



**NATIONAL INFORMATION AND COMMUNICATIONS
TECHNOLOGY AUTHORITY**

Public Consultation into the Service-Specific Pricing Principles for Certain Declared Services
– Methodology and Pricing Principles

**RESPONSE TO COMMENTS AND DRAFT PARTIAL
DETERMINATION (METHODOLOGY) ON SERVICE-SPECIFIC
PRICING PRINCIPLES FOR: WHOLESALE SERVICE
DECLARATION No. 1 Of 2025, WHOLESALE SERVICE
DECLARATION No. 2 Of 2025, AND WHOLESALE SERVICE
DECLARATION No. 3 Of 2025**

In Reference to

Consultation Paper: Draft Service-Specific Pricing Principles For: Wholesale Service
Declaration No. 1 Of 2025, Wholesale Service Declaration No. 2 Of 2025, And Wholesale
Service Declaration No. 3 Of 2025

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1. INTRODUCTION

1. On 19 November 2025, following a recommendation by the National Information and Communications Technology Authority (“NICTA”), the Minister adopted the following three wholesale services declarations (the “Three Declarations”) encompassing five services:
 - (a) Declaration No. 1 of 2025 declared the wholesale international dedicated submarine cable capacity service and the international submarine cable facilities access service;
 - (b) Declaration No. 2 of 2025 declared the wholesale long-haul dedicated capacity service and the wholesale local dedicated capacity service; and
 - (c) Declaration No. 3 of 2025 declared the wholesale Internet access service.
2. Section 135 of the National Information and Communications Technology Act 2009 (the “Act”) empowers NICTA to make a determination on the service-specific pricing principles applicable to declared services. In particular, Section 135(2) empowers NICTA to make service-specific pricing principles that:

“may contain price related terms and conditions (whether relating to a price or the method of ascertaining a price) and non-price terms and conditions relating to access to the declared service.”
3. Before NICTA makes, amends, or revokes, any service-specific pricing principles, Section 135 (4) of the Act requires it to:
 - “(a) publish a draft of the relevant determination, amended determination or revocation decision and provide the public with at least four (4) weeks to make submissions to NICTA; and*
 - (b) consider any submission that are received within this time limit.”*
4. Pursuant to Section 229 of the Act, NICTA initiated a public consultation of three service-specific pricing principles covering the Three Declarations.
5. At the same time, NICTA published the public consultation paper entitled: *“DRAFT SERVICE-SPECIFIC PRICING PRINCIPLES FOR: WHOLESAL SERVICE DECLARATION No. 1 OF 2025, WHOLESAL SERVICE DECLARATION No. 2 OF 2025, AND WHOLESAL SERVICE DECLARATION No. 3 OF 2025. Public Consultation into the Service-Specific Pricing Principles for Certain Declared Services – Methodology and Pricing Principles”* (“Public Consultation Paper”). This Public Consultation Paper included in Annex A, three draft partial service-specific pricing principles proposing a methodology and pricing principles covering the Three Declarations.
6. Following the publication of the Public Consultation Paper, NICTA received comments from the following interested parties:
 - Vodafone PNG (“Vodafone”), dated 19th January 2026
 - Digicel (PNG) Limited (“Digicel”), dated 20th February 2026

- Nextgen Technology PNG Limited (" Nextgen Technology") dated 20th February 2026
 - U-Space Communications dated 20th February 2026
 - PNG DataCo Limited ("DataCo"), dated 19th January 2026 and received by NICTA on the 21st of January 2026
7. DataCo submitted a cover letter referencing an accompanying submission that would provide detailed responses to the consultation questions; however, the detailed submission was not provided. As a result, NICTA is unable to respond to DataCo's comments because we did not receive these.
 8. This Response to Comments Report presents the responses to the stakeholders' comments on the Public Consultation Paper and the draft partial Service-Specific Pricing Principles ("SSPPs") covering the Three Declarations. These comments has allowed NICTA to make a better decision on the methodology and principles, to be used for setting price-related terms and conditions for the services in the Three Declarations in the second phase of this public consultation.
 9. With the publication of this Response to Comments Report and the accompanying draft partial determinations in Annex A, the initial phase of this public consultation has concluded. NICTA is including the three draft partial determinations in Annex A to inform interested parties about the methodology NICTA will use to calculate cost-based prices for the services in the Three Declarations. In consequence, NICTA is starting the second and final phase of this public consultation which will involve consultation on the application of the methodology and principles described in Annex A to calculate the costs and determine the prices of the services in the Three Declarations.
 10. For the avoidance of doubt, the second phase of this public consultation will only be concerned with the cost calculations and determination of prices resulting from the application of the methodology and principles described in Annex A of this report and, not with the methodology and principles themselves, which were consulted with interested parties during the initial phase.
 11. Next, this Response to Comments Report presents the comments received from interested parties to the questions posed in the Public Consultation Paper. For each question or group of questions, NICTA addresses the comments received and state NICTA's final determination on the questions posed in the Public Consultation Paper.

2. COMMENTS AND RESPONSES TO COMMENTS – QUESTIONS 1 AND 2

Question 1. Do you agree with NICTA's view that either the cost modelling approach or the benchmarking approach could be consistent with the General Pricing Principles? If so, do you agree with NICTA's preference for using a cost modelling approach? Please explain your answer.

Question 2. Do you agree with NICTA's view that either approach, top-down, bottom-up, or hybrid for cost modelling may be used? Please explain your answer.

2.1 Comments received from interested parties for Questions 1 and 2

12. Question 1: Vodafone expressed its support for the cost-modelling approach proposed by NICTA. Vodafone also stated that the selected cost modelling approach should lead to prices reductions in the domestic and international fibre capacity in 2026. Vodafone stated that any cost reduction at the wholesale level would be passed on to consumers, thereby driving up the adoption of smartphones and internet connectivity in PNG. Vodafone noted that PNG currently has one of the lowest internet penetration rates in the region.
13. Vodafone further stated that sector-wide benefits would result from the reduction in the fibre capacity rates including: Reduced internet or data costs for users, improved rural and remote connectivity through lower retail tariffs that support low-income and previously underserved populations; stimulation of competition as operators redirect savings from wholesale costs into network expansion, quality improvements, and innovative digital services; reduced financial pressure on operators, enabling sustainable capital investments in network upgrades, 4G/5G expansion, and resilience; and, support for national digital transformation objectives by aligning government and industry on affordability and accessibility targets.
14. Question 2: Vodafone proposed a Hybrid approach for cost modelling, stating that this will enable better visibility for NICTA on the specific variables impacting the operational costs of the access provider's network.
15. Vodafone also requested NICTA to review the current market rates for wholesale capacity services in lieu of the expiration of the Reference Interconnect Offer (RIO). Vodafone further indicated that licensed operators are required to submit annual financials to NICTA and impressed that the line rental costs and impact to their respective business may be observed from the financials.
16. Vodafone requested NICTA to review current market rates following the expiry of the current Reference Interconnect Offer (RIO) to determine price ceilings. They emphasized that besides cost modelling and using existing data on hand, NICTA should consider the impact of wholesale costs on licensed operators, as these costs are passed to consumers. Vodafone highlighted a significant need for a more affordable Domestic Dedicated Capacity Service to reach end customers across all provinces, noting that long-haul dedicated capacity costs are currently nearly identical to international submarine cable capacity costs. Vodafone emphasized that in aligning towards an effective Governments Digital Transformation Program, Broadband and Internet accessibility and affordability is only possible if access to infrastructure is made more affordable.
17. Question 1: Digicel agreed that either the cost modelling or benchmarking approach could be consistent with the General Pricing Principles.
18. Digicel considers that in the context of the international submarine cable facilities access service (Declaration No. 1 of 2025) and the wholesale internet access service (Declaration No. 3 of 2025), comparability issues between jurisdictions are less likely

to arise as the provision of these services in PNG in all material aspects to equivalent services provided in other international jurisdictions, are likely similar.

19. Digicel further noted that cost modelling is a lengthy process that may not suit interim determinations under section 146 of the Act; therefore, NICTA should have no a priori preference for cost modelling over international benchmarking and should decide on the approach in the context of a relevant access dispute.
20. Question 2: Digicel shared its view in support of the top down or hybrid modelling approaches to be most likely consistent with the principles.
21. Digicel submitted that the modelling approach must be consistent with Section 134(2) of the Act regarding costs "actually incurred". Digicel argued that, under Section 134(2):

*"efficient costs" include the direct and indirectly attributable capital, operating and maintenance costs **actually incurred by the access provider** in providing the declared service to itself and access seekers (including a reasonable contribution to any common costs), unless NICTA determines that such costs are inefficient having regard to the efficiency objective and any evidence before it" (emphasis added).*
22. They argued the starting point should be the access provider's actual deployed network and operating costs rather than those of a hypothetical operator, favoring top-down or hybrid models to reflect these actualities.
23. Digicel also stated that cost modelling approaches needs to reflect any regulatory obligations imposed on the access providers, citing those of the coverage obligations under the *Standard and Special Conditions of Individual Licences Rule 2025* "(Licences Rule 2025").
24. Question 1: Nextgen Technology expressed support for that both cost modelling and benchmarking may align with the GPPs if applied appropriately. Nextgen Technologies expressed a preference for the cost modelling approach because it more accurately reflects Papua New Guinea's specific local market conditions, geographic realities, and infrastructure limitations. Nextgen Technology suggested that benchmarking should primarily be used only as a validation tool.
25. Question 2: Nextgen Technology agreed that top-down, bottom-up, and hybrid approaches are all acceptable depending on data availability. They recommended a bottom-up approach as primary, hybrid as secondary, and top-down for validation.
26. Question 1: U-Space Communications stated that both approaches can fit within the law. However, they stated that cost modelling is superior because it utilizes PNG's own data and reflects real costs. They noted that benchmarking is only helpful if the countries being compared are similar to PNG.
27. Question 2: U-Space Communications stated that all three approaches can be used, including top-down, bottom-up, and hybrid. They advised that the choice should depend on which fits the data best.

2.2 NICTA's responses to comments received on questions 1 and 2

28. NICTA thanks all interested parties for their thoughtful and thorough comments. We recognize that the submissions provided a comprehensive thought process, considering the holistic nationwide benefits as well as the specific impacts on the declared services and the access provider's operations. The methodological considerations revealed a deep understanding of the cost drivers facing the access provider and the practical effects of applying various regulatory approaches. NICTA values this level of engagement and thanks each party for their detailed contributions.
29. NICTA welcomes the broad consensus from Vodafone, Nextgen, and U-Space Communications supporting the use of cost modelling as the primary regulatory tool. NICTA agrees with Nextgen and U-Space that a PNG-specific cost model is the most robust way to reflect local geographic realities, infrastructure limitations, and "efficient costs" as required by Section 134 of the Act.
30. In response to Digicel's view that benchmarking is more pragmatic for international services, NICTA acknowledges Digicel's concern regarding the time-intensive nature of cost modelling—especially regarding interim determinations under Section 146—but wishes to reiterate that this public consultation was initiated at NICTA's own accord pursuant to Section 135(3). Digicel's reference to Section 146 pertains to determinations arising from an access dispute which is not pertinent to this public consultation.
31. In NICTA's view, both a cost modelling or a benchmarking approach could be regarded as consistent with the General Pricing Principles in the Act. However, provided there is enough data available, NICTA should prefer a cost modelling approach due to its greater ability to incorporate in the model PNG-specific characteristics such as a reference operator's scale, topology, or technologies.
32. Regarding the specific modelling approach, NICTA notes U-Space and Nextgen's support for any model approach, either top-down, bottom-up, or hybrid to be use based on the data availability and suitability. Vodafone supports a hybrid model as it allows for the validation of theoretical model results against the actual operational variables of the access provider.
33. NICTA acknowledges Digicel's position regarding the use of actually incurred costs as per Section 134(2). It may seem that Digicel is advocating the use of historical accounting costs. In NICTA's view, this would be inconsistent with Section 134 (2) of the Act. As NICTA pointed out in paragraphs 54-57 of the Public Consultation Paper, the terms "actual costs" incurred, and "efficient costs" in Section 134 of the Act, refer to *actual economic costs* and *efficient costs*.
34. NICTA further acknowledges Digicel's view regarding the likely consistency of the top-down or the hybrid model approaches with the General Pricing Principles. Regarding the regulatory obligations mentioned by Digicel, NICTA maintains that the cost model would capture the costs associated with meeting existing coverage obligations, if any.

35. NICTA notes Vodafone's observation regarding the high cost of Domestic Dedicated Capacity Service relative to international capacity and intends to ensure the model appropriately reflects the efficient cost of these services.

2.3 NICTA's Conclusion - Questions 1 and 2

36. Having considered the submissions from all interested parties, NICTA concludes that while international benchmarking represents a quick and low-cost approach relative to cost modelling, the unique geographic and infrastructure challenges of PNG necessitate a model tailored to national realities to ensure regulatory accuracy and long-term stability. However, where data is not available, the use of international benchmarks can be utilized.
37. Consequently, NICTA will proceed with the development of the cost model as the primary mechanism for price ascertainment. Benchmarking and top-down accounting data may be utilized as essential validation tools to calibrate the model's assumptions, ensuring the final pricing outcomes are robust, transparent, and fair to both access providers and seekers.

3. COMMENTS AND RESPONSES TO COMMENTS – QUESTIONS 3 AND 4

Question 3: Do you agree with NICTA's view that it should use either a LRIC+ [or] a FAC approach that includes fair and reasonable common and joint costs in its cost model?

Question 4: Are you in agreement with NICTA's view that the use of current cost accounting (CCA) to value the capital assets used for the supply of the Declared Services would reflect the efficient costs of those assets, and that historical accounting costs would not?

3.1 Comments received from interested parties for questions 3 and 4

38. Question 3: Vodafone expressed agreement with NICTA's view that either a LRIC+ or a FAC approach that includes fair and reasonable common and joint costs in the model.
39. Question 4: Vodafone expressed agreement with NICTA's views that the use of the current cost accounting to value the capital assets used for the supply of the declared services would reflect the efficient costs of those assets and that the historical accounting costs would not.
40. Question 3: Digicel expressed support for the LRIC+ or a FAC approach.
41. Question 4: Digicel did not state that it supported the use of a current cost accounting (CCA) to value the capital assets used for the supply of the Declared services to reflect the efficient costs of those assets and that historical accounting costs would not.
42. Instead, Digicel reiterated its stance for NICTA's modelling approach to be in consistent with Section 134 (2) with efficient cost to cover "actual cost incurred" regardless of which modelling approach NICTA selects.

43. Digicel submitted that any modelling approach adopted by NICTA must remain strictly consistent with Section 134(2) of the Act. Digicel emphasized that "efficient costs" are defined by the Act to include the direct or indirect cost attributable to capital, operating, and maintenance costs actually incurred by the access provider, unless NICTA determines that such costs are specifically proven inefficient. They cautioned that deviating significantly from actual historical investment costs could conflict with the "actually incurred" requirement of Section 134(2).
44. Question 3: U-Space expressed support for NICTA to use either LRIC+ or FACT but on the condition that selection includes fair shares of joint and common costs.
45. Question 4: U-Space expressed strong support for Current Cost Accounting (CCA). They noted that historical costs are often outdated and do not show the real economic value of assets.
46. Question 3: Nextgen agreed with the use of either LRIC+ or FAC, provided the assumptions are transparent and consistently applied. However, they expressed a clear preference for LRIC+, noting that it promotes economic efficiency and reflects incremental cost causation.
47. Question 4: Nextgen strongly supported Current Cost Accounting (CCA) over historical cost accounting. They stated that CCA should be used because it reflects real economic value and supports the modernization of infrastructure.

3.2 NICTA's responses to comments received on questions 3 and 4

48. NICTA is of the view that both the LRIC+ and FAC methodologies, provided they include a fair and reasonable allocation of common and joint costs, are consistent with the General Pricing Principles set out under Section 134 of the Act. While NICTA acknowledges Digicel's emphasis on "actually incurred" costs as referenced in Section 134(2) of the Act, NICTA maintains that either approach, LRIC+ or FAC would fulfill the mandate under Section 134(1)(a) that prices are to be set to recover the efficient costs of providing the relevant service, and to fulfill the cost recovery principle.
49. NICTA is of the view that CCA is the appropriate approach to use. As submitted by Nextgen, U-Space, and Vodafone, historical costs may not accurately reflect the real economic value or the current costs of capital related assets required for the provision of the wholesale services. By using CCA NICTA would ensure that the cost model is forward-looking and reflects the efficient economic costs an efficient operator would incur in the current market, as required by Section 134(1)(a)(i) of the Act.
50. In response to Digicel's comments making express references that NICTA should consider the access provider's costs "actually incurred", in accordance with Section 134(2), it seems that Digicel may be advocating the use of historical cost accounting with no reference to the economic value of those assets. As indicated in the Public Consultation Paper in paragraphs 54-57, it is clear from Sections 134(2) and 124(1) that the term "costs actually incurred", refer to economic costs and not historical accounting costs. Therefore, it is NICTA's view that the references to "costs" and "efficient costs" in the General Pricing Principles represent *economic costs* and

efficient economic costs, and not historical accounting costs, as Digicel appears to suggest.

51. In consequence, NICTA is of the view that the use of CCA for costing capital related assets would be consistent with the General Pricing Principles and would promote the achievement of the efficiency objectives in Section 124(1)(b) of the Act.

3.3 NICTA's Conclusion - Questions 3 and 4

52. Having considered the submissions and the statutory requirements under the Act, NICTA concludes that either the LRIC+ or the FAC cost allocation that includes fair and reasonable common and joint costs should be used.

NICTA further concludes that CCA also known as forward-looking costs, is the appropriate valuation method for capital assets used for the supply of the relevant wholesale services.

4. COMMENTS AND RESPONSES TO COMMENTS – QUESTION 5

Question 5: Do you agree with the proposed approach for valuing assets by either (i) using the cost of replacement with the modern equivalent asset, or (ii) use as the cost of replacement, the economic cost of the depreciated assets in use? Please explain your answer.

4.1 Comments received from interested parties for question 5

53. Question 5: Vodafone expressed its view that asset valuation should reflect cost of replacement, the economic cost of the depreciated assets in use.
54. Question 5: Digicel did not indicate a direct response to question 5. Instead, Digicel reinforced its stance on the necessity of maintaining consistency with Section 134(2) of the Act. They reiterated that asset valuation must reflect "actual costs incurred," specifically citing the statutory definition of "efficient costs" which includes the "capital, operating and maintenance costs actually incurred by the access provider in providing the declared service." Digicel submitted that any methodology deviating from this approach would be inconsistent with the General Pricing Principles and the mandatory requirements of the Act.
55. Question 5: U-Space expressed support for a model that is reflective of PNG's real geography and network layout, that is simplified but realistic in design to enable fair costs calculation.
56. Question 5: Nextgen agreed that either replacement cost or economic depreciated value are appropriate asset valuation methods. They further suggested that NICTA should publish valuation guidelines to ensure consistency across the regulatory framework.

4.2 NICTA's responses to comments received on question 5

57. Question 5: NICTA concurs with the views of Nextgen, U-Space, and Vodafone. For clarity, NICTA is of the view that asset valuation should be valued by either approach, i) using the cost of the replacement with the modern equivalent asset, or ii) use as the cost of replacement, the economic cost of the depreciated assets in use.
58. As indicated earlier, NICTA views Digicel's repeated and explicit references to "actually incurred costs" under Section 134(2) of the Act, as perhaps suggesting that NICTA should use a historical cost accounting method to value capital assets. Again, NICTA rejects the use of historical accounting costs to value capital related assets for the reasons explained in paragraphs 56-58 of the Public Consultation Paper.
59. As noted in the Public Consultation Paper, international best practice—including guidance from the EU Independent Regulators Group—emphasizes that, asset valuation should be based on replacement costs derived from Current Cost Accounting methodologies. As explained earlier, NICTA is of the view that the references to "costs" in the General Pricing Principles must represent *economic costs*, as historical book values are heavily influenced by internal corporate depreciation policies and would not reflect the economic costs of those assets.

4.3 NICTA's Conclusion - Questions 5

60. In consequence, NICTA is of the view that capital-related costs should be valued based on their current economic worth employing Current Cost Accounting methodologies to reflect the valuation of a Modern Equivalent Asset (MEA), or use as the cost of replacement, the economic cost of the depreciated assets in use.

5. COMMENTS AND RESPONSES TO COMMENTS – QUESTIONS 6 AND 7

Question 6: Do you agree that NICTA could use either a Scorched Earth, Scorched Node, or a Modified Scorched Node approach? Please explain your answer.

Question 7: Do you agree that NICTA should favor using either a Scorched Node approach or a Modified Scorched Node approach if there is sufficient information about the location of the reference operator's nodes?

5.1 Comments received from interested parties for questions 6 and 7

61. Question 6 & 7: Vodafone expressed support for the use of the Scorched Node or Modified Scorched Node approach to build up the cost model.
62. Question 6 and 7: Digicel argued that the network topology in the cost model must reflect the actual network as deployed. They maintained that the model should utilize the access provider's existing network footprint to ensure the costs modelled are representative of the actual conditions faced in providing the Declared Services. Digicel further submitted that any cost modelling should be relevant to the access

provider's actual deployed network and operating costs, rather than assuming the costs of a hypothetical or notional operator.

63. Digicel also submitted that the cost modelling must reflect the actual costs that access providers incur, or would be obliged to incur, to comply with regulatory mandates. This includes specific obligations imposed on access providers such as the coverage requirements stipulated under the Licensing Rule 2025
64. Question 6: U-Space expressed support for the use of a "model operator" approach.
65. Question 7: U-Space submitted that each declared service should be modelled separately but increments (like extra capacity) should also be included to reflect actual usage.
66. Question 6: Nextgen agreed that the Scorched Earth, Scorched Node, and Modified Scorched Node approaches are all valid methodologies. They submitted that the specific selection should depend on data availability and the underlying modelling objectives.
67. Question 7: Nextgen agreed that the Scorched Node or Modified Scorched Node approaches should be favoured if sufficient data is available, if they provide a more realistic representation of the network.

5.2 NICTA's responses to comments received on questions 6 and 7

68. NICTA acknowledges the range of views regarding network topology and the level of optimization required within the model. NICTA notes Vodafone and Nextgen's support for the Scorched Node or Modified Scorched Node approaches.
69. Regarding Digicel's concern that NICTA's approach to the notional operator's network topology might lead to cost under-recovery, NICTA maintains that its methodology is specifically designed to meet the General Pricing Principles in the Act. As indicated in paragraphs 70-75 of the Public Consultation Paper, in NICTA's view, either approach: scorched earth, scorched node, or modified scorched node, would be consistent with Section 134 of the Act. The reason being is that, as explained earlier, Section 134 (1)(a)(i) requires that the price (or revenue) of the relevant service be set to recover only the efficient economic costs of providing such service.
70. Section 134(2) of the Act does not grant a right to recover historical inefficient costs. The "notional" operator approach is a standard regulatory approach used to filter out identifiable inefficiencies or technological obsolescence. This ensures that the prices set are forward-looking and based on what an efficient operator, utilizing the same footprint as the access provider, would incur in today's market.

5.3 NICTA's Conclusion - Questions 6 and 7

71. NICTA concludes that it will adopt a Scorched Node or a Modified Scorched Node approach for network topology, where sufficient information on the location of the reference operator's nodes exists.

6. COMMENTS AND RESPONSES TO COMMENTS – QUESTION 8

Question 8: Do you agree with NICTA's view that a cost model for the Declared Services should be based on a notional or hypothetical operator with a market share, network coverage, and facilities, similar or equivalent to that of PNG DataCo Limited, with reasonable adjustments, as needed to reflect efficient costs? Explain your answer.

6.1 Comments received from interested parties for question 8

72. Vodafone expressed support for the use of a hypothetical efficient operator based on DataCo, noting it serves as a "realistic benchmark for the cost model's scale." Vodafone specifically requested that the model account for the fact that the benchmark operator is "utilizing the existing infrastructure of PNG Power Limited" to ensure the cost structure is accurately reflected.
73. Digicel again expressed concern that NICTA's proposed approach towards network coverage and facilities is inconsistent with Section 134 of the Act. They submitted that the modelling approach "must be consistent with Section 134(2)" and argued that the "starting point for any cost analysis should therefore be the relevant access provider's actually deployed network and operating costs and not that of the assumed cost of an hypothetical or notional operator."
74. Digicel further maintained that costs must reflect those "actually incurred" or that "would be obliged to be incurred" to comply with regulatory mandates. Specifically, they stated that the cost modelling must incorporate the specific obligations imposed on access providers, such as the coverage requirements stipulated under the Licences Rule 2025.
75. U-Space submitted that careful consideration must be given to the international aspect of the network, given that it is costly, but costs must reflect the efficient use of submarine cables.
76. Nextgen submitted that a hypothetical efficient operator model is appropriate "provided assumptions and inputs are transparent and evidence-based."

6.2 NICTA's responses to comments received on questions 8

77. NICTA notes a general consensus among Vodafone, Nextgen, and U-Space regarding the appropriateness of utilizing a cost model for a hypothetical efficient operator. NICTA maintains its view that international best practice has moved away from modelling an actual operator toward a notional or hypothetical model reflecting certain demand and network coverage similar or equivalent to that of a reference access provider, which for the declared services would be DataCo.
78. NICTA clarifies that the model will indeed be based on a market share, network coverage, and facilities similar or equivalent to that of DataCo.
79. In response to Nextgen, NICTA reaffirms that all model assumptions and inputs will be transparent and evidence-based. However, having regard to the confidentiality provisions under Section 44 of the NICT Act, NICTA notes that where an access provider submits a claim for confidentiality, certain sensitive information may be withheld or redacted accordingly to protect proprietary data.

80. NICTA acknowledges the submission from Vodafone supporting NICTA's approach to use of DataCo's network coverage, market share, and similar facilities, to model the notional operator's costs.
81. In response to Digicel's concern regarding Section 134, NICTA emphasizes that while the model uses a hypothetical operator, it is intentionally designed to be equivalent to a reference access provider. The cost model would be flexible enough to incorporate any coverage requirements for the access provider under the Licences Rule 2025. As indicated earlier, the cost model of the notional access provider would be modelled having equivalent network coverage and market share as the reference operator, which in this case, would be DataCo.

6.3 NICTA's Conclusion – Question 8

82. NICTA concludes that the cost model for the declared services shall be based on a hypothetical efficient operator with a market share, network coverage, and facilities equivalent to those of the reference access provider, PNG DataCo Limited.

7. COMMENTS AND RESPONSE TO COMMENTS – QUESTIONS 9 AND 10

Question 9: Considering the cost model for the Wholesale International Dedicated Submarine Cable Capacity Service; do you agree with the proposed network components to be include in the hypothetical access provider's cost model along with the proposed services to be modelled?

Question 10: Considering the cost model for the International Submarine Cable Facilities Access Service; do you agree with the proposed component and services to be modelled? Please explain your answer.

7.1 Comments received from interested parties for questions 9 and 10

83. Question 9: Vodafone expressed agreement with the network components and proposed services identified by NICTA, including the wet plant, fronthaul, dry plant, and connection gateway, as well as the four specified wholesale services and their capacity-based increment units.
84. Question 10: Vodafone expressed agreement with the components and proposed facility access services mentioned in Sections 83 and 84 of the Public Consultation Paper. However, Vodafone submitted that NICTA should consider international best practices for colocation on Tier 1 datacentres, noting that besides colocation, there will also be cross connects to the gateway for international or domestic circuits.
85. Vodafone further noted that capacity services typically include bandwidth and a one-off installation charge; therefore, consideration must be made as to how these one-off connectivity charges will be applied for Facilities Access Service.
86. Questions 9 and 10: Digicel reiterated that the modelling approach must be strictly consistent with Section 134(2) of the Act, which defines "efficient costs" as those actually incurred by the access provider unless specifically proven inefficient.

87. Digicel stated again that the starting point for any cost analysis must be the relevant access provider's own "direct and indirectly attributable capital, operating and maintenance costs actually incurred", and that any deviation from this approach would render it inconsistent with the General Pricing Principles and the requirements of the Act.
88. Question 9: U-Space submitted that for domestic backbone services, prices should reflect efficient transmission costs across Papua New Guinea's specific terrain.
89. Question 10: U-Space submitted that this is a critical area for ISPs and that prices must reflect fair costs so that smaller ISPs can compete effectively.
90. Question 9: Nextgen agreed that the proposed submarine cable cost components appear complete, though they noted that redundancy and resilience costs should also be considered in the model.
91. Question 10: Nextgen agreed that the facilities access modelling components are appropriate, noting that the use of rack units, energy consumption, and Power Usage Effectiveness factors reflects industry standards.

7.2 NICTA's responses to comments received on questions 9 and 10

92. Digicel's comments do not address the questions posed; rather, they suggest that Digicel tries to advocate for the use of historical accounting costs, unless such costs are deemed inefficient. As NICTA explained clearly in paragraphs 53-69 of the Public Consultation Paper, our view is that the use of historical accounting costs would be inconsistent with Section 134 (2) and would not promote the achievement of the efficiency objective in Section 124(1)(b) of the Act. In consequence, NICTA rejects the use of historical cost accounting to calculate the costs of supplying the declared services.
93. In response to Vodafone's comment regarding cross connects to the gateways and one-off charges, NICTA is grateful to Vodafone for bringing this to our attention. While we understand Vodafone's concern with cross connects' one-off charges, NICTA understands that this issue goes beyond cross connects. NICTA intends to address the broader issue of one-off charges in Division 2 of the service-specific pricing principles during the second phase of this public consultation.
94. NICTA notes Vodafone's support for the proposed network components and service increments identified in the Public Consultation Paper.
95. NICTA sympathises with U-Space's view that prices must be fair to support effective competition.
96. NICTA is pleased that Nextgen agrees with the proposed network components and services to be modelled. Regarding Nextgen's comment on network redundancy and resilience; NICTA considers that issue to be better addressed within the context of either a reference interconnection offer (Sec. 141 of the Act), or model terms for declared services under section 133 of the Act.

7.3 NICTA's Conclusion – Questions 9 and 10

97. NICTA reaffirms its position that its cost model should use the components and services identified in the Public Consultation Paper and reflected in the draft SSPPs for Declaration No. 1 of 2025 in said consultation paper.
98. For the avoidance of doubt, the cost model for the Wholesale International Dedicated Submarine Cable Capacity Service will include the following components of the access provider's network:
 - i. Wet plant: Consisting of a submarine cable, in-line repeaters, and branch units.
 - ii. Fronthaul: Beach manhole and associated facilities.
 - iii. Dry plant: Power feeder equipment, line terminal equipment, and optical add-drop multiplexers, and related facilities.
 - iv. Connection gateway.
99. NICTA's cost model should include all the services' demands specified below:
 - i. Wholesale international dedicated submarine cable capacity service
 - ii. Wholesale long-haul dedicated capacity service
 - iii. Wholesale local dedicated capacity service
 - iv. Wholesale Internet access service.
100. Modelled service increment units:
 - i. Capacity services: Bandwidth connection
101. NICTA's cost model for the International Submarine Cable Facilities Access Service will include the following components of a grid-connected shelter for telecommunications equipment:
 - i. 20-foot telecommunications shelter and associated land and civil works.
 - ii. Standard racks and power distribution units.
 - iii. Redundant (N+1) uninterrupted power supply and Diesel back-up generator.
 - iv. Redundant (N+1) cooling system.
 - v. Fire protection, monitoring and security systems.
102. The cost model should include the following facilities access services:
 - i. Space.

- ii. Energy (i.e., electricity).

103. The modelled service increment units are:

- i. Space: Rack units ("RU"). Each RU is a standard space of 1.75 inches high and 19 inches wide on a standard cabinet for telecommunications equipment.
- ii. Energy: Kilowatt-hour

8. COMMENTS AND RESPONSES TO COMMENTS – QUESTION 11

Question 11: Do you agree with the proposed network components to be include in the hypothetical access provider's cost model along with the proposed services to be modelled?

8.1 Comments received from interested parties for question 11

- 104. Vodafone expressed agreement with the network components and proposed services identified in Sections 92 and 93 of the Public Consultation Paper.
- 105. Digicel submitted again that the modelling approach must be strictly consistent with Section 134(2) of the Act. They argued that "efficient costs" include the direct and indirectly attributable capital, operating, and maintenance costs actually incurred by the access provider.
- 106. Digicel further emphasized that the starting point for any analysis must be the access provider's own costs, and any deviation from this approach would likely be inconsistent with the General Pricing Principles and the requirements of the Act.
- 107. U-Space submitted that joint and common costs should be spread fairly across all services, noting that methodologies such as LRIC+ or FAC are appropriate for this purpose.
- 108. Nextgen agreed that the proposed network components are suitable but noted that NICTA should also consider monitoring systems, redundancy links, and maintenance infrastructure.

8.2 NICTA's responses to comments received on question 11

- 109. NICTA welcomes the broad consensus from Vodafone, Nextgen, and U-Space Communications supporting the suitability of the proposed network components and services. NICTA wishes to clarify to Nextgen, that the fact that certain systems or cost categories are not explicitly modelled in the cost model, does not mean that those costs are not included in broader cost categories in the cost model.
- 110. Digicel's comments do not address the question posed. Again, Digicel repeats that Section 134 (2) of the Act requires NICTA to use the "cost actually incurred" to calculate the cost of providing the declared services. Digicel, however, does not

explain what this term means, or how to implement it to calculate the costs of supplying the declared services. As mentioned, earlier, this suggests that Digicel may be advocating for the use of a historical cost accounting approach. If that were the case, NICTA submits that it would be inconsistent with Section 134 and the efficiency objective under section 124 of the Act. For a comprehensive explanation of NICTA's view, please refer to paragraphs 53-69 of the Public Consultation Paper.

8.3 NICTA's Conclusion – Question 11

111. Based on the reasons presented, NICTA will use the proposed network components and will model the proposed services as described in paragraphs 92-93 of the Public Consultation Paper, and the accompanying draft service-specific pricing principles for wholesale service declaration No. 2 of 2025 in the annex to said consultation paper.

112. For the avoidance of doubt, NICTA's cost model will include the following components of the access provider's network:

- i. Access nodes (points of presence)
- ii. Aggregation and repeaters nodes
- iii. Terrestrial and submarine fibre optic cables
- iv. Cable landing stations
- v. Core network
- vi. Dark fibre

113. The cost model should include all the services' demands specified below.

- i. Wholesale international dedicated submarine cable capacity service
- ii. Wholesale long-haul dedicated capacity service
- iii. Wholesale local dedicated capacity service
- iv. Wholesale Internet access service.

114. The modelled service increment units will be:

- i. Capacity services: Bandwidth connection.

9. COMMENTS AND RESPONSES TO COMMENTS – QUESTION 12

Question 12: Do you agree with the proposed network components to be include in the hypothetical access provider's cost model along with the proposed services to be modelled?

9.1 Comments received from interested parties for question 12

115. Vodafone expressed agreement with the network components and proposed services identified in Sections 94 and 95 of the Public Consultation Paper.
116. Digicel maintained that the identification of these components and the resulting modelling approach must be strictly consistent with Section 134(2) of the Act. They again emphasized that the starting point for any analysis must be the access provider's own "actually incurred" capital, operating, and maintenance costs.
117. Digicel further argued that any deviation from the access provider's specific costs when modelling these network components would likely be inconsistent with the General Pricing Principles and the requirements of the Act.
118. U-Space commented on the valuation of these components, submitting that depreciation should reflect the real economic life of the assets rather than adhering strictly to accounting rules. They argued that straight-line or economic depreciation methods are superior to arbitrary book values.
119. Nextgen submitted that the network components listed are appropriate and comprehensive for the purposes of the hypothetical access provider's cost model.

9.2 NICTA's responses to comments received on question 12

120. NICTA welcomes the consensus from Vodafone and Nextgen regarding the suitability and comprehensiveness of the proposed network components.
121. In response to Digicel's comments, NICTA wishes to point out that by using PNG DataCo Limited as the reference operator, the network components within the model are directly anchored in the infrastructure actually deployed in Papua New Guinea. As indicated earlier in this report and in the Public Consultation Paper, NICTA's approach to cost modelling is fully consistent with the General Pricing Principles in Section 134 and the efficiency objective in Section 124 of the Act.
122. Regarding U-Space's comments on depreciation, NICTA agrees that depreciation of assets must reflect the economic life of these assets rather than arbitrary accounting book values.

9.3 NICTA's Conclusion – Question 12

123. NICTA concludes that the network components and service increments identified in the Public Consultation Paper are appropriate, comprehensive, and suitable for the cost model. These components and services are reflected in the accompanying draft partial service-specific pricing principles in the annex to this report. For the avoidance of doubt, NICTA's cost model for the service specific pricing principles for the Wholesale Service Declaration No. 3 of 2025 should include the following components of the access provider's network:
 - i. National terrestrial fibre optic backbone
 - ii. Kumul submarine cable network
 - iii. Metropolitan fibre optic networks

iv. International submarine cable network

124. NICTA's cost model should include all the services demands specified below.

i. Services to be modelled:

- a. Wholesale international dedicated submarine cable capacity service
- b. Wholesale long-haul dedicated capacity service
- c. Wholesale local dedicated capacity service
- d. Wholesale Internet access service

ii. Modelled service increment units:

- a. Capacity: Bandwidth connection

10. COMMENTS AND RESPONSES TO COMMENTS – QUESTIONS 13 AND 14

Question 13: Do you agree that for the allocation of network related joint and common costs, NICTA should use the capacity-based allocation? Please explain your reasons for why or why not.

Question 14: Do you agree that for the allocation of overhead common costs, NICTA should use the equal proportionate mark-up (EPMU) approach? Please explain your reasons for why or why not.

10.1 Comments received from interested parties for questions 13 and 14

- 125. Vodafone expressed agreement with both the capacity-based allocation for network-related joint and common costs and the Equal Proportionate Mark-Up (EPMU) approach for the allocation of overhead common costs.
- 126. Digicel noted that the proposed method to allocate joint and common costs is broadly in line with international practice. However, they argued that the application of such a methodology would depend on the circumstances of specific access disputes. Digicel suggested that since they are unaware of any existing access disputes, it is unnecessary for NICTA to determine this issue at the current time.
- 127. U-Space commented on the broader financial implications, to balance investor confidence with consumer fairness.
- 128. U-Space expressed agreement with NICTA's approach to using the equal proportionate mark-up (EPMU) approach. Additionally, U-Space emphasized that NICTA should share assumptions and results with providers to build trust and facilitate constructive feedback.

129. Nextgen submitted that capacity-based allocation is appropriate because telecommunications networks are dimensioned according to demand capacity. Regarding overheads, Nextgen agreed that the EPMU approach is suitable due to its simplicity and transparency, though they recommended periodic reviews.

10.2 NICTA's responses to comments received on questions 13 and 14

130. In response to Nextgen and Vodafone, NICTA acknowledges the consensus supporting capacity-based allocation and the EPMU approach for overhead common costs.
131. NICTA disagrees with Digicel's submission that this determination is unnecessary in the absence of an access dispute. The primary purpose of developing a cost-based pricing model is to provide a transparent and predictable framework for all market participants. Relying on an ad-hoc, dispute-driven approach would lead to regulatory uncertainty and inconsistent pricing for the declared services.
132. In response to U-Space's comments on transparency, as part of the Public Consultation process, the final outputs to the model will be shared in the second phase of this public consultation process.

10.3 NICTA's Conclusion – Questions 13 and 14

133. NICTA concludes that for the allocation of network-related joint and common costs, the capacity-based allocation methodology shall be used. Regarding overhead (non-network related) common costs, NICTA determines that the Equal Proportionate Mark-Up (EPMU) approach shall be applied.

11.COMMENTS AND RESPONSES TO COMMENTS – QUESTION 15

Question 15: Do you agree that NICTA should use the tilted annuity approach to calculate the depreciation of assets? Please explain your reasons for why or why not.

11.1 Comments received from interested parties for question 15

134. Vodafone expressed agreement with the use of the Tilted Annuity approach to calculate the depreciation of assets in the cost model for the declared services.
135. Digicel noted that the proposed tilted annuity approach is broadly in line with international practice. However, they submitted that the application of such a methodology would depend upon the circumstances of any access dispute and, since they are unaware of any current disputes, they consider it unnecessary for NICTA to determine this issue at this time.
136. U-Space did not directly state a position on the adoption of the tilted annuity approach; however, it emphasized that NICTA should implement regular monitoring of access providers to ensure compliance with maximum price rules. U-Space further noted that this oversight would be best supported by clear reporting requirements and audits.

137. Nextgen submitted that they agree with the tilted annuity depreciation, stating that it accurately reflects telecommunications asset price declines and aligns with international regulatory practice.

11.2 NICTA's responses to comments received on question 15

138. NICTA is pleased to learn that Nextgen and Vodafone agree that the Tilted Annuity is the most appropriate method for calculating the depreciation of assets in the cost model.

139. Digicel's comments indicating that because they are not aware of an access dispute, NICTA would not need to decide on this matter, may suggest that Digicel ignores that NICTA initiated this public consultation on its own accord by the powers conferred by Section 135 of the Act.

140. Regarding U-Space's suggestion on monitoring and audits, NICTA wishes to point out that some of U-Space's concerns are addressed in the three declarations associated with these service-specific pricing principles, while other related matters will be addressed during the second phase of this public consultation.

11.3 NICTA's Conclusion – Question 15

141. NICTA concludes that the Tilted Annuity approach shall be implemented in the cost model to calculate the annualized cost of depreciation for capital assets used in the declared services.

12.COMMENTS AND RESPONSES TO COMMENTS – QUESTION 16

Question 16: Do you agree that NICTA should use the approach presented in the SSPPs to calculate the WACC for the access provider's cost model? Please explain your reasons for why or why not.

12.1 Comments received from interested parties for question 16

142. Vodafone expressed agreement with the approach to calculate the WACC as described in Section 15 in Division 1 Part II of the Service Specific Pricing Principles (SSPPs) for the Three Declarations.

143. Digicel noted that the proposed approach to calculate the WACC is broadly in line with international practice. However, they maintained that the application of such a methodology depends on the circumstances of specific access disputes. In the absence of any currently existing disputes, Digicel considers it unnecessary for NICTA to determine this issue at the current time.

144. U-Space commented that the mix of cost modelling, fair allocation, CCA, and transparency seems reasonable, noting that it follows international best practice while fitting the specific context of Papua New Guinea.

145. Nextgen submitted that the proposed WACC methodology is appropriate. To ensure transparency, Nextgen recommended that NICTA publish the underlying assumptions, benchmark sources, and specific calculation inputs used in the model.

12.2 NICTA's responses to comments received on question 16

146. NICTA is pleased to know that Nextgen, U-Space, and Vodafone, agree with the proposed methodology for determining the WACC, as set out in Division 1 in Part II of the SSPPs. NICTA acknowledges Nextgen's recommendation for transparency and confirms that the final model outputs will be provided. However model inputs or other information that NICTA considers confidential in nature may be withheld according to section 44 of the NICT Act.

147. In response to Digicel, NICTA maintains that the establishment of a WACC methodology is a fundamental requirement for a functional cost model and cannot be deferred until an access dispute arises. Furthermore, NICTA rejects the notion that a determination is unnecessary at this time. Setting price related terms and conditions for declared services via SSPPs is within the power conferred to NICTA by Section 135 of the Act. Digicel seems to mistakenly think that an access dispute under Sections 143-155 of the Act is the only way to set those price related terms and conditions.

12.3 NICTA's Conclusion – Question 16

148. NICTA concludes that the pre-tax WACC approach presented in the SSPPs shall be implemented in the cost model.

ANNEX A. DRAFT PARTIAL DETERMINATIONS

DRAFT PARTIAL SERVICE-SPECIFIC PRICING PRINCIPLES FOR SERVICES DECLARED UNDER WHOLESALE SERVICE DECLARATION NO. 1 OF 2025

National Information and Communications Technology Act 2009

THE NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AUTHORITY makes this Determination under section 135 of the *National Information and Communications Technology Act 2009*.

Dated [xxx, 202X]

[Name]

[Signature]

Member

[Name]

[Signature]

Member

National Information and Communications Technology Authority

PART I – PRELIMINARY

1 Name of Determination

This Determination is the *Service-Specific Pricing Principles Determination for Services Declared Under Wholesale Service Declaration No. 1 of 2025*

2 Commencement

(1) This Determination commences on [XX, Month 202X] (*the Commencement Date*).

3 Interpretation

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

- (2) In this Determination, unless the context in Part II – Pricing Principles, otherwise requires:
- (a) **“Act”** means the *National Information and Communications Technology Act, 2009*.
 - (b) **“Bottom-up Cost Models”** are:
 - (i) Models that use data on demand, network coverage, geographic and technical information to dimension the required network to serve the geographic coverage area with the required capacity and technology. The underlying technical engineering model of a network is used to develop unit costs of various network components. These costs are then allocated to the various services supplied by the access provider.
 - (c) **“Declared Services”** are – the wholesale international dedicated submarine cable capacity service and the international submarine cable facilities access service.
 - (d) **“Equity Beta”** is the risk that a company or investment adds to a market portfolio. Intuitively, it measures the sensitivity of a company’s rate of return on equity to changes on the market rate of return.
 - (e) **“Gearing”** is – the ratio of the debt to the total capital of a company (debt plus equity).
 - (f) **“Hybrid Cost Models”** are cost models where a Bottom-up Cost Model is used as the primary model to calculate the costs, and then a partial Top-down Cost Model is used only to fine-tune some of the assumptions in the bottom- up model.
 - (g) **“International Submarine Cable Facilities Access Service”** means the wholesale service defined in Part III of the Wholesale Service Declaration No. 1 of 2025.
 - (h) **“Modern Equivalent Asset”** means the lowest cost asset providing at least equivalent functionality and output as the asset being valued.
 - (i) **“Modified Scorched Node”** means an approach to model the network topology where the location of the nodes is based on the location of the reference operator’s nodes but are not strictly fixed at the operator’s locations. Locations may be modified or calibrated to optimize the real network.
 - (j) **“Scorched Earth”** means an approach to model the network topology that allows the cost model’s hypothetical network to be optimized to the fullest extent by having no constraints on the location of the nodes. With this

approach the cost model could place optimally the nodes to serve the required demand with an optimized network.

(k) **“Scorched Node”** means an approach to model the network topology where the existing location of a reference operator’s nodes are used to design the hypothetical or notional network in the cost model. There is room for optimizing the notional network in the model, but it is constrained by the predetermined location of the nodes. The resulting optimized network would have a similar footprint as the reference network

(l) **“Top-down Cost Models”** are:

- (i) Cost models that use data from an access provider’s accounts and allocation rules, to distribute the costs across the services supplied by the access provider. This approach does not involve detailed network modelling.
- (ii) To avoid incorporating the access provider’s inefficiencies, the model would need to adjust the accounting costs to reflect forward-looking (efficient) costs. This may require adjustments to the network configuration and costs in the model.

(m) **“Wholesale International Dedicated Submarine Cable Capacity Service”** means the wholesale service defined in Part II of the Wholesale Service Declaration No. 1 of 2025.

4 Determination

The National Information and Communications Technology Authority (“NICTA”) determines, pursuant to Section 135 of the Act, that the service-specific pricing principles specified in Part II are to apply to the following services declared by the Minister in the Wholesale Service Declaration No.1 of 2025:

- Wholesale International Dedicated Submarine Cable Capacity Service, and
- International Submarine Cable Facilities Access Service.

PART II – PRICING PRINCIPLES

Division 1 – Methodology to be used for calculating cost-based prices of Wholesale International Dedicated Submarine Cable Capacity Service and International Submarine Cable Facilities Access Service

5 Introduction

- (1) NICTA outlines in this Division 1 of the service-specific pricing principles the applicable methodology to be used for calculating cost-based prices for the Declared Services.
- (2) Division 2 of this service-specific pricing principles presents the results of applying this methodology to ascertain the price of the Declared Services.
- (3) Division 3 provides the method NICTA would follow to assess the access provider's compliance with the maximum allowable prices set in Division 2.

6 Appropriate approach to determine cost-based prices: International benchmarking or cost modelling

- (1) In principle NICTA accepts that both approaches: cost modelling and benchmarking, could be regarded as being in accordance with the General Pricing Principles ("GPPs"), and therefore, could be used to calculate the costs of supplying the Declared Services.
- (2) However, NICTA's view is that the cost modelling approach provides greater accuracy for calculating PNG-specific efficient costs of supplying those services.
- (3) Despite its greater data requirements and modelling time, NICTA will use primarily a cost modelling approach to calculate PNG-specific efficient costs of providing the Declared Services. For the avoidance of doubt, when applying the cost modelling approach, NICTA would model the efficient costs of supplying the Declared Services in accordance with the GPPs in Section 124 of the Act.
- (4) When using the cost modelling approach, NICTA may also use a benchmarking approach to justify some of the cost assumptions that would be used as inputs in the cost model.
- (5) Notwithstanding what is said elsewhere in this Determination, if NICTA considers that the data received for developing a cost model is inadequate, NICTA may decide to use a benchmarking approach instead to calculate the cost-based prices of supplying the Declared Services.

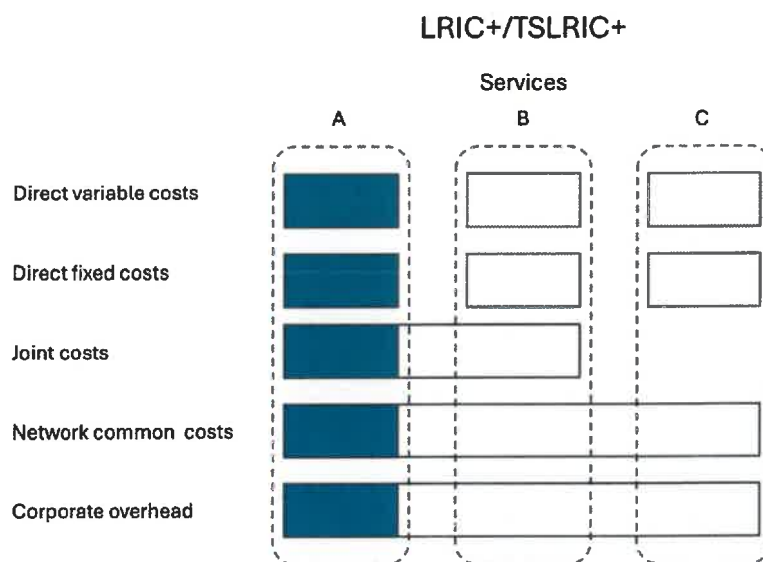
7 Modelling approach: Top-down, bottom-up, or hybrid

- (1) In principle, NICTA could either use a Bottom-up, a Top-down, or a Hybrid cost model.

8 Approach for allocating costs

- (1) NICTA will either use (i) a long-run incremental cost ("LRIC+") cost allocation approach that includes fair and reasonable common and joint costs (also known as TSLRIC+), or (ii) a fully allocated cost ("FAC") approach, that includes fair and reasonable common and joint costs.

- (2) Joint costs are the costs of an input that is used in the supply of two or more services. Common costs are the costs of certain inputs that are necessary for the supply of two or more services but that cannot be directly assigned to specific services. Common costs can be subdivided into network common costs and corporate overhead costs. The figure illustrates the different categories of costs for an operator that is assumed supplies three services.



9 Treatment of capital related costs

- (1) NICTA will use current cost accounting (“CCA”) also known as forward-looking costs to value the capital assets used for the supply of the Declared Services. Specifically, NICTA will value the capital related costs by either (i) using the cost of replacement with the Modern Equivalent Asset, or (ii) use as the cost of replacement, the economic cost of the depreciated assets in use.

10 Network topology for cost model

- (1) In principle, NICTA could either use a Scorched Node approach, a Scorched Earth approach, or a Modified Scorched Node approach. However, given that the Declared Services are supplied at fixed locations within the access provider network, NICTA will favour either, a Scorched Node approach or a Modified Scorched Node approach, provided that there is sufficient information about the location of the reference operator’s nodes. PNG DataCo Limited (“DataCo”) shall be the reference operator.

11 Hypothetical or notional operator’s network coverage and demand

- (1) The cost model to calculate cost-based prices for the Wholesale International Dedicated Submarine Cable Capacity Service, will be based on a notional or hypothetical operator with a market share, and network coverage, similar or equivalent to that of DataCo, with reasonable adjustments, as needed, to reflect efficient costs. A similar assumption would be applicable to calculate cost-based prices for the International Submarine Cable Facilities Access Service.

12 Modelled services and service increments

- (1) NICTA's cost model for the Wholesale International Dedicated Submarine Cable Capacity Service will include, but not be limited to, the following components of the access provider's network:
 - (a) Wet plant: Consisting of a submarine cable, in-line repeaters, and branch units.
 - (b) Fronthaul: Beach manhole and associated facilities.
 - (c) Dry plant: Power feeder equipment, line terminal equipment, and optical add-drop multiplexers, and related facilities.
 - (d) Connection gateway.
- (2) NICTA's cost model should include all the services' demands specified below.
 - (a) Services to be modelled:
 - (i) Wholesale international dedicated submarine cable capacity service
 - (ii) Wholesale long-haul dedicated capacity service
 - (iii) Wholesale local dedicated capacity service
 - (iv) Wholesale Internet access service.
 - (b) Modelled service increment units:
 - (i) Capacity services: Bandwidth connection
- (3) NICTA's cost model for the International Submarine Cable Facilities Access Service will include but not be limited to the following components of a grid-connected shelter for telecommunications equipment:
 - (a) 20-foot telecommunications shelter and associated land and civil works.
 - (b) Standard racks and power distribution units.
 - (c) Redundant (N+1) uninterrupted power supply and Diesel back-up generator.

- (d) Redundant (N+1) cooling system.
 - (e) Fire protection, monitoring and security systems.
- (4) NICTA’s cost model should include the following facilities access services:
- (a) Space.
 - (b) Energy (i.e., electricity).
- (5) Modelled service increment units:
- (a) Space: Rack units (“RU”). Each RU is a standard space of 1.75 inches high and 19 inches wide on a standard cabinet for telecommunications equipment.
 - (b) Energy: Kilowatt-hour
- (6) To calculate the monthly cost-based price of energy service, NICTA will use the following formula:

$$Energy\ Fee = \frac{E_{ICT} \times Tariff}{12} \times (1 + Mark - up)$$

Where,

E_{ICT} : Energy consumption increment due to the access seeker’s collocated ICT equipment for one year, measured in Kilowatt-hour,

Tariff: Is the ongoing electricity tariff charge to the access provider in PNG Kina (“PGK”) per Kilowatt-hour,

Mark-up: Is the mark-up to cover the access provider’s corporate overhead common costs (%).

- (7) To calculate the energy consumption of the access seeker’s collocated ICT equipment for one year, NICTA should use the following formula:

$$E_{ICT} = PUE \times ICT_{KW} \times 8,760$$

Where,

PUE: Is the power use effectiveness factor which generally is between 1.5 and 1.8,

ICT_{KW} : Is the average power (KW) of the access seeker’s collocated ICT equipment.

13 Method to allocate joint and common costs to services

- (1) For the allocation of network related joint and common costs, NICTA will use the capacity-based allocation approach.

- (2) NICTA will implement the equal proportionate mark-up (“EPMU”) approach for the allocation of overhead common costs.

14 Depreciation

- (1) NICTA will use the tilted annuity approach to calculate the depreciation of assets.

15 Approach to determine a reasonable rate of return

- (1) NICTA shall use the pre-tax weighted average cost of capital (“WACC”) formula below to calculate the costs of capital.

$$Pre - tax WACC = \frac{After-tax WACC}{(1-t)},$$

Where the after-tax WACC is:

$$WACC = \left(\frac{E}{E+D}\right) \times r_e + \left(\frac{D}{E+D}\right) \times (1-t) \times r_d,$$

where,

r_e : cost of equity capital or shareholder’s expected return on equity,

r_d : cost of debt,

E: Equity of the operator’s capital structure,

D: Debt of the operator’s capital structure, and

t: corporate tax rate.

- (2) For the Gearing ratio, NICTA shall use a value that reflects a reasonably efficient capital structure and not the capital structure of the sole access provider, DataCo. To that end, NICTA shall use a Gearing ratio informed by benchmarking telecom operators from the U.S., Australia, or comparable jurisdictions, that can be regarded as having an efficient capital structure. Alternatively, NICTA could use Gearing ratios from telecom service providers from the U.S., Australia, and comparable jurisdictions, as reported by Professor Damodaran in the extensive database that he regularly updates.¹
- (3) NICTA will use the following formula to calculate the cost of debt of the modelled notional access provider:

$$r_d = r_f + CRP + D_p,$$

¹ Prof. Damodaran’s database can be found following this link: <https://pages.stern.nyu.edu/~adamodar/>. Prof. Damodaran is a world-renowned authority on the valuation of financial assets and accompanies. He is a professor of finance at the Stern School of Business at New York University (NYU).

Where,

r_d : Cost of debt,

r_f : Risk-free rate of return

CRP: Country risk premium, and

D_p : Debt-risk premium.

- (4) NICTA will use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return.
- (5) NICTA will either use Prof. Damodaran's estimate of the country risk premium ("CRP") for PNG or compute the CRP using the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity.
- (6) To calculate the debt-risk premium (D_p) in the above formula, NICTA will either use the difference between the cost of debt and the risk-free rate of return from telecom companies in the U.S., Australia, or comparable jurisdictions, as reported by Professor Damodaran, or benchmark debt-risk premiums on a sample of appropriate telecom companies.
- (7) NICTA will use the following formula to calculate the cost of equity capital for the modelled notional access provider:

$$r_e = r_f + \beta \times (MRP + CRP),$$

Where,

r_e : is the cost of equity capital,

r_f : risk-free rate of return,

β : equity beta,

MRP: Market risk premium, and

CRP: Country risk premium.

- (8) NICTA will use the difference between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return as the general approach to calculate the market-risk premium ("MRP"). To implement this approach, NICTA could use Prof. Damodaran's calculation of the MRP.
- (9) NICTA will benchmark the Equity Betas of publicly traded telecom companies in other jurisdictions as the general approach to calculate the Equity Beta of the

modelled notional access provider. To implement this, NICTA could use Prof. Damodaran estimated Equity Betas from publicly traded telecom companies from the U.S., Australia, or comparable countries.

[Division 2 and Division 3 to be inserted in the second phase of this public consultation]

DRAFT PARTIAL SERVICE-SPECIFIC PRICING PRINCIPLES FOR SERVICES DECLARED UNDER WHOLESALE SERVICE DECLARATION NO. 2 OF 2025

National Information and Communications Technology Act 2009

THE NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AUTHORITY makes this Determination under section 135 of the *National Information and Communications Technology Act 2009*.

Dated [xxx, 202X]

[Name]

[Signature]

Member

[Name]

[Signature]

Member

National Information and Communications Technology Authority

PART I – PRELIMINARY

1 Name of Determination

This Determination is the *Service-Specific Pricing Principles Determination for Services Declared Under Wholesale Service Declaration No. 2 of 2025*

2 Commencement

(1) This Determination commences on [XX, Month 202X] (*the Commencement Date*).

3 Interpretation

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

- (2) In this Determination, unless the context in Part II – Pricing Principles, otherwise requires:
- (a) **“Act”** means the *National Information and Communications Technology Act, 2009*.
 - (b) **“Bottom-up Cost Models”** are:
 - (i) Models that use data on demand, network coverage, geographic and technical information to dimension the required network to serve the geographic coverage area with the required capacity and technology. The underlying technical engineering model of a network is used to develop unit costs of various network components. These costs are then allocated to the various services supplied by the access provider.
 - (c) **“Declared Services”** are – the wholesale long-haul dedicated capacity service and the wholesale local dedicated capacity service.
 - (d) **“Equity Beta”** is the risk that a company or investment adds to a market portfolio. Intuitively, it measures the sensitivity of a company’s rate of return on equity to changes on the market rate of return.
 - (e) **“Gearing”** is – the ratio of the debt to the total capital of a company (debt plus equity).
 - (f) **“Hybrid Cost Models”** are cost models where a Bottom-up Cost Model is used as the primary model to calculate the costs, and then a partial Top-down Cost Model is used only to fine-tune some of the assumptions in the bottom- up model.
 - (g) **“Modern Equivalent Asset”** means the lowest cost asset providing at least equivalent functionality and output as the asset being valued.
 - (h) **“Modified Scorched Node”** means an approach to model the network topology where the location of the nodes is based on the location of the reference operator’s nodes but are not strictly fixed at the operator’s locations. Locations may be modified or calibrated to optimize the real network.
 - (i) **“Scorched Earth”** means an approach to model the network topology that allows the cost model’s hypothetical network to be optimized to the fullest extent by having no constraints on the location of the nodes. With this approach the cost model could place optimally the nodes to serve the required demand with an optimized network.
 - (j) **“Scorched Node”** means an approach to model the network topology where the existing location of a reference operator’s nodes are used to design the hypothetical or notional network in the cost model. There is room for

optimizing the notional network in the model, but it is constrained by the predetermined location of the network nodes. The resulting optimized network would have a similar footprint as the reference network.

(k) ***“Top-down Cost Models”*** are:

- (i) Cost models that use data from an access provider’s accounts and allocation rules, to distribute the costs across the services supplied by the access provider. This approach does not involve detailed network modelling.
- (ii) To avoid incorporating the access provider’s inefficiencies, the model would need to adjust the accounting costs to reflect forward-looking (efficient) costs. This may require adjustments to the network configuration and costs in the model.

(l) ***“Wholesale Local Dedicated Capacity Service”*** means the wholesale service defined in Part III of the Wholesale Service Declaration No. 2 of 2025.

(m) ***“Wholesale Long-Haul Dedicated Capacity Service”*** means the wholesale service defined in Part II of the Wholesale Service Declaration No. 2 of 2025.

4 **Determination**

The National Information and Communications Technology Authority (“NICTA”) determines, pursuant to Section 135 of the Act, that the service-specific pricing principles specified in Part II are to apply to the following services declared by the Minister in the Wholesale Service Declaration No.2 of 2025:

- Wholesale Long-Haul Dedicated Capacity Service, and
- Wholesale Local Dedicated Capacity Service.

PART II – PRICING PRINCIPLES

Division 1 – Methodology to be used for calculating cost-based prices of Wholesale Long-Haul Dedicated Capacity Service and Wholesale Local Dedicated Capacity Service

5 **Introduction**

- (1) NICTA outlines in this Division 1 of the service-specific pricing principles the applicable methodology to be used for calculating cost-based prices for the Declared Services.
- (2) Division 2 of this service-specific pricing principles presents the results of applying this methodology to ascertain the price of the Declared Services.
- (3) Division 3 provides the method NICTA would follow to assess the access provider's compliance with the maximum allowable prices set in Division 2.

6 Appropriate approach to determine cost-based prices: International benchmarking or cost modelling

- (1) In principle NICTA accepts that both approaches: cost modelling and benchmarking, could be regarded as being in accordance with the General Pricing Principles ("GPPs"), and therefore, could be used to calculate the costs of supplying the Declared Services.
- (2) However, NICTA's view is that the cost modelling approach provides greater accuracy for calculating PNG-specific efficient costs of supplying those services.
- (3) Despite its greater data requirements and modelling time, NICTA will use primarily a cost modelling approach to calculate PNG-specific efficient costs of providing the Declared Services. For the avoidance of doubt, when applying the cost modelling approach, NICTA would model the efficient costs of supplying the Declared Services in accordance with the GPPs in Section 124 of the Act.
- (4) When using the cost modelling approach, NICTA may also use a benchmarking approach to justify some of the cost assumptions that would be used as inputs in the cost model.
- (5) Notwithstanding what is said elsewhere in this Determination, if NICTA considers that the data received for developing a cost model is inadequate, NICTA may decide to use a benchmarking approach instead to calculate the cost-based prices of supplying the Declared Services.

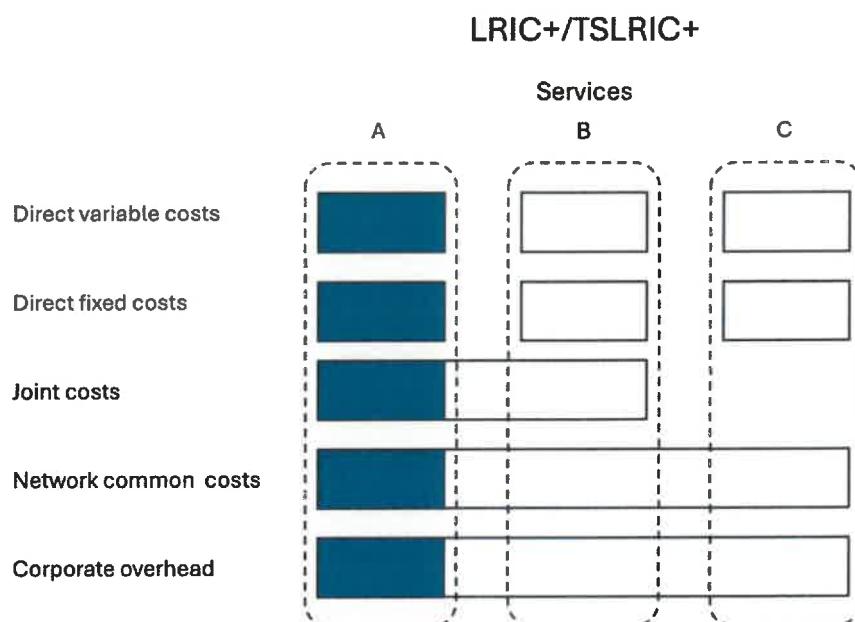
7 Modelling approach: Top-down, bottom-up, or hybrid

- (1) In principle, NICTA could either use a Bottom-up, a Top-down, or a Hybrid Cost Model.

8 Approach for allocating costs

- (1) NICTA will either use (i) a long-run incremental cost ("LRIC+") cost allocation approach that includes fair and reasonable common and joint costs (also known as TSLRIC+), or (ii) a fully allocated cost ("FAC") approach, that includes fair and reasonable common and joint costs.

- (2) Joint costs are the costs of an input that is used in the supply of two or more services. Common costs are the costs of certain inputs that are necessary for the supply of two or more services but that cannot be directly assigned to specific services. Common costs can be subdivided into network common costs and corporate overhead costs. The figure illustrates the different categories of costs for an operator that is assumed supplies three services.



9 Treatment of capital related costs

- (1) NICTA will use current cost accounting (“CCA”) also known as forward-looking costs to value the capital assets used for the supply of the Declared Services. Specifically, NICTA will value the capital related costs by either (i) using the cost of replacement with the Modern Equivalent Asset, or (ii) use as the cost of replacement, the economic cost of the depreciated assets in use.

10 Network topology for cost model

- (1) In principle, NICTA could either use a Scorched Node approach, a Scorched Earth approach, or a Modified Scorched Node approach. However, given that the Declared Services are supplied at fixed locations within the access provider’s network, NICTA will favour either, a Scorched Node approach or a Modified Scorched Node approach, provided that there is sufficient information about the location of the reference operator’s nodes. PNG DataCo Limited (“DataCo”) shall be the reference operator.

11 Hypothetical or notional operator’s network coverage and demand

- (1) The cost model to calculate cost-based prices for the Declared Services, will be based on a notional or hypothetical operator with a market share, and network coverage, similar or equivalent to that of DataCo, with reasonable adjustments, as needed, to reflect efficient costs.

12 Modelled services and service increments

- (1) NICTA's cost model will include, but not be limited to, the following components of the access provider's network:
 - (a) Access nodes (points of presence)
 - (b) Aggregation and repeaters nodes
 - (c) Terrestrial and submarine fibre optic cables
 - (d) Cable landing stations
 - (e) Core network
 - (f) Dark fibre
- (2) NICTA's cost model should include all the services' demands specified below.
 - (i) Services to be modelled:
 - (i) Wholesale international dedicated submarine cable capacity service
 - (ii) Wholesale long-haul dedicated capacity service
 - (iii) Wholesale local dedicated capacity service
 - (iv) Wholesale Internet access service
 - (b) Modelled service increment units:
 - (i) Capacity services: Bandwidth connection

13 Method to allocate joint and common costs to services

- (1) For the allocation of network related joint and common costs, NICTA will use the capacity-based allocation approach.
- (2) NICTA will implement the equal proportionate mark-up ("EPMU") approach for the allocation of overhead common costs.

14 Depreciation

- (1) NICTA will use the tilted annuity approach to calculate the depreciation of assets.

15 Approach to determine a reasonable rate of return

- (1) NICTA shall use the pre-tax weighted average cost of capital ("WACC") formula below to calculate the costs of capital.

$$\text{Pre-tax WACC} = \frac{\text{After-tax WACC}}{(1-t)}$$

Where the after-tax WACC is:

$$\text{WACC} = \left(\frac{E}{E+D}\right) \times r_e + \left(\frac{D}{E+D}\right) \times (1-t) \times r_d,$$

where,

r_e : cost of equity capital or shareholder's expected return on equity,

r_d : cost of debt,

E: Equity of the operator's capital structure,

D: Debt of the operator's capital structure, and

t: corporate tax rate.

- (2) For the Gearing ratio, NICTA shall use a value that reflects a reasonably efficient capital structure and not the capital structure of the sole access provider, DataCo. To that end, NICTA shall use a Gearing ratio informed by benchmarking telecom operators from the U.S., Australia, or comparable jurisdictions, that can be regarded as having an efficient capital structure. Alternatively, NICTA could use Gearing ratios from telecom service providers from the U.S., Australia, and comparable jurisdictions, as reported by Professor Damodaran in the extensive database that he regularly updates.¹
- (3) NICTA will use the following formula to calculate the cost of debt of the modelled notional access provider:

$$r_d = r_f + CRP + D_p,$$

¹ Prof. Damodaran's database can be found following this link: <https://pages.stern.nyu.edu/~adamodar/>. Prof. Damodaran is a world-renowned authority on the valuation of financial assets and accompanies. He is a professor of finance at the Stern School of Business at New York University (NYU).

Where,

r_d : Cost of debt,

r_f : Risk-free rate of return

CRP: Country risk premium, and

D_p : Debt-risk premium.

- (4) NICTA will use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return.
- (5) NICTA will either use Prof. Damodaran's estimate of the country risk premium ("CRP") for PNG or compute the CRP using the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity.
- (6) To calculate the debt-risk premium (D_p) in the above formula, NICTA will either use the difference between the cost of debt and the risk-free rate of return from telecom companies in the U.S., Australia, or comparable jurisdictions, as reported by Professor Damodaran, or benchmark debt-risk premiums on a sample of appropriate telecom companies.
- (7) NICTA will use the following formula to calculate the cost of equity capital for the modelled notional access provider:

$$r_e = r_f + \beta \times (MRP + CRP),$$

Where,

r_e : is the cost of equity capital,

r_f : risk-free rate of return,

β : equity beta,

MRP: Market risk premium, and

CRP: Country risk premium.

- (8) NICTA will use the difference between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return as the general approach to calculate the market-risk premium ("MRP"). To implement this approach, NICTA could use Prof. Damodaran's calculation of the MRP.
- (9) NICTA will benchmark the Equity Betas of publicly traded telecom companies in other jurisdictions as the general approach to calculate the Equity Beta of the modelled notional access provider. To implement this, NICTA could use Prof.

Damodaran estimated Equity Betas from publicly traded telecom companies from the U.S., Australia, or comparable countries.

[Division 2 and Division 3 to be inserted in the second phase of this public consultation]

DRAFT SERVICE-SPECIFIC PRICING PRINCIPLES FOR SERVICE DECLARED UNDER WHOLESALE DECLARATION NO. 3 OF 2025

National Information and Communications Technology Act 2009

THE NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AUTHORITY makes this Determination under section 135 of the *National Information and Communications Technology Act 2009*.

Dated [xxx, 202X]

[Name]

[Signature]

Member

[Name]

[Signature]

Member

National Information and Communications Technology Authority

PART I – PRELIMINARY

1 Name of Determination

This Determination is the *Service-Specific Pricing Principles Determination for Service Declared Under Wholesale Service Declaration No. 3 of 2025*

2 Commencement

(1) This Determination commences on [XX, Month 202X] (*the Commencement Date*).

3 Interpretation

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

- (2) In this Determination, unless the context in Part II – Pricing Principles, otherwise requires:
- (a) **“Act”** means the *National Information and Communications Technology Act, 2009*.
 - (b) **“Bottom-up Cost Models”** are:
 - (i) Models that use data on demand, network coverage, geographic and technical information to dimension the required network to serve the geographic coverage area with the required capacity and technology. The underlying technical engineering model of a network is used to develop unit costs of various network components. These costs are then allocated to the various services supplied by the access provider.
 - (c) **“Declared Service”** is – the wholesale Internet access service.
 - (d) **“Equity Beta”** is the risk that a company or investment adds to a market portfolio. Intuitively, it measures the sensitivity of a company’s rate of return on equity to changes on the market rate of return.
 - (e) **“Gearing”** is – the ratio of the debt to the total capital of a company (debt plus equity).
 - (f) **“Hybrid Cost Models”** are cost models where a Bottom-up Cost Model is used as the primary model to calculate the costs, and then a partial Top-down Cost Model is used only to fine-tune some of the assumptions in the bottom- up model.
 - (g) **“Modern Equivalent Asset”** means the lowest cost asset providing at least equivalent functionality and output as the asset being valued.
 - (h) **“Modified Scorched Node”** means an approach to model the network topology where the location of the nodes is based on the location of the reference operator’s nodes but are not strictly fixed at the operator’s locations. Locations may be modified or calibrated to optimize the real network.
 - (i) **“Scorched Earth”** means an approach to model the network topology that allows the cost model’s hypothetical network to be optimized to the fullest extent by having no constraints on the location of the nodes. With this approach the cost model could place optimally the nodes to serve the required demand with an optimized network.
 - (j) **“Scorched Node”** means an approach to model the network topology where the existing location of a reference operator’s nodes are used to design the hypothetical or notional network in the cost model. There is room for optimizing the notional network in the model, but it is constrained by the

predetermined location of the network nodes. The resulting optimized network would have a similar footprint as the reference network.

(k) **“Top-down Cost Models”** are:

- (i) Cost models that use data from an access provider’s accounts and allocation rules, to distribute the costs across the services supplied by the access provider. This approach does not involve detailed network modelling.
- (ii) To avoid incorporating the access provider’s inefficiencies, the model would need to adjust the accounting costs to reflect forward-looking (efficient) costs. This may require adjustments to the network configuration and costs in the model.

(l) **“Wholesale Internet Access Service”** means the wholesale service defined in Part II of the Wholesale Service Declaration No. 3 of 2025.

4 Determination

The National Information and Communications Technology Authority (“NICTA”) determines, pursuant to Section 135 of the Act, that the service-specific pricing principles specified in Part II are to apply to the following service declared by the Minister in the Wholesale Service Declaration No. 3 of 2025:

- Wholesale Internet Access Service.

PART II – PRICING PRINCIPLES

Division 1 – Methodology to be used for calculating cost-based prices of Wholesale Internet Access Service

5 Introduction

- (1) NICTA outlines in this Division 1 of the service-specific pricing principles the applicable methodology to be used for calculating cost-based prices for the Declared Service.
- (2) Division 2 of this service-specific pricing principles presents the results of applying this methodology to ascertain the price of the Declared Service.
- (3) Division 3 provides the method NICTA would follow to assess the access provider’s compliance with the maximum allowable prices set in Division 2.

6 Appropriate approach to determine cost-based prices: International benchmarking or cost modelling

- (1) In principle NICTA accepts that both approaches: cost modelling and benchmarking, could be regarded as being in accordance with the General Pricing Principles (“GPPs”), and therefore, could be used to calculate the costs of supplying the Declared Service.
- (2) However, NICTA’s view is that the cost modelling approach provides greater accuracy for calculating PNG-specific efficient costs of supplying that service.
- (3) Despite its greater data requirements and modelling time, NICTA will use primarily a cost modelling approach to calculate PNG-specific efficient costs of providing the Declared Service. For the avoidance of doubt, when applying the cost modelling approach, NICTA would model an efficient notional or reference access provider to calculate the efficient costs of supplying the Declared Service in accordance with the GPPs in Section 124 of the Act.
- (4) When using the cost modelling approach, NICTA may also use a benchmarking approach to justify some of the cost assumptions that would be used as inputs in the cost model.
- (5) Notwithstanding what is said elsewhere in this Determination, if NICTA considers that the data received for developing a cost model is inadequate, NICTA may decide to use a benchmarking approach instead to calculate the cost-based prices of supplying the Declared Service.

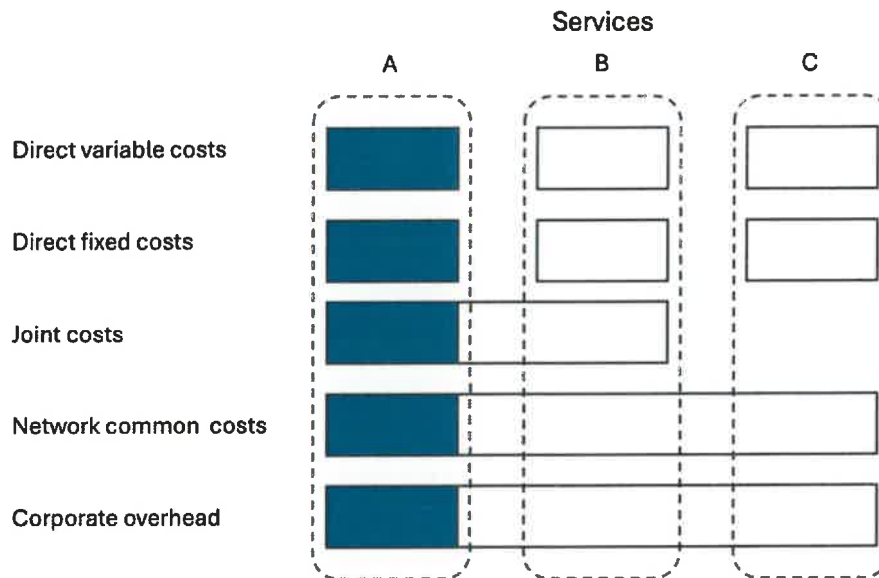
7 Modelling approach: Top-down, bottom-up, or hybrid

- (1) In principle, NICTA could either use a Bottom-up, a Top-down, or a Hybrid Cost Model.

8 Approach for allocating costs

- (1) NICTA will either use (i) a long-run incremental cost (“LRIC+”) cost allocation approach that includes fair and reasonable common and joint costs (also known as TSLRIC+), or (ii) a fully allocated cost (“FAC”) approach, that includes fair and reasonable common and joint costs.
- (2) Joint costs are the costs of an input that is used in the supply of two or more services. Common costs are the costs of certain inputs that are necessary for the supply of two or more services but that cannot be directly assigned to specific services. Common costs can be subdivided into network common costs and corporate overhead costs. The figure illustrates the different categories of costs for an operator that is assumed supplies three services.

LRIC+/TSLRIC+



9 Treatment of capital related costs

- (1) NICTA will use current cost accounting (“CCA”) also known as forward-looking costs to value the capital assets used for the supply of the Declared Service. Specifically, NICTA will value the capital related costs by either (i) using the cost of replacement with the Modern Equivalent Asset, or (ii) use as the cost of replacement, the economic cost of the depreciated assets in use.

10 Network topology for cost model

- (1) In principle, NICTA could either use a Scorched Node approach, a Scorched Earth approach, or a Modified Scorched Node approach. However, given that the Declared Service is supplied at fixed locations within the access provider’s network, NICTA will favour either a Scorched Node approach or a Modified Scorched Node approach, provided that there is sufficient information about the location of the reference operator’s nodes. PNG DataCo Limited (“DataCo”) shall be the reference operator.

11 Hypothetical or notional operator’s network coverage and demand

- (1) The cost model to calculate cost-based prices for the Wholesale Internet Access Service, will be based on a notional or hypothetical operator with a market share, and network coverage, similar or equivalent to that of DataCo, with reasonable adjustments, as needed, to reflect efficient costs.

12 Modelled services and service increment

- (1) NICTA's cost model for Wholesale Internet Access Service will include, but not be limited to, the following components of the access provider's network:
 - (a) National terrestrial fibre optic backbone
 - (b) Kumul submarine cable network
 - (c) Metropolitan fibre optic networks
 - (d) International submarine cable network
- (2) NICTA's cost model should include all the services demands specified below.
 - (a) Services to be modelled:
 - (i) Wholesale international dedicated submarine cable capacity service
 - (ii) Wholesale long-haul dedicated capacity service
 - (iii) Wholesale local dedicated capacity service
 - (iv) Wholesale Internet access service
 - (b) Modelled service increment units:
 - (i) Capacity: Bandwidth connection

13 Method to allocate joint and common costs to services

- (1) For the allocation of network related joint and common costs, NICTA will use the capacity-based allocation approach.
- (2) NICTA will implement the equal proportionate mark-up ("EPMU") approach for the allocation of overhead common costs.

14 Depreciation

- (1) NICTA will use the tilted annuity approach to calculate the depreciation of assets.

15 Approach to determine a reasonable rate of return

- (1) NICTA shall use the pre-tax weighted average cost of capital ("WACC") formula below to calculate the costs of capital.

$$\text{Pre-tax WACC} = \frac{\text{After-tax WACC}}{(1-t)}$$

Where the after-tax WACC is:

$$\text{WACC} = \left(\frac{E}{E+D}\right) \times r_e + \left(\frac{D}{E+D}\right) \times (1-t) \times r_d,$$

where,

r_e : cost of equity capital or shareholder's expected return on equity,

r_d : cost of debt,

E: Equity of the operator's capital structure,

D: Debt of the operator's capital structure, and

t: corporate tax rate.

- (2) For the Gearing ratio, NICTA shall use a value that reflects a reasonably efficient capital structure and not the capital structure of the sole access provider, DataCo. To that end, NICTA shall use a Gearing ratio informed by benchmarking telecom operators from the U.S., Australia, or comparable jurisdictions, that can be regarded as having an efficient capital structure. Alternatively, NICTA could use Gearing ratios from telecom service providers from the U.S., Australia, and comparable jurisdictions, as reported by Professor Damodaran in the extensive database that he regularly updates.¹
- (3) NICTA will use the following formula to calculate the cost of debt of the modelled notional access provider:

$$r_d = r_f + CRP + D_p,$$

Where,

r_d : Cost of debt,

r_f : Risk-free rate of return

CRP: Country risk premium, and

D_p : Debt-risk premium.

¹ Prof. Damodaran's database can be found following this link: <https://pages.stern.nyu.edu/~adamodar/>. Prof. Damodaran is a world-renowned authority on the valuation of financial assets and companies. He is a professor of finance at the Stern School of Business at New York University (NYU).

- (4) NICTA will use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return.
- (5) NICTA will either use Prof. Damodaran’s estimate of the country risk premium (“CRP”) for PNG, or compute the CRP using the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity.
- (6) To calculate the debt-risk premium (D_p) in the above formula, NICTA will either use the difference between the cost of debt and the risk-free rate of return from telecom companies in the U.S., Australia, or comparable jurisdictions, as reported by Professor Damodaran, or benchmark debt-risk premiums on a sample of appropriate telecom companies.
- (7) NICTA will use the following formula to calculate the cost of equity capital for the modelled notional access provider:

$$r_e = r_f + \beta \times (MRP + CRP)$$

Where,

r_e : is the cost of equity capital,

r_f : risk-free rate of return,

β : equity beta,

MRP: Market risk premium, and

CRP: Country risk premium.

- (8) NICTA will use the difference between the rate of return on the U.S. Standard & Poor’s 500 Index and the risk-free rate of return as the general approach to calculate the market-risk premium (“MRP”). To implement this approach, NICTA could use Prof. Damodaran’s calculation of the MRP.
- (9) NICTA will benchmark the Equity Betas of publicly traded telecom companies in other jurisdictions as the general approach to calculate the Equity Beta of the modelled notional access provider. To implement this, NICTA could use Prof. Damodaran estimated Equity Betas from publicly traded telecom companies from the U.S., Australia, or comparable countries.

[Division 2 and Division 3 to be inserted in the second phase of this public consultation]
