

# **Designation of Singapore Telecommunication Limited's Local Leased Circuits as Mandatory Wholesale Service**

## **Consultation Paper of The Infocomm Development Authority of Singapore**

### **Response by Cable & Wireless**

***30 June 2003***

#### **1. Introduction**

This document contains Cable & Wireless's (C&W) response to the Infocomm Development Authority's (IDA) consultative document on designation of Singapore Telecommunication Limited's (SingTel) local leased circuits (LLC) as a mandatory wholesale service.

C&W is a leading supplier of global data and IP services, operating networks in major business centers throughout the world. C&W has significant investments and presence in Singapore and the region, and is committed to serving business customers by enhancing choice, quality, value and global reach of the communications services it provides. C&W believes that this objective is consistent with the info-communications environment that the IDA is seeking to create in Singapore.

In C&W's view, the IDA is correct in identifying local leased circuits as a fundamental input for high bandwidth telecommunications services. High bandwidth telecommunications services, in turn, are critical to secure Singapore's position as a leading international telecommunications and information hub, and to enhance Singapore's economic development, particularly in information related industries. Therefore, the supply of local leased circuits, at efficient prices and best feasible terms and conditions, is a critical issue.

The structure of this document is as follows:

- Section 2 describes the conceptual economic case for why LLC regulation is required.
- Section 3 provides evidence on why this case applies to Singapore.
- Section 4 provides C&W's analysis of the appropriate remedies to the problems identified in provision of SingTel's LLCs.

- Section 5 provides responses to the IDA's specific questions.
- Section 6 provides a summary of C&W's position.

## 2. Economic Case for Why Regulation of LLC is Required

If competitive supply of LLCs were sufficient to ensure efficient prices and best feasible terms and conditions, there would be no need for regulation. However, C&W's experience is that this is not the case in Singapore (or, for that matter, most other telecommunications markets).

To begin with, there are strong a priori reasons for believing that competition cannot be effective in the supply of LLC. The cost of building a local network capable of supplying LLCs is characterized as being largely:

- **Fixed**, with a low proportion of costs dependent on either the number of circuits supplied in a given district, or the capacity of circuits supplied;
- **Sunk**, consisting predominantly of street works with potentially endless asset lives, especially in the case of a mature network where only a low level of engineering intervention is necessary;
- **Joint to other services**, notably the PSTN, thus increasing the degree to which costs are fixed in respect to LLC volumes alone.

Because of the economies of scale embedded in the fixed, sunk (and written down) nature of local network costs, incumbent local access network operators have the lowest cost base of any access network.

With SingTel's local access network now built, in general these cost characteristics suggest there can be little commercial opportunity for competitive supply of this infrastructure. The only exceptions are:

- Particular types of geographic area, where the costs of new build are not excessive, and where the incumbent maintains geographically averaged prices: SingTel's LLC tariffs distinguish only between CBD (Central Business District) and non-CBD areas, and so provide some limited incentive for competitive build in particular CBD or non-CBD areas where costs are lower than average. StarHub has focused its own network build in this type of area. However, due to the scale of SingTel's general cost advantage (for reasons given above), it is likely that StarHub has now exhausted these commercial possibilities, whilst achieving access to only 20-30% of commercial buildings in Singapore, and with a market share in the local loop that C&W believe to be only between 5 and 10%.<sup>1</sup> The incumbent, SingTel, remains the only possible provider, either to single site customers in areas where competitive provision is not economic, or to multi-site customers.

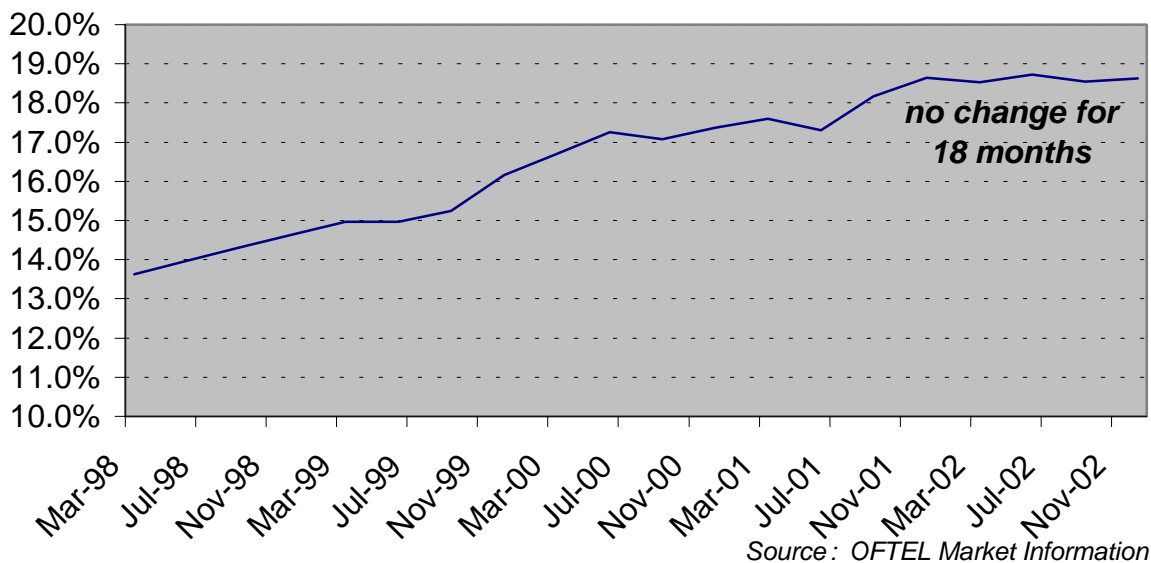
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<sup>1</sup> These are rough C&W estimates. StarHub themselves may be able to provide a more accurate figure.

- As and when new technologies become available that offer substantial cost savings or capacity advantages to challenge the cost characteristics of the ubiquitous incumbent network: as of this time, no technology exists that is able to challenge the fixed and sunk cost structure of the incumbent's local network on a ubiquitous basis. We return to consider the future likelihood of such competitive networks later in this submission.

The experience of Singapore in this regard is typical of that of other developed countries. In the US, the FCC reports that the Competitive Local Exchange Carriers (CLEC) hold only 13% of total end-user switched access lines.<sup>2</sup> Similarly, in the UK, OFTEL reports that BT's competitors have won only 18.6% of UK access lines, and this percentage has remained unchanged for over a year, suggesting that further access line competition will not occur in the foreseeable future. Complete data is shown in Chart 1.<sup>3</sup>

**Chart 1:  
UK Competitors' Share of Access Lines**



OFTEL has required BT to provide wholesale LLC (termed Partial Private Circuits – PPC) since August 2001. In its recent market analysis OFTEL concluded:

<sup>2</sup> See [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-235340A1.doc](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-235340A1.doc).

<sup>3</sup> See [http://www.oftel.gov.uk/publications/market\\_info/index.htm](http://www.oftel.gov.uk/publications/market_info/index.htm) for source data.

*4.33 The Director considers that the markets for terminating segments [of PPCs] are not effectively competitive and that BT has market power in markets for both the high and low bandwidth terminating segments. Due to the lack of extensive data on these markets, the Director has reached this conclusion on the basis of the significant barriers to entry that characterise them and of the close parallel between these markets and the corresponding retail markets for leased lines, where all the indicators suggest that BT has market power.*

*4.34 The Director considers that the market for trunk segments is not yet effectively competitive. However, he believes that this market is prospectively competitive given that entry has occurred and there is likelihood of further entry.<sup>4</sup>*

These conclusions from OFTEL are mirrored by virtually every telecoms regulator worldwide that has seriously sought to analyse these markets within their own jurisdiction.

In the case of Singapore, fixed line competition is even more immature than in most other developed economies. StarHub has been in existence since only 1998, and multi-operator fixed line competition since 2000, and so the expectation that SingTel retains market power is even stronger. As stated above, C&W estimate that SingTel retains control of 90-95% of Singapore's access lines, and 70-80% of commercial buildings in Singapore have no alternative to using a SingTel access line.

C&W concludes, therefore, that in Singapore there should be an expectation that competitors will be dependent on SingTel for the provision of local access lines to their customer sites. The next section will verify this by specific reference to the Singapore market.

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<sup>4</sup> See [http://www.oftel.gov.uk/publications/broadband/leased\\_lines/ppcs0602.htm#Chapter4](http://www.oftel.gov.uk/publications/broadband/leased_lines/ppcs0602.htm#Chapter4)

### **3. Evidence of Problems in Singapore**

The most striking evidence of SingTel's dominance in local access, and LLCs in particular, is its ability to charge inflated prices irrespective of competitor action. In Singapore, the only possible competitor is StarHub which, despite charging LLC prices that are significantly below those of SingTel, still only manages to achieve a market share of 5-10%, principally because of its limited network coverage to actual buildings (only 20-30% of commercial buildings).

In particular, it is relevant to note that, in the face of recent reductions in StarHub's prices for LLCs, SingTel has found it unnecessary to respond to the same extent with price cuts of its own, despite having prices that were already noticeably higher. This is clear evidence of market dominance.

On an international benchmark analysis, SingTel's LLC prices are significantly above those of comparator countries and territories such as Hong Kong. This is despite the underlying cost structure in Hong Kong being higher due to larger geographic coverage (with more rural areas) and higher labour costs. (Labour costs are an important component of LLC costs due to the labour capitalized in local network construction.)

One further impact of SingTel's excessive pricing is that StarHub prices are often also above those of comparator countries such as Hong Kong. Therefore, the effect of SingTel exploiting its dominant position is to provide room for StarHub to also raise prices of its own circuits above benchmark levels in areas where it is able to provide coverage.

## 4. Remedies to SingTel's Dominance in LLC

In view of SingTel's dominance of LLCs supplied to competitive carriers, C&W strongly supports the IDA's proposals that SingTel should be required to make a wholesale leased line offering as part of its RIO.

Three areas need consideration:

- Price regulation;
- Service level agreement regulation;
- Access to underlying facilities;
- Migration of LLCs to new wholesale prices.

### Price Regulation

C&W believes there to be two important elements to price regulation:

- Individual price caps on wholesale LLCs of different speeds;
- "Imputation test" associated with SingTel's downstream products, whenever prices are amended.

#### *Individual Price Cap on Circuits of Different Speeds*

Ideally, LLC wholesale prices should be regulated at their true cost (including a normal return on capital employed). This will result in efficient investment decisions and, more generally, maximize economic efficiency of both the SingTel and competitor networks. Prices above costs will encourage competitors to "under-use" SingTel's network and withhold supply to end-customers, whilst prices below cost will encourage competitors to over-use the network and supply services to end customers on an uneconomic basis.

However, true cost based pricing would require significant and time consuming preparatory work to develop and verify a cost model of SingTel's local access network, taking account of the written-down nature of the costs. The IDA may wish to consider this as an option in 12 to 24 months time, assuming work can be started now.

There remains a need to determine regulated prices immediately. The IDA have proposed a "retail minus 40%" scheme, where the reduction from retail tariffs may represent a suitable allowance for avoided retail costs, and network efficiencies in providing circuits to other operators (e.g. a higher proportion of circuit ends will be at existing switch sites rather than in remote customer

locations). The appropriate discount over retail prices is best determined by benchmarking internationally against other operators that offer both retail and wholesale LLC. 40%, as proposed by IDA, would seem a reasonable level. It is important that the “retail price” nets off “average” discounts available to large customers.

The “retail minus 40%” approach has much to commend it, allowing an effective transition to true cost based pricing as a longer-term objective. Effectively, this is the route taken in the UK with Partial Private Circuits. BT was required to provide cost based PPCs from August 2001. However, OFTEL then took a period of 17 months to consider whether BT’s prices were indeed cost orientated, before issuing a Direction setting the prices that resulted in significant price reductions.<sup>5</sup>

Nevertheless, C&W remains concerned that the “retail minus” formula, on its own, may not provide a sufficient safeguard. The reason for this is that the “retail” tariffs used as a base for calculation of wholesale rates may not be true “average” retail tariffs offered by SingTel, taking full account of retail tariff discounts. If this were not the case, there would be a risk that the price to wholesale customers would be no lower than the actual retail prices.

In the light of this concern, C&W proposes that an additional safeguard be introduced, whereby the wholesale tariffs would, in any event, be no higher than an international benchmark. The IDA could follow the European Commission’s practice, and set a price benchmark for each circuit speed based on the 3<sup>rd</sup> lowest of a suitable sample of international carriers. This method avoids distortion to the benchmark from potentially artificially low prices of one or two carriers.

It is important that any international benchmarks are based entirely on circuits of lengths appropriate to Singapore – around 5 km, corresponding to the average distance between competitors’ customer premises and their network hub or point of presence. Competitive carriers purchase from SingTel very few circuits longer than 5 km. Indeed, some circuits are far shorter. SingTel, therefore, is able to keep a distance insensitive price structure in the knowledge that very few circuits will exceed 5 km in length. So, the assumption of longer circuits in benchmark calculations will significantly bias the results. The benchmarking would effectively compare a price appropriate for a SingTel circuit (that SingTel are able to base on a 5 km length) with (say) a true 30 km circuit for other operators, making SingTel’s prices appear artificially cheap.

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<sup>5</sup> See [http://www.oftel.gov.uk/publications/broadband/leased\\_lines/ppc1202/sum\\_ch2.htm](http://www.oftel.gov.uk/publications/broadband/leased_lines/ppc1202/sum_ch2.htm)

*“Imputation test” associated with SingTel’s downstream products, whenever prices are amended*

Price caps on wholesale LLCs, although necessary, are not sufficient to prevent SingTel from exploiting its dominant position in local network bandwidth. This is because, if the price cap was inadvertently or deliberately set above the underlying incremental cost of LLC capacity (as may be the case), SingTel alone would be able to benefit from a lower cost for its downstream products. In effect, SingTel could impute a lower local access charge to its own downstream products compared to that which competitors would need to pay for wholesale LLC. This can be looked at another way. Even if SingTel claimed not to discriminate in LLC prices available to competitors compared to its own downstream operations, SingTel could still be subsidizing its downstream products from profits on inflated LLC prices.

Evidence of this kind of behavior is extremely difficult for competitors to establish, since actual (discounted) prices paid by SingTel’s customers for downstream products are generally confidential, and competitors have no knowledge of SingTel’s underlying local network cost base, or its downstream network and retail costs that should be recovered if the product is not sold anti-competitively.

For this reason, it is important that the IDA itself establish and police an “Imputation test” applied to each new or amended price of SingTel’s downstream products that make use of local network bandwidth. This test, which can be applied on a routine basis, would require SingTel to demonstrate that the downstream service price allowed SingTel to make a reasonable return on capital employed for the product even when the appropriate wholesale LLC price is imputed to the downstream product, and so was not pricing anti-competitively. These tests are routinely used by OFTEL and other regulators.<sup>6</sup>

As stated above, the test can only be applied by SingTel, and supervised by the IDA. It is not possible to rely on competitors bringing ex-post complaints. It is absolutely critical that this test is routinely applied, especially if there has been

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<sup>6</sup> For example, the “imputation” or “stack” test is incorporated in BT’s existing license. The relevant condition is condition 71, which discusses the different cost elements that BT needs to provide in its cost stack to determine whether a price is “Type A” or “Type B” (Type A prices are below cost) and what BT would be required to do should a price be shown to be Type A. This regime will be modified as a result of the new European regulatory framework. An indication of the new regime can be found in Paragraphs 3.34 to 3.38 of the OFTEL document “Imposing access obligations under the new EU directives”, 13 September 2002.

any relaxation on the obligation for SingTel to publish all prices offered to individual customers in downstream markets, since this will destroy any possibility of competitors identifying such behavior from published documents.

## **Service Level Agreements**

In addition to price, incumbents are able to use service quality (both provisioning and fault repair times) to exploit dominant market positions on competitors. It is, therefore, essential that the IDA require SingTel to provide a regulated Service Level Agreement (SLA) on its wholesale LLC offerings.

The SLA standards are best set from the better of SingTel's own SLAs for retail customers, or external benchmarks.<sup>7</sup>

## **Access to Underlying Facilities**

### *Co-location of Competitor LLC Equipment at SingTel Exchanges*

C&W agrees with the IDA that a requirement for SingTel to provide co-location at its exchanges for competitors' LLC equipment is a further useful remedy. Co-location would allow, in some instances, competitors to economically self provide circuits between SingTel's exchanges and their network hubs or facilities. However, SingTel has a clear incentive and means to either prevent or over-price co-location. Therefore, regulation is required of both co-location prices and terms and conditions (including lead times for making co-location space available) through suitable SLAs.

The co-location requirement may speed up the process to a truly competitive market for these circuits, and may allow for an earlier review of the need for regulation of these particular LLCs (ie. circuits from Singtel switches to competitor network hubs). However, self-provision of circuits between SingTel switches and competitors' own network hubs or facilities may not always be economic, and so regulation of SingTel circuits for this purpose will still be required for the time being.

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<sup>7</sup> Examples of the scope and extent of OFTEL's requirements for BT's PPC SLAs can be found in Chapter 6 of: [http://www.oftel.gov.uk/publications/broadband/leased\\_lines/ppc1202/direction.htm](http://www.oftel.gov.uk/publications/broadband/leased_lines/ppc1202/direction.htm)

### *Unbundling SingTel Dark Fibre*

C&W also propose a further supplementary remedy that would incrementally reduce the dependency of competitors on SingTel LLCs in some instances. This proposal is based on C&W's experience in the Japanese market, where unbundled NTT/East and NTT/West dark fibre to end customer sites on regulated terms and conditions and cost-based prices has been available to competitors since mid-2001. This has allowed competitors to economically construct their own customer access network in urban areas. C&W, for example, has constructed a fibre access network in Tokyo and Yokohama, and plans to extend this in due course. This has significantly reduced C&W 's dependency on NTT's LLCs.

Details of the regulated product, which forms part of the interconnection offerings of NTT/East and NTT/West, are shown in the Box 1 over the page.

**Box 1:**  
**NTT/East and NTT/West Regulated Customer Access Dark Fibre**

***Product***

Fiber Local Loops (Dark Fiber) between the CTF (Cable Termination Frame) in the Switch Office and Terminal Adapter in the end customer premises including the CTF.

***Price Structure***

	<u>NTT/East</u>	<u>NTT/West</u>
Dark fibre charge:		
...maintenance provided only for 9:00-17:00	4,603 yen/fiber/month (S\$67)	4,603 yen/fiber/month (S\$67)
...maintenance provided 24 hours and 365 days	4,879 yen/fiber/month (S\$71)	4,879 yen/fiber/month (S\$71)
Line information management charge:		
	139 yen/line/month (S\$2.03)	147 yen/line/month (S\$2.15)
	125 yen/bill/month (S\$1.83)	125 yen/bill/month (S\$1.83)

Arguments that regulated access to local network dark fibre will reduce the incentive for incumbents to invest in fibre networks are easily refuted if competitors are required to pay genuine cost based prices for fibre they lease (including capital costs of depreciation plus a reasonable rate of return on capital employed). In fact, as competitors develop innovative (incremental) services over the huge bandwidth that dark fibre provides, the incumbent will benefit from the additional revenue stream contributing towards for the cost of the fibre network build, providing greater incentives for fibre network investment.

Placing SingTel's customer access network dark fibre in the RIO, would be entirely appropriate, given SingTel's dominance in customer access bandwidth, and the IDA's broader policy objectives. This would give competitors more flexibility in the development of high bandwidth services.

Again, it needs to be emphasized that requiring SingTel to provide unbundled dark fibre does not immediately remove the need for wholesale LLC regulation. This is because incumbent fibre may not always be available, or end-customer demand may be insufficient to justify the investment in the optical and electronic transmission equipment. In Japan, LLCs remain regulated. Regulated fibre unbundling does, however, increase the options available to competitors in some areas.

## **Migration**

In order to minimize current market distortions, the IDA must require that SingTel migrate all requested circuits to new wholesale prices without penalty from existing retail contracts.

## 5. Responses to IDA's Specific Questions

**a) The IDA welcomes views and comments on competition in the local LLCs market. Is the local LLCs market competitive and if not, what are the factors contributing to this?**

This has been discussed in Sections 2 and 3 above. The LLC market is not competitive, due to the scale and sunk cost nature of SingTel's local network (see Section 2). Evidence of excessive pricing by SingTel for LLC, and the fact that SingTel's prices are not constrained by those of its only (and partial) competitor, supports this view (see Section 3).

**b) The IDA welcomes views and comments on the IDA's proposed regulatory measures to promote greater competition in the local LLC'S market and those market sectors that may depend on LLCs. Are there additional issues that the IDA needs to consider in implementing these measures? Would these regulatory measures be effective in stimulating network rollout by competing operators in the longer term? Are there other more appropriate or effective regulatory measures that the IDA should consider rather than designating SingTel's LLCs as a mandatory wholesale service under the Code in the short-term?**

C&W's response to this question is covered in Section 4. In view of SingTel's dominance of LLC supplied to competitive carriers, C&W strongly supports the IDA's proposals that SingTel should be required to make a wholesale leased line offering as part of RIO.

Regulation should cover three areas:

- wholesale price regulation;
- an "imputation test" associated with SingTel's downstream products, whenever prices are amended, to guard against the residual incentive for anti-competitive pricing by SingTel;
- service level agreement regulation;
- access to co-location and unbundled dark fibre facilities, in order to provide some additional choice in self provision of circuits.

Full reasons for these proposals have been provided in Section 4.

**c) The IDA welcomes views and comments on the technical definition or specification for the LLCs including the range of bandwidths (for**

***example, 64 kbps, 512 kbps, 2 Mbps) that the IDA should designate as mandatory wholesale service.***

Although competitive operators most commonly use 2 Mbps circuits, all speeds are potentially required, and the same issue of SingTel dominance applies in all cases.

As demand for high bandwidth applications increases, it will be increasingly important to include speeds above 2 Mbps, up to STM-1.

***d) The IDA welcomes views on other related issues that the IDA needs to address in designating SingTel's LLCs as a mandatory wholesale service.***

Some additional views have been provided in the body of this document.

***e) The IDA also seeks views and comments on the proposed pricing principle to be adopted in the designation of SingTel's LLCs as a mandatory wholesale service and its effectiveness in promoting competition in the local LLCs market. As set out in paragraph 3.1(a) in this consultation paper, the IDA welcomes views on the proposed pricing methodologies to be adopted, in particular the magnitude of discount for "retail-minus" and whether it should be a single discount or tiered based on quantity purchased.***

C&W's views on the proposed pricing principles were expressed in Section 4. C&W believes, in the first instance, prices should be set using a retail price (net of discounts available to large retail customers) less 40% formula, but with a further safeguard cap set at international benchmarks for 5km circuits. C&W's reasons are given in Section 4.

Two additional points need to be made:

- Volume discounts should not be included in the regulated wholesale LLC pricing structure.<sup>8</sup> This is because, apart from the final customer drop (which is a very small proportion of total cost) the local access network is a shared resource. It is true that there is a difference in unit cost between a route running, for example, at STM16 compared to STM4, but there is no difference in the cost of an E1 of capacity used by a large customer compared to an E1

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<sup>8</sup> This should not prevent commercially negotiated volume discounts, which should be permitted.

of capacity used by a smaller customer on the same route. Both benefit equally from the economies of scale on the route as a whole.<sup>9</sup>

- The revised SingTel “Code of Practice” must make it clear that the new wholesale LLC pricing regime applies to all existing circuits leased by competitive operators from SingTel immediately. That is, it must be possible to migrate all existing circuits to the new wholesale arrangements at the request of the purchasing operator.

**f) The IDA welcomes views on the adequacy of the proposed 2-3 year timeframe for FBOs to build or develop the necessary infrastructure to compete in the local LLCs market in the longer term. The IDA welcomes any comments or alternative proposals on the pricing methodologies to be adopted.**

The IDA should note that commercial realities today are not favourable to infrastructure build –out. In the recent report by the Singapore Economic Review Committee’s (ERC) ICT Working Group, a recommendation on the removal of certain ‘bottleneck’ infrastructure, stated:

*"Given that it is not economically feasible for another operator to build a duplicate last-mile network, the government should focus on services-based competition by improving access to existing infrastructure..."*

C&W ‘s view, therefore, is that any proposed timeframe for LLC regulation should not be a sunset, after which effective competition in the facilities-based market is presumed to be effective. Rather, the regulatory period should terminate in a review (not a sunset). Further, C&W believes that the review period should be set longer, at 4 years. This is because further roll-out of alternative ubiquitous access networks in Singapore (from the limited base currently provided by StarHub) will probably require the use of a different technology (perhaps wireless based). This is highly unlikely to materialise in less than 4 years.

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<sup>9</sup> In any case, as noted above, under a “retail minus” formula, “average” retail discounts will have been netted off from the “average” retail price.

## 6. Conclusion

The LLC market is not competitive, due to the scale and sunk cost nature of SingTel's local network. Evidence of excessive pricing by SingTel for LLCs, and the fact that SingTel's prices are not constrained by those of its only (and partial) competitor, supports this view.

In view of SingTel's dominance of LLCs supplied to competitive carriers, C&W strongly supports the IDA's proposals that SingTel be required to make a wholesale leased line offering as part of its RIO. Regulation should cover three areas:

- **Wholesale price regulation.** In the first instance, prices should be set using a retail price (net of average retail discounts available to large customers) less 40% formula, **but** with a further safeguard cap set at international benchmarks for 5km circuits. Volume discounts should not be included in the regulated wholesale LLC pricing structure. This is because, apart from the final customer drop (which is a small proportion of total cost) the local access network is a shared resource in which all users benefit equally from the combined economies of scale;
- An “**imputation test**” applied to SingTel's downstream products, whenever prices are amended, to guard against the residual incentive for anti-competitive pricing by SingTel;
- **Service level agreement** regulation;
- **access to co-location and unbundled dark fibre facilities**, in order to provide some additional choice in self provision of circuits.

C&W believes that the review period should be set at 4 years. This is because further roll-out of alternative ubiquitous access networks in Singapore (from the limited base currently provided by StarHub) will probably require the use of a different technology (perhaps wireless based). This is highly unlikely to materialise in less than 4 years.

There are currently a large number of competitive operators in Singapore's relatively small market. Therefore, the IDA needs to take speedy action in order to leverage off the competitive presence that currently exists.

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**30<sup>th</sup> June 2003**

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