

**Information Paper:**

**Costing Methodology for Local Leased Circuits (Tail  
Circuits) as an Interconnection Related Service**

**28 October 2005**

## **COSTING METHODOLOGY FOR LOCAL LEASED CIRCUITS (TAIL CIRCUITS) AS AN INTERCONNECTION RELATED SERVICE**

### **INTRODUCTION**

1. The Infocomm Development Authority of Singapore (“**IDA**”) has decided to adopt the methodology of Forward Looking Economic Costs (“**FLEC**”) using Long-Run Average Incremental Costs (“**LRAIC**”) for determining the cost-based prices at which Singapore Telecommunications Limited (“**SingTel**”) is required to offer Tail Local Leased Circuits (“**TLLC**”) as an Interconnection Related Service (“**IRS**”) under its Reference Interconnection Offer (“**RIO**”). This document sets out the explanation for IDA’s decision.

### **BACKGROUND**

2. On 16 December 2003, IDA issued its decision (“**LLC Decision**”)<sup>1</sup>, to require SingTel to offer Full Local Leased Circuits (“**FLLCs**”) and TLLCs as Mandated Wholesale Services (“**MWS**”) under its RIO for an interim period. The interim period is currently specified in the Code of Practice for Competition in the Provision of Telecommunication Services (RIO Requirements) Notification 2005 (G.N. S 414/2005) as being:
  - (i) from 15 October 2004 to 14 April 2006 (18 months) for FLLCs and TLLCs terminating within the CBD proxy-region<sup>2</sup>; and
  - (ii) from 15 October 2004 to 14 October 2006 (24 months) for FLLCs and TLLCs terminating outside the CBD proxy-region.
3. The LLC Decision further provides that after the expiry of the interim period, TLLCs will be designated as an IRS to be offered under SingTel’s RIO at cost-based prices (“**IRS Prices**”) to be determined by IDA based on appropriate costing methodology to be adopted by IDA.
4. IDA has decided to adopt the FLEC/LRIAC methodology for determining the cost-based prices for SingTel to offer TLLCs as IRS under its RIO. IDA’s decision for doing so is further explained as follows.

---

<sup>1</sup> A copy of the LLC Decision can be found on the IDA website at <http://www.ida.gov.sg>.

<sup>2</sup> The “CBD proxy-region” is the area within the Central Business District containing the locations where SingTel, as at 20 July 2004, offered retail local leased circuits under its IDA-approved retail tariff for local leased circuits in the Central Business District area.

## VARIOUS COST METHODOLOGIES

5. Broadly speaking, there are two cost methodologies that IDA could adopt for determining the IRS prices for TLLCs: (a) historical costs or (b) FLEC.

### **(a) Historical Costs**

6. Simply put, historical costs are the costs that an operator would have recorded in its accounts at the time the costs were incurred, i.e., they reflect the actual costs at a particular point in time in the past. The extent to which historical costs reasonably reflect the costs that would be incurred today for a similar purchase, and hence be taken into account in an investment decision, depends on:

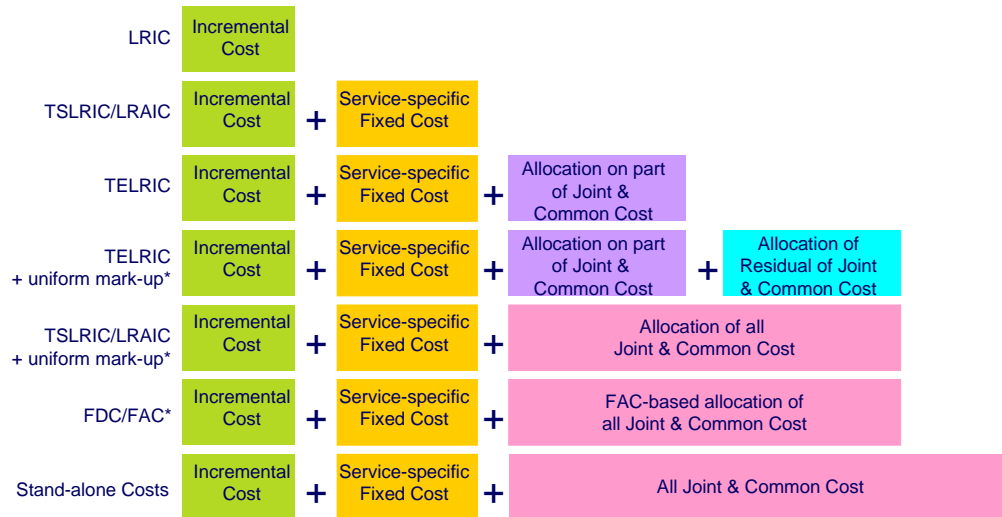
- (i) whether there have been significant changes to the prices of materials or equipment in the meantime; and
- (ii) whether the types of goods purchased by the operator are subject to significant technological changes.

7. In the telecommunications industry, historical costs are unlikely to reflect today's costs given the pace of change in material prices and technology. For instance, prices for major input resources, such as network capital items are significantly affected by underlying technological changes that: (i) reduce unit costs; (ii) increase functionalities; and (iii) change cost relationships, over a relatively short period of time.

### **(b) Forward Looking Economic Costs (FLEC)**

8. FLEC reflect the prospective costs an operator would incur in producing a service using an efficient network architecture which is based on best-in-use technology and product practices. In a fully competitive market, "build vs buy" decisions will be made on the basis of competitive offerings priced on the basis of FLEC. The decision will be based on a comparison of what the operator would have to spend to buy equipment today, compared to services supported by networks priced on the same basis.
9. While many methods for determining FLEC currently exist around the world, almost all of them use LRAIC as their starting point. This is because costs measured over the long run would possibly avoid the volatility associated with spare capacity (high short run costs) or capacity constraints (low short-run

costs), and establish a true measure of the profitability of entry. Thereafter, the various FLEC approaches differ on the extent to which service specific fixed costs and joint and common costs (or part there of) are to be included. The following Figure 1, extracted from the World Bank Telecommunications Handbook, shows the cost elements included under the various definitions of FLEC.



Notes: (a) For TSLRIC/LRAIC the increment is defined as the total service.  
 (b) FDC/FAC is assumed to be based on forward looking economic cost  
 (c) The total costs of the three concepts identified by an asterisk (\*) do not necessarily have to be equal as shown in the diagram.

Source: The World Bank - Telecommunications Regulation Handbook

**Figure 1: The relationship between costs, costing methodologies and allocations**

## IDA'S CONSIDERATIONS

### (a) Historical Costing Methodology

10. In order to consider the use of historical costing methodology for determining the IRS Prices for TLLCs, one has to ascertain the extent to which the historical costs incurred in the provision of TLLCs would reasonably reflect the costs that would be incurred by an operator if it is to provide TLLCs today. IDA understands that the underlying costs for providing TLLCs comprise the costs of the following constituent components, namely –

- (i) the physical transmission medium supporting the circuits;
- (ii) the physical infrastructure (trenches, ducts, manholes, etc) in or on which the transmission medium is located;

- (iii) the termination units defining the circuits in terms of capacity and electronic interface with other equipment (line and channel cards); and
  - (iv) the operating and other systems for monitoring and supervising the operation of the TLLCs, and for determining whether maintenance or other intervention is required to ensure the TLLC performance.
11. IDA notes that changes in technology and operating practice are transforming the costs and cost relationships of these constituent components in significant ways. The introduction of optical technologies, for example, enables significant reductions in the unit cost of capacity by allowing operators to perform aggregation of traffic, particularly when service density permits the use of efficient ring architectures. The costs of line and channel cards are also decreasing as mass production techniques evolve. Lastly, network management systems enable remote supervision and intervention, thereby reducing the reliance on expensive on-site support.
12. Given the extent of the change in technology and operating practice, historical costs of TLLCs are unlikely to be a fair reflection of current costs, and the adoption of a historical costing approach would not provide an adequate basis for economic investment decisions by both new and incumbent operators on TLLCs.

**(b) FLEC using LRAIC Methodology**

13. IDA's position, as set out in the LLC Decision, is that while it will not be economically feasible for new entrants to duplicate the extensive reach of the SingTel's LLC network, new entrants should build portions of the LLC infrastructure where it is economically feasible to do so. The costing methodology ultimately adopted by IDA for the determination of the IRS Prices for TLLCs, should therefore further advance this position by encouraging new and incumbent operators to:
- (i) use existing facilities where economically desirable; and
  - (ii) invest in new facilities where economically justified, e.g., modernisation of existing infrastructure and facilities to embrace new technologies, the deployment of new infrastructure in greenfield sites, etc.

14. In this regard, IDA views that FLEC using LRAIC<sup>3</sup> would be the most appropriate and reasonable costing methodology to adopt as it:
- (i) creates the right balance between investment incentives for facilities-based entry by new entrants since, in a fully competitive environment, “build vs buy” decisions will be made on the basis of competitive offerings priced on the basis of FLEC; and
  - (ii) sends the right signals to incumbents as it retains the investment incentives for incumbents to upgrade or extend their existing facilities when new technologies are available and/or their current practices are inefficient.
15. In addition, IDA considers it reasonable to allow for the recovery of a portion of joint and common costs associated with the provision of LLC Tail Circuits, to be applied on FLEC using LRAIC. This is because in the long term, joint and common costs must be recovered by any operator to ensure continued viability.
16. IDA notes that it is possible for some to argue that the concept of FLEC hinges on the fact that FLEC sends the appropriate “build vs buy” signals to new entrants, and that because new entrants are not be expected to build the tail portions of the LLC infrastructure, the case for FLEC is weakened since there is no possibility of any decision by new entrants to “build”, and only an option to “buy” for LLC Tail Circuits. However, while the “build vs buy decision” consideration may not be fully applicable to the case for TLLCs, FLEC nonetheless provides a standard for cost-based compensation to SingTel that is based on the levels of efficiency that would have resulted from the dynamics of a fully competitive market. As such, from an overall market efficiency perspective, the adoption of FLEC would help to ensure that the same incentive towards efficiency, similar to that in a fully competitive market, is maintained on SingTel in the provision of TLLCs.

**(c) Other considerations: Additional Mark-up Above FLEC**

17. Separately, IDA has considered whether it would be appropriate to include an additional mark up on the pricing of TLLCs to reflect the investment risks associated with service provisioning. However, after careful evaluation of the

---

<sup>3</sup> LRAIC consists of all variable costs and those fixed costs that are directly attributable to the incremental change in the IRS, including the sum of the operating and maintenance costs, as well as the capital costs that a licensee would incur in providing the IRS.

matter, IDA believes that the risks associated with the provisioning of TLLCs are not likely to be materially or exceptionally different from the risks associated with the provisioning of other IRS which SingTel has a regulatory obligation to offer to other Licensees. In that respect, IDA assesses that any investment risks associated with the provisioning of TLLCs, would already have been appropriately addressed through the application of a cost of capital (i.e., Weighted Average Cost of Capital) that had been adjusted for the risk associated with the return on the investments made by the service provider.

## **CONCLUSION**

18. Based on the above assessment and considerations, IDA deems the adoption of FLEC using LRAIC costing methodology as appropriate for the determination of IRS Prices for TLLCs. This would also be consistent with the costing methodology adopted for all other IRS offered under SingTel's RIO.