

## **RECOMMENDATION REPORT**

**A Report to the Minister recommending the declaration of Domestic Mobile and Fixed Termination Access Services under Division 3, Part VI of the NICTA Act 2009**

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## Executive Summary

1. Section 130 of the National Information and Communications Technology Act 2009 (the "Act") gives power to the Minister, upon the recommendation of the National Information and Communications Technology Authority ("NICTA"), to declare a wholesale service.
2. NICTA has completed a public inquiry into whether the Domestic Mobile Termination Access Service (DMTAS) and the Domestic Fixed Termination Access Service (DFTAS) shall be declared and has concluded that they should be declared for the following reasons.
3. First, NICTA found that the current system for setting prices for DMTAS and DFTAS based on commercial negotiations, does not provide adequate constraints on access provider's pricing. This has resulted in DMTAS and DFTAS prices that are significantly higher than in countries that impose cost-based pricing regulation.
4. Using a benchmark study from a sample of countries that developed cost models to imposed cost-based pricing regulation, NICTA found that the price of DMTAS in PNG is nearly four times the median value in the benchmarked countries. A similar analysis for the price of DFTAS, found that the price in PNG is more than 10 times higher than the median in the benchmarked countries.
5. Second, the high price of DMTAS and DFTAS contributes to having a significant price difference between off-net and on-net calls. This in turn, lessens competition in the retail mobile voice service markets.
6. The price of DMTAS or DFTAS, are components of the cost of a mobile off-net call but are not a component of the cost of an on-net call. The higher the price of DMTAS or DFTAS, the higher the price difference between off-net and on-net calls, holding all else constant. This, in turn makes the so-called club effect<sup>1</sup> stronger, and creates a vicious circle in which consumers would prefer to subscribe to the larger mobile network and not to the smaller rival networks to avoid placing expensive off-net calls. Being a subscriber of a smaller network becomes unappealing as most calls would be off-net to the larger network. This in turn lessens competition, makes the retail market more concentrated, and consequently, would tend to keep the prices higher compared to a situation with no strong club effect.
7. NICTA has found evidence that the high price of prepaid retail mobile voice service in PNG is to a large extent the result of a high market concentration.
8. NICTA is satisfied, that the proposed declaration in Appendix A, meets all of the Declaration Criteria in accordance with Section 128 of the Act.

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<sup>1</sup> This is the tendency of consumers to subscribe to the same mobile network as their family, friends, and associates to avoid placing costly off-net calls. When there is significant difference in the size of the rival mobile networks, as is the case in PNG, in conjunction with a high price difference between the retail mobile on-net and off-net calls, the club effect can be very strong.

9. In particular, NICTA is satisfied that the proposed declaration would meet the Declaration Criteria under Section 128 (a) by furthering the achievement of the objective of Part VI of the Act, as set out in Section 124:

*“(1) The objective of this Part and Part VII of this Act is to -*

*(a) promote effective competition in markets for ICT services in Papua New Guinea, to be known as the “competition objective”, subject to –*

*(b) promoting the economically efficient use of, and the economically efficient investment in, the facilities by which ICT services may be supplied, to be known as the “efficiency objective”.*

*(2) In determining the extent to which a particular thing is likely to further the achievement of the efficiency objective, regard shall be had (without limitation) to all of the following matters –*

*(a) whether it is technically feasible for the relevant ICT services to be supplied, having regard to –*

*(i) the technology available or likely to become available; and*

*(ii) the reasonableness of the costs involved; and*

*(iii) the effect of supplying the ICT services on the integrity, operation or performance of other ICT services or facilities; and*

*(b) the legitimate commercial interests of the access provider in supplying the ICT services, including the ability of the access provider to exploit economies of scale and scope; and*

*(c) the incentives for investment in the facilities by which the ICT services may be supplied, including the risks involved in making the investment.”*

10. NICTA is also satisfied that the proposed declaration meets the Declaration Criteria under Sections 128 (b) and (c):

*“(b) specifically, in relation to the competition objective, that --*

*(i) access or increase access to the wholesale service (as a consequence of declaration) is necessary for the promotion of effective competition in at least one market other than the market for the wholesale service; and*

*(ii) the wholesale service is supplied in whole or in part via a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply that wholesale service; and*

*(c) specifically, in relation to the efficiency objective, that --*

*(i) declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied; and*

*(ii) access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124(2)(a); and*

*(iii) in the case of wholesale services that are facilities access services, increased access to the wholesale service would avoid inefficient replication of underlying facilities that may be efficiently shared.”*

11. Accordingly, NICTA recommends to the Minister that the domestic mobile termination access service and the domestic fixed termination access service be declared.



## 1. Background

12. Sections 127(1) and 127(2) of the National Information and Communications Technology Act 2009 (the “Act”) give powers to the National Information and Communications Technology Authority (“NICTA”) to hold a public inquiry on its own initiative, on whether a recommendation should be made to the Minister that a wholesale service should be declared including recommendations on appropriate terms for such declaration.
13. In accordance with Sections 127 and 230 of the Act, on 21 October 2022 NICTA commenced a public inquiry into a potential declaration of Domestic Mobile and Fixed Termination Access Services (the “Public Inquiry”) by publishing a Discussion Paper entitled “Public inquiry into a potential declaration of Domestic Mobile and Fixed Termination Access Services” (the “Discussion Paper”), in accordance with Section 232 of the Act.
14. In its Discussion Paper, NICTA concluded that a declaration of wholesale Domestic Mobile Termination Access Service (DMTAS) and Domestic Fixed Termination Access Service (DFTAS) is warranted because,
- (a) each operator has a monopoly in the provision of DMTAS and DFTAs on its own network, which in conjunction with the calling network party pay (CNPP) system in use, does not adequately restrain the pricing power of access providers; and
  - (b) to ensure that access to these wholesale services cannot be denied or unduly delayed; and
  - (c) to ensure that these services are provided at cost-based prices; and
  - (d) to regulate the price of DMTAS and DFTAS that contribute to the existing large price difference between off-net and on-net calls, and in consequence, minimize the so-called “club effect”<sup>2</sup> that lessens competition on downstream mobile retail markets; and
  - (e) because the proposed declaration satisfies the Declaration Criteria in Section 128 of the Act, namely:
    - “(a) that declaration of the wholesale service will further the achievement of the objective of this Part as set out in Section 124; and*
    - (b) specifically, in relation to the competition objective, that –*
      - (i) access or increase access to the wholesale service (as a consequence of declaration) is necessary for the promotion of*

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<sup>2</sup> The club effect is the tendency of consumers to subscribe to the same mobile network as their family, friends and associates to avoid placing costly off-net calls. When there is a significant difference in the size of the rival mobile networks, and a significant difference between the price of off-net and on-net calls, as in PNG, the club effect can be very strong. Because off-net calls have a higher price than on-net calls, and most calls would be off-net if one subscribes to a smaller network, consumers will prefer subscribing to the larger network. This in turn would lessen competition and lead to a higher market concentration and higher retail prices.

*effective competition in at least one market other than the market for the wholesale service; and*

*(ii) the wholesale service is supplied in whole or in part via a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply that wholesale service; and*

*(c ) specifically, in relation to the efficiency objective, that –*

*(i) declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied; and*

*(ii) access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124(2)(a); and*

*(iii) in the case of wholesale services that are facilities access services, increased access to the wholesale service would avoid inefficient replication of underlying facilities that may be efficiently shared.”*

15. Following the publication of the Discussion Paper, NICTA received comments from the following interested parties:
  - a) Digicel (PNG) Limited, dated 30 November 2022;
  - b) Digitec Communications Limited trading as Vodafone PNG, dated 30 November 2022; and
  - c) Telikom Limited, dated 30 November 2022.
16. Comments received from Digitec Communications Limited trading as Vodafone PNG (“Digitec-Vodafone”) and Telikom Limited (“Telikom”) were supportive of the proposed declaration. However, Digicel (PNG) Limited (“Digicel”) opposed such declaration, providing extensive comments about the reasons for their opposition.
17. Subsequently, NICTA provided an additional opportunity for interested parties to comment on the submission of the other parties. Digicel submitted comments responding to Digitec-Vodafone and Telikom submissions, dated 1 February 2023. No other interested party submitted further comments.
18. On 11 October 2023, NICTA issued its “Response to Comments Report: In Reference to: Discussion Paper: Public Inquiry into the potential declaration of Domestic Mobile and Fixed Termination Access Services”. In said report NICTA addressed the comments received by each interested party. In particular, NICTA expanded its analysis and provided extensive explanations with new data to address Digicel’s concerns and comments, including how the proposed declaration would satisfy the Declaration Criteria in accordance with Section 128 of the Act.



## **2. Objective of the Declaration of Domestic Mobile and Fixed Termination Access Services**

19. The specific objective of the proposed declaration is to declare the subject wholesale services so that the declared service would be within the purview of NICTA as the regulator to, where necessary, review and ensure that the prices of DMTAS and DFTAS better reflect the actual costs of providing those services, in accordance with Sections 134 and 135 of the Act. More broadly, it seeks to ensure that the declared wholesale services are supplied in accordance with the provision in Part VI of the Act.

## **3. Reasons for NICTA's Intervention**

### **3.1 The current arrangement for setting the prices for DMTAS and DFTAS does not adequately constrain providers to set cost-based prices**

20. The wholesale markets for the supply of DMTAS and DFTAS are not competitive. Each operator has a monopoly on call termination on its own network. This creates a situation in which each operator has substantial market power (SMP) on call termination on its own network. This, along with the system of Calling Network Party Pays which is used in PNG, does not provide adequate constrain on each operator's pricing.

21. The lack of adequate market constraints on pricing and the fact that prices for the DMTAS and DFTAS are set based on commercial negotiations, has led to a situation where those prices are significantly higher than in other countries that regulate these based on cost-based principles.

### **3.2 The prices of DMTAs and DFTAS are significantly above cost-based prices**

22. NICTA undertook an international benchmark analysis using a sample of countries that imposed cost-based pricing regulation on the supply of DMTAS and DFTAS. NICTA's analysis shows that the prices in PNG are several multiples of those in the benchmarked countries.<sup>3</sup> For example, the price of DMTAS in PNG is nearly four times higher than the median value for the benchmarked countries, while the price of DFTAS is more than 10 times the median value in the benchmarked countries (see Tables 1 and 2).

23. While Digicel provided data on the price of DMTAS from two countries (New Zealand and Fiji), showing their prices to be similar or lower than in PNG, neither of those countries developed a cost model to set their prices and relied on alternative methodologies. NICTA does not regard those prices as cost-based prices subject to undertaking its own cost modelling.

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<sup>3</sup> The selection criteria for the benchmark countries include (i) being a middle-income country as classified by the World Bank; (ii) having developed a cost model to set the prices based on cost (typically a long-run incremental cost model); and (iii) the prices being current as of 31 December of 2022.

24. NICTA does not intend to assert or imply, that the median value of the prices of DMTAS and DFTAS shown in Tables 1 and 2, should be used in PNG or should be regarded as a target price to be used in PNG. Rather, we used the median value to compare it with the corresponding price in PNG to note that the difference is so large, that it strongly suggests that the prices in PNG must be significantly above cost-based prices.

**Table 1. DMTAS rates in sample of countries that undertook cost modelling**

Country	DMTAS country currency per minute	Currency	Exch. rate	DMTAS cents of USD per minute
Jamaica	0.6900	Jamaican Dollar	151.01	0.457
Peru	0.0013	USD	1	0.129
Dominica	1.9300	Cents of Eastern Carib Dollars	2.7	0.715
Grenada	1.8300	Cents of Eastern Carib Dollars	2.7	0.678
St. Lucia	1.4000	Cents of Eastern Carib Dollars	2.7	0.519
St. Vincent and the Grenadines	2.3600	Cents of Eastern Carib Dollars	2.7	0.874
Nigeria	3.9000	Naira	447.275	0.872
Tanzania	2.0000	Tanzanian Shillings	2324.75	0.086
Median of cost modelled rates				0.598
PNG	8	PNG toea	3.4375	2.327

Source: NICTA and each country's regulatory or competition authority. Source of exchange rate is the International Monetary Fund's International Financial Statistics, monthly exchange rate. Exchange rate values are for December of 2022.

**Table 2. DFTAS rates in sample of countries that undertook cost modelling**

Country	DFTAS country currency per minute	Currency	Exch. rate	DFTAS cents of USD per minute
Jamaica	6.72	cents of JMD	151.01	0.045
Dominica	1.04	Cents of Eastern Carib Dollars	2.7	0.385
Grenada	0.6	Cents of Eastern Carib Dollars	2.7	0.222

St. Lucia	0.53	Cents of Eastern Carib Dollars	2.7	0.196
St. Vincent and the Grenadines	0.83	Cents of Eastern Carib Dollars	2.7	0.307
Nigeria	3.9000	Naira	447.275	0.872
Tanzania	2.0000	Tanzanian Shillings	2324.75	0.086
Median of cost modelled rates				0.222
PNG	8	PNG toea	3.4375	2.327

Source: NICTA and each country's regulatory or competition authority. Source of exchange rate is the International Monetary Fund's International Financial Statistics, monthly exchange rate. Exchange rate values are for December of 2022.

### 3.3 The high prices of DMTAS and DFTAS contribute to lessening competition in the retail mobile voice service market

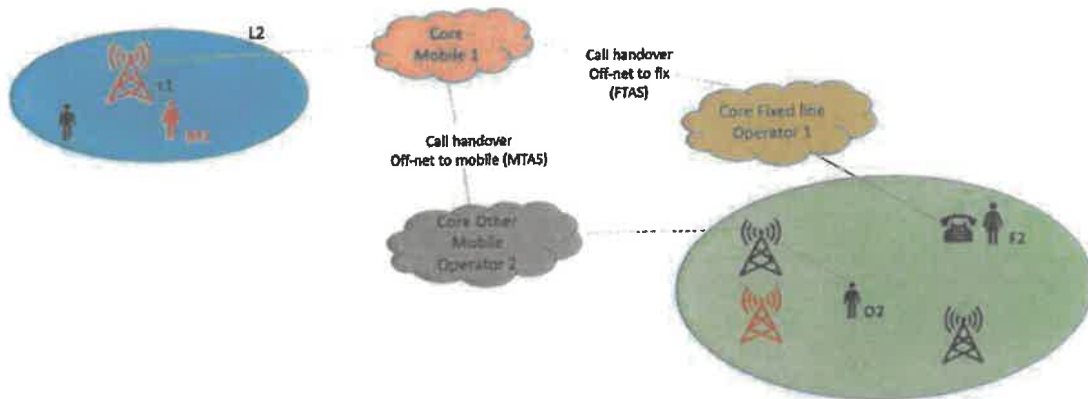
3.3.1 The prices of DMTAS and DFTAS are a component of the cost of providing retail mobile voice service

25. Figure 1 is used to show that the DMTAS and DFTAS prices are components of the cost of a retail mobile off-net call. The figure depicts two mobile networks and one fixed line operator. A mobile network is represented with orange coloured cell sites and a customer marked M1. A second mobile network is represented with black coloured cell sites and a customer labelled O2. Finally, a fixed network is represented with a black coloured phone and a customer labelled F2.
26. There are two localities represented by blue and green oval shapes. Customer M1 of the orange mobile operator is in Blue Town. Customers O2 of the black mobile operator, and F2 of the fixed line operator are in Green City.

**Figure 1. Cost of off-net calls**

Illustration: Cost of a mobile off-net calls

Cost Off-net call M1 to O2 = Cost (L1+L2) + MTAS  
 Cost Off-net call M1 to F2 = Cost (L1+L2) + FTAS



27. Figure 1 illustrates with dotted lines the signal paths of an off-net call from customer M1 in Blue Town to customer O2 in Green City. Different segments of the signal path are marked as L1 and L2, and each segment has an associated cost such as, Cost (L1) or Cost (L2). Note that Cost (L1) plus Cost (L2) is equal to Cost (L1 + L2). Importantly, when operators interconnect to deliver an off-net call, the originating operator is charged a termination rate (DMTAS or DFTAS) by the terminating operator.

28. From Figure 1, an off-net call from customer M1 to customer O2 has a cost to the Orange Operator of:

$$\text{Cost off - net} = \text{Cost (L1 + L2)} + \text{DMTAS}$$

29. Similarly, an off-net call from customer M1 to customer F2 has a cost of:

$$\text{Cost off - net} = \text{Cost (L1 + L2)} + \text{DFTAS}$$

30. It is clear from the foregoing analysis that a reduction in the DMTAS and DFTAS charges due to the proposed declaration would reduce the cost of off-net calls and in consequence the price of off-net calls to consumers. To the extent that the average price of mobile voice service is a weighted average price of off-net and on-net calls, the proposed declaration would effectively lower the average price of mobile voice service moving prices closer to the competitive level.

### 3.3.2 A high price for DMTAS and DFTAS makes the club effect stronger and lessens competition in the mobile retail voice market

31. The high price for DMTAS and DFTAS contributes to lessening competition in the downstream retail mobile voice services market for two reasons. First, it raises the price of off-net calls over on-net calls. To the extent that the average price of mobile voice service is the weighted average of the price of off-net and on-net calls, it raises the average price of mobile voice service to all consumers.

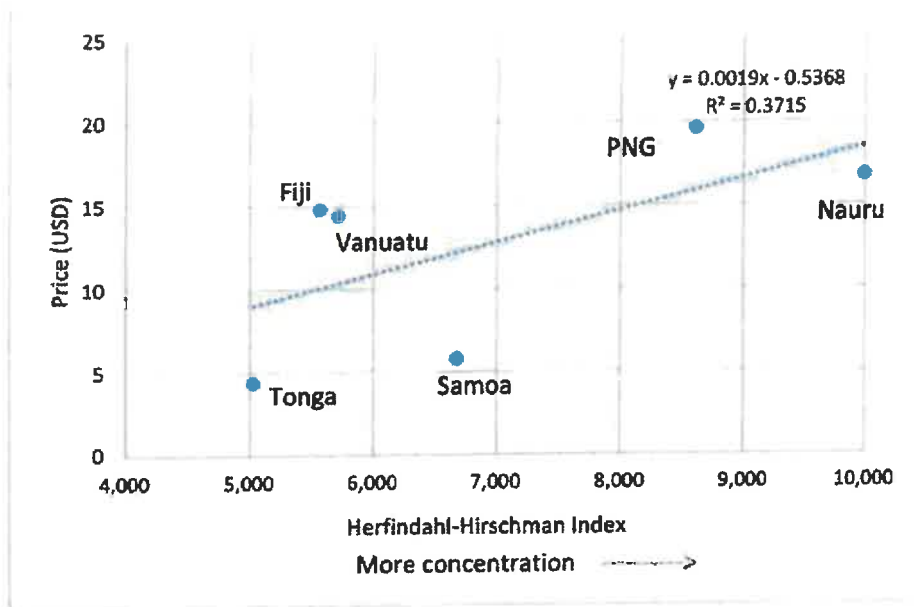
32. Second, a large price difference between off-net and on-net calls creates, or exacerbates, the so-called “club effect.” This is the tendency of consumers to subscribe to the same mobile network as their family, friends, and associates to avoid placing costly off-net calls. When there is significant difference in the size of the rival mobile networks, as is the case in PNG, in conjunction with a high price difference between the retail mobile on-net and off-net calls, the club effect can be very strong.
33. A high price of DMTAS (or DFTAS) increases the price difference between off-net and on-net calls. This, in turn makes the club effect stronger and creates a vicious circle in which consumers would prefer to subscribe to the larger mobile network and not to the smaller rival networks to avoid placing expensive off-net calls. Being a subscriber of a smaller network becomes unappealing as most calls would be off-net to the larger network. This in turn makes the retail market more concentrated, and consequently, would tend to keep the prices higher compared to a situation with no strong club effect.<sup>4</sup>
34. The link between a high market concentration and high prices is a well-established economic fact in markets such as mobile communications, which exhibit high barriers to entry and expansion. The economic theory behind it, is the so-called Cournot model of oligopolistic competition.<sup>5</sup> This model shows that as the number of firms in the market increases (and the market concentration falls), the price falls towards the competitive level. The reason for the fall on price is that as more firms enter the market, each individual firm faces a reduced demand, which forces the firms to reduce the markup above cost, making prices trend towards the competitive level. Of course, the highest markup above cost is attained when there is only one firm (monopoly). The high market concentration in PNG with Digicel holding 95.1% by revenue (or 92.1% using 2019 values) is close to a monopoly, suggesting that prices in PNG must be substantially above the competitive level.

**Figure 2. Higher market concentration leads to higher prices of mobile voice/SMS**

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<sup>4</sup> NICTA is undertaking a separate public inquiry aimed at issuing a Retail Service Determination to cap the maximum price difference between mobile off-net and on-net calls to the price of MNTAs or DFTAS. This proposed declaration deals only with the DMTAS and DFTAS.

<sup>5</sup> W. Kip Viscusi; John M. Vernon; and Joseph E. Harrington, Jr. *Economics of Regulation and Antitrust*. Third Edition, 2000. Cambridge, MA: The MIT Press. Pages 107-108, 149.



Source: Data of prices is from ITU. ICT Price Baskets (IPB). Price is in US Dollars for basket of 70 minutes and 20 SMS in year 2021. <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx> HHI calculated based on Digicel market share data from 2015, except for PNG which is based on 2019 data. Securities and Exchange Commission. Form F-1 Registration Statement. Digicel Group Limited, 26 June 2015, page 11. [https://www.sec.gov/Archives/edgar/data/1645826/000119312515236163/d946689df1.htm#rom946689\\_5](https://www.sec.gov/Archives/edgar/data/1645826/000119312515236163/d946689df1.htm#rom946689_5)

35. The general prediction of the Cournot model is that higher prices (and a higher markup above cost) are found in markets that are more concentrated. We can use the Herfindahl-Hirschman index to illustrate that. Figure 2 uses data on prices of mobile voice/SMS service from the International Telecommunications Union (ITU)<sup>6</sup> on a sample of countries in the Pacific region. The HHI is computed based on market share data from Digicel.<sup>7</sup> Market share data is from 2015,<sup>8</sup> but market shares are generally quite stable unless there are major changes in the market structure. We did not find evidence of major changes in the market structure in these countries to lead us to believe that market shares had changed significantly. Figure 2 shows that more concentrated markets such as in PNG, (denoted by a higher HHI), tend to have higher prices. This of course is strong evidence that the mobile prepaid voice market in PNG is not effectively competitive, and the high prices of DMTAS and DFTAS are a contributing factor to that outcome.

<sup>6</sup> International Telecommunications Union, ICT Price Baskets (IPB) for 2021. Price is for low consumption basket of 70 minutes and 20 SMS. Price is in USD. <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx>

<sup>7</sup> Securities and Exchange Commission. Form F-1 Registration Statement. Digicel Group Limited, 26 June 2015, page 11. Except for PNG which source is NICTA using latest data available.

[https://www.sec.gov/Archives/edgar/data/1645826/000119312515236163/d946689df1.htm#rom946689\\_5](https://www.sec.gov/Archives/edgar/data/1645826/000119312515236163/d946689df1.htm#rom946689_5)  
<sup>8</sup> Except PNG which data is from 2019.

## **4. The Proposed Declaration Meets all the Declaration Criteria in Section 128 of the Act**

### **4.1 The proposed declaration meets the Declaration Criteria in accordance with Section 128 (a)**

36. The proposed declaration would meet the Declaration Criteria under Section 128 (a) by furthering the achievement of the objective of Part VI of the Act, as set out in Section 124:

*“(1) The objective of this Part and Part VII of this Act is to -*

*(a) promote effective competition in markets for ICT services in Papua New Guinea, to be known as the “competition objective”, subject to –*

*(b) promoting the economically efficient use of, and the economically efficient investment in, the facilities by which ICT services may be supplied, to be known as the “efficiency objective”*

*(2) In determining the extent to which a particular thing is likely to further the achievement of the efficiency objective, regard shall be had (without limitation) to all of the following matters –*

*(a) whether it is technically feasible for the relevant ICT services to be supplied, having regard to –*

*(i) the technology available or likely to become available; and*

*(ii) the reasonableness of the costs involved; and*

*(iii) the effect of supplying the ICT services on the integrity, operation or performance of other ICT services or facilities; and*

*(b) the legitimate commercial interests of the access provider in supplying the ICT services, including the ability of the access provider to exploit economies of scale and scope; and*

*( c ) the incentives for investment in the facilities by which the ICT services may be supplied, including the risks involved in making the investment.”*

37. Below NICTA explains how the proposed declaration would meet the Declaration Criteria under Section 128 (a) of the Act.

#### **4.1.1. The proposed declaration will further the competition objective in accordance with Section 124 (1) (a) of the Act**

38. By lowering the prices of DMTAS and DFTAS to cost-based prices according to Sections 134 and 135 of the Act, the declaration would promote effective competition in the retail market for mobile voice services.
39. As explained earlier, A high price of DMTAS (or DFTAS) increases the price difference between retail mobile off-net and on-net calls. This, in turn makes the club effect stronger and creates a vicious circle in which consumers would prefer to subscribe to

the larger mobile network and not to the smaller rival networks to avoid placing expensive off-net calls. Being a subscriber of a smaller network becomes unappealing as most calls would be off-net, to the larger network. This in turn lessens competition in the retail market, makes it more concentrated, and consequently, tend to keep the prices higher than otherwise.

40. By enabling a reduction in the prices of DMTAS and DFTAS, the proposed declaration would reduce the cost of off-net calls and in consequence the price of off-net calls to consumers. Given that the average price of mobile voice service is a weighted average price of off-net and on-net calls, the proposed declaration would effectively lower the average price of mobile voice service moving prices closer to the competitive level.
41. Equally important, the proposed declaration would reduce the price difference between off-net and on-net calls, weakening the currently strong club effect that exists in PNG, and promoting effective competition in the retail mobile voice market.<sup>9</sup>

4.1.2. The proposed declaration will further the efficiency objective in accordance with Sections 124 (1) (b) and 124 (2) of the Act

*It is technically feasible to supply the relevant ICT services*

42. The proposed declaration will considerably further the achievement of the efficiency objective, because it is technically feasible for the relevant wholesale services to be supplied (they are being supplied already), and will not impose any significant additional costs to the supplier, or will not have any detrimental effect on the integrity, operation, or performance of other ICT services or facilities.

*It will further the ability of access providers to exploit economies of scale and scope*

43. The proposed declaration will also further the efficiency objective by enhancing the access providers' ability to exploit economies of scale, and scope. By enabling a reduction in the price of off-net calls, the proposed declaration will make it more appealing for consumers to subscribe to the smaller mobile networks due to most calls being off-net for these consumers, and therefore, increase competition in the market for mobile services. The increase in subscribership and off-net voice minutes would prompt specially, but not exclusively, the smaller networks to increase investment on network expansion, enabling them to exploit economies of scale.
44. To the extent that mobile voice service is often supplied bundled with SMS and data, the proposed declaration will also enable the access providers to further exploit economies of scope.

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<sup>9</sup> As mentioned earlier, NICTA is undertaking a separate public inquiry aimed at issuing a Retail Service Determination to cap the maximum price difference between mobile off-net and on-net calls to the price of MNTAs or DFTAS. This proposed declaration deals only with the DMTAS and DFTAS.



*It will further the incentive for investment in facilities by which the ICT services are supplied*

45. The proposed declaration will also further the efficiency objective by increasing the access providers' incentive for investing in network expansion as a result of increased competition in the retail mobile market.
46. Increased competition would lead to lower prices for mobile voice and bundled services. This in turn would lead to increased consumption, all of which would induce increased investment, especially in underserved areas in PNG.

#### **4.2 The proposed declaration meets the Declaration Criteria in accordance with Section 128 (b)**

47. The proposed declaration meets the Declaration Criteria under Section 128(b) of the Act; specifically in relation to the competition objective that,

*“(i) access or increase access to the wholesale service (as a consequence of declaration) is necessary for the promotion of effective competition in at least one market other than the market for the wholesale service; and*

*(ii) the wholesale service is supplied in whole or in part via a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply that wholesale service;”.*

4.2.1 The proposed declaration is necessary to increase access to DMTAS and DFTAS which in turn would promote effective competition in the retail markets within which the national mobile voice call service is supplied

48. Below we explain in detail the reasons why the proposed declaration is necessary to promote effective competition in the markets within which the national mobile voice call service is supplied.

*Setting the DMTAS and DFTAS charges based on voluntary negotiations between the parties has produced prices significantly higher than cost-based prices*

49. The current system for setting the rates for terminating voice calls on each operator's network has relied on commercial negotiations. Although, the prices of DMTAS and DFTAS have been declining over the past decade, it has nonetheless, resulted in prices that are significantly above costs. They have remained static in recent years, despite reducing unit costs. This is evident from NICTA's international benchmark analysis presented earlier in Tables 1 and 2.

50. NICTA's international benchmark analysis used a sample of middle-income countries, according to the World Bank classification. We also applied two other selection criteria. One is to use only data from countries that have undertaken a cost modelling exercise. That is because those prices would more closely resemble cost-based prices in accordance with the meaning in the General Pricing Principles under Section 134(2) of the Act. A second selection criterion was that the termination prices needed to be current as of 31 December 2022.

51. As indicated earlier, the median value of the per minute DMTAS price of the benchmarked countries is USD 0.598 cents per minute. By comparison, the DMTAS charge in PNG is equivalent to USD 2.327 cents per minute, or nearly four times more.
52. Similarly, NICTA's benchmark analysis for the DFTAS found that the median value of the DFTAS in the benchmarked countries is much lower than that in PNG. In this case the difference is more striking with the value in PNG being more than 10 times the median value of the benchmarked countries.
53. These results are not surprising, and strongly support what has been known from the international experience; that is, if the price of call termination is left to be determined by commercial negotiations between operators, the result would be a much higher price than cost-based prices. In words of a 2018 evaluation of the European Commission:

*"termination markets are structural monopolies where competitive conditions are not prone to change due to the calling party pays principle (CPP), according to which terminating operators have not sufficient incentives to negotiate efficient termination rates...(...)...the terminating operator is not constrained by the receiver of the call to set lower termination charges. By subscribing to an operator's network, the subscriber grants monopoly power to its operator on all parties requesting termination in that operator's network."*<sup>10</sup>

*Lowering the charges for DMTAS and DFTAS would lower the price of retail voice call service*

54. The proposed declaration would enable a steep reduction in the per minute charge for DMTAS and DFTAS. Given that these charges are part of the cost of providing retail mobile voice call service, as shown in paragraphs 25 through 30, a reduction on the DMTAS and DFTAS charges would lower the price of mobile voice call service and enable it to move closer to the competitive level.<sup>11</sup>
55. NICTA demonstrates below that the retail markets within which the national mobile call service is supplied are not effectively competitive, and that the proposed declaration is needed to promote effective competition in those markets. For a detailed explanation of the definition of the relevant retail markets see Appendix B.

*Neither the retail market for prepaid mobile national voice only service, nor the market for prepaid mobile bundled service, are effectively competitive*

56. Neither the market for prepaid mobile voice only service, nor the market for prepaid mobile bundled services are effectively competitive. There are few reasons for this.
57. First, the market is highly concentrated with one firm (Digicel) holding almost a monopoly position. The latest available data indicates that Digicel's market share

<sup>10</sup> European Commission. "Commission Staff Working Document. Evaluation Report on the Commission's 2009 Recommendation on Termination Rates (Recommendation 2009/396/EC)". Brussels 12 November 2018. pp.4.

<sup>11</sup> European Commission. "Commission Staff Working Document. Evaluation Report on the Commission's 2009 Recommendation on Termination Rates (Recommendation 2009/396/EC)". Brussels 12 November 2018, pp. 18-21.

based on revenue of prepaid national mobile voice service stand at approximately 95.1% (and 92.1% using 2019 data). Once revenue from SMS and data services are added, Digicel's market share is calculated at 92% (and 93.7% using 2019 data). See Table 3. Given Digicel long-term stable market share in the mobile markets,<sup>12</sup> it is safe to presume that its current market share is within a reasonable margin of error from those numbers notwithstanding the entry of Digitec Communications (trading as Vodafone) in April of 2022.

58. The high market share of Digicel translates into a very high market concentration as measured by the Herfindahl-Hirschman Index (HHI),<sup>13</sup> a commonly used index to measure market concentration. NICTA calculates an HHI of 8,613 for the market for prepaid mobile national voice only service. Such a high market concentration strongly suggests that the market is not effectively competitive. As a reference, the U.S. Department of Justice and the Federal Trade Commission, consider a market with an HHI above 2,500 to be "highly concentrated", and a threshold that "potentially raise significant competitive concerns" when analysing mergers.<sup>14</sup>

**Table 3. Market share by revenue - Prepaid mobile services<sup>15</sup>**

<b>Market Share by Revenue - National Prepaid Mobile Voice</b>			
	<b>2018</b>	<b>2019</b>	<b>2022</b>
Digicel	93.2%	92.1%	95.1%
Digitec-Vodafone	n.a.	n.a.	0.2%
Telikom-Bmobile	n.a.	n.a.	4.7%
Bmobile	6.0%	7.4%	n.a.
Telikom	0.8%	0.4%	n.a.
<b>Market Share by Revenue - National Prepaid Mobile Voice/SMS</b>			
	<b>2018</b>	<b>2019</b>	<b>2022</b>
Digicel	93.9%	92.5%	95.6%
Digitec-Vodafone	n.a.	n.a.	0.2%
Telikom-Bmobile	n.a.	n.a.	4.2%
Bmobile	5.4%	7.1%	n.a.
Telikom	0.7%	0.4%	n.a.
<b>Market Share by Revenue - National Prepaid Mobile Voice/SMS and data service</b>			
	<b>2018</b>	<b>2019</b>	<b>2022</b>
Digicel	95.8%	93.7%	92%
Digitec-Vodafone	n.a.	n.a.	2%
Telikom-Bmobile	n.a.	n.a.	6%

<sup>12</sup> For example, Digicel market share on the national (prepaid and postpaid) mobile voice market by revenue was estimated to be above 95% in 2016. It is important to cite what NICTA observed at the time: "Digicel's market shares have remained very high over the last five years despite renewed efforts by bmobile and Telikom to improve their competitiveness." See "Public Inquiry into a potential Retail Service Determination regarding certain mobile telephony services supplied by Digicel. Discussion Paper." 20th November 2017, paragraph 3.2.7 and Figure 4.

<sup>13</sup> The HHI is calculated by adding the square of the market share of each company in the market. So, if there are three companies with market shares, s1, s2 and s3; then the HHI is calculated as: (s1)<sup>2</sup>+(s2)<sup>2</sup>+(s3)<sup>2</sup>.

<sup>14</sup> U.S. Department of Justice and Federal Trade Commission. "Horizontal Merger Guidelines". Issued August 19, 2010. Page 19.

<sup>15</sup> Telikom figures are estimated.

Bmobile	3.2%	5.6%	n.a.
Telikom	1.0%	0.7%	n.a.

Source: NICTA, based on data provided by each operator.

Note: data for Digitec-Vodafone is from April to December of 2022 only.

59. The data provided by the mobile operators in Table 3 was not disaggregated between the voice only service and the voice portion of the bundled services. Nevertheless, any reasonable allocation of revenue between the voice only service and the bundled services<sup>16</sup> between the operators would end with an estimated market shares similar to the values in Table 3.
60. This high market concentration together with high and non-transitory barriers to entry and expansion (see next paragraphs), render the mobile retail prepaid markets not effectively competitive.
61. Second, the existence of high and non-transitory barriers to entry and expansion in the mobile voice market is a contributing factor to make this market not effectively competitive. Barriers to entry prevent or delay entry of companies even when the incumbent companies in the market are earning profits.
62. Barriers to entry can be structural or legal/regulatory barriers. Both types of barriers exist in PNG. Structural barriers are present when:
- “given the level of demand, the state of the technology and the resulting cost structure are such that they create asymmetric conditions between incumbents and new entrants and impede or prevent market entry of the latter. For example, high structural barriers are found to exist when the market is characterised by substantial economies of scale, scope and density in combination with high sunk costs”<sup>17</sup>*
63. The supply of mobile voice service has a substantial proportion of fixed costs. That creates economies of scale, where a larger network has a cost advantage (holding all else constant) over smaller networks. That cost advantage deters entry of would be competitors, which precludes the development of effective competition.
64. Similarly, the supply of mobile voice services is characterised by economies of scope, economies of density, and a high proportion of sunk costs. Sunk costs are expenditures that have been made and cannot be recovered, even if a firm go out of business.<sup>18</sup> For example, sunk cost includes expenses that must be undertaken prior to entering the market such as, market studies, and payments to secure radio spectrum assignments and licenses (i.e., start-up costs). It also includes capital investments to roll out a mobile network and expenditure on advertising before and after the launch of service.

<sup>16</sup> One approach for apportioning revenue would be based on each operator’s network coverage by mobile technology: 2G, 3G and 4G, and use that in conjunction with reasonable assumptions about apportioning revenue to the voice only service and the portion of voice in the bundled services.

<sup>17</sup> Stumpf, Ulrich. “Markets Susceptible to ex ante Regulation: Methodology and Commission Recommendation.” *Communications & Strategies*. No. 64, 4<sup>th</sup> Quarter 2006, pp. 41- 60. pp. 51.

<sup>18</sup> Pindyck, Robert S. “Sunk Costs and Real Options in Antitrust Analysis”, In *Issues in Competition Law and Policy* 619 (ABA Section of Antitrust Law 2008). Chapter 26, pp. 621.

65. Sunk costs are different than fixed costs. Fixed costs imply economies of scale, as output increases, the average cost declines. This can create a barrier to entry. However, in general fixed costs are less of a barrier to entry than sunk costs:

*“a fixed cost is a flow of money that does not need to be financed in advance, and that can be terminated if the firm (or plant) shuts down. A sunk cost, on the other hand, is a lump sum payment that must often be made up front before the firm has any significant sales and knows how successful its product will be. Most firms operate in a world of uncertainty, making a lump sum payment riskier than an equivalent (in present value terms) flow of cash that can be terminated should market conditions become unfavourable.”<sup>19</sup>*

66. As the ABA Telecom Antitrust Handbook puts it:

*“Not only are incumbents advantaged by the frequently high capital costs of entering the communications industry. They are also advantaged by the ‘sunk’ nature of these costs to the incumbent.”<sup>20</sup>*

67. In addition to the abovementioned structural barriers to entry, the mobile voice market also exhibits important barriers to expansion. It takes a considerable number of years and billions in capital expenses to roll out a network in PNG. It is costly and time consuming to secure land permits and land leases for cell sites, towers, and masts, plus associated rights of way, when necessary. All of these constitute barriers to expansion of an operator’s network.

68. Moreover, potential entrants face regulatory and legal barrier to entry. These barriers arise from licenses or permits needed to be able to launch a mobile service, and the need to secure rights for the use of radio frequencies, rights to use phone numbers, and negotiate agreements to secure interconnection and access to essential resources for mobile communications, to name a few.

69. The combination of structural and regulatory/legal barriers to entry does not allow the market for mobile voice service to be effectively competitive. Clear evidence of the barriers to entry in PNG is that it took about 15 years for a second private mobile operator to enter the market following Digicel’s entry.

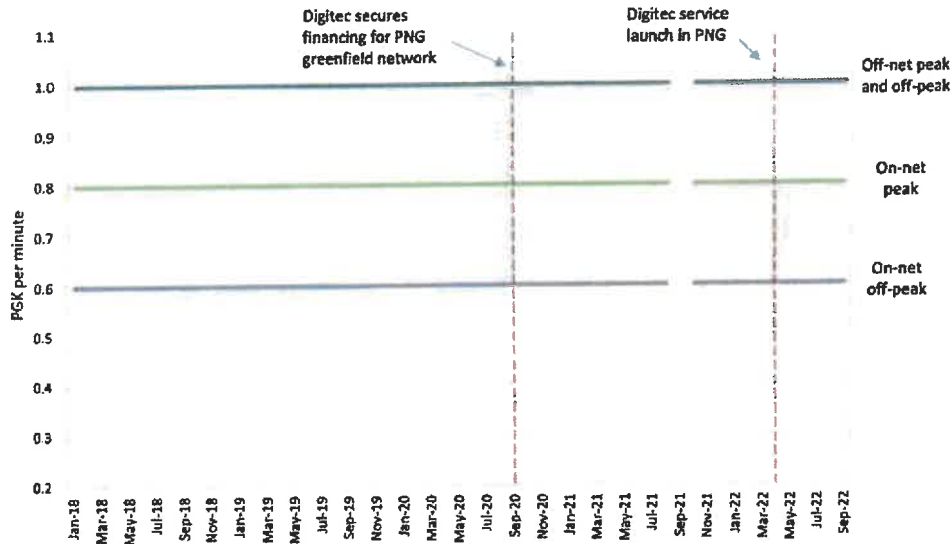
70. Despite the entry of Vodafone-Digitec in April of 2022, the persistent high barriers to entry and expansion described above, does not allow the market for mobile voice service to evolve towards being effectively competitive in the foreseeable future.

71. Third, the price of mobile voice service is significantly above the competitive level. As indicated earlier in paragraphs 34 and 35, there is evidence that the price of mobile voice service in PNG is considerably above the competitive level, when one compares it with prices in other nations in the Pacific (See Figure 2).

**Figure 3. Digicel’s Standard price per minute of on-net and off-net calls (Jan. 2018 – Sep. 2022)**

<sup>19</sup> *Id.*, pp. 622.

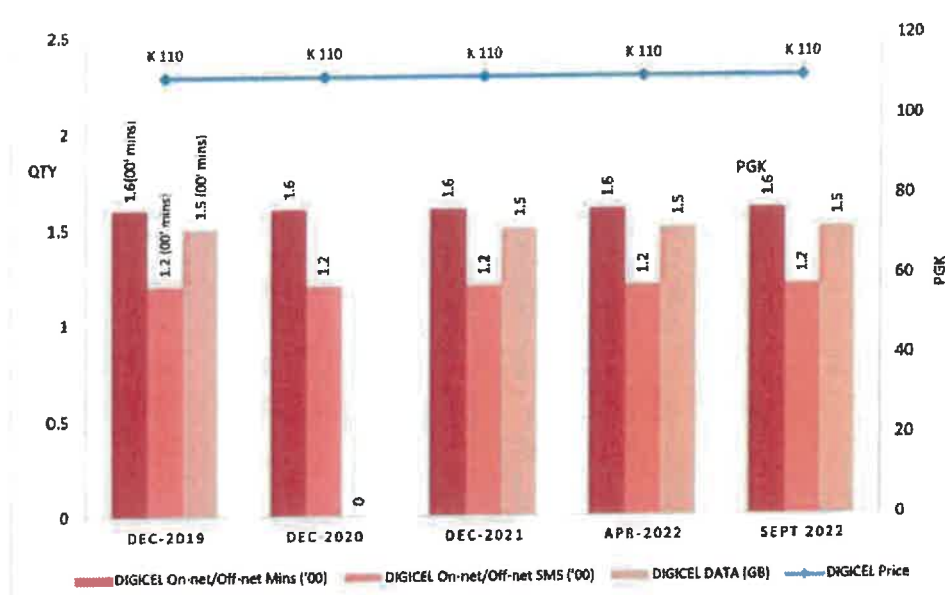
<sup>20</sup> American Bar Association. Telecom Antitrust Handbook. ABA (2005). pp. 97.



Source: NICTA based on information provided by operators. Prices are standard prices reported by Digicel.

72. Fourth, the price of mobile voice service is not trending towards the competitive level. Another strong indicator of the lack of effective competition in a market is when there is little or no observable price competition between rival firms. This is precisely what happens in the market for prepaid mobile national voice service. Consider that the highly anticipated entry of Digitec-Vodafone in April of 2022 didn't trigger a change on Digicel's standard price of on-net or off-net calls as shown in Figure 3. Neither did it trigger changes on the price of Digicel's prepaid bundled services, or the non-price features of these services, as shown in Figure 4. These are strong signs of a lack of effective competition in the two prepaid relevant retail markets.

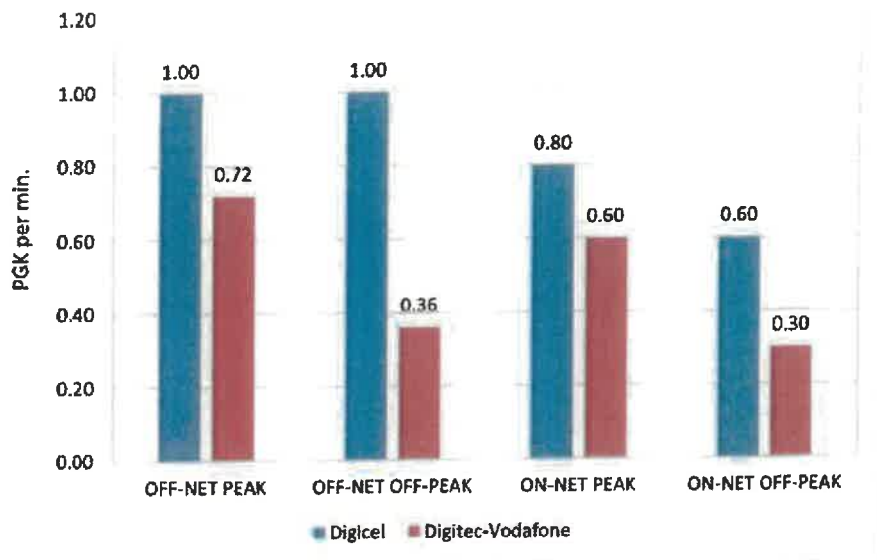
Figure 4. Digicel's price and quantities of minutes, SMS, and GB in a monthly prepaid bundle (Dec. 2019 through Sep. 2022)



Source: NICTA. Based on information from Digicel.

73. Further evidence of the lack of price competition in the market is found when one compares the high prices of Digicel, the dominant operator, and the prices of Digitec-Vodafone which entered in April of 2022. For example, the off-net price per minute of Digicel during peak times is 39% higher than Digitec-Vodafone's. On the other hand, the off-net price of Digicel during off-peak hours is 178% higher than that of Digitec-Vodafone. See Figure 5. Such lack of price competition between supposedly rival firms is another clear sign that the market is not effectively competitive.

**Figure 5. Digicel and Digitec-Vodafone Standard prices per minute of on-net and off-net national voice calls**



Source: NICTA based on information provided by operators. Prices are standard rates for September 2022.

4.2.2 The proposed declaration would meet the Declaration Criteria in accordance with Section 128 (b)(ii) of the Act

74. The DMTAS and DFTAS are supplied via a facility that cannot feasibly be substituted, as a matter of commercial reality, via another facility in order to supply those wholesale services.

75. Each licensed operator that provides national retail voice fixed or mobile service has a monopoly in the supply of call termination (i.e., DMTAS or DFTAS) on its network. That is because, it is not feasible to bypass an operator's network to terminate a call on that operator's network. We quote the European Commission:

*"Call termination can only be provided by the operator of the called party. No other network operator can replicate this service. The barrier to provide termination by any network operator other than that of the called party is unsurmountable."*<sup>21</sup>

4.3 The proposed declaration would meet the efficiency objectives of the Declaration Criteria in accordance with Section 128 (c)

76. NICTA is satisfied that the conditions in Section 128 (c) of the Act are satisfied. In particular, that:

<sup>21</sup> European Commission. "Commission Staff Working Document. Explanatory Note Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code." Brussels 18.12.2020. SWD (2020) 335 final. Page 76. <https://digital-strategy.ec.europa.eu/en/news/commission-updated-recommendation-relevant-markets>



*“(i) declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied; and*

*(ii) access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124(2)(a).”*

77. Below we explain in detail how the proposed declaration would meet these criteria.

4.3.1 The declaration would not materially compromise the incentives for efficient investment in any facility over which the wholesale service may be supplied.

78. The facilities an operator uses to terminate calls originated in other networks (i.e., off-net incoming traffic) are substantially the same as those used by the same operator to terminate calls originated on its own network (i.e., on-net traffic). Therefore, even in the hypothetical case that there was no off-net traffic to terminate on an operator’s network, said operator would still need substantially the same facilities to terminate (and also originate) on-net traffic on its network. In consequence, the incentive to invest in those facilities does not depend on the price of DMTAS or DFTAS, and therefore, would not be adversely affected by the declaration.

79. On the contrary, as explained earlier, by enabling a reduction on the price difference between off-net and on-net calls, the proposed declaration will cause an increase on overall voice traffic (holding all else constant) over the existing facilities, this in turn would translate into an increase in the utilization of current facilities, increasing the economic efficiency of existing facilities. Moreover, increased competition due to a weaker claw back effect, as explained in paragraphs 38 through 41, would provide additional incentives for access providers to increase investments and expand their networks and facilities.

4.3.2 Access or increased access to the wholesale service (as a consequence of declaration) is technically feasible having regard to the specific factors identified in Section 124 (2) (a)

*The availability of the technology to supply the wholesale services*

80. Specifically with respect to whether the technology to supply the wholesale services is available or likely to become available; it is evident that the technology is available.

81. The interconnection facilities already exist, so it is technically feasible to access or increase access to the wholesale services (i.e., DMTAS and DFTAS). The proposed declaration would likely increase the total traffic (off-net plus on-net) on the facilities, holding all else constant. NICTA notes that historically, voice traffic has been growing in PNG, and that the licensed operators have demonstrated to be technically capable of accommodating the increased traffic. Therefore, NICTA concludes that the expected increase in voice traffic because of the proposed declaration, is technically and commercially feasible.

*The reasonableness of the costs involved to supply the wholesale services*

82. No additional costs are expected as a result of the declaration because the existing facilities each operator uses to terminate its own on-net traffic are the same as the facilities used to terminate incoming traffic from other operators.
83. Perhaps one may argue, that as a result of the proposed declaration, overall traffic would likely increase, and that at there could be a marginal increase on capital expenses to accommodate the increase on traffic over existing facilities. However, that would not qualify as a cost, but would be a capital expense or investment.

*The effect of supplying the wholesale services on the integrity, operation or performance of other ICT services or facilities*

84. Finally, with respect to the network integrity, operation, or performance, it is evident from the historical growth on voice traffic in PNG, that any increase on traffic arising from the proposed declaration would be technical feasibility, and would not materially diminish the integrity, operation, or performance of the access providers' networks.

## **5. Conclusion**

85. NICTA considers that regulatory intervention is necessary to address the relatively high prices of domestic mobile and fixed termination access services. This, in turn will promote effective competition in the downstream retail markets within which the mobile voice call service is supplied.
86. For the reasons exposed in this Report and having considered all information and comments of interested parties, NICTA is satisfied that all of the Declaration Criteria would be met by the Minister's making of the proposed declaration of services provided in Annex A.

# Attachment A

## **Annex A: Draft Wholesale Service Declaration No. 1 of 2023**

### *National Information and Communications Technology Act 2009*

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The MINISTER FOR COMMUNICATIONS AND INFORMATION TECHNOLOGY makes this declaration under section 130 of the *National Information and Communications Technology Act 2009*.

Dated [xxx, 2023]

Honorable Timothy Masiu  
Minister for Communications and Information Technology

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### **PART I – PRELIMINARY**

#### **1 Name of Declaration**

This Declaration is *Wholesale Service Declaration No.1 of 2023*.

#### **2 Commencement**

- (1) This Declaration commences 30 calendar days after the date on which it is notified in the National Gazette (*the Commencement Date*).
- (2) This Declaration expires on the day before the fifth anniversary of the Commencement Date unless it is varied or revoked earlier in accordance with section 130 of the Act.

#### **3 Definitions**

- (1) Subject to subsection (2), unless the context otherwise requires, terms used in this Declaration have the same meaning as in the Act.
- (2) In this Declaration, unless the context otherwise requires:

- (a) **Act** means the *National Information and Communications Technology Act, 2009* and includes any regulations made under that Act;
- (b) **call** means a continuous communication;
- (c) **cell** means the geographic area served by a base station;
- (d) **B-party** means a retail customer located in Papua New Guinea to whom a call is made;
- (e) **fixed network** means a network that is not a mobile network;
- (f) **mobile network** means a network that:
- (i) *comprises multiple base stations that transmit and receive radiocommunications to and from apparatus of a B-party located in a Cell associated with each base station; and*
  - (ii) *detects the customer equipment within which the Cell is located and causes the base station in that Cell to transmit and receive Calls to and from that customer equipment; and*
  - (iii) *enables Calls to continue without interruption when such apparatus moves between Cells;*
- (g) **point of interconnection** is a location in Papua New Guinea which is a physical point of demarcation between the access seeker's network and the access provider's network.

NOTE: The following terms are defined in the Act:

- Access Provider
- Access Seeker
- Any-to-Any Connectivity
- Communication
- Facilities
- Facilities Access Service
- Interconnection
- Network
- Network Service
- Retail Customer
- Wholesale Service

## **PART II – MOBILE TERMINATING ACCESS SERVICE**

### **4 Declaration of service**

The mobile terminating access service is hereby declared.

## **5 Service description**

- (1) The mobile terminating access service:
  - (a) is a Network Service for the carriage of any combination of:
    - (i) *voice Communications; and/or*
    - (ii) *short messaging services,*

*from a Point of Interconnection, or potential Point of Interconnection, to any B-party connected to the Access Provider's Mobile Network; and*
  - (b) includes such Facilities Access Services as are necessary to enable the Access Seeker to interconnect its Facilities to the Facilities of the Access Provider at Points of Interconnection to realise Any-to-Any Connectivity; and
  - (c) is a designated interconnection service for the purpose of the Any-to-Any Connectivity obligation.
- (2) For the avoidance of doubt, the mobile terminating access service applies to the termination of Calls and short messaging services on a Mobile Network situated in Papua New Guinea where those communications were originated inside Papua New Guinea.

## **PART III – FIXED TERMINATING ACCESS SERVICE**

### **6 Declaration of service**

The fixed terminating access service is hereby declared.

### **7 Service description**

The fixed terminating access service:

- (a) is a Network Service for the carriage of any combination of voice Communications from a Point of Interconnection, or potential Point of Interconnection, to any B-party connected to the Access Provider's Fixed Network; and
- (b) includes such Facilities Access Services as are necessary to enable the Access Seeker to interconnect its Facilities to the Facilities of the Access Provider at Points of Interconnection to realise Any-to-Any Connectivity; and
- (c) is a designated interconnection service for the purpose of the Any-to-Any Connectivity obligation.

- (2) For the avoidance of doubt, the fixed terminating access service applies to the termination of Calls on a Fixed Networks situated in Papua New Guinea where those communications were originated inside Papua New Guinea.

## **PART IV – General Terms and Condition for the Supply of the Declared Services**

### **8 General Terms and Conditions**

- (1) The price of access to the above mentioned declared services (“Declared Services”) shall be set in accordance with the General Pricing Principles under Section 134 of the Act; and
  - (2) the Declared Services shall be supplied in accordance with the Non-Discrimination Obligations under Section 136 of the Act; and
  - (3) the Access Seeker and the Access Provider of the Declared Services shall comply with the Any-to-Any Connectivity Obligations under Section 137 of the Act.
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# Attachment B



## **Appendix B. Definition of relevant retail markets where the proposed Declaration would promote effective competition**

1. Section 128 (b) (i) of the Act requires NICTA to define at least one market other than market for mobile or fixed termination access services, where the declaration is necessary to promote effective competition. Below we define such market.
2. Although the Act does not require NICTA to define more than one market, NICTA also defines below a second market where the declaration is necessary to promote effective competition.

### **The national retail mobile voice call service**

3. The retail mobile voice call service is sold as either a prepaid or a postpaid service. Prepaid retail mobile voice service is sold typically in bundles. Bundles are sold as a single-service bundle or bundled with other services. Single-service mobile bundles refer to voice only service, Short Messaging Services (SMS) only, or data (i.e., Internet) only service. Operators provide a menu of options for consumers to pick different quantities of minutes, or SMS, or Gigabytes of data. Bundles have a term and maximum quantities to be consumed. Consumption outside the bundle is charged at the standard rates, which are higher than the unit price charged for consumption within a bundle.
4. The national mobile voice service is also provided as part of a multi-service bundle. Multiple-service bundles typically combine voice, SMS, and data services. Bundles come with various combinations of minutes, SMS and Gigabytes with different prices and terms (for example, 1 day, 7 days, and 30 days). Consumption outside the bundle is charged at the standard rates.
5. The national prepaid retail mobile voice service is typically purchased as either a single-service bundle (i.e., voice-only bundle),<sup>22</sup> or bundled together with SMS and data.
6. The national post-paid retail mobile voice service is sold typically bundled with SMS and (mobile) data (Internet) service. The majority of users of the postpaid service are medium/large businesses and organizations including government, and the bundle of services can be customized to the clients' needs with various options of add-on services.

### **Market Definition Methodology**

7. Pursuant to Section 128 (b) (i) of the Act, NICTA is required to define at least one market, other than the market for the wholesale service (i.e., the DMTAS and DFTAS), where increased access to the wholesale service (due to the proposed declaration)

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<sup>22</sup> In general, the voice only service also includes emergency call number, voicemail, and customer services.

would promote effective competition. Therefore, we focus our attention on the national mobile prepaid voice service only.<sup>23</sup>

8. To define the relevant market, NICTA followed the widely accepted methodology known as the Hypothetical Monopolist Test (HMT), also known as the SSNIP test, after its acronym that stands for small but significant non-transitory increase on price.<sup>24</sup>
9. The methodology is based on the notion that a relevant market for a good or service includes all services that are considered to be close substitutes. The focus of the delineation of relevant markets is therefore based on those services that are possible close substitutes from the point of view of the consumer (i.e., demand-side substitution), and those suppliers who produce, or could quickly produce, those services (i.e., supply-side substitution).
10. Once the relevant service market has been defined, one must assess the relevant geographic market. To that end, one must consider the geographic area where the services in the relevant market are demanded and supplied, and assess whether the conditions of competition in a geographic area, are sufficiently similar relative to those in contiguous geographic areas.<sup>25</sup> In practice, regulatory authorities have often defined the relevant geographic market based on the area covered by a network or the area covered by an operator's license.<sup>26</sup>

#### **Relevant Retail Market – Prepaid mobile national voice only service**

11. NICTA used the foregoing methodology to define the relevant market or markets within which the prepaid national mobile voice service is supplied. As mentioned before, the national mobile voice service is typically purchased as either a voice only service (single-service bundle), or as a multiple-service bundle together with SMS, and data service. Importantly, a non-trivial proportion of consumers use simple button phones (also called one-bang) for their voice service needs. Moreover, NICTA estimates that between 25% and 30% of PNG's population is covered only with 2G mobile technology, permitting just voice and SMS services. This has important implications for the definition of market(s) as we explain below.
12. First, NICTA used the prepaid voice only service as the focal service to analyse demand-side substitution with alternative services. An alternative tested was the prepaid mobile bundled services, which includes voice, SMS, and data. NICTA considers the buyers of the voice only service to have typically a lower budget than

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<sup>23</sup> Of course, this doesn't mean that the proposed declaration won't also promote effective competition in the market for postpaid voice service. Whether the service is sold as a prepaid or postpaid service, the proposed declaration would promote competition in both markets.

<sup>24</sup> See for example, European Commission. Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services. (2002|C 165|03). Official Journal of the European Commission. 11.7.2002. Paragraphs 40-43. OECD, Defining the Relevant Market in Telecommunications (2014), pages 10-11. U.S. Department of Justice and the Federal Trade Commission. Horizontal Merger Guidelines. Revised, April 8, 1997, pages 4-7.

<sup>25</sup> European Commission. Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services. (2002|C 165|03). Official Journal of the European Commission. 11.7.2002. Paragraphs 55-56.

<sup>26</sup> *Id.*, paragraph 59.

buyers of the bundled services. A nontrivial proportion of the buyers of the voice only service access that service using low-cost simple button phones (2G/3G phones). In a recent survey conducted by NICTA among 309 phone users in Port Moresby and Mt. Hagen, we found that 45% still use the simple button phones (2G/3G). See Table below.

**Table 4. Smartphone users v. simple 2G/3G phone users**

	No. users	% users
No. smartphone users	170	55%
No. of simple (2G/3G) phone users	139	45%
Total	309	100%

*Source: NICTA's 2022 survey in Port Moresby and Mt. Hagen.*

13. Users of the voice only service typically live in rural or remote areas, have a lower budget or lower income, are generally older, and do not value as much having mobile Internet access. In NICTA's assessment a SSNIP on the voice only service by an hypothetical monopolist would likely be maintained over a period of time, as not enough consumers of the voice only service would switch to buying the bundled services. There are three main reasons for this. First, not enough consumers of the voice only service value mobile Internet service as much as the consumers of the bundled services. Second, switching to buying the bundled services would likely require an increase in expenses due to the bundle containing additional services and access to applications. Third, to take advantage of those additional services and applications, a voice only consumer would need to upgrade his or her phone to a 4G enabled smartphone, which is costly. For those reasons, NICTA's view is that the voice only service is a relevant service market separate from the bundled services which include SMS and data.
14. NICTA notes that over the past few years, increasingly consumers have opted to purchase the bundled services instead of the voice only service. However, this trend does not negate NICTA's view that, holding all else constant, a SSNIP on the voice only service would not prompt enough consumers to switch to buying the bundled services. Buyers of the voice only service have a much lower willingness to pay for the bundled services than buyers of those services. They would find costly to switch to mobile over-the-top (OTT) applications as a substitute, because they would need to upgrade to a more expensive smartphone and a more costly bundle.<sup>27</sup> Moreover, their family and friends with whom they often call would need also a more expensive 4G phone, which makes OTT voice applications not a close substitute for the voice only service customer.
15. Assessing supply-side substitution doesn't change our view of the relevant market as the existing mobile network operators would be the only suppliers able to supply the

<sup>27</sup> Bundled services may provide a lower per minute price than voice only (single-service bundle) service. However, because the bundled services come with other services in addition to voice, the total expenditure of buying bundled services would be higher than buying the voice only service.

voice only service or the bundled services. Therefore, the relevant service market shall be the market for mobile prepaid national voice only service.

16. NICTA considers the geographic market to be the national territory, which is the same geographic area covered by each mobile operator's license. Moreover, the national territory is also the geographic area covered by each operator's radio spectrum assignments which are used to supply the voice only service and the bundled services.
17. While NICTA is not required to identify a second market where the proposed declaration would promote effective competition in accordance with Section 128(b)(i) of the Act, we nevertheless think that it is worth pointing out that there is one more prepaid retail mobile market where the proposed declaration would promote effective competition.<sup>28</sup>

#### **A second retail relevant market**

18. NICTA considers that the bundled services comprising prepaid mobile voice, SMS and data service shall be considered a second relevant market for the following reasons. As mentioned before, consumers are increasingly purchasing the bundled services, rather than the voice only service. This has led to a noticeable segmentation between the consumers of the voice only service and those of the bundled services.
19. In addition to voice and SMS, consumers of the bundled services use the mobile data services to access the Internet, e-mail, OTT applications and social media. These consumers value data services to a much higher degree than the consumers of the voice only service, holding all other factors constant.
20. NICTA used again, the hypothetical monopolist test to assess the degree of demand-side substitution between the bundled services and the voice only service. The focal service is the bundled services, and the alternative is the voice only service. In NICTA's view, an hypothetical monopolist would be able to maintain a SSNIP on the bundled services in the near term without prompting a significant number of consumers to switch to the voice only service. As mentioned before, consumers of the bundled services value having access to all the services in the bundle, plus access to the applications that come with access to the Internet. If they were to consider switching to the voice only service, they would need to purchase each component of the bundle separately, which will be more costly for them.
21. An analysis of the supply-side substitution between the bundled services and the voice only service does not alter our findings for the same reasons explained earlier. The bundled services constitute a separate relevant market.
22. Similar to our earlier analysis of the geographic market, and for the same reasons, NICTA is of the view that the relevant geographic market shall be the national territory of Papua New Guinea.
23. Therefore, a second relevant market has been identified where the prepaid mobile national voice service is supplied bundled with SMS, and data service.

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<sup>28</sup> Of course, this doesn't mean that these are the only markets where the proposed declaration would promote effective competition.

