



## INDEPENDENT CONSUMER & COMPETITION COMMISSION

### Submission to NICTA in response draft determination on Service Specific Pricing Principles for Submarine Cable Services

#### Introduction

The Commission believes the pricing principles should be designed to achieve the outcomes which are best for PNG as a nation. Therefore before setting pricing principles, the required outcomes should be first be understood.

Submarine fibre optic cables offer high capacity, low latency<sup>1</sup> connectivity and do not suffer from interference and so are ideal infrastructure for international connectivity for Papua New Guinea. Satellite services are widely available in many areas as an alternative to undersea cables, and where national connectivity might be limited to connect to the submarine cables, this technology is often the only practical way to provide national and international communications to remote parts of the country. Satellites do offer lesser performance with regards to ultimate capacity, latency and atmospheric interference when compared to submarine cables, and should not be regarded as a primary form of international connectivity.

The Commission is concerned that the current Telecommunications submarine cable infrastructure from Port Moresby (Ela Beach) to Sydney is at the end of service life and may fail at any time. The newer submarine cable that lands near Madang is of less concern with regard to age. The ideal situation is for at least two high capacity reliable submarine cables serving Papua New Guinea that terminate in different geographies. This means that if one cable fails for any reason, the other cable has a physically diverse route to another location and the high quality communications capacity for the country will be preserved via the remaining undersea cable.

Our view is that when the old undersea cable from Ela Beach fails or runs out of capacity, there will be a need for a significant capital investment for its replacement, and that the Service Specific Pricing Principles should be flexible enough to allow for a reasonable return on this important future investment. The time between contractual agreement to replace a submarine cable and commissioning the new cable could be two years.

The Commission believes that current wholesale international connectivity is many times the real cost of the current submarine cable services, and that this results in correspondingly high retail prices for telephony and internet services that are likely to constrain demand, especially for small business and residential consumers. There are many international studies that conclude that low cost telecommunications services are economic drivers for developed and developing countries, and the Commission is concerned that the relatively high cost of international telecommunications services do limit demand in Papua New Guinea.

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<sup>1</sup> Signal delay

In this submission, the Commission has outlined a number of principles for your consideration and suggests they be considered to support an investment climate for the replacement of one of the submarine cables, and to reduce the costs to end users in Papua New Guinea. The TSLRIC methodology is the method that best supports these principles.

### Problems with Current Infrastructure

Currently there are two international fibre connections to PNG:

1. APNG2 connects at Ela Beach which provides 1 Gbit/s
2. Mandang connection to Sydney and Guam which provides 20 Gbit/s in each direction

The ANPG2 connection will reach its technical end of life and in 2016 and could fail at any time. If it did fail, then the result would be reduced national capacity and a loss of cable redundancy.

The current connection to Madang is a few years old and while it has a fiber connection to Lae, Lae itself has limited capacity to the rest of PNG at this point in time. This limits the use and value economically of this submarine cable connection.

The Madang fibre is laid through an undersea area which has a history of problems related to undersea earthquakes, volcanos and landslides and as a result reliability in this respect may be compromised compared to the cable that lands at Ela Beach.

In our view the current arrangements are at risk of significantly reduced capacity if one of the cables fails, and if this does occur then it would force reliance upon less effective satellite connectivity. There can be significant delays in repairing or replacing a damaged undersea cable – potentially up to 3-6 months to arrange for a cable laying ship to be contracted and the repair work carried out, if repair is feasible.

### Need for further investment

PNG needs further investment in telecommunications infrastructure to support competition and growth. It is therefore essential that any regulatory arrangements which are set up, have this in mind.

In particular, we believe that Service Specific Pricing Principles must support the following requirements;

- Capacity to increase bandwidth requirements in line with market demand – through augmentation of capacity on existing cables and more importantly, to support the significant investment required to replace a cable.
- Diversity – PNG needs at least two geographically diverse and reliable fibre optic cables landing in PNG.
- National backhaul – having international connections by themselves is not enough. All major urban areas should ideally have low cost access to the international fibre links. A national fibre or reliable high capacity microwave network is an essential component in the delivery of low cost international connectivity to users in PNG.

### Regulatory framework to support commercial competition

There is a trade-off between encouraging further investment and achieving affordable retail pricing to all users of international bandwidth. Investors in submarine cable infrastructure must be able to receive sufficient return on their investment to be able to continually invest with confidence.

We note that the nature of telecommunications economics is that:

- The technology available is continually improving:

- The capacity of equipment used to light fibre has been and is expected to continue to double every 18 months (approximately)<sup>2</sup>.
- The cost of the terminal and regenerator equipment remains roughly static over time, which has the effect of halving the cost per Gbit/s every 18 months (approximately)<sup>3</sup>.
- This means that in a competitive environment we would expect to see retail prices falling as international bandwidth prices fall. This is the experience of other nations.
- It is important that any regulatory framework is able to assess and pass on cost reductions through the life of the assets.
- Telecommunications networks have economies of scale:
  - This means that it is usually cheaper to have one large network than two smaller networks that duplicate resource.
  - Because of these characteristics, owners of large Telecommunications networks tend to be natural monopolies.

It is the combination of technology evolution, falling real costs and that large telecommunications companies can be natural monopolies that may result in consideration of the need for regulation. Under these circumstances, either the access provider may not pass on the economic value of the network to customers, or they will not invest in new infrastructure. There is sometimes a tendency for monopolies to restrict supply in order to maximise their profitability.

In the Commission's view, it is worth considering how to develop a wholesale submarine cable network that operates on a 'cost plus' basis which makes reasonable allowance for investment in new cables, and which encourages telecommunications service providers to compete for international voice and data services.

### Consider New Entrants

Competition has a crucial role to play in ensuring the needs of PNG's households, businesses, public enterprises and government agencies are fully met. In our view this is not just about services being affordable but also the range of services which are available and ensuring that the quantity of bandwidth supplied is not overly constrained.

To promote competition in PNG for international services, it is essential to lower the barriers to market entry for telecommunications service providers. Service Specific Pricing Principles need to both encourage the investment in new infrastructure and the provision of reduced wholesale costs. We note that Digicel was once a new entrant, but now provides major market benefits to the country. In our view, their presence in the market has lowered prices and increased the economic benefit of cellular communications to all customers in the market, and specifically helped to reduce international telephony costs.

Overseas experience has shown that small internet service providers (ISP's) can enter a market relatively easily and provide competition against larger service providers such as the large telecoms companies. Over time small ISPs can grow to become significant market players. Innovation in the market often comes from

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<sup>2</sup> The capacity limits of a fibre network are largely determined by the repeater and terminal equipment, not the fibre itself. While a fibre network has a large fixed cost element, the capacity of the network can normally be increased as demand increases. With submarine cables however, the cost of replacing submerged repeaters can be very high and there is a risk of damaging the cable in the process, so the originally designed capacity of the cable tends to be fixed at the time of installation.

<sup>3</sup> <http://www.lightwaveonline.com/articles/2012/01/2012-optical-industry-trends-137207543.html>

the small competitors because larger companies often have little incentive to change the status quo until they suffer significant market loss.

The Commission understands that NICTA supports this concept in the way it has described pricing principles in section 6 of its document.

*"The price of the transmission capacity service may be different in terms of the price per megabit per second for services with different transmission capacities...."*

The Commission understands that small ISPs are more likely to want to purchase contended bandwidth with specified quality of service parameters. Large telco's are more likely to want to buy dedicated capacity or wavelengths and provide a range of high quality services to business in particular. This range of services should be available on a regulated basis.

### Pricing Principles

The Commission believes there are a number of pricing principles which must be followed in order to ensure the best outcomes for the country. Many of these requirements are correctly captured in NICTA's draft list of principles. The Commission believes it is important to be more specific about these principles to ensure the desired outcomes are achieved:

- Pricing must support further investment – not just maintenance of existing infrastructure.
  - Pricing which is only designed to cover current costs will not succeed in driving the further investment that PNG needs.
- Pricing should be based upon replacement costs.
  - This means the prices may not be based upon the cost of the equipment and infrastructure that the access provider currently has in place.
  - If prices do not cover replacement cost then no further investment is likely to occur.
  - Replacement should be regarded as "Modern Equivalent Assets" and should reflect the "best-in-use" technology available to the network operator.
  - A cost methodology should be used to distribute the capital costs over the life of the asset.
  - Replacement costs should reflect not only the cost of replacing the equipment but also the most efficient design that is available to the network operator.
  - Because Telecommunications equipment and international connectivity costs are falling on a per unit bandwidth basis, prices should be reviewed regularly. The Commission recommends that pricing reviews should be done at least once every two years, if not annually.
- The access provider must receive a reasonable return on their investment and be able to fully recover the depreciation costs of their investment.
  - The Commission supports the proposed principles outlined by NICTA in their document (principle 7).
  - A complicating factor occurs here where the replacement cost of Telecommunications equipment per unit bandwidth is falling over time. If prices are based upon replacement costs and costs are falling on a per unit bandwidth basis, then an investor may not fully recover their investment before the end of the equipment's economic life. A solution to this which the Commission recommends for consideration is the use of "tilted annuities". This has the effect of front loading the depreciation on an asset (similar to diminishing value depreciation except

it also allows for the cost of capital). This method of cost determination has been used in other jurisdictions around the world including Australia and New Zealand.

- The cost model used to establish pricing is recommended to be a bottom up model , not a top down model.
  - A top down model uses the network operator's current actual costs and attributes them to the individual parts of the business for which the regulator is trying to establish costs.
    - If used, this model needs to be adjusted to reflect true replacement costs, and this can be difficult to do, given the declining cost per unit capacity of equipment.
    - It tends to build in any current inefficiency which is likely to be inherent in the existing business and therefore costs are likely to be overstated.
    - The regulator generally relies on the network operator to provide accurate information and may find it difficult to confirm accuracy.
    - The approach may not be transparent enough to assure efficient pricing.
    - It can be difficult to identify the source of costs as they tend to be merged in a company's accounting system.
  - A bottom up model considers individual components of the network when pricing is being developed:
    - Bottom up models identify the cost of individual elements of the network. The cost of these elements are then attributed to regulated services according to the way the service uses the network elements.
    - Bottom up models are more transparent than top down models and it is easier to understand exactly where costs have come from.
    - They do not have to rely on the access provider to supply information, although it is usually desirable to use information supplied by the access provider if it is considered reliable.
    - They avoid arbitrary allocation of costs and avoid inefficiencies.
    - However the weakness of this approach is that it may understate operating costs, and it is easy to miss out some costs. It is usually desirable to reconcile bottom up models to a company's financials to ensure that costs have not been missed.
- Prices should include a reasonable contribution towards the common costs of the Network operator.
  - NICTA have already proposed this principle in their draft and the Commission supports this approach.
  - However, the Commission believes that the international Transmission and Gateway services of the type proposed could be efficiently provided by a stand-alone organisation.
  - The costs of such a standalone organisation could be relatively easily estimated and would avoid the risk of unnecessary contributions from the remainder of the common costs of the of an overall telco operation providing wholesale and retail services.
  - A variety of methods could be used to establish the requirements for a standalone organisation including:
    - Benchmarking similar businesses in other countries. (Benchmarking would need to be adjusted to reflect PNG labour rates, as already proposed by NICTA in their document.)
    - Using % markup on capital costs, as used by other jurisdictions.

- The common costs of the “Stand-alone” network organisation should be apportioned between regulated services using a method that most fairly represents the value received by the users of each service:
  - The Commission notes that any allocation of common costs to individual services is always arbitrary and therefore splitting costs can be difficult.
  - Many jurisdictions have used the “Equal proportionate mark up” method to achieve common cost allocation to services and allocates common costs to services in proportion to their TSLRIC.
  - To avoid over or under recovery of these common costs, a forecast of total sales volume should be done to allocate these costs. This allocation should be reviewed regularly, to ensure that common costs are not over recovered (or under recovered) as demand for services grows.
- The access provider must be able to recover the cost of spare capacity, subject to NICTA’s approval of the level of spare capacity delivered:
  - As previously noted in this document, monopoly businesses may have a tendency to limit supply because there is limited or no competition and assets are sometimes allowed to deteriorate. With regulated prices this motive is reduced.
  - However the access provider may still have an incentive to restrict supply, in order to avoid the risk of investing in capacity that they may not sell. This means that when new orders are received for additional capacity there is likely to be a delay before the demand is met, or indeed the demand cannot be met through a lack of capacity.
  - NICTA needs to consider how to encourage the access provider to meet new demand in reasonable time frames.
  - One approach is to allow the network organisation to hold some spare capacity and to be able to recover the cost of this spare capacity as part of the common costs of the business.
  - The Commission notes that unnecessary spare capacity can be avoided by using long term contracts with service provider companies to minimise risk to Return on Investment (ROI) for the access provider.
- Pricing should reflect the underlying structure of the access providers costs.
  - Where a cost is variable with some input or is fixed with regard to some input, then prices should also be variable and fixed in the same way. If fixed and variable prices are averaged, then costs will either be over or under recovered, and resources are likely to be allocated inefficiently.

## TSLRIC vs FAC

The Commission is of the view that TSLRIC more closely supports the pricing principles outlined in this paper than a Fully Allocated Cost (FAC) approach. TSLRIC will better support:

- Use of forward looking replacement costs
- A bottom up approach
- Using pricing structures that reflect economic cost drivers.

Conversely, fully allocated cost models are more likely to accommodate inefficiency in regulated prices, and are also less transparent. They also tend to make the regulator more reliant upon the network organisation to supply accurate information.


Consequently the Commission is of the opinion that the TSLRIC approach is more likely to achieve the desired outcomes, including lower costs and suitable investment encouragement for the access provider. The consequent benefits, for PNG as a nation, of lower cost access to high capacity international services.

## Conclusion

There is little doubt that currently, international services are limited in capacity, may be unreliable because the Ela Beach – Sydney cable is beyond the end of commercial life, and are expensive compared to other countries. These restrictions constrain the economic benefits that arise from low cost international services.

The Commission supports the development of a determination on Service Specific Pricing Principles. The benefits that may result from the proposed draft determination on Service Specific Pricing Principles for Submarine Cable Services are:

- Cheaper international bandwidth is key to driving down telephony and internet service costs in Papua New Guinea.
- Access to cloud computing services which will offer an important benefits for businesses when reliable high speed international connectivity is in place. Access to a wider range of more cost effective applications for business will result, with the potential for greater efficiency for PNG business and government entities.
- Users of broadband services can access high quality education and health services hosted in PNG and provided and backed up in other countries.



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