As noted above, the ICCC gave its temporary consent to Digicel to carry international communications using its own international gateway, until connection to the Telikom PNG gateway was achieved.

¹⁰ Under the terms of Telikom PNG's Regulatory Contract ICCC was precluded from issuing new general carrier licences prior to 17 October 2007, to persons other than Telikom PNG.

2. The information available to the Government confirms the ability of the existing facilities to support increased traffic and hence to accommodate and facilitate the growth of competitive service provision;
3. The right to provide international gateway services is a highly valuable asset which was not part of the original allocation of mobile licenses. The Government has no intention of giving that right, which belongs to the people of PNG, away for free to foreign investors. As a result, before removing the current exclusivity, the Government needs the time to determine an appropriate approach to introducing competition into those services, while protecting the interests of the people of PNG;
4. The Government is not convinced that it would be in the interests of PNG for competition to drive down the termination charges payable to PNG for the carriage of in-bound traffic, and is not convinced of the efficacy of regulatory solutions to that problem;
5. Removing the exclusivity at this early stage would damage Telikom without addressing any clear and pressing purpose, other than effecting a transfer of revenue to foreigners.

Therefore, under the National ICT Policy 2008, Telikom PNG's exclusive rights over the international gateway will be retained for the duration of Phase 1. The Government expects that the existing temporary consent to Digicel to operate its own international gateway will shortly cease.

Under open competition to be implemented in Phase 2 the reserved rights model currently embodied within the *Telecommunications Act* and which is to continue during Phase 1, will fall away. This will include liberalisation of the international gateway. Liberalising the gateway is a logical step in the staged introduction of competition that will further contribute to securing the economic benefits of competition in the telecommunications sector. The precise terms and mechanism for gateway liberalisation will be determined by Government as part of the implementation of Phase 2.

4.4 LICENSED MOBILE CARRIERS

Licensed mobile carriers will continue to be able to operate using their own network infrastructure and operating in accordance with their licences and the law.

No new mobile licences will be issued during Phase 1.

4.5 TRANSFORM TELIKOM PNG

Telikom PNG will undergo a strict program of transformational change into a viable and efficient competitor.

For reasons discussed above¹¹, this is both a legitimate national interest objective and one which can be pursued in the context of the phased introduction of competition.

¹¹ on page 16.

4.6 PROMOTE EFFICIENT DEVELOPMENT OF BACKBONE NETWORK

Under the current provisions of the *Telecommunications Act*¹² general carriers have reserved rights to supply domestic transmission services using satellite-based and microwave facilities.¹³

The law will be amended to make clear that these rights are granted to both general and mobile carriers. This will remove some of the general carrier's exclusive rights. This is an important change to the law for the following reasons.

1. The efficient development of backbone network facilities to ensure increased network coverage across the country is fundamental to the development of PNG's telecommunications services. Reserving the right to supply domestic transmission services to the general carrier may impede the ability of mobile carriers to develop their own satellite-based and microwave facilities and other physical network connectivity infrastructure both within cities and across the country.
2. If the general carrier has such reserved rights a mobile carrier will be obliged either to:
 - obtain such services from the general carrier (and negotiate the terms on which those services are supplied); or
 - obtain from the general carrier the right to supply such services itself, presumably on terms agreed with the general carrier.

There are currently no specific provisions¹⁴ that would protect the mobile carrier from delays and frustration that may arise from the requirement to deal with the general carrier in respect of services that are fundamental to the success of the mobile network. There is no public interest served by such a scenario.

3. The situation is further complicated because Telikom PNG does not have an ubiquitous network. This potentially exposes substantial problems if rights over certain services are reserved to Telikom PNG which it is not in a position to provide. At the least, mobile carriers are potentially confronted with delay in obtaining the services, consequently frustrating the development of the network.

Accordingly, the law will be amended to make it clear that both general and mobile carriers will have the right to supply telecommunications services across the country by satellite-based and microwave facilities.

This will provide legal certainty to the scope of the operations of licensed carriers and a clearer basis to efficiently develop the backbone network across the country.

Of course, this change will also remove from Telikom PNG a potentially important and valuable reserved right. While Telikom PNG's existing backbone network

¹² In particular section 46.

¹³ ICCC has taken a different view of the law and permitted Digicel to build and use its own satellite-based and microwave facilities across the country. The legal basis for that approach is unclear and at the very least is shrouded in legal uncertainty. Given the current wording of section 46 of the *Telecommunications Act*, the current situation creates substantial risk of legal dispute relating to the scope of Digicel's domestic operations.

¹⁴ Apart from the misuse of market power provisions in section 58 of the ICCC Act.

infrastructure is in need of substantial capital investment and enhancement, it remains a very important and valuable asset to Telikom PNG. Moreover, a key opportunity exists for a transformed Telikom PNG to make full use of this existing network to supply domestic transmission services to other carriers.

However, for the reasons discussed above, to retain to Telikom PNG the rights over the domestic transmission services (using satellite-based and microwave facilities) would undermine a key national interest objective to develop an efficient backbone network. Even with the removal of the exclusive rights, Telikom PNG has the opportunity to improve the efficiency and capabilities of its network so as to make its services attractive to other carriers. It will need to operate in a competitive environment but one that also creates clear opportunities.

4.7 PRIVATE NETWORKS

Currently private networks are dealt with under the general carrier licence provisions of the *Telecommunications Act* with the ICCC having issued 2 limited general carrier licences for private networks.

In principle, and subject to clear delineation of the scope of such networks, there is no reason why private networks should not be permitted during Phase 1 of the introduction of competition. In this regard a private network service is one that involves the carriage of private traffic by the person supplying the service or by persons with a common interest, where that common interest is in a purpose other than the supply or use of the relevant service.¹⁵

Amendments to the *Telecommunications Act* will implement a Private Network class licence regime.

Under this regime the ICCC will be empowered to issue a class licence under which persons may supply a private network service. Those provisions will also require that persons seeking to supply a private network service under a class licence first register with the ICCC. This will aid in ensuring that illegal services are not supplied.

4.8 INTERCONNECTION

Interconnection of carrier networks is a fundamentally important mechanism to ensure effective competition and the delivery of the full benefits of competition. An interconnection regime that achieves interconnection without delay, while providing certainty in the principles that apply to interconnection charges, is important regulation.

Unfortunately, the current regime, as incorporated in Part XI of the *Telecommunications Act*, has not proved effective. Specifically, the current provisions have not secured early interconnection of new mobile carriers' networks with incumbents. Without seeking to attribute blame, the fact remains that delays experienced between Digicel and Telikom PNG have not been in the public interest and the current regime has not operated to secure early interconnection.

¹⁵ But would not include a value added service, as defined in the *Telecommunications Act*.

Under the current negotiate/arbitrate model built into the *Telecommunications Act*, resolving interconnection disputes is primarily a matter for the parties who can initiate an ICCC arbitration. It is only where a dispute is referred by the parties that the ICCC has a direct role in determining the dispute. The Minister is currently given no power to intervene to resolve an interconnection impasse.

Aspects of the law can be usefully revised to enhance the current regime. For example, an express power for the ICCC to make interim pricing determinations (ultimately subject to a full arbitration on defined principles) is appropriate as one way of ensuring that complex negotiations and pricing determinations do not unduly delay interconnection. Moreover, the ability of the Minister to make a determination in the absence of the parties securing agreement or a referral to the ICCC may aid earlier interconnection. Finally, it could be helpful for the Minister to have a power (similar to that provided for under the current Australian arrangements) to establish general principles that should guide the ICCC in determining the terms and conditions of interconnection. Such a power could be important in ensuring consistency between the interconnection regime and future universal service arrangements.

As part of Phase 2 implementation further revisions of the current interconnection regime will be considered.

4.9 MANDATE AND FUNCTIONS OF REGULATORS

As discussed above¹⁶, the Minister for Communication and Information will undertake a review of regulatory structures and processes, including the mandate to each of the telecommunications regulators (ICCC and PANGTEL) and report to the NEC with recommendations on any appropriate amendments aimed at securing more efficient regulatory arrangements having regard to:

- the desirability of a distinction between the policy making function of the National Government and the implementation of those rules by independent regulators operating with transparent regulatory processes and appropriate levels of regulator accountability;
- clarification of areas of potential overlap between the two regulators; and
- the ICCC's continued role and powers in respect of issuing, varying and revoking telecommunications licences.

4.10 CONSIDERATION OF CSO REGIME

As noted above¹⁷ during Phase 1, the Minister for Communication and Information will also consider the desirability of developing a CSO regime to apply in the telecommunications sector in PNG.

The primary objective would be to provide a strong funding basis to aid rural connectivity in PNG. Subject to the outcome of the Minister's review (and consideration by the NEC) any such CSO regime would be introduced as part of the Phase 2 reforms.

¹⁶ on page 21

¹⁷ on page 12

4.11 TIMING OF PHASE 1 AND REVIEW

No fixed period will be set at this stage for the duration of Phase 1. While some would advocate locking in a fixed period of time for the transition to open competition, it is desirable to first assess developments in the market against the broader national interests before this step is taken.

The introduction of mobile competition has already seen dramatic changes to telecommunications markets in PNG. The markets will continue to experience dramatic change over the next few months as Telikom PNG transformation efforts proceed, mobile networks are expanded and service is available to more Papua New Guineans.

In these circumstances, the Minister for Communication and Information will commence and complete by 1 March 2009 (approximately twelve months after the commencement of Phase 1), a review of the operation of the telecommunications sector. This review is to assess:

- the state of the market;
- the manner in which competition is operating at that time; and
- Telikom's transformation,

with a view to recommending to NEC a timetable for the transition to Phase 2.

5. PHASE 2 – THE INTRODUCTION OF OPEN COMPETITION

At the conclusion of the transitional Phase 1 period, the Government will introduce open competition, with new entrants free to invest in telecommunications infrastructure or continue to rely on Telikom PNG's (or other third party's) or both.

Prior to the introduction of Phase 2:

1. the Minister for Communication and Information will have completed:
 - his review of regulatory structures and processes and reported to NEC – and any changes adopted by Government will be formulated;
 - his consideration of the desirability of developing a CSO regime to apply in the telecommunications sector in Papua New Guinea with the details of any such regime to be formulated;
 - his review of the operation of the sector and reported to NEC on the timetable for Phase 2 implementation;
2. the Minister for Public Enterprises and the IPBC will have advanced steps to transform Telikom PNG;
3. legislative amendments will be formulated to:
 - establish the regulatory structures and processes to apply during Phase 2;
 - provide the legislative basis for increased competition;
 - refine the interconnection regime as necessary so as to bring greater certainty and effectiveness in this important area; and
 - implement any CSO regime approved by NEC.

6. USE OF THE INTERNET

6.1 INTRODUCTION

The growth of the use of the internet is a modern phenomenon. In 1996, 40 million people of the world were connected to the internet. Today, that figure is about half a billion.

By contrast the number of PNG citizens who are connected to the internet is relatively low. This is mainly due to:

- lack of access to computers;
- poor quality of connectivity; and
- a lack of understanding, on the part of the population, as to how the internet works and how it can benefit their lives.

As a consequence, the people of PNG have not achieved the full benefits of the information economy.

The potential benefits are evidence in all aspects of PNG society.

Business, particularly small and medium enterprises which are the backbone of the PNG economy, are in need of reliable ICT infrastructure in order to grow and increase profitability. Reliable connectivity, the means to engage in e-commerce, and the ability to obtain information from the internet are, in the current day, vital paths to economic prosperity and business success.

Similarly, entrepreneurship can not flourish with bottlenecks in a country's ICT system, where internet access is cumbersome and unwieldy, phone calls are difficult to make and receive and calls are expensive.

These obstacles to business success can be removed with a rehabilitated network followed by a competitive Operational Separation model for service delivery.

The increased ability to engage in electronic commerce will link Papua New Guinea's entrepreneurs with the world, and will enable produce from the nation to be sold at competitive prices all over the region.

The internet can also assist the cultural issues facing Papua New Guinea. In a country as linguistically and culturally diverse as ours, the ability to use the internet as a tool for bringing people together will serve to assist in building national spirit. This will not happen automatically but as regions communicate more readily and ideas are shared with greater fluidity, cultural boundaries will be reduced.

Where cultural practices need to be altered, for example to reduce the spread of HIV, the internet has the potential to provide an effective medium for exchanging information that is relevant and persuasive.

ICT has the power to facilitate developmental goals in a unique and valuable way, through improved communication and exchange of information, supported by an environment that will create improved and novel economic and social structures.

In education, there are a myriad of ways in which ICT can assist the population. An important attribute of the internet, particularly for Papua New Guinea, is its ability to solve distance learning problems and to build bridges between teachers and students.

Delivering reliable health outcomes across a geographically complex nation as Papua New Guinea is a very difficult task. ICT has provided breakthroughs in this space that will, if supported by the right healthcare structures, redefine the state of medicine in Papua New Guinea.

Effective use of ICT can aid in the empowerment of the people of Papua New Guinea. It is also of assistance to the Government that people can more easily participate on government through the use of ICT systems. This allows an independent validation of the democratic process and provides legitimacy to a government.

ICT vests power in the hands of a population to act as enforcers of environmental change, particularly, through the creation of environmental interest groups developing in cyberspace.

The development of information technology combined with a robust effective communications network enhances the country's ability to obtain economic benefits in both a tangible and an intangible way. In an immediate sense, ICT creates sector-specific job opportunities, process improvements for manufacturers or producers and an increase in economic activity.

6.2 POLICY OBJECTIVES

The Government's policy is to:

- provide the population with greater access to computers;
- encourage increased use of the internet particularly in areas of business, cultural persuasion, development, education, health, empowerment and participation, the environment, economic opportunity, and e-Government; and
- ensure that relevant education and training programmes allow everyone to maximize the opportunities afforded by ICT technologies to improve the quality of their lives and to enhance their work prospects.

6.3 STRATEGIES

To promote **development** of the use of the internet in PNG the Government will:

1. encourage use of the internet by government, commerce, health and educational institutions, as a driver for network development;
2. promote the development of ICT based businesses to address market opportunities both inside PNG and elsewhere in the world;
3. promote entrepreneurial activity in PNG particularly where such activity would enhance the technology sector, the intellectual property of the country or the education of its people;
4. encourage regional centres to create their own "hot spots" or access zones as local Internet Service Providers – the infrastructure required to create pre-paid "hot-spots" will be provided for a fee by the incumbent provider or its agent;

5. design and construct one to two "Telecentres" in an appropriate rural or regional area. These may be sold to entrepreneurs once they are cash flow positive; and
6. make special purpose loans available to entrepreneurs seeking to build "Telecentres" in rural or regional areas.

To promote use of the internet for **Education** in PNG the Government will:

1. encourage online learning in the educational institutions and universities of Papua New Guinea;
2. promote centres of excellence that are held up as beacons of online learning for other institutions to emulate;
3. create awareness of the educational possibilities of ICT enabled learning;
4. facilitate the sharing of e-learning knowledge and resources between educational institutions;
5. encourage vocational training and awareness of vocational training through the use of employer incentives for staff undertaking such training;
6. investigate the provision of computing devices, with pre-loaded literacy and numeracy software, to children and students inside Papua New Guinea under the One Laptop Per Child program;
7. provide incentives to the private sector to donate equipment and sponsor community based privately owned internet kiosks; and
8. create a set of applications that are focused on particular areas of society and make them accessible via low cost privately owned kiosks

To promote use of the internet for **Health** in PNG the Government will:

1. encourage the adoption of tele-medicine as a method of bringing medicine to remote communities and allowing medical practitioners to obtain second opinions from overseas surgeons where necessary;
2. explore ways in which national medical conditions (such as malaria) are able to be mitigated or eradicated using ICT as an enabler;
3. encourage the widespread adoption of mobile phones together with an awareness campaign sufficient to assist medical practitioners deal with outbreaks as and when they occur;
4. set as a priority in all public hospitals the development of ICT systems that provide medical information access for all medical practitioners, database and patient management services and other applications as necessary such that medical services in Papua New Guinea are constantly improving;
5. mobilise ICT resources in the fight against HIV/AIDS by developing ICT learning kits in local languages and presenting them in an online format; and
6. improve the NACS web site so that it functions effectively to provide information about HIV.

To promote use of the internet for **Empowerment and Participation** in PNG the Government will:

1. encourage the population at large and in particular minority groups to assemble, interact and exchange ideas through ICT forums;
2. create government platforms which allow access to public information across the full range of government services; and
3. create awareness of these platforms as adoption of ICT increases across the country.

To promote use of the internet for **Justice** in PNG the Government will:

1. expand the PNGInLaw utility of an electronic database of legislation and cases for Papua New Guinea;
2. investigate the workability of migrating from paper based filings to online court documents (including the scanning of all statements, affidavits and exhibits);
3. instigate a process of publishing court lists and judgments on court web sites to improve efficiency and transparency in the administration of justice; and
4. add real time transcription to court proceedings with a view to improving access to transcripts and decreasing administration costs.

To promote use of the internet for the **Environment** in PNG the Government will:

1. mandate emergency service personnel including firefighters, emergency rescue and care and health agencies such as the St. Johns Ambulance Service and Red Cross to become ICT enabled with a view to response co-ordination and providing effective command and control structures;
2. promote awareness of environmental reporting authorities and encourage citizens to take action in the face of environmental crimes;
3. investigate the possibility of using ICT to enable better farming and forestry management on a nationwide basis; and
4. promote regional tele-working and decentralization as a viable alternative to excessive congregation inside cities.

To promote use of the internet for **Economic Opportunity** in PNG the Government will:

1. develop the ICT network sufficiently to encompass the maximum number of rural areas that can be reached within realistic economic parameters;
2. foster the development of appropriate applications that make the rural adoption of ICT relevant and attractive;
3. create a government web site for farming communities which provides information about farming practices, weather patterns, crop prices and advice about which crops to plant or animals to farm;
4. promote or encourage this web site's adoption by the rural community;
5. encourage other primary industries to adopt the practice of creating and sharing information through industry specific portals;
6. encourage the use of broadcast infrastructure to enhance the value of primary industry information sharing and extension service creation;
7. encourage and promote e-commerce to the export business community;
8. enact e-commerce supportive legislation that allows for electronic signature and electronic agreements; and
9. adopt a government strategy to express a preference for web based supply and service delivery so as to incubate the nation's ICT sector.

To promote use of the internet for **Agriculture, Mining and Fishing** in PNG the Government will:

1. establish an e-marketplace enterprise specifically providing opportunities for participants in the Agriculture, Mining and Fishing sectors to participate in the exchange of goods and services via e-commerce.

To promote use of the internet for **e-Government** in PNG the Government will:

1. target people groups, citizens, businesses that will have an immediate use for online services with the creation of the PNG Government Portal;
2. refine and catalogue all government services so that they can be accessed easily via the PNG Government portal; and
3. consider a multi-technology approach combining not only the internet but radio and newspaper columns where citizens can learn about e-Government;

7. EDUCATING THE NATION

7.1 INTRODUCTION

One of the greatest opportunities which will arise from increase use of the internet by the people of Papua New Guinea is the opportunity for increased access to education.

The ability for ICT to act as a catalyst to support various educational and career advancement programs is essential to the growth of the country and its people.

As with all developing countries the ability to internally train, educate, inform and employ is critical to skill retention and development of programs for all aspects of the community.

When education opportunities are not available locally, alternative offshore sources are explored. These options are often expensive and only available to a small number of citizens. Only a selected few are privileged to be provided with basic education levels to enable them to travel overseas to participate in further secondary or university based education. These individuals often choose to remain in the country of further education to take advantage of opportunities often not available in PNG.

As a result these individuals, who are now highly trained and specialised, defer returning to PNG to pass on the skill sets, education and training achieved overseas in return for well paid occupations in offshore locations. Whilst this may result in a small financial return to some communities, the long term effects have serious implications.

Specialised skill sets particularly in health, education and manufacturing are already in short supply. PNG needs to ensure that skill sets are retained, regionalised and promulgated back into the community to ensure that alternative education locations are not the first choice for those wishing or being able to afford a world class education and resultant career.

The ability for ICT to act as a catalyst to support various educational and career advancement programs is essential to the growth of the country and its people.

People must be supplied with the skills to drive towards the information economy. This includes the leaders and workers with the vision and skills to develop and manage new approaches to learning and to implement coordinated and timely change. Professional development for teachers, trainers, content developers, researchers and all other workers in education and training is essential to allow them to be change agents to achieve the goals of the information economy. Working with other industries to develop the specialist skills needed, will ensure that PNG is able to take its place in the global information economy in the medium to long term.

7.2 POLICY OBJECTIVES

The Government policy is to:

1. encourage programs to educate the population on the effective use of the internet as a business and life tool; and
2. encourage PNG citizens to engage in education programs available by means of the internet.

7.3 STRATEGIES

To develop a **National Education Plan** relating to use of the internet. This will be a detailed plan to:

1. ensure that all citizens possess broad literacy, numeracy and technological literacy skills for life, work, and lifelong learning and that there are adequate numbers of people with the specialist skills needed by the ICT industries and other PNG industries to service the needs of the economy;
2. improve people's understanding of the social, cultural and economic impact of the information economy on education, training, research and development;
3. develop a comprehensive framework for education and training, including research and development that supports the information economy and a knowledge society;
4. implement a program which will enable PNG's education and training industry to become nationally effective and internationally competitive in order to retain its children; and
5. reconsider the ways that the people of PNG do business to achieve and maintain their national and international competitiveness.

To initiate **ICT technical colleges** in which:

1. e-Learning initiatives are established and a framework for content and delivery is developed;
2. based on the above initiatives and framework, customisations based on region, policy and priority are completed; and
3. mapped against these requirements, media types are selected based on geographic location and telco bandwidth availability .

Local resources and skills transfer – In collaboration with vendors, development of local resources will be given a high priority and skills transfer will be mandatory on all Government related projects. Initial remote learning of concepts and techniques will be complemented with the creation of vendor based user groups and support functions.

8. SECURITY AND SPECIFIC REGULATION

8.1 INTRODUCTION

Once mechanisms for connectivity are in place and use of the internet becomes more widespread, the Internet will provide an economical and simple way for linking citizens with industry and government across Papua New Guinea and the world.

Increased use of the internet in PNG society will present a number of challenges, not merely of a technical nature but also ethical, cultural, legal, economic and organisational.

Telecommunications, intellectual property management models, online content, e-commerce, and a range of other regulatory frameworks need to be in place so that the education and training industry can operate efficiently and effectively and become internationally competitive. The regulatory and technical frameworks will need to reflect international developments and should support and not impede the needs of PNG's education and training industry.

Security is an important component of the policy framework for the Internet. Developing and transitional countries must examine their laws to ensure that they cover cyber-crime and provide law enforcement agencies the investigative tools they need, consistent with privacy protection. But the criminal law is only a small part of the cyber-security framework. Governments and private sector systems need to cooperate in improving the security of those systems by applying sound security practices, improving sharing of information, and raising awareness.

Developing countries around the world rightly see the Internet as a potentially powerful tool to advance economic and human development. At the same time, however, criminals also see the potential of the Internet – as a means to perpetrate fraud and as a communications medium of global reach and low cost. Hackers find a thrill in penetrating networks and destroying data, while terrorists could purposely disrupt the critical infrastructures that are dependent on networked computers. Meanwhile, consumers hesitate from disclosing personal and credit card data on the Internet, with security and privacy their number one concern, and businesses face losses of proprietary data, intellectual property, and online access to customers and suppliers due to security breaches and intentional service interruptions.

In order for the Internet to contribute to economic growth, human development and democratization, it must be trustworthy and secure. Lack of trust and security jeopardizes development goals that could be supported by a widely accessible and widely trusted Internet.

Effective public policy for the Internet is based on a mix of laws, industry self-regulation and technical standards that give users control. Together, these elements create the policy environment supporting investment, innovation and growth. In terms of trust and security, this environment includes the criminal law, laws of privacy and consumer protection, and the commitment of industry to build and operate more secure systems.

Consideration of cyber-crime often leads to questions about the standards under which the government is authorized to obtain access to the electronic communications and computer data that may constitute evidence of cyber-crime and other types of crime. Many countries have procedural laws granting the government investigative powers to access information stored in computers. These include judicial orders for the production stored data and warrants for the immediate search and seizure of computers and computerized data. Many countries also allow real-time interception of communications and the traffic data or transactional data that shows the origin and destination of communications.

Privacy is widely recognized as a human right. Numerous international policy statements and frameworks for the information age declare that individuals are

entitled to fair treatment in the way that personal information is collected and used. This includes personally identifiable information in the hands of government agencies.

Governments are increasingly using the Internet as a means to deliver services and information. This development allows users to register for government services, obtain and file government forms, apply for employment, comment on public policy issues, and engage in a growing number of other functions – all on-line.

The trend towards e-government and the electronic delivery of services has further expanded government collection of personally identifiable data. In providing services to the public and carrying out various functions, governments collect and use a wide range of personal information about their citizens (e.g., health, education, employment and property ownership records, tax returns, law enforcement records, driver's license data, and others).

A government's practices in collecting, retaining, and managing personal data about its citizens pose a wide range of privacy concerns. With this increasing use of technology in government-to-citizen interactions, it is important to ensure that government agencies that collect personal information from citizens adopt and maintain adequate privacy practices.

Trust is a crucial ingredient of any successful online program, whether in the field of e-commerce or in the field of e-government. Privacy and security are in turn key elements of online trust. Individuals will not use services that do not handle personal data responsibly. Privacy is often cited as a major concern of Internet users. It is also the main reason why many non-users still avoid the Internet. Citizens will not entrust sensitive personal, financial and medical data to the government in order to utilize e-government systems (or they will refuse to give accurate information) unless they are assured that the information will be responsibly used and protected against abuse. Therefore, countries seeking to facilitate the efficient online provision of governmental services must protect the privacy of the information they collect.

To build trust, privacy must be addressed in the planning and design of e-government systems since it is much harder to interject privacy protections after a system is built.

8.2 POLICY OBJECTIVES

The Government's policy is to ensure that, under the legal framework of Papua New Guinea:

1. Cyber-Crime is not permitted;
2. privacy is protected to a degree meeting International Privacy Standards
3. consumers and traders who conduct business electronically are adequately protected;
4. the Intellectual Property of others is adequately protected; and
5. critical ICT systems are protected in the event of war, disaster or civil disturbance.



Henao Iduhu
Acting Secretary

SECRETARY'S ACKNOWLEDGEMENT

The National ICT Policy of April 2008 encourages competition in the telecommunication sector but in a staged approach towards open market competition. This Policy also strives to ensure that Telikom PNG transforms to a competitive Public Corporation to be able to sustain its operations under an Open Market competition.

I would like to pay tribute to persons and agencies that played significant roles leading towards installation of the National ICT Policy endorsed under NEC Decision No. 21/2008

In this regard, I make special mention of both Hon. Arthur Somare, Minister for Public Enterprises and Hon. Patrick Tammur, Minister for Communication and Information, for their foresight and continuous guidance to finally install a National ICT Policy for Papua New Guinea under the current Somare-Temu Government.

Let me also acknowledge the leadership of the former Chief Secretary to Government Mr. Joshua Kalinoe, who started this process with the Taskforce under initial NEC Decision 280/2005. I also extend gratitude to members of the Taskforce under respective organizations including:

- Department of Prime Minister and NEC
- Department of Treasury
- Department of National Planning and Monitoring
- ICC
- Pangtel
- IPBC

I also acknowledge Freehills and Concept Economics from Australia for providing the Strategic Advisory to the Government in the development of the ICT Policy document.

I also take this opportunity to acknowledge the Ethan Group of Australia which provided the initial strategic advice to the Taskforce.


Let me also acknowledge the agencies mentioned below who provided a check and balance to ensure the policy content reflects interests of all stakeholders:

- National Research Institute
- Port Moresby Chamber of Commerce
- PNG Chamber of Commerce
- Institute of National Affairs
- Telikom PNG
- Digicel PNG
- PNG Media industry, and the
- General Public, and others who have contributed in many other ways. This final policy document has been achieved with your support.

This policy content reflects the current government's priorities within the telecommunication sector and this now provides the basis for the formulation of a National ICT Policy under the current review process in par with advances in technology, trends and practices so that we obtain the maximum benefit from latest ICT opportunities available.

NEC Decision 21/2008 that approved the National ICT Policy directs the Minister for Communication and Information, Hon. Patrick Tammur to revert to Cabinet in March of 2009 to report on the findings of the above review in order for the Government to determine the Phase Two objective which is to open the telecommunication market for full competition and determine the National ICT Policy.

Let me conclude in saying that the Department of Communication and Information continues the review process to map out, amongst others, Community Service Obligation and increased rural telecommunication connectivity, the regulatory regime, together with a study on the current telecommunication industry performance under the Phase One of the National ICT Policy.



Henao Iduhu
Acting Secretary



Government Printing Office