

MALAYSIAN COMMUNICATIONS AND MULTIMEDIA
COMMISSION

**ACCESS LIST DETERMINATION AND STATEMENT ON
ACCESS PRICING PRINCIPLES**

CONSULTATION PAPER

21 December 2000

Preface

Under the *Communications and Multimedia Act 1998*, the Malaysian Communications and Multimedia Commission (the Commission) may determine that a network facility, a network service, or any other facilities and/or services or applications services, including content applications services shall be included in or removed from the access list. The inclusion of a facility or service in the access list means that a network facilities provider and a network service provider is under an obligation to provide access to their facilities or services listed in the access list, upon written request and on reasonable terms and conditions.

On 11 August 2000, the Commission issued a discussion paper seeking industry submissions in relation to the following broad matters:

- What network facilities, network services, and other facilities and/or services should be included in the access list *at this stage*?
- Should the Commission develop regulatory statements on access pricing principles and other broad principles relating to the terms and conditions of access? If so, what matters should the regulatory statements address?

The Commission has considered the submissions received and information provided, and takes the view that the access list should include all services or facilities which are currently subject to interconnection obligations under the present interconnection and access regime. The Commission believes that the existing interconnection and access regime reflects a deliberate policy progression from a monopoly environment to an environment of greater competition, and the access regime under the Act should build on the existing policy environment. The Commission also believes that including all services or facilities which are currently subject to interconnection obligations in the access list would promote or support Malaysia's national policy objectives for the communications and multimedia industry.

Additionally, the Commission has also decided to include an origination service for internet access in the access list.

This consultation paper sets out the Commission's findings as a result of the industry consultative process. It also includes the Commission's draft determination to include certain services or facilities in the access list, as well as a *Statement on Access Pricing Principles* (draft version – December 2000).

As part of a public inquiry process, the Commission invites submissions from members of the public on the consultation paper, including the draft determination and the *Statement on Access Pricing Principles* (draft version – December 2000).

Written submissions should be provided to the Commission by **9 February 2001**. Submissions should be provided in hard copy as well as electronic form and addressed to:

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For further inquiries on this consultative process, please contact Ms Janakky Raju (tel: 4047 7055) or Encik Wan Faizal Wan Hassan (tel: 4047 7066).

In the interest of fostering an informed and robust consultative process, the Commission proposes to make submissions received by the Commission available to interested parties upon request. Any commercially sensitive information should be provided under a separate cover clearly marked 'Commercial in Confidence'.¹

The Commission thanks interested parties for their participation in this consultative process and for providing written submissions.

¹ Some parties have earlier chosen to provide confidential and non-confidential versions of their submissions on the discussion paper. In the interest of fostering an informed and robust consultative process, the Commission encourages interested parties to provide only non-confidential submissions to the Commission, while submitting any commercially sensitive information under a separate cover clearly marked 'Commercial in Confidence'.

TABLE OF CONTENTS

<i>Section 1:</i>	<i>Introduction</i>	<i>1</i>
<i>Section 2:</i>	<i>Background</i>	<i>4</i>
2.1	<i>Current interconnection and access regime</i>	<i>4</i>
2.2	<i>Access regime under the Communications and Multimedia Act 1998</i>	<i>6</i>
<i>Section 3:</i>	<i>Framework for decision making</i>	<i>9</i>
<i>Section 4:</i>	<i>What facilities or services should be included in the access list?</i>	<i>12</i>
4.1	<i>Proposed access list to maintain existing interconnection obligations</i>	<i>12</i>
4.2	<i>Expansion of access list to include other facilities or services</i>	<i>18</i>
4.3	<i>Internet Access Origination Service</i>	<i>21</i>
<i>Section 5:</i>	<i>Broad principles relating to the terms and conditions of access</i>	<i>23</i>
<i>Appendix A:</i>	<i>Draft determination under sections 55, 146 and 292 of the Act</i>	<i>25</i>
<i>Appendix B:</i>	<i>Proposed framework for decision making in relation to determination on the access list</i>	<i>32</i>
<i>Appendix C:</i>	<i>Expansion of the access list – summary of comments made by Celcom et al and Telekom Malaysia</i>	<i>39</i>
<i>Appendix D:</i>	<i>Economics of Access Pricing</i>	<i>43</i>
<i>Appendix E:</i>	<i>Draft Statement on Access Pricing Principles</i>	<i>49</i>

ABBREVIATIONS

AMPS	Advanced Mobile Phone System
CDMA	Code Division Multiple Access
DLS	Digital Local Switch
DTS	Digital Tandem Switch
ETACS	Extended Total Access Communications System
FDC or FAC	Fully Distributed Cost or Fully Allocated Cost
GFIA	General Framework of Interconnect and Access
GSM	Global System for Mobile Communications
IASP	Internet Access Service Provider
ISDN	Integrated Services Digital Network
LAF	Local Access Fund
LRIC	Long Run Incremental Cost
POI	Point of Interconnection
PSTN	Public Switched Telephone Network

GLOSSARY

Access list	A list of network facilities or network services in respect of which standard access obligations apply.
The Act	The <i>Communications and Multimedia Act</i> 1998.
The Commission	The Malaysian Communications and Multimedia Commission.
Interconnection service	A facility or service (including the physical connection between separate networks) provided by a Network Operator to an Interconnecting Operator which involves or facilitates the carriage of communications between an end user connected to the network of the Network Operator and an end user connected to another network (not necessarily the network of the Interconnecting Operator).
National Policy Objectives	The national policy objectives for Malaysia's communications and multimedia industry as set out in section 3 of the Act.
Standard access obligation (SAO)	Includes the obligation to provide access to network facilities or network services listed in the access list on reasonable terms and conditions.

SECTION 1: INTRODUCTION

Under the *Communications and Multimedia Act 1998*, the Malaysian Communications and Multimedia Commission (the Commission) may determine that a network facility, a network service, or any other facilities and/or services or applications services, including content applications services shall be included in or removed from the access list. The inclusion of a facility or service in the access list means that a network facilities provider and a network service provider is under an obligation to provide access to their facilities or services listed in the access list, upon written request and on reasonable terms and conditions.

On 11 August 2000, the Commission issued a discussion paper seeking submissions in relation to the following broad matters:

- What network facilities, network services, and other facilities and/or services should be included in the access list *at this stage*?
- Should the Commission develop regulatory statements on access pricing principles and other broad principles relating to the terms and conditions of access? If so, what matters should the regulatory statements address?

Submissions on the discussion paper were sought from a number of interested parties from a broad spectrum of industry including telecommunications operators, internet service providers and value added service providers. The following written submissions were received during the course of the consultative process:

Initial submissions:

- Telekom Malaysia Berhad's first submission dated 20 September 2000;
- Celcom (Malaysia) Sdn Bhd, Celcom Transmission (M) Sdn Bhd, DiGi Telecommunications Sdn Bhd, Maxis Communications Bhd, TT dotCom Sdn Bhd, Time Reach Sdn Bhd and Time Wireless Sdn Bhd's first joint submission dated 29 September 2000;
- ntv7 submission dated 6 October 2000;
- Mimos submission dated 2 November 2000.

Supplementary submissions:

- Celcom (Malaysia) Sdn Bhd, Celcom Transmission (M) Sdn Bhd, DiGi Telecommunications Sdn Bhd, Maxis Communications Bhd, TT dotCom Sdn Bhd, Time Reach Sdn Bhd and Time Wireless Sdn Bhd's second joint submission dated 27 October 2000;
- Telekom Malaysia Berhad's second submission dated 2 November 2000.

All the submissions received by the Commission during the course of this industry consultation process were made available to interested parties. Telekom Malaysia submitted a confidential version of its second submission dated 2 November 2000, but made available a non-confidential version of this submission. Only the non-confidential version of Telekom Malaysia's written submission was made available to interested parties.

In addition, the Commission held the following meetings with interested parties in the course of the consultative process:

- Meeting with Celcom (Malaysia) Sdn Bhd, Celcom Transmission (M) Sdn Bhd, DiGi Telecommunications Sdn Bhd, Maxis Communications Bhd, TT dotCom Sdn Bhd, Time Reach Sdn Bhd and Time Wireless Sdn Bhd (collectively referred to in this report as Celcom et al) on 8 November 2000;
- Meeting with Telekom Malaysia Bhd on 15 November 2000.

The Commission has considered the submissions made and information provided and takes the view that the access list should include all services or facilities which are currently subject to interconnection obligations under the present interconnection and access regime. The Commission believes that the existing interconnection and access regime reflects a deliberate policy progression from a monopoly environment to an environment of greater competition, and the access regime under the Act should build on the existing policy environment. The Commission also believes that including all services or facilities which are currently subject to interconnection obligations in the access list would promote or support Malaysia's national policy objectives for the communications and multimedia industry. In particular the Commission believes that:

- including the services or facilities in the access list would lead to a competitive communications and multimedia industry, and this would help establish Malaysia as a major global center and hub for communications and multimedia information and content services;
- a competitive communications and multimedia industry would bring long-term benefits to the end user;
- a competitive communications and multimedia industry would promote a high level of consumer confidence in service delivery from the industry;
- a competitive communications and multimedia industry would facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
- a competitive communications and multimedia industry would help ensure information security and network reliability and integrity;
- a competitive communications and multimedia industry would help create a robust applications environment for end users; and
- a competitive communications and multimedia industry is consistent with an equitable provision of affordable services over ubiquitous national infrastructure.

In addition to services or facilities which are currently subject to interconnection obligations, the Commission has decided to include an origination service for internet access in the access list. The Commission believes that including such a service would promote or support Malaysia's national policy objectives for the communications and multimedia industry.

The facilities and services which the Commission believes should be included in the access list at this stage are as set out in a draft determination in Appendix A to this paper. The Commission welcomes comments on the draft determination.

This paper sets out the Commission's findings as a result of the consultative process outlined above. In preparing this paper, the Commission has taken into consideration the submissions received over the course of the consultative process as well as all

relevant information available to the Commission. Although the paper does not specifically address every point made in submissions by interested parties, this should not be taken to mean that the Commission has not given due consideration to the points raised.

This paper is structured in the following manner:

Section 2 briefly describes the existing interconnection and access regime, and outlines the key components of the access regime under the *Communications and Multimedia Act 1998* (the Act).

Section 3 develops and proposes a framework for decision making within which the Commission would exercise its discretionary powers under section 146 of the Act in relation to the determination of an access list.

Section 4 then addresses the question of what facilities or services should be included in the access list.

Section 5 highlights a number of issues relating to access pricing principles and other broad principles relating to the terms and conditions of access, and includes out a discussion of these issues. A *Statement on Access Pricing Principles* (draft version – December 2000) is set out in Appendix E.

SECTION 2: BACKGROUND

2.1 Current interconnection and access regime

At present, there is an obligation on the part of each licensed network operator (LNO) to permit interconnection of another LNO's network with the network of that LNO. This obligation is stipulated as a condition of the LNO's licence.²

The obligation to permit interconnection is set out in greater detail in the following regulatory instruments:

- The *General Framework of Interconnection and Access* (GFIA) issued on 17 May 1996;
- TRD001/98, *Customer Access Arrangements*, issued on 24 May 1998;
- TRD006/98, *Determination of Cost-based Interconnect Prices and the Cost of Universal Service Obligation*, issued on 15 July 1998.

The above regulatory instruments together form what may be loosely described as an interconnection and access regime. The key features of this regime include the following:

Interconnect call conveyance services

Cost based charges apply to the following interconnect call conveyance services³:

- Fixed networks
 - Local call termination;
 - Single tandem origination and termination;
 - Double tandem origination and termination.
- Mobile networks
 - Call termination from a Point of Interconnection (POI) in the called-party's home area;
 - Call termination from a POI outside the called-party's home area.
- Fixed and mobile
 - For a fixed interconnect service that require the use of the submarine cables between Peninsula Malaysia and Sabah/Sarawak, an additional charge will added to the relevant interconnect charge.

The above services are regarded as 'well established' and utilize 'bottleneck facilities'. Cost-based prices are available to operators providing public switched telephony network (PSTN) and public land mobile network services.

Cost based pricing principle

For fixed network interconnect services, charges are set closer to Fully Allocated Costs. For mobile interconnect services, charges are set closer to long-run incremental costs.⁴ These charges are set out in Appendix IV of TRD006/98.

² The licenses also typically contain provisions requiring the provision of Equal Access.

³ Para 2.2.2 TRD006/98.

⁴ Para 2.4.1 of TRD006/98.

Ancillary services	In addition, emergency services, the inclusion of customer numbers in telephone directories (white pages), copies of printed telephone directories, and access to the database of all customer numbers for the resolution of directory enquiries are to be offered at cost-based charges. ⁵ The charges for directory enquiries, emergency services and operator calls are set out in Appendix III of TRD006/98.
Private circuit completion service	A 'private circuit completion' interconnection service is to be made available for conveyance of a private circuit between a POI and customer premises. ⁶ According to TRD006/98, private circuits are regarded as a well-established service, and the junction transmission and local loop portions of private circuits are classified as a bottleneck. In addition, the trunk network in certain areas of the country are to be considered as a bottleneck for call conveyance services. However, specific charges for the private circuit completion interconnection service have not been determined by the regulator.
POI	Points of interconnection (POI) are to be offered at trunk or tandem switch level installed between assigned trunk switches. ⁷
Co-location	Limited physical co-location is to be allowed for establishing interconnect links, subject to negotiations between the operators. One operator is given the right to co-locate and to offer virtual co-location facilities / in-span interconnection to other operators at each exchange. ⁸
Local Access Fund	A Local Access Fund (LAF) mechanism has been established to fund any increase in the net cost of universal service provision arising from the introduction of equal access. ⁹ All local access network operators receive LAF payments from interconnecting operators originating calls on their local access network. The LAF payments are based on originating traffic minutes and are billed at the same frequency as originating interconnect fees. The level of LAF charge has been determined by the regulator to be 10 cents a minute on all originating traffic minutes.
Customer access arrangement	Customer access arrangements (referred to as 'Equal Access') are to be implemented by way of call-by-call selection (from 1 January 1999) and preselection (from 1 January 2001).

The interconnection and access regime described above is based on regulatory instruments issued under the *Telecommunications Act* 1950 (now repealed). Whilst these regulatory instruments have been preserved under the transitional provisions of the Act, it is intended that the interconnection and access regime would be replaced by the access regime established under Chapter 3, Part VI of the Act.

⁵ Para 2.2.6 of TRD006/98.

⁶ Para 2.2.8 of TRD006/98.

⁷ Para 4 of TRD001/98.

⁸ Para 2.2.10 TRD006/98.

⁹ Para 5 TRD006/98.

2.2 Access regime under of the Communications and Multimedia Act 1998

Chapter 3, Part VI of the Act seeks to establish a regime to ensure that all network facilities providers, network service providers and applications service providers can gain access to the necessary facilities and services on reasonable terms and conditions in order to prevent the inhibition of the provision of downstream services.¹⁰

The Act provides for the establishment of an access list of network facilities, network services, and ancillary facilities and services which are considered essential to the provision of network services or applications services.

Pursuant to sections 55 and 146 of the Act, the Commission may determine that a network facility, a network service or any other facilities and/or services which facilitate the provision of network services or applications services (including content applications services) shall be included in the access list.

The key components of the access regime in the Act may be summarised in the following manner:

Applicability of access regime

The access regime applies to:

- network facilities,
- network services, or
- any other facilities and/or services which facilitate the provision of network services or applications services (including content applications services).

'Network facilities' refers to any element or combination of elements of physical infrastructure used principally for, or in connection with, the provision of network services, but does not include customer equipment. 'Network services' refers to a service for carrying communications by means of guided and/or unguided electromagnetic radiation. 'Applications service' refers to a service provided by means of, but not solely by means of, one or more network services. 'Content applications service' refers to an applications service which provides content.

Access list

A network facility, network service, or other facilities and/or services which facilitate the provision of network services or applications services may be determined by the Commission to be included in (or removed from) an access list. A determination by the Commission may be made by the Commission on its own accord (usually following a public inquiry¹¹), or on the recommendation of an access forum (where the Commission is satisfied that the access forum has consulted with persons who have an interest in the recommendation, and the access forum was unanimous in supporting the recommendation¹²).

Standard access obligations

Standard access obligations apply to network facilities providers and network service providers in respect of network facilities or network services listed in the access list. In particular, a network facilities provider and a network services provider is required to provide access to their network facilities or network services listed in the access list to any other:

- network facilities provider;
- network service provider;

¹⁰

Explanatory Statement to the Communications and Multimedia Act 1998, para 82.

- applications service provider; or
- content applications service provider,

who makes a written request for access to such network facilities provider or network service provider on reasonable terms and conditions. A 'network facilities provider' refers to a person who is an owner of any network facilities. A 'network service provider' refers to a person who provides network services. An 'applications service provider' refers to a person who provides an applications service.

Access agreements

A written access agreement for the provision of listed network facilities or network services must be registered with the Commission in accordance with section 91 of the Act. The Commission may direct any party to a registered agreement to comply with the registered agreement.

Access disputes

Where there is a dispute over the compliance with standard access obligations, a party to the dispute may notify the Commission of the dispute under Chapter 7, Part V of the Act. A dispute must first be attempted to be resolved by negotiation between the parties. The Commission may publish guidelines setting out the principles and procedures which it may take into account in resolving disputes or a class of disputes. The Commission may resolve the dispute upon such terms and conditions as it may deem fit. The terms and conditions of any resolution of a dispute by the Commission must be accompanied with reasons and be in writing. The decision of the Commission is binding on the parties.

Access code

The Commission will make a written request to the access forum to prepare an access code. The access code will provide model terms and conditions for compliance with the standard access obligations. Matters which the access code may address include, but are not limited to:

- the time frame and procedures for negotiations and the concluding of access agreements;
- rate methodologies;
- protection of intellectual property;
- protection of commercial information;
- provisioning of facilities; and
- sharing of technical information.

The access code may provide for different terms and conditions for the different network facilities and network services listed in the access list. The Commission must not register an access code unless it is satisfied that the

¹¹ Subsection 55(2) provides that the Commission may conduct an inquiry to decide whether a determination should be made, either (a) in response to a written request from a person; or (b) on its own initiative. Subsection 55(3) provides that the Commission shall not conduct an inquiry unless it is satisfied that the matter is of significant interest to either the public or to current or prospective licensees under the Act. In general, a section 146 determination is likely to be of significant interest to current or prospective licensees, and therefore a public inquiry will usually be appropriate, but not mandatory.

¹² Subsection 147(2).

access code is consistent with the standard access obligations.

***Access
undertaking***

A licensee may provide an access undertaking in accordance with section 10 of the Act. An access undertaking may specify more than one set of terms and conditions for access to a particular network facility or network service listed in the access list. The Commission must not register an undertaking unless it is satisfied that the undertaking is consistent with the standard access obligations.

SECTION 3: FRAMEWORK FOR DECISION MAKING

In the discussion paper of 11 August 2000, the Commission sought to develop a framework for decision making within which the Commission would exercise its discretionary power to make a determination to include (or remove) facilities or services in (or from) the access list. The proposed framework for decision making is set out in Appendix B.

Interested parties were invited to comment on the proposed framework for decision making. Some of the key comments made by interested parties are set out below:

Comments on the proposed framework for decision making

Telekom Malaysia emphasized that any communications market definition utilized by the Commission should use convergence models. In fact, Telekom argued that the definitions of communications markets in Malaysia must 'necessarily be broader' than those utilized in other countries.

Telekom Malaysia also argued that any rigidities caused by, or resulting from retail tariffs not being able to reflect their underlying cost structures be specifically acknowledged in the Commission's cost-benefit analysis.

Telekom Malaysia would endorse an approach of establishing access rules and charges in such a way as to encourage the 'build' rather than always the 'buy/lease' option.

Celcom et al, in their joint submission, expressed concerns that the proposed framework and criteria are very broad. The proposal that the Commission would make a determination if 'it would promote one or more of the national policy objectives' is too broad, as many of the national policy objectives are only distantly related to the access provisions of the Act. Celcom et al instead recommends a list of specific criteria to guide the Commission's decision. The criteria proposed are:

- Will inclusion of the service on the access list promote choice, quality and affordability in communications markets?
- Will inclusion of the service on the access list promote any-to-any connectivity?
- Will inclusion of the service on the access list promote competition in communications markets?
- Will inclusion of the service on the access list encourage the economically efficient use of, and economically efficient investment in, the infrastructure by which services are supplied?

Celcom et al also argued that there should be no formal requirement to define markets in the decision-making framework. Identification of markets is only required to assess whether inclusion of the relevant service on the access list will promote competition in the relevant upstream and downstream markets. This does not require precise market definition.

In its second submission, **Telekom Malaysia** submitted that Celcom et al's proposed methodology for analysing whether a service or facility should be included in the access list is flawed. However, if the Commission were to endorse an approach where there are clearly defined criteria, Telekom proposed additional questions for such criteria to be consistent with the national policy

objectives:

- Has the industry attempted to negotiate for the service to be added to the access list? Has the industry attempted to negotiate the terms and conditions for such access to be included in the Access Code?
- What are the relevant markets? How would the inclusion of particular services on the access list affect upstream and downstream markets?
- Will the inclusion of the service on the access list facilitate and promote the provision of a ubiquitous national infrastructure?
- Is the retail charging for such a service regulated? If so, what are the implications for affordability or the continued provision of the service by licensees if such a service is included on the access list?
- Will the inclusion of the service have an impact on network reliability and security? Or will it compromise information security?

Telekom Malaysia considers that only facilities-based competition will deliver sustainable and self-sufficient competition in Malaysia's underdeveloped telecommunications markets.

Celcom et al in their second submission submitted that Telekom Malaysia is attempting to have the Commission adopt as wide a definition of market as possible so that Telekom can point to the number of competitors and alternative infrastructure, and divert attention from itself. Such a broad definition serves no real regulatory purpose.

Celcom et al argued that a requirement for facilities-based competition would distort market forces, leading to sub-optimal investment choices by competing network operators. The Commission should adopt the 'efficient build/buy' principle.

The Commission would like to thank Telekom Malaysia and Celcom et al for their helpful comments on the framework for decision making outlined in the discussion paper. The Commission would make the following points by way of clarification:

- Sections 55 and 146 of the Act does not set out a criteria or test for deciding whether or not a facility or service should be included in the access list. This is in contrast to the 'Long Term Interest of End Users' test set out in Australian law.¹³
- In the absence of a legislative criteria, the Commission proposes to exercise its discretionary power in a manner which the Commission believes would promote or support one or more of the national policy objectives of the Act.
- The proposed decision making framework outlines a cost-benefit methodology for assessing the economic case for a determination on the access list. In the Commission's view, this is no more than a tool of analysis to assist in analysing issues relevant to a proposed determination.
- As part of the cost-benefit analysis, the Commission would expect to identify the relevant markets with a view to assessing the likely effects on competition and on economic efficiency if a proposed determination were to be made. The process

¹³

See section 152AB of the Australian *Trade Practices Act* 1974.

of identifying the relevant markets and defining the scope of the markets is not an end in itself, but simply an analytical tool to assist the Commission in making its decision. Consequently the Commission does not expect that it is generally necessary to define the relevant markets with a high degree of precision. Nor does the Commission expect that it is necessary to expend substantial time and resources to reach a view on the identity and scope of the relevant markets.

- The Commission notes Telekom Malaysia's views that markets should be defined in convergent terms. If this means that the identity and scope of the relevant markets should be defined independently of license boundaries as set out in the now repealed *Telecommunications Act 1950* and *Broadcasting Act 1988*, then the Commission would agree with Telekom Malaysia on this point. In reaching a view on the identity and scope of the relevant markets, the Commission will have regard to the substitutability (both demand and supply) of the relevant services in question, regardless of whether the service is characterized as a broadcasting service or as a telecommunications service. However, the Commission does not believe it is appropriate to form *a priori* views on the identity and scope of the relevant markets. The Commission believes such an approach may lead to decisions which are not based on a realistic assessment of the conditions in which market participants operate. Indeed, it could give rise to a distorted view of convergence in the Malaysian communications and multimedia industry.
- The Commission notes the debate between Telekom Malaysia and Celcom et al in relation to facilities-based competition. The Commission also notes the comments by Kiessling and Blondeel on inter-modal and intra-modal competition.¹⁴ The Commission notes that inter-modal and intra-modal competition does not necessarily correspond to facilities-based competition and service-based competition. The Commission's thinking on this matter is still developing and the Commission does not propose to form a view on this matter at this stage.
- The Commission notes Celcom et al's views on the cost-benefit methodology outlined in the discussion paper. Whilst the Commission would seek to quantify the relevant costs and benefits wherever practicable, the Commission expects that the cost-benefit analysis would generally be undertaken in a qualitative manner.

As noted in the 11 August 2000 discussion paper, the Commission expects to review the cost-benefit methodology outlined in the proposed decision making framework in light of subsequent experience.

¹⁴ Thomas Kiessling & Yves Blondeel, *Effective competition in European telecommunications: an analysis of recent regulatory developments*, Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media, Vol 1, No 5, October 1999.

SECTION 4: WHAT FACILITIES OR SERVICES SHOULD BE INCLUDED IN THE ACCESS LIST?

In deciding what facilities or services should be included in the access list in an access list determination, the Commission takes, as the starting point, the existing interconnection and access regime. The Commission believes that the existing interconnection and access regime reflects a deliberate policy progression from a monopoly environment to an environment of greater competition, and the access regime under the Act should build on the existing policy environment.

Consequently, in deciding what facilities or services should be included in the access list, the Commission proposes to, in the first instance, include in the access list all facilities or services which are currently subject to interconnect obligations under the present interconnection and access regime. The Commission would then examine if, on a cost-benefit analysis, there is an economic case for expanding the access list to include other facilities or services.

4.1 Proposed access list to maintain existing interconnection obligations

The 11 August 2000 discussion paper outlined a list of facilities or services for inclusion in the access list. (See Box 1 below.)

Box 1: Facilities and services for inclusion in the access list (proposed)

1. Fixed network interconnection termination services including but not limited to:
 - a. Local termination service for fixed to fixed calls;
 - b. Single tandem termination service for fixed to fixed, mobile to fixed and incoming international calls;
 - c. Double tandem termination service for fixed to fixed, mobile to fixed and incoming international calls.
2. Fixed network interconnection origination services including, but not limited to:
 - a. Single tandem origination service for long distance and outgoing international calls;
 - b. Double tandem origination service for long distance and outgoing international calls.
3. Mobile network interconnection services including, but not limited to:
 - a. Intra home ATUR exchange area termination service;
 - b. Inter home ATUR exchange area termination service.
4. Ancillary services consisting of the following:
 - a. Directory enquiries calls;
 - b. Emergency services calls;
 - c. Operator calls;
 - d. Inclusion of customer numbers in telephone directories (White Pages);
 - e. Copies of printed telephone directories;
 - f. Access to the database of all customer numbers for the resolution of directory enquiries;
 - g. Physical co-location service to a single interconnecting operator at any point in time;
 - h. Virtual co-location service;
5. Physical circuit completion interconnection service which is available for one end of a private circuit only.

The Commission invited interested parties to address the following matters in their submission:

- Whether the proposed list of facilities and services for inclusion in the access list is complete (for the purposes of maintaining interconnection obligations under

the existing interconnection and access regime); and

- Whether the facilities and services proposed have been correctly described in the proposed access list determination.

Some of the key comments received by the Commission are set out below:

Comments on the proposed access list

Telekom Malaysia did not consider that the proposed access list fully and accurately reflect the decisions taken in TRD006/98. For example, it does not include the determined interconnection charges, the LAF mechanism and the price floor. Telekom also made a number of comments on the description of the services and facilities in the proposed access list.

Celcom et al submitted that the Commission should determine an access list which includes as a minimum services and facilities covered under TRD006/98 and other services currently supplied by Telekom to itself or to the market place. In addition, there are other facilities and services which Celcom et al anticipate will be needed in the near to mid term future to allow the provision of emerging retail services.

According to Celcom et al, only individually licensed network facilities providers and network services providers should be entitled to access listed services and facilities at cost based prices.

Celcom et al also submitted that wherever possible, the services and facilities included on the access list be described in a 'generic' form with limited use of technology specific and detailed descriptions. The access list definitions should include, as examples, the minimum current technologies that are covered by the service. According to them, a generic definition does not mean generic pricing. Prices for different sub-services under an access list service may have different prices. For example, local, single tandem and double tandem fixed origination services are simply three subsets of a single access service.

Celcom et al argued that access seekers should be permitted to interconnect at any switch where access is technically possible and commercially viable.

Celcom et al made a number of comments on the description of the services and facilities in the proposed access list determination.

ntv7 and **Mimos** suggested a number of services or facilities for inclusion in the access list.

Telekom Malaysia, in its second submission, strongly opposed any widening of the access list beyond that covered by TRD006/98. Amongst others, Telekom argued that only 'well established services' utilizing 'bottleneck facilities' should be included on the access list and subject to cost based interconnect charging.

Telekom agreed that only individually licensed network facilities providers and network service providers should be entitled to network services and network facilities on the access list at cost based prices.

Telekom indicated its support for the migration of current facilities and services detailed in TRD006/98 to the access list, but considered that the summary of such services by Celcom et al goes considerably further than the scope of the current access services. In addition, Telekom thought that the summary attempts to include within the service definition issues which are for the access code.

Celcom et al, in their second submission, did not agree that only 'well established' services should be included in the access list. They believe that 'new and innovative' services should be available on the access list, but these should be provided on a cost basis which includes a premium in the mark-up above long run incremental cost.

The Commission has taken into consideration the comments made by interested parties on what should be included in the access list at this stage, and how the services and facilities should be described in the determination. The Commission continues to take, as its starting point, the view that the access list should include all services or facilities which are currently subject to interconnection obligations under the present interconnection and access regime. In this respect, the Commission notes broad support from both Celcom et al and Telekom Malaysia for migrating the facilities and services detailed in TRD006/98 to the access list.¹⁵

Services and facilities to be included in the access list

The following services or facilities should be included in the access list to maintain existing interconnection obligations:

- Fixed Network Origination Service
- Equal Access (Fixed Network) Service
- Fixed Network Termination Service
- Mobile Network Origination Service
- Mobile Network Termination Service
- Ancillary Services
- Interconnect Link Service
- Private Circuit Completion Service
- Domestic Transmission Service

The above services and facilities are described in greater detail in the draft access list determination set out in Appendix A.

The policy rationale for including the above services and facilities in the access list is briefly outlined below:

Fixed Network Origination Service and Mobile Network Origination Service

The relevant downstream services appear to be the markets for 1800 number, 1300 number and other similar services which require any-to-any connectivity. Access to these interconnection services can be expected to lead to greater competition in the downstream markets by giving subscribers of these special number services a choice of competing service providers who can supply the any-to-any connectivity required to support the special number services. Greater competition can be expected to lead to allocative, productive and dynamic

¹⁵ See section 2.3.1 of Telekom Malaysia's Second Submission, and section 2.1 of Celcom et al's First Submission.

efficiencies. Optimal incentives in fixed and mobile networks can be maintained by adopting an appropriate access pricing methodology.

Equal Access (Fixed Network) Service

The relevant downstream markets appear to be the markets for domestic long distance and international fixed calls. Access to this interconnection service can be expected to lead to greater competition in the downstream markets by giving end users a choice of competing service providers for long distance and international calls. Greater competition can be expected to lead to greater allocative, productive and dynamic efficiencies. Optimal incentives for investments in fixed networks can be maintained by adopting an appropriate access pricing methodology. In this respect, it is generally accepted that the local loop exhibit strong natural monopoly characteristics.

Fixed Network Termination Service and Mobile Network Termination Service

The relevant downstream markets appear to be the markets for fixed telephony services and mobile services to directly connected customers. In the fixed telephony market, fixed network operators compete with one another to attract end users to be directly connected to their respective networks. In the mobile services market, mobile network operators compete with one another to provide mobile services to end users. Fixed network termination services facilitate competition in these markets by ensuring that end users who choose to be directly connected to a given network (fixed or mobile) will continue to enjoy any-to-any connectivity with end users connected to other fixed networks. Similarly, mobile network termination services facilitate competition in these markets by ensuring that end users who choose to be directly connected to a given network (fixed or mobile) will continue to enjoy any-to-any connectivity with end-users connected to other mobile networks. Greater competition in these markets can be expected to lead to greater allocative, productive and dynamic efficiencies. Again, optimal incentives for investments in fixed and mobile networks can be maintained by adopting an appropriate access pricing methodology.

Private circuit completion service

The relevant downstream market appears to be the market for end-to-end private circuits. End-to-end private circuits are in turn important for the development of further downstream communications services such as internet access, private networks and other multimedia applications. There is a view that local loop and junction networks are difficult to reproduce on a widespread basis for leased lines because of the high sunk costs involved.¹⁶ The provision of private circuit completion services can be expected to facilitate competition in the market for end-to-end private circuits by enabling competing operators to provide end-to-end private circuits to end users between locations where services are provided by different operators. Greater competition in the end-to-end private circuits market can be expected to lead to economic efficiency benefits both in that market as well as further downstream markets. Optimal incentives for investments in private circuit infrastructure can be maintained by adopting an appropriate access pricing methodology.

Domestic Transmission Service

¹⁶

See Analysys, *Interconnection and Universal Service: Arrangements for a Competitive Market*, 11 December 1997, page 31.

The relevant downstream markets appear to include markets for end-to-end local permanent circuits, narrowband digital end-to-end transmission, broadband digital end-to-end transmission, e business, and dial-up domestic long distance calls. Whilst the Private Circuit Completion Service allows the operation of private networks, a Domestic Transmission Service allows competing operators to develop their own public networks. Although there may be parts of the transmission network which can be, and has been, duplicated, in other parts of the network it is still unfeasible for there to be duplication. For instance, the junction transmission network, which connects local exchanges to other local exchanges, is a very extensive network of low-to-medium capacity routes. For much of the country, it is not feasible for this to be duplicated because of the high sunk costs involved. Greater competition in the downstream markets can be expected to lead to economic efficiency benefits in those markets. Optimal incentives for investment in transmission networks can be maintained by adopting an appropriate access pricing methodology.

Interconnect Link Service (Physical Co-location, Virtual Co-location and In-span Interconnection)

Co-location enables potential cost reductions and quality improvements in the provision of interconnect links by making this service competitive.¹⁷ Interconnect Link Services facilitates interconnection required to access a range of Interconnection Services (including fixed network termination and origination, mobile network termination and origination, equal access, private circuit completion) and can be expected to facilitate competition in their respective downstream markets.

Ancillary Services

Ancillary Services (relating to directory inquiry call services, emergency service call services, operator assistance services, printed telephone directories, inclusion of customer numbers in telephone directories, and access to customer numbering database) are required to support effective multi-operator markets.

Conclusion

The above discussion is not a comprehensive analysis of the relevant issues, but serves to support the Commission's decision to take, as the starting point, the current interconnection and access regime in the Commission's assessment of what facilities or services should be included in the access list.

However, the Commission has reviewed the manner in which the services or facilities should be described in the access list determination taking into account, amongst others, the following considerations:

- Celcom et al were concerned that the original description of the services or facilities for inclusion in the access list did not include Equal Access obligations. The Commission proposes to describe a separate Equal Access (Fixed Network) Service to address this concern.

¹⁷ See Analysys, *Interconnection and Universal Service: Arrangements for a Competitive Market*, 11 December 1997, page 40.

- Telekom Malaysia argued that Equal Access should be limited to fixed-to-fixed calls only¹⁸. Accordingly, the Equal Access (Fixed Network) Service has been described to apply to fixed-to-fixed and fixed-to-international calls only.
- Consistent with existing obligations relating to Equal Access, the Commission believes that the Equal Access (Fixed Network) Service should be described broadly so as to include both call-by-call Equal Access and Pre-selection. However, the Commission notes that only call-by-call Equal Access has been implemented to date, while the economic case for implementing Pre-selection is being reviewed.
- Celcom et al proposed including a Mobile Network Origination Service to ensure any-to-any connectivity for value-added services such as freecall 1800, 1300 and similar services. Telekom Malaysia argued that this is already included in the proposed access list as a mobile network terminating service. Since this is the case, the Commission proposes to include a Mobile Network Origination Service to support mobile calls in so far as they relate to freecall 1800 number services, local call 1300 number services, and other similar services which require any-to-any connectivity.
- Telekom Malaysia submitted that the Virtual Co-Location Service should be restricted so as to make it clear that it is provided by a single Interconnection Operator to other Network Operators. According to Telekom Malaysia, the right provided for in TRD006/98 was not a broad right as described in the draft determination. The Commission notes Telekom Malaysia's submission, but considers that the merits of restricting the Virtual Co-Location Service in the manner described in TRD006/98 is a matter properly addressed in the context of assessing the terms and conditions of access.
- Celcom et al submitted that PSTN and ISDN are technologies with similar functionality and that a technology neutral approach requires the relevant interconnect services to be described in a manner which includes PSTN, ISDN as well as other technologies with similar functionality.¹⁹ Consistent with the convergence approach of the Act, the Commission believes that in general services and facilities included in the access list should be described in a technology neutral manner. Consequently, the Commission proposes to describe the relevant interconnect services in a technology neutral manner.
- The interconnect services in TR006/98 currently requires interconnect at tandem switch levels only. Analysys, in their report, recommended that interconnect at the local switch level should also be available as it would lead to more efficient build or buy decisions on the part of the interconnecting operator. The Commission believes that the level at which interconnect should take place is a matter properly addressed in the context of assessing the terms and conditions of access. This issue should not be pre-empted by restricting the description of

¹⁸ Although not clear from Telekom's submission, it appears that Telekom's reference to 'fixed-to-fixed' calls includes 'fixed-to-international' calls as well.

¹⁹ In their report *Interconnection and Universal Service: Arrangements for a Competitive Market*, Analysys recommended that interconnect services include similar call conveyance services for ISDN as are made available for PSTN. Analysys also took the view that ISDN should be regarded as 'well-established'.

the relevant services in the access list. Consequently, the Commission has described the Fixed Network Origination Service, the Fixed Network Termination Service and the Equal Access (Fixed Network) Service in a manner which includes interconnect at the local switch level.

The Commission notes that the manner in which the relevant services or facilities have been described may have the effect of extending interconnection obligations beyond its existing scope. The Commission believes that it is nevertheless appropriate to do so to ensure that issues which are properly addressed when assessing the terms and conditions of access are not pre-empted by a narrow description of the relevant services in the access list.

4.2 Expansion of access list to include other facilities or services

In the 11 August 2000 discussion paper, the Commission also sought submissions on:

- whether the access list should be expanded to include services or facilities not currently subject to interconnect obligations; and
- what the costs and benefits of mandating access to these services or facilities are.

Celcom et al provided a list of services or facilities which they believe should also be included in the access list. A brief description of the services or facilities, the costs and benefits of mandating access (as perceived by Celcom et al), and Telekom Malaysia's comments are set out below:²⁰

Service or facility	Costs and benefits of mandating access (per Celcom et al)	Telekom's comments
Payphone conveyance service - for carriage of voice and data to and from public payphones	Promotes competition in payphone based services. Cost of complying with standard access obligations (SAO) is low as the service is already provided.	No specific comments.
Public payphone originating access service - for carriage of voice and data between a public payphone and a point of interconnection (POI)	Promotes competition in payphone originated calls market including VAS services. Competition improves range of services available (eg, stimulates provision of calling card services).	No specific comments.
Equal access of payphone origination - allows a payphone end user to select an equal access operator for STD, IDD calls etc.	Promotes competition in payphone originated calls market including VAS services. Competition improves range of services available (eg, stimulates provision of calling card services).	No specific comments.

²⁰ The detailed justification provided by Celcom et al for including the services or facilities is reproduced in Appendix C.

Service or facility	Costs and benefits of mandating access (per Celcom et al)	Telekom's comments
Internet access call origination - for carriage of voice and data between customer equipment and POI or POP.	Promotes competition in internet access.	Inappropriate to include at this time given current negotiations between Telekom and other operators.
Internet peering	Promotes competition in internet access. Only extra POI capacity required. Therefore low cost of complying with SAO.	No specific comments.
Local call wholesale - carriage of local calls at wholesale prices.	Allows operators to compete in providing bundled package which includes local call services.	Telekom is very concerned about the effect that resale will have on margins. The wholesale price of resale may be higher than their retail price.
Packet switched data access service - for carriage of communications between transmission points using frame relay, ATM or other packet switched protocol.	Promotes competition in provision of end-to-end permanent and virtual private circuits.	No specific comments.
DSL access service - for carriage of communications between end user equipment and POI using DSL technology.	Promotes competition in provision of broadband services and other downstream services (interactive TV, internet, email, etc)	Given the large quantum of the investment, a 3 year moratorium from access provisions is appropriate. The moratorium should be effective from commencement of broadband ADSL services, with an option for a further extension of 2 years.
Unbundled local loop - use of the unconditioned communications wire leading to end user premises.	Promotes competition in provision of broadband services and other downstream services (interactive TV, internet, email, etc)	Unbundling would remove the incentive for other operators to deploy the capital required to build additional and alternative facilities.

In general, Telekom Malaysia is opposed to the inclusion of all of the new services

proposed by Celcom et al in the access list without commercial negotiations first.

Mimos and ntv7 have also proposed facilities and services for inclusion in the access list.

Facilities or services suggested by Mimos	Facilities or services suggested by ntv7
<ul style="list-style-type: none">• Access to services – ISDN, PRI, DSL, and Centrex;• Interconnection at local switch level (DLS);• Originating service for internet access;• Physical co-location of equipment.	<ul style="list-style-type: none">• Channel combining (sharing of infrastructure such as hill access, antenna system and feeder, channel combiner, right of way, etc);• Co-sitting (of transmission sites);• Owning private multiplexers when advanced to digital terrestrial transmission;• 600 PRS;• 'set top boxes' and 'condition access card'.

Consistent with the self-regulatory approach underlying the Act, the Commission will generally expect to be guided by the views of industry operators and other market participants – particularly those who are likely to provide or seek access to facilities or services included in the access list – when considering whether new facilities or services should be included in the access list. In this respect, the Commission welcomes the comments provided by Telekom Malaysia, Celcom et al, ntv7 and Mimos on what facilities or services should or should not be included in the access list.

The Commission has decided to include an Internet Access Call Origination Service in the access list. The reasons for this is set out below.

However, apart from the Internet Access Call Origination Service, the Commission is not yet in a position to form a view on whether Malaysia's national policy objectives would be promoted or supported if the access list is expanded to include the other services and facilities suggested by interested parties. The Commission is also not yet in a position to form a view on the merits of Telekom Malaysia's proposal that there be a moratorium in respect of ADSL services. The Commission believes that further consultation is required before the Commission is in a position to form a view on these matters.

In general, the Commission would expect proposals to include services or facilities in the access list to be discussed at the access forum before the matter is referred to the Commission for consideration. That said, the Commission is conscious that there has been considerable delay in setting up an industry body for designation as the access forum. To date no industry body has been designated as an access forum. The Commission is concerned to ensure that Malaysia's national policy objectives are supported by an effective access regime. Consequently the Commission is minded to continue close consultations with industry on what measures need to be implemented to ensure that the access regime is effective. The Commission believes such consultation is consistent with, and supportive of, the self-regulatory nature of the access regime.

The Commission anticipates holding further consultation on the following matters:

- whether a payphone conveyance service should be included in the access list;

- whether there should be a moratorium on mandating access to DSL services; and
- whether an unbundled local loop service should be included in the access list.

However, the above matters are not necessarily the only matters which the Commission would seek to consult on.

4.3 Internet Access Origination Service

In the 11 August 2000 discussion paper, the Commission raised for consideration the possibility of including an origination service for internet access in the access list. If included in the access list, this service would require a network service provider to originate calls made by end users directly connected to the network of that service provider in order to access the services of internet access providers. This would involve the carriage of communications between an end user and the point of presence of an internet access provider.

The Commission has had a limited opportunity to undertake a comprehensive analysis of the costs and benefits of including an origination service for internet access. Nevertheless, the Commission considers that including an origination service for internet access would promote or support Malaysia's national policy objectives for the communications industry. The reasons for this view include the following:

- There are only a limited number of internet access service providers in Malaysia at present. In this respect, the Commission notes that there are presently only two major internet access service providers in Malaysia – Jaring and TMNet. The Minister has indicated that the provision of internet access services in Malaysia should be liberalized and in this regard, the provision of internet access services is now a class license activity. In order for other internet access service providers to compete effectively, it is necessary for them to have access to end users who are directly connected to the networks of network service providers such as Telekom Malaysia. In this respect, an origination service for internet access would give internet access service providers access to these end users.
- The Commission considers that an origination service for internet access is unlikely to be provided to internet access service providers on a competitive basis. This is because the local access network (over which the origination service for internet access would be provided) exhibits strong bottleneck characteristics. It is not economical for the local access network to be duplicated. Other forms of access to end users are unlikely to be satisfactory substitutes to the local access network. In particular, mobile networks do not presently have the capacity to deliver data at the minimum rates required by end users to access the internet. Furthermore, mobile call charges are significantly higher than fixed call charges. Satellite services may be an alternative form of access to the end user; however the cost of installing set top boxes and other instruments required to access satellite services suggest that satellite services are likely to be a poor substitute for the local access network.
- Given the Commission's findings that the local access network is not economical to duplicate, it is unlikely that mandating access to an origination service for internet access would have an adverse effect on optimal investment incentives in the local access network. Furthermore, the Commission expects that the access price would be set at a level which takes into account a reasonable commercial return on

investments in the local access network.

In the 11 August 2000 discussion paper, it was originally envisaged that the internet access origination service would carry calls to a point of interconnection associated with a switch (at the local switch or tandem switch levels). However, the Commission has since received information that the call traffic can also be carried to a point of presence associated with the access seeker's modem bank or router co-located at the access provider's switch, or at the access provider's modem bank or router. Under these situations, the dedicated circuit would be limited to the access loop, line card and a small part on the switch. All other equipment is shared because the internet protocol can handle multiple calls at the same time. The Commission understands that these alternative ways of routing internet calls are likely to be more efficient than through a point of interconnection. Consequently the Commission proposes to describe the internet access origination service in a manner which accommodates these alternative ways of obtaining access to end users.

The 11 August 2000 discussion paper had also raised the possibility of including a billing service in the access list as an ancillary service to the origination service for internet access. This would require the originating network operator to bill end users on behalf of the internet access service provider. However, there did not appear to be an interest for this service. Consequently the Commission does not propose to include a billing service in the access list.

SECTION 5: BROAD PRINCIPLES RELATING TO THE TERMS AND CONDITIONS OF ACCESS

The access regime under the Act envisages that the terms and conditions of access will, in the first instance, be a matter for commercial negotiations between the access provider (i.e., the network facilities provider or network service provider who is subject to standard access obligations) and the access seeker (i.e., network facilities providers, network service providers, applications service providers or content applications service providers who request access from the access provider). Where there is a dispute over the compliance with standard access obligations, a party to the dispute may notify the Commission of the dispute for resolution by the Commission upon such terms and conditions as the Commission may deem fit.

The Act also envisages that the terms and conditions of access will be set out in an access code to be developed by the access forum. The Commission must not register an access code unless it is satisfied that the access code is consistent with the standard access obligations.

Finally, the Act provides for the registration of access agreements and access undertakings. The Commission must be satisfied that the agreement or undertaking is consistent with the objects of the Act.

The Commission proposes to develop and publish a series of regulatory statements which would set out 'the principles and procedures which it may take into account in resolving disputes' relating to the terms and conditions of access.²¹ The Commission considers that such regulatory statements would also:

- assist the access forum in developing an access code; and
- assist the development of access agreements and access undertakings.

In the 11 August 2000 discussion paper, the Commission foreshadowed developing a regulatory statement on broad principles relating to access pricing and raised the following issues:

- Under what circumstances should access prices be based on cost?
- Where access prices are to be based on cost, should they be based on incremental cost or fully allocated cost? How should incremental cost be determined?
- Should access prices include a contribution to fixed (i.e., non-incremental) cost?
- Should costs be determined on a forward looking basis or a backward looking (historical) basis?
- How regularly should access prices be reviewed? Where access prices are set for an extended period, should access prices be indexed to a price index for measuring inflation? Should access prices be indexed to a rate of expected technological progress? Should access prices be regulated as a basket of wholesale services under an overall price cap?
- Should benchmark access prices be set? If so, which service should benchmark prices be set for? How should these benchmark prices be set?²²

²¹ See section 85 of the *Communications and Multimedia Act 1998*.

²² For instance, benchmark prices could be proposed by the access provider and reviewed by the Commission using the broad principles enunciated in the Commission's regulatory

Appendix D contains a discussion relating to the economics of access pricing.

The Commission has developed a *Statement on Access Pricing Principles* (draft version – December 2000) which is set out in Appendix E. The statement should be regarded as draft only, and indicative of the Commission's preliminary views on broad principles relating to the determination of access prices. This statement does not, and cannot, bind the Commission in any decision the Commission makes in respect of an access dispute.

The *Statement on Access Pricing Principles* (draft version – December 2000) is accompanied by a discussion which includes a summary of comments received by the Commission on a number of issues relating to access pricing, and the Commission's preliminary views on some of these issues. The statement should be read in conjunction with the discussion and also this report.

statements. Alternatively, the Commission could set benchmark prices, perhaps using the Analysys report, *Interconnection and Universal Service: Arrangements for a Competitive Market*, 11 December 1997.

Appendix A: Draft determination under sections 55, 146 and 282 of the Act

Communications and Multimedia Commission

Determination

The Communications and Multimedia Commission (the Commission) makes the following determination pursuant to sections 55, 146 and 282 of the *Communications and Multimedia Act 1998* (the Act):

Determination of facilities and services

1. The following Facilities and/or Services shall be included in the access list:

1.1 Fixed Network Origination Service

A Fixed Network Origination Service is an Interconnection Service provided by means of a fixed network for the carriage of Call Communications over the voice bandwidth from customer equipment at an end user's premises to a POI. The Fixed Network Origination Service includes:

- local origination (where the POI is at a local switch or associated with a local switch);
- single tandem origination (where the POI is at a tandem switch or associated with a tandem switch); and
- double tandem origination (where the POI is at a double tandem switch or associated with a double tandem switch),

for fixed-to-fixed, fixed-to-mobile and fixed-to-international outgoing calls in so far as they relate to freecall 1800 number services, local call 1300 number services, and other similar services which require any-to-any connectivity.

The functionality of the Fixed Network Origination Service includes:

- circuit switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Public switched telephone network (PSTN);
- Integrated services digital network (ISDN); and
- other technologies with similar functionality.

1.2 Equal Access (Fixed Network) Service

The Equal Access (Fixed Network) Service is an Interconnection Service provided by means of a fixed network for the carriage of Call Communications over the voice bandwidth from customer equipment at an end user's premises to a POI which allows an end user to select and use the services of a Network Operator other than the Network Operator of the network to which the Customer is directly connected. The Equal Access (Fixed Network) Service may be provided on a call-by-call basis (for instance, through dialing of an equal access prefix code) or on a preselection basis (for instance, via a semi-permanent switch recognition of customer choice).

The Equal Access (Fixed Network) Service includes:

- local origination (where the POI is at a local switch or associated with a local switch);
- single tandem origination (where the POI is at a tandem switch or associated with a tandem switch) and
- double tandem origination (where the POI is at a double tandem switch or associated with a double tandem switch)

for fixed-to-fixed calls (including Centrex services) and fixed-to-international outgoing calls only.

The functionality of the Equal Access (Fixed Network) Service includes:

- circuit switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Public switched telephone network (PSTN);
- Integrated services digital network (ISDN); and
- other technologies with similar functionality.

1.3 Fixed Network Termination Service

A Fixed Network Termination Service is an Interconnection Service provided by means of a fixed network for the carriage of Call Communications over the voice bandwidth from a POI to customer equipment at an end user's premises. The Fixed Network Termination Service includes:

- local termination (where the POI is at a local switch or associated with a local switch);
- single tandem termination (where the POI is at a tandem switch or associated with a tandem switch); and
- double tandem termination (where the POI is at a double tandem switch or associated with a double tandem switch),

for fixed-to-fixed, mobile-to-fixed and incoming international-to-fixed calls.

The functionality of the Fixed Network Termination Service includes:

- circuit switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Public switched telephone network (PSTN);
- Integrated services digital network (ISDN); and
- other technologies with similar functionality.

1.4 Mobile Network Origination Service

A Mobile Network Origination Service is an Interconnection Service for the carriage of Call Communications over the voice bandwidth and/or over the digital signal from an A party to a POI. The Mobile Network Origination Service supports mobile-to-

mobile, mobile-to-fixed and mobile-to-international outgoing calls in so far as they relate to freecall 1800 number services, local call 1300 number services, and other similar services which require any-to-any connectivity.

The functionality of the Mobile Network Origination Service includes:

- circuit or packet switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Advanced Mobile Phone System (AMPS);
- Global System for Mobile Communications (GSM);
- Code Division Multiple Access (CDMA);
- Message services;
- Extended Total Access Communications System (ETACS);
- paging services; and
- other technologies with similar functionality.

1.5 Mobile Network Termination Service

A Mobile Network Termination Service is an Interconnection Service for the carriage of Call Communications over the voice bandwidth (and data over the digital signal) from a POI to a B party. The Mobile Network Termination Service supports fixed-to-mobile and incoming international-to-mobile calls.

The functionality of the Mobile Network Termination Service includes:

- circuit or packet switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Advanced Mobile Phone System (AMPS);
- Global System for Mobile Communications (GSM);
- Code Division Multiple Access (CDMA);
- Message services;
- Extended Total Access Communications System (ETACS);
- paging services; and
- other technologies with similar functionality.

1.6 Ancillary Services

An ancillary service is a Facility or Service which facilitates the provision of network services or applications services including content applications, and comprise the following:

- facilities or services which facilitate the provision of directory inquiry call services;

- facilities or services which facilitate the provision of emergency service call services;
- facilities or services which facilitate the provision of operator assistance services;
- copies of printed telephone directories;
- the inclusion of customer numbers in telephone directories which are commonly known as White Pages;
- access to customer numbering databases (excluding silent numbers) which facilitate the provision of directory enquiry services.

1.7 Interconnect Link Service

An Interconnect Link Service is a Facility or Service which enables the physical connection between the network of a Network Operator and the network of an Interconnecting Operator for the purpose of providing an Interconnection Service. The Interconnect Link Service includes:

- Physical Co-location, which refers to the provision of space at a Network Operator's premises to enable an Interconnecting Operator to install and maintain its own equipment necessary for establishing interconnect links where space exists and secure isolated facilities can be constructed. Physical Co-Location includes physical space, power, environmental services (heat, light, ventilation and air-conditioning), security, site maintenance and access for the personnel of the Interconnecting Operator;
- Virtual Co-Location, which refers to the provision of facilities or services at a Network Operator's premises to maintain interconnect links where equipment at the Network Operator's premises for maintaining the interconnect links is owned and maintained by the Network Operator on behalf of the Interconnecting Operator;
- In-span Interconnection, which is the provision of a POI at a designated point on a physical cable linking a Network Operator's network facilities to an Interconnecting Operator's network facilities.

1.8 Private Circuit Completion Service

A Private Circuit Completion Service is an Interconnection Service for the carriage of communications at one end of a private circuit between end users where the POI is at a tandem switch (or associated with a tandem switch) or at a local switch (or associated with a local switch).

The functionality of the Private Circuit Completion Service includes:

- circuit or packet switching; and
- the signaling required to support the Interconnection Service.

Technologies include but are not limited to:

- Public switched telephone network (PSTN);
- Integrated services digital network (ISDN); and
- other technologies with similar functionality.

1.9 Domestic Network Transmission Service

A Domestic Transmission Service is a Facility or Service for the carriage of communications between transmission points (not being customer transmission points) via network interfaces at a Designated Rate (or at such other transmission rate as may be agreed between the Access Provider and the Access Seeker) on a permanent basis by means of guided and/or unguided electromagnetic energy, including:

- a local switch and a tandem switch;
- a tandem switch and a tandem switch;
- a tandem switch and a mobile group switch;
- a mobile group switch and a mobile group switch;
- submarine cable and satellite services between a transmission point in East Malaysia and a transmission point in Peninsula Malaysia

but excludes the carriage of communications between transmission points (not being customer transmission points) in areas where there are three or more independent transmission networks to carry those communications.

The functionality of the Domestic Transmission Service includes:

- circuit or packet switching;
- signaling required to support the technology or to provide a service;
- termination at either end by a port, router, network termination unit, switch, earth station or other electronics;
- any digital protocol or no digital protocol.

Network interfaces include fixed wire, microwave, laser, fibre optic or satellite links.

1.10 Internet Access Call Origination Service

An Internet Access Call Origination Service is a network service provided by means of a fixed network for the carriage of Call Communications over the voice bandwidth or digital signal from customer equipment at an end user's premises to a POP being:

- a POI, via switched circuit;
- the input to the Access Seeker's modem bank or router co-located at the local Access Provider's local or tandem switch; or
- the output from the Access Provider's modem bank or router located at the Access Provider's local or tandem switch.

The Internet Access Call Origination Service includes:

- local origination (where the POP is at a local switch or associated with a local switch);
- single tandem origination (where the POP is at a tandem switch or associated with a tandem switch); and

- double tandem origination (where the POP is at a double tandem switch or associated with a double tandem switch).

The functionality of the Internet Access Call Origination Service includes:

- circuit or packet switching;
- the signaling required to support the network service; and
- dial-up access to any mode of access including short digit access.

Interpretation

2. In this determination, unless the contrary intention appears -

‘Access Provider’ means a network facilities provider or a network service provider who owns or provides a Facility or Service included in the access list;

‘Access Seeker’ means a network facilities provider, a network service provider, an applications service provider, or a content applications service provider who makes a written request for access to a Facility or Service included in the access list.

‘Any-to-Any Connectivity’ is achieved when each end user who is supplied with an applications service that involves communication between end users is able to communicate, by means of that service, with each other end user who is supplied with the same service or a similar service, whether or not the end users are connected to the same network.

‘A party’ means, in the context of communications between end users, the end user from whom the communication is originated.

‘B party’ means, in the context of communications between end users, the end user to whom the communication is terminated.

‘Call Communications’ means communications (including voice and data) from, or to, or involving a number used in the operation of each Network Operator’s network and as allocated by the Commission in accordance with the Act.

‘Customer’ means, in relation to a Network Operator, a person having a contractual relationship with the Network Operator for the provision of communications by means, inter alia, of that Network Operator’s Facilities.

‘Designated Rate’ means a transmission rate at 2.048 megabits per second, 4.096 megabits per second, 6.144 megabits per second, 8.192 megabits per second, 34 to 45 megabits per second, or 140/155 megabits per second.

‘Facility’ means network facilities and/or other facilities which facilitate the supply of network services or applications services, including content applications services.

‘Interconnecting Operator’ means the network facilities provider and/or network service provider to whom the relevant Interconnection Service is provided and includes a network facilities provider or network services provider who is seeking the relevant Interconnection Service.

‘Interconnection Service’ means a Facility or Service (including the physical connection between separate networks) provided by a Network Operator to an Interconnecting Operator which involves or facilitates the carriage of communications

between an end user connected to the network of the Network Operator and a POI to facilitate Any-to-Any Connectivity.

'Network Operator' means a network facilities provider and/or a network services provider and, unless the context otherwise requires, includes an Interconnecting Operator.

'POI' or 'Point of Interconnection' means a point of demarcation between the network of a Network Operator and the network of an Interconnecting Operator (collectively referred to as the 'Interconnecting Networks') and is the point at which communications is transferred between the Interconnecting Networks.

'POP' or 'Point of Presence' means a point at which an Access Seeker has established itself for the purpose of obtaining access to network facilities or network services and is the point at which communications is transferred between the Access Provider and the Access Seeker.

'Service' means network services and/or other services which facilitate the supply of network services or applications services, including content applications services.

3. Unless the contrary intention appears, the terms used in this determination have the same meaning as the corresponding terms in the *Communications and Multimedia Act 1998*.
4. Unless the contrary intention appears, the singular includes the plural and vice versa.

Chairman
Malaysian Communications and Multimedia Commission
(date)

APPENDIX B: PROPOSED FRAMEWORK FOR DECISION MAKING IN RELATION TO DETERMINATION ON THE ACCESS LIST

National Policy Objectives

Sections 55 and 146 of the Act does not set out a criteria or test for deciding whether or not a facility or service should be included in or removed from the access list.²³ In the absence of a legislative criteria, the Commission proposes to exercise its discretionary power in a manner consistent with the objects of the Act.

Subsection 3(1) of the Act provides that the objects of the Act are, amongst others, to promote national policy objectives for the communications and multimedia industry and to establish a licensing and regulatory framework in support of the national policy objectives.

Box B1: National policy objectives²⁴:

- a) To establish Malaysia as a major global center and hub for communications and multimedia information and content services;
- b) To promote a civil society where information-based services will provide the basis of continuing enhancements to quality of work and life;
- c) To grow and nurture local information resources and cultural representation that facilitate the national identity and global diversity;
- d) To regulate for the long-term benefit of the end user;
- e) To promote a high level of consumer confidence in service delivery from the industry;
- f) To ensure an equitable provision of affordable services over ubiquitous national infrastructure;
- g) To create a robust applications environment for end users;
- h) To facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
- i) To promote the development of capabilities and skills within Malaysia's convergence industries; and
- j) To ensure information security and network reliability and integrity.

Consequently, in considering whether to exercise its discretionary power under section 146, the Commission will seek to ascertain whether the decision in question would promote or support (rather than detract from) any one or more of the national policy objectives set out in the Act. In general, the Commission would be inclined to exercise its discretionary power under section 146 (to include or exclude facilities or services from the access list) if it would promote or support one or more national policy objectives.

Methodology for analyzing relevant issues

In assessing whether a proposed determination under section 146 would promote or support the national policy objectives, the Commission proposes to undertake a cost-

²³ This is in contrast to the 'long term interest of end-users' criteria found in Australian law – see section 152AB of the Australian *Trade Practices Act 1974*.

²⁴ Subsection 3(2).

benefit analysis of the relevant issues to assess the economic case for the section 146 determination. Broadly, this would involve an assessment of the benefits of making the proposed determination, and comparing it with the costs associated with the proposed determination. Wherever practicable, the Commission would seek to quantify the expected costs and benefits. However, a quantitative analysis of the costs and benefits will not always be practicable.²⁵ Furthermore, the terms 'costs' and 'benefits' are to be interpreted broadly and are not limited to items which are quantifiable. Consequently, many of the issues would need to be assessed on a qualitative basis.

The Commission does not take the view that a cost-benefit analysis is the only methodology which should be used to analyze the relevant issues. Nevertheless, the Commission believes that a cost-benefit analysis usually provides a reasonably rigorous framework for analyzing many of the issues relevant to a determination by the Commission under section 146.

The Commission proposes to undertake a cost-benefit analysis of a proposed section 146 determination using the following broad steps:

1. Identify the relevant market(s) which would be affected by the proposed section 146 determination.²⁶
2. Undertake a competition analysis of the relevant market(s) with a view to assessing the state of competition in the relevant market(s), the likely impact of the proposed section 146 determination on competition in the relevant market(s) and the likely market outcomes in terms of price, consumption/output, service quality, etc.
3. Identify and, where practicable, quantify the expected direct costs of complying with standard access obligations if the proposed section 146 determination is made. This step would include an assessment of the technical feasibility of complying with standard access obligations.
4. Assess the likely impact of the proposed section 146 determination on economic efficiency (including allocative, productive and dynamic efficiency). This would include taking into consideration the likely impact, if any, of the proposed section 146 determination on optimal investment incentives (i.e., incentives to undertake optimal amounts of investments).

²⁵ In assessing the practicability of a qualitative analysis, the Commission would take account of not only the cost of any such qualitative studies, but also the need for making timely decisions and the opportunity costs implicit in any delay caused whilst the qualitative study is being undertaken.

²⁶ For instance, the relevant markets could be 'an applications market for international telephony services', or 'an applications market for national long distance telephony services'.

Box B2: Methodology for analyzing relevant issues – relevance to the national policy objectives

The Commission believes that the proposed methodology for analyzing the relevant issues would facilitate an assessment of whether a proposed section 146 determination would promote or support the national policy objectives.

For instance, the Commission may find that a proposed section 146 determination is likely to facilitate greater competition in the market for international call services. This is likely to promote the objective of establishing Malaysia as a major global center and hub for communications and multimedia information and content services. Greater competition can also be expected to lead to a more efficient allocation of resources, a higher level of consumer confidence in service delivery from the industry, a robust applications environment for end users, and ensure information security and network reliability and integrity. These outcomes are likely to be in the long-term benefit of the end user and enhance the quality of work and life.

On the other hand, the Commission may conclude that a proposed section 146 determination is likely to have an adverse impact on optimal investment incentives. This could detract from an efficient allocation of resources and investments in a ubiquitous national infrastructure. These outcomes are likely to detract from the long-term benefit of the end user.

The above discussion is illustrative only and is not intended to indicate the Commission's view of the relevant issues in any given matter.

Step 1: Identification of the relevant market(s)

Conceptually, a section 146 determination will usually have an effect on at least two markets:- an upstream market and a downstream market.

The upstream market is the market in which the relevant network facility or network service (i.e., the facility or service which would be subject to standard access obligations following the section 146 determination) is supplied. This will usually be a network facility market or network service market.

The downstream market is the market for downstream services where the relevant network facility or network service is an input to the downstream services. This will usually be an applications service market (or content applications service market) but may also be a network service market. More than one type of applications service market may be affected by the section 146 determination. For instance, a determination to include a network interconnection service in the access list may have an effect on an applications service market for international calls, and a separate applications service market for national long distance calls.

In identifying and defining the boundaries of the relevant markets, principles of substitutability (both demand and supply) will usually be relevant. In general, services or facilities which are close substitutes for one another will usually be included in the same economic market. Conversely, services or facilities which exhibit very low cross elasticities of demand and supply will usually be treated as being supplied in separate markets.

Economic markets can be defined in product, geographic and functional dimensions.²⁷

²⁷ Please refer to the Commission's *Guideline on Dominant Position in a Communications Market* [RG/DP/1/00(1)] and *Guideline on Substantial Lessening of Competition in a*

Step 2: Competition analysis

The state of competition, the competition effects of a section 146 determination, and the likely market outcomes following a section 146 determination can be analysed for both the relevant upstream market and the relevant downstream market(s).

At the upstream market, a section 146 determination to include network services or network facilities in the access list would have the effect of regulating the terms and conditions (including the price) for supplying those services or facilities. Some of the issues which could be addressed include the following:

- To what extent can the relevant network facilities or network services be duplicated economically? Does the provision of the relevant network facilities or network services exhibit strong natural monopoly characteristics (for instance, because of large sunk costs and large scale economies)?
- Would regulating the terms and conditions of providing the relevant network facilities or network services discourage efficient entry into the upstream market?

In general, if the provision of the relevant network facilities or network services exhibit strong natural monopoly characteristics or cannot be duplicated economically, then regulating the terms and conditions of providing those facilities or services is unlikely to have any effect in terms of discouraging entry into the upstream market. Indeed, by giving downstream suppliers access to these facilities or services, inefficient entry into the upstream market may be avoided.

A section 146 determination would also have the effect of regulating the terms and conditions on which network facilities or network services may be acquired as an input in downstream markets. Some of the issues which could be addressed include the following:

- To what extent are the relevant downstream markets already competitive? For instance, are there high barriers to entry in the downstream markets? Are there close substitutes in the downstream markets which do not use the relevant upstream network facilities or network services as an input?
- To what extent would regulation of the terms and conditions on which the upstream network facilities or network services may be acquired lead to greater competition in the downstream markets?

In general, if the relevant downstream markets are already competitive, then regulating the terms and conditions on which network facilities or network services may be acquired is unlikely to have any further effect on the level of competition in the downstream markets.

Step 3: Identify direct costs and assess technical feasibility

Direct costs could include, for example, any upfront modification costs to a network facility or network service which may be necessary to comply with the standard access obligations which would apply to the facility or service following the section 146 determination. There could also be ongoing operational costs incurred to comply with

standard access obligations. Direct costs would also include any costs incurred to maintain information security and network reliability and integrity.

The direct costs incurred to comply with standard access obligations will, to a large extent, depend on what network facilities or network services are included in the access list and how they are described. To a certain extent, the description of the relevant network facilities or network services can have a significant impact on the magnitude of the direct costs. Wherever possible, network facilities or network services should be described in a manner which minimizes the direct costs of complying with standard access obligations.

The Commission will also assess the technical feasibility of complying with standard access obligations.

Step 4: Impact on economic efficiency

Economic efficiency can be assessed in terms of:

- **Productive efficiency.** This is achieved when goods are produced in a technically efficient way – that is, in the way that minimizes on inputs used (capital, labor and so on). Productive efficiency also requires that the mix of inputs used is allocatively efficient. That is, when the choice of inputs minimizes cost, so that output is maxised per ringgit spent on inputs.
- **Allocative efficiency.** This is achieved when the prices of products (goods and services) reflect their relative scarcity. When prices are allocatively efficient, products tend to go to those who value them most (as expressed by their willingness-to-pay for them).
- **Dynamic efficiency.** This is achieved when incentives exist for resources to move over time to their highest value uses, in particular by encouraging efficient investment, research and development, and the diffusion of new ideas and technologies.

Reflecting the strong relationship between economic efficiency and competition, the Commission's assessment of the likely effect of a section 146 determination on competition will usually inform the Commission's analysis of the impact of the section 146 determination on economic efficiency.

The relationship between economic efficiency and competition, and the notions of productive efficiency, allocative efficiency and dynamic efficiency can be illustrated with the aid of [Figure B1](#) below.

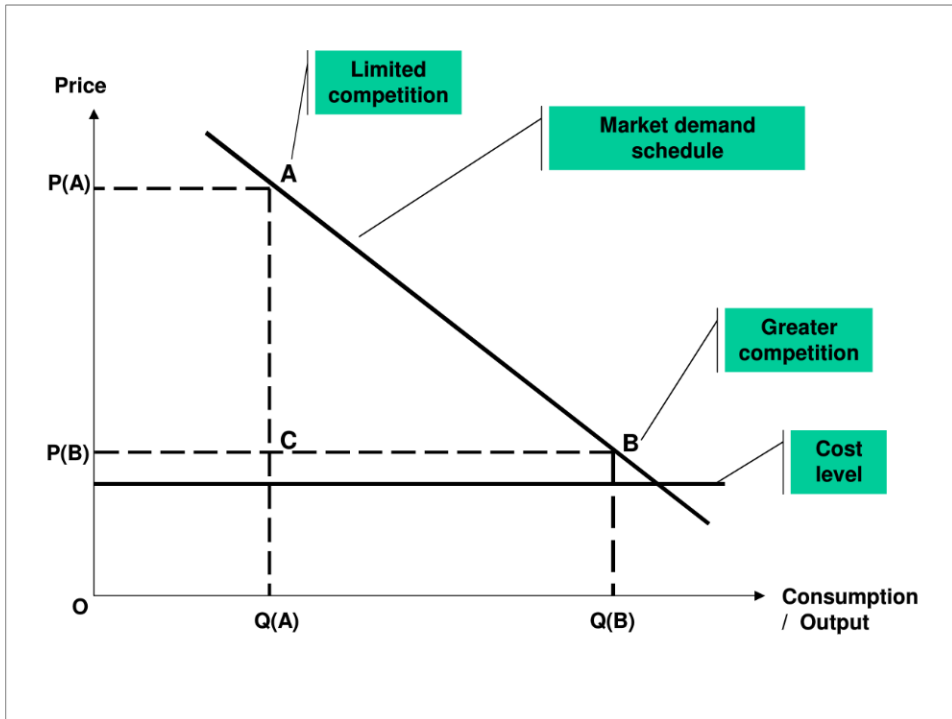


Figure B1: Relationship between economic efficiency and competition

Figure B1 contrasts two possible positions along the market demand schedule – ‘A’ and ‘B’. At ‘A’, competition is relatively limited and the market price ‘P(A)’ is correspondingly higher while consumption ‘Q(A)’ is relatively lower. Position ‘B’ can be thought of as corresponding to a situation where there is greater competition.²⁸ Consequently, the price ‘P(B)’ is relatively lower while consumption ‘Q(B)’ is relatively higher.

The economic benefits to end-users where there is greater competition can be represented by the area within triangle ‘ABC’. This area can be thought of as the benefits from the *additional* consumption at *lower* prices which end users enjoy as a result of greater competition in the market.²⁹ In this respect, the price and consumption outcomes at position ‘B’ is allocatively efficient relative to position ‘A’.

²⁸ In general, competition can be expected to lead to lower price outcomes (assuming everything else, including the underlying cost structures, are equal). Firms which attempt to charge prices at a significant margin above cost are likely to find themselves undercut by competitors or new entrants. As prices fall, consumption tends to rise.

Conversely, where competition is limited, profit maximizing firms tend to find it worthwhile restricting output and charging above cost prices. This is because the increased revenue from higher prices (which is charged to all the firm’s customers) tend to be greater than the reduction in revenue due to lower sales (since some customers cannot afford the higher prices).

²⁹ The lower price, P(B) applies across the entire consumption range from O to Q(B). Thus the benefit to consumers is, strictly speaking, represented by the parallelogram constituted by the points P(A), A, B, and P(B). Of this, the rectangle constituted by the points P(A), A, C, and P(B) is a straight transfer from producer surplus to consumer surplus. Consequently, the net benefit to society is the triangle ‘ABC’.

Competition (including the threat of competition) can also lead to greater productive efficiency as firms compete with one another to search out for efficiencies in production. In terms of Exhibit 1, productive efficiency can be illustrated by a downward shift of the cost schedule.

The link between competition and dynamic efficiency is less clear. In theory, some degree of competition can be expected to stimulate greater innovation – for instance, firms would compete with one another to introduce innovative products into the market place which cater to changes in consumer taste. The effects of dynamic efficiency is harder to depict using Exhibit 1. In some instances, innovation and technological changes could lead to the development of new markets, or convergence between existing markets.

In assessing economic efficiency, the Commission will also take into consideration the effect of a proposed section 146 determination on optimal investment incentives (i.e., incentives to undertake optimal amounts of investments). Optimal investment incentives can be assessed for both the upstream market and the downstream market(s):-

- A decision to regulate the terms and conditions on which products and services in upstream markets are supplied is likely to have an impact on efficient 'build or buy' investment decisions in that market. In principle, access pricing methodologies could be developed which address the need to foster optimal investment incentives by providing for a normal commercial return on prudent investments. Nevertheless, where the upstream market is competitive or potentially competitive, the risk that regulated prices could be set incorrectly may have an adverse effect on optimal investment decisions. However, if the upstream market has strong natural monopoly characteristics, then the risk of regulatory error is likely to have a smaller impact on optimal investment incentives.
- Where a proposed section 146 determination leads to greater competition in downstream markets, it is likely to foster optimal investment incentives in those markets. However, an underlying assumption is that the price of any regulated inputs is cost-based. If the regulated inputs are priced below cost, this may generate inefficient entry in downstream markets. If the regulated inputs are priced above cost, this could induce inefficient bypass.

Context of the proposed cost-benefit methodology

The cost-benefit methodology outlined above should not be taken as the only way in which the Commission would assess the issues relevant to a proposed section 146 determination. The Commission's responsibility, ultimately, is to exercise its discretion under section 146 in a manner which promotes or support the national policy objectives under the Act. Where there are relevant issues which are not adequately addressed in the proposed cost-benefit methodology, the Commission will consider these when exercising its discretionary powers under section 146.

APPENDIX C: EXPANSION OF THE ACCESS LIST – SUMMARY OF COMM

Celcom et al's submission				
Access service	Market in which service operates	Key downstream markets	Promotion of choice, quality and affordability in communications markets	Promo any-to-connect
Public payphone conveyance service	Local Dial-up Customer Access, Narrowband Digital Transmission	Payphone services	Access will increase competition from interconnecting operators. Competition provides choice of operator, wider choice of service and pricing packages, stimulates improved quality of service and lower prices in the downstream markets.	Access between network promote to-any connect particular relation such as
Public payphone originating access service	Local Dial-up Customer Access	Payphone originated services including local voice and data calls, long distance voice and data calls, international voice and data calls, Internet access, cellular mobile calls, mobile radio calls, paging messages, voice messaging, email, online services, VAS voice and data services	Promotes competition in Payphone originated calls market including VAS services. Competition improves range of services available (eg, stimulates provision of calling card and other services). Competition promotes lower prices.	Access between network promote to-any connect between paypho service service provide other op
Equal access of payphone	Local Dial-up Customer	Payphone originated services	Promotes competition in Payphone originated	Access between

Celcom et al's submission				
Access service	Market in which service operates	Key downstream markets	Promotion of choice, quality and affordability in communications markets	Promotion of any-to-any connectivity
origination	Access	including local voice and data calls, long distance voice and data calls, international voice and data calls, Internet access, cellular mobile calls, mobile radio calls, paging messages, voice messaging, emails, online services, VAS voice and data services.	calls market including VAS services. Competition improves range of services available (eg, stimulates provision of calling card and other services). Competition promotes lower prices.	network promote to-any connectivity between payphone service providers other op
Internet access call origination	Local Dial-up Customer Access	Internet access (local, national, international), long distance and international voice calls, E-mail, Online services, VAS services.	Competition in internet access will promote choice of operator, stimulate improved service quality (eg installation of greater capacity to meet demand), promote lower charges to end users. Promotes use of international VOIP services which are more affordable for end users.	Promote to-any connectivity although essential any-to-any connectivity (provide local or and term service separat provide
Internet peering	Narrowband Digital Transmission, Broadband Digital	Internet access (local, national, international), long distance and international voice	Competition in internet access will promote choice of operator, stimulate improved service quality (eg	Reduce barriers interconnect between network

Celcom et al's submission				
Access service	Market in which service operates	Key downstream markets	Promotion of choice, quality and affordability in communications markets	Promotion of any-to-any connectivity
	Transmission	calls, E-mail, Online services, VAS services.	installation of greater capacity to meet demand), promote lower charges to end users. Promotes use of international VOIP services which are more affordable for end users.	therefore promote any-to-any connectivity
Local call wholesale service	Local Dial-up Customer Access	Local voice and data calls, long distance domestic calls, international calls, mobile network calls (due to effect on ability for interconnecting operators to compete with bundled discount packages which bundle local, long distance and mobile network calls).	Promotes competition in all downstream markets. Wide availability and competition in provision of bundled discount packages promotes choice and lower prices for consumers. Competition stimulates improved quality of services in downstream markets affected.	Not essential for any-to-any connectivity; provide local or long distance services are provided
Packet switched data access service	Local Permanent Customer Access, Narrowband Digital Transmission,	End-to-end permanent and virtual circuits.	Promotes competition in downstream markets leading to improved quality of service, wider choice of service, new and innovative services and more competitive	Essential for any-to-any connectivity between customers

Celcom et al's submission				
Access service	Market in which service operates	Key downstream markets	Promotion of choice, quality and affordability in communications markets	Promotion of any-to-any connectivity
	Broadband Digital Transmission		prices.	
DSL access service	Local Permanent Customer Access, Broadband Digital Transmission	Broadband services, interactive services, Internet, E-mail, Online Services, VAS services, Interactive TV, other.	Promotes competition in downstream markets leading to improved quality of service, wider choice of service, new and innovative services and more competitive prices. Promotes robust growth of broadband services.	Promotes any-to-any connectivity for broadband services.
Unbundled local loop	Local Permanent Customer Access, Broadband Digital Transmission	Broadband services, interactive services, Internet, E-mail, Online Services, VAS services, Interactive TV, Others.	Promotes competition in downstream markets leading to improved quality of service, wider choice of service, new and innovative services and more competitive prices.	Essential for any-to-any connectivity for broadband services.

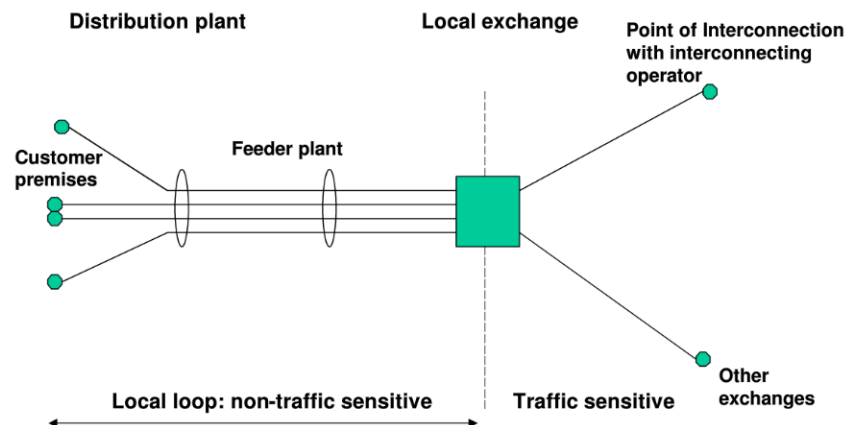
APPENDIX D: ECONOMICS OF ACCESS PRICING

The following is a discussion of a number of issues relating to the economics of access pricing in the communications sector.

Recovery of incremental and non-incremental costs

The choice of the overall *level* of access prices is delicate. High access prices may erect barriers to entry and prevent the development of competition in downstream markets. They may also induce inefficient bypass or duplication of bottleneck facilities in the upstream market. Conversely, low access prices may generate entry by inefficient entrants. They may discourage the network facilities providers in the upstream market from maintaining and upgrading their networks, and dissuade entrants from building their own facilities.

Traditional representation of the local loop



Starting from the end users, the individual connections from the interface at the customer premises form the distribution plant. The cost of the distribution plant is by and large non-traffic sensitive; that is, at current usage levels it does not vary much with the customer's communications usage. The feeder plant then gathers the lines of the distribution plant and thus consists of concentrated bundles of cables that terminate at the local exchange. The feeder plant too is rather traffic insensitive. Altogether, the cost of the transmission from the customer to the local exchange is non-traffic sensitive. It really involves a (large) fixed cost and no marginal cost. Or, putting it differently, the marginal cost relates to the decision of connecting the customer (or creating a new line for a customer) rather than the traffic this customer generates.

Then comes the first switch. Part of the cost of the local exchange is non-traffic sensitive (existence of exchange, design of software, etc); part (the interface) depends on the number of connecting lines; and the third part (the switches themselves) varies with traffic. Further transmission facilities then take the call from the local exchange to an interconnecting operator or to another exchange.

There is in general a trade-off between the number of exchanges and the cost of the distribution and feeder plants.

[Adapted from Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, pp 12, 13.]

A starting point in the determination of efficient access prices is recognition that the costs of the Public Switched Telephony Network (PSTN) can broadly be divided into two groups:-

- *Traffic sensitive costs:* These are mainly the additional cost of switching brought about by the originating or terminating traffic, and the transmission of the call between the local and trunk switch. These costs vary with the number of calls being made on the PSTN. Traffic sensitive costs are recovered from call charges (including charges for local calls, national long distance calls and international calls).
- *Line related (non-traffic sensitive) costs:* These are costs of the lines that connect customers to the network. Line related costs vary with the number of users connected to the PSTN. They do not vary with the number of calls made or received by end-users. They are not incremental cost and are treated as the fixed cost of the PSTN operator. At least some of the line related costs are recovered from line rental and connection charges. Any shortfall may be termed as the access deficit.

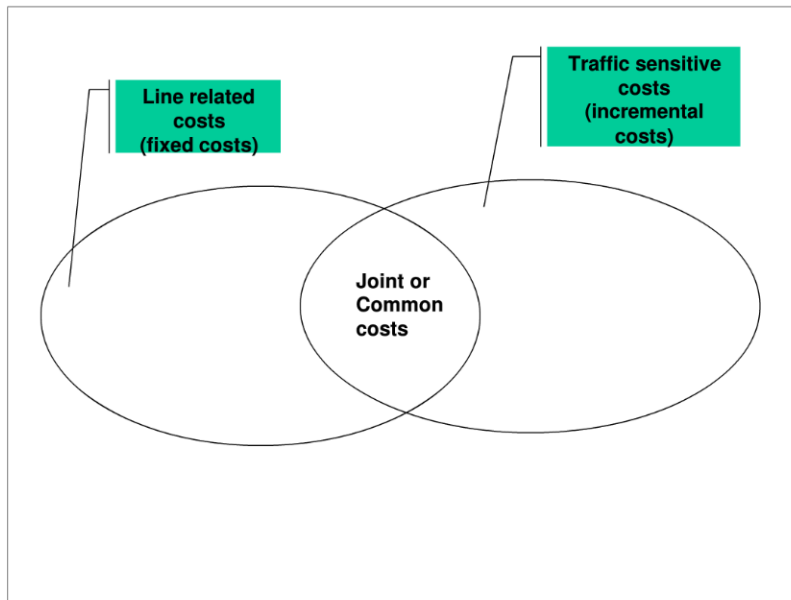


Figure 1: Relationship between traffic sensitive and line related costs

In reality there are cost items which fall into both groups (i.e., joint or common costs), while other cost items can be attributed solely to a specific group. Figure 1 illustrates the overlap between traffic sensitive costs and line related costs.³⁰

³⁰ It should be noted that 'costs' refers to economic costs and, in the long run, includes capital costs as well as operational costs.

In a first-best world, access prices would be set equal to the marginal (i.e., incremental) cost of the incumbent's network. 'Marginal cost' (or 'incremental cost'), in the context of access to interconnect services, refers to the traffic sensitive costs of the local access network. By setting access price equal to marginal cost, new entrants would be internalizing the marginal cost of the incumbent's network. Retail prices for call services would therefore also reflect marginal costs. The line related costs would (in the first -best world) in turn be recovered from line rental and connection charges.

To the extent that the incumbent operator is constrained from increasing line rental and connection charges by retail price regulations and does incur an access deficit, it must recover these costs from call revenues. This may include revenues from retail services (such as local calls, long distance calls, fixed to mobile calls, international calls, toll free calls) as well as wholesale services (including interconnect services). There is thus a need for markups above marginal costs. The theory of multi-product pricing implies that efficient recovery of the fixed cost entails spreading of the burden on all services (wholesale as well as retail). Each service should contribute towards the coverage of the fixed cost in a way that minimizes the economic distortion from the markups.³¹

Forward looking costs versus backward looking (i.e., historical) costs

In principle, costs (whether incremental only, or with a contribution to fixed costs) can be determined either on a forward looking basis, or a historical basis: -

- Forward looking costs are the ongoing costs of providing the relevant service in the future using the most efficient means possible and commercially available (i.e., best-in-use technology³²). In practice, this often means basing costs of an element (eg, a switch) on the best-in-use technology derived from an engineering model, on a forecast of the likely usage of the element, and on a rule for treating depreciation. Estimating forward looking costs can be difficult and time consuming, often involving bottom-up studies based on the cost of replicating the functionality of the network on the basis of its most efficient use. Bottom-up analyses entail reconstructing the PSTN operator's costs based on prevailing conditions on equipment costs, technology and capacity requirement forecasts. They require the formulation of an abstract, and necessarily simplified, depiction of the incumbent operator's network and operations. They also involve decisions on the topology of a hypothetical efficient network, which may be difficult to justify.

³¹ According to Ramsey-Boiteux pricing rules, it would be inefficient to charge high markups on those services for which consumers are not willing to pay much above marginal cost. Cost recovery should place a higher burden on those services with relatively inelastic demands. (Elasticity of demand refers to the extent to which demand for a service varies in response to a unit change in price for that service.) The structure of markups must thus reflect the structure of demand elasticities. Furthermore, the cross-elasticities (ie, the extent to which demand for a given service varies in response to a unit change in the price for another service) must also be accounted for. (Boiteux, M. "On the Management of Public Monopolies Subject to Budgetary Constraints." *Journal of Economic Theory*, 3:219-240, 1971. Ramsey, F. "A Contribution to the Theory of Taxation." *Economic Journal*, 47. Ramsey-Boiteux pricing rules are discussed in Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, at pp 60-65.)

³² Best-in-use technology should be comparable with the existing network design, and may often be best-in-commercial-use.

- Historical costs are the incumbent operator's actual (embedded) costs. It is measured using a top-down approach based on actual traffic, and on the historical procurement decisions of the incumbent operator, in terms of both quantity and capacity of network units purchased. This approach can use either historical cost accounting, where assets are costed at historical price, or current cost accounting, which uses replacement asset costs. Top-down models offer the advantage of readily available data (generally consistent with the operator's accounts) and can be reproduced easily every year. However, the top-down approach lacks transparency (cost causation is not always explicit), and is locked into past procurement decisions for the quantity of assets, and may result in new entrants paying for the incumbent's inefficiencies.

The main appeal of historical costs (particularly if fixed costs are fully allocated) is that it commits the regulator to allow the incumbent operator to recoup its investments and to break even. Thus, to a large extent, it solves the problem of regulatory takings. For instance, an operator who incurs a large fixed cost to install fiber optics in the local loop or to endow switches with new functions need not be concerned that this investment will later be expropriated by the regulator setting low access charges. However, historical costs has well-known flaws. In particular, it does not encourage cost minimization since cost increases are automatically passed through in the form of higher access prices without any assessment as to the efficiency of the relevant investment.

The main appeal of forward looking costs is that it eliminates the 'cost pass through' feature of backward looking cost-based pricing, thus providing much better incentives for static cost efficiency. In theory, the in-built benchmarking ensures that if an operator does not adopt best-in-use technology, it cannot expect to recoup any inefficiencies in production through access prices. Conversely, if an operator engages in cost-cutting measures, adopts more efficient production technologies or practices than that commercially available, it will be appropriately rewarded. However, in practice the determination of forward looking costs using bottom-up studies is highly discretionary. For instance, what constitutes efficient equipment in general depends on a forecast of the future usage of the elements.³³

Price setting approaches

Whilst in theory the regulator could direct that access prices should be based on the incumbent's cost (whether forward looking or historical), in practice access prices are set for a specific period (eg, quarterly, yearly, or longer) and reviewed at the end of each period. This is in part because cost studies take time to undertake, and also because they can be expensive. A complicating factor is the presence of incomplete information about the firm's costs. This gives rise to a trade-off between maximising incentives for the regulated firm to minimize costs, and ensuring that prices are in fact cost-based. The following discussion illustrates this trade-off, using the example of a procurement contract.

³³ The lumpiness of investments in telecommunications networks implies that it is often efficient to install equipment and use it below capacity for some extended period of time. If one were to approximate forward looking incremental cost by some form of cost average, one must foresee its likely usage over the element's lifetime.

Trade-off between incentives and rent extraction

The regulation of interconnection services is comparable to a procurement contract. Suppose a government wishes to procure a public good (for instance, an interconnection service). Only one firm has the know-how or capacity to supply this public good. However, the government has imperfect information about the cost that will be incurred by the firm. The expected cost of supplying this public good depends on exogenous and endogenous variables.

Exogenous variables refer to the technological requirements that the firm faces in producing the public good. To the extent that the firm is better informed about its production costs than the government (as is likely to be the case), the government faces an *adverse selection* problem. The government does not know whether a low payment will suffice to convince the firm to undertake the project. The firm will not be eager to reveal that its production cost is low even if this is the case, since it is in its interest to persuade the government that only a high price will do.

Endogenous variables refer to those post-contractual decisions taken by the firm that, together with the exogenous variables, determine the firm's final production cost and that cannot be contracted upon because they are not verifiable³⁴. These discretionary choices by the firm create the scope for poor cost performance on the part of the firm. Only if the firm is made accountable for a large fraction of its realized cost will it not abuse this discretion.

Suppose the government wants to buy the public good but would like to pay as little as possible. The government could offer a high-powered incentive scheme – for instance, a fixed-price contract in which the firm receives a fixed payment. Thus any endogenous cost savings or overruns would be fully internalized by the firm, hence increasing the firm's incentives to reduce its production costs. Alternatively, the government could offer a low-powered incentive scheme – for instance a cost-plus contract in which the firm's endogenous costs are fully reimbursed. Here the firm is not made accountable for its cost savings or overruns.

In the presence of incomplete information, the government faces a trade-off between giving good incentives to the firm to minimize its production costs, and paying a low price to the firm. A fixed-price contract, which allows the firm to keep any endogenous cost savings, also allows the firm to keep any cost savings for exogenous reasons. This potentially generates substantial rents. In contrast, a cost-plus contract, while providing poor incentives to keep cost down, is efficient at capturing the firm's potential rent.

Thus there is a basic trade-off between incentives, which call for a high-powered incentive scheme, and rent extraction, which requires low-powered incentives.

[Adapted from Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, pp 38 -41.]

A regulatory scheme in which access prices are reviewed regularly is comparable to a low-powered incentive scheme. Here, there is little incentive to minimize production

³⁴ That is, the government is not in a position to assess whether the post-contractual decision is justifiable.

costs since any cost overruns due to endogenous variables ³⁵ will be passed through in the form of higher access prices at the next review. On the other hand, regular review of access prices are efficient at ensuring that access prices are kept close to costs since any cost savings will be captured by the regulator in the form of lower access prices.

In contrast, a regulatory scheme in which access prices are reviewed only at the end of an extended period (of say 5 years) is comparable to a high-powered incentive scheme. Here, any cost savings are internalized by the firm, and therefore the firm will strive to minimize its endogenous costs particularly when the next review is still some years away. On the other hand, access prices will not be cost-based to the extent that the firm is successful in minimizing its endogenous costs in between reviews.

³⁵ For instance, a decision install equipment with excess capacity to cater for future growth would be an endogenous variable as the regulator is usually not in a position to determine whether the excess capacity is efficient.

APPENDIX E: STATEMENT ON ACCESS PRICING PRINCIPLES (DRAFT VERSION – DECEMBER 2000)

1. Introduction

- 1.1. This statement may be referred to as a *Statement on Access Pricing Principles* (draft version – December 2000).
- 1.2. This statement forms part of a series of statements which the Commission intends to publish 'setting out the principles and procedures which it may take into account in resolving disputes' relating to the terms and conditions of access.³⁶
- 1.3. This statement sets out the Commission's preliminary views on broad principles relating to the determination of access prices. In particular, this statement seeks to address the following issues:
 - Under what circumstances should access prices be based on cost?
 - Where access prices are to be based on cost, what costing methodologies should be used to determine cost?
- 1.4. This statement has no effect in terms of creating legal rights or obligations. This statement does not, and cannot, bind the Commission in relation to any decision the Commission makes in respect of an access dispute. However, it may be taken as an indication of the Commission's preliminary views on broad principles relating to the determination of access prices.
- 1.5. This statement is intended to be an 'evolving' document which may be reviewed by the Commission from time to time, either on its own accord, or in response to a request for a review made by an interested party.
- 1.6. This statement should be read in conjunction with the discussion which follows this statement.

2. Criteria for the application of cost-based access prices

- 2.1. Cost-based access prices should be applied to all **well-established** interconnection services where that interconnection requires the use of **bottleneck** facilities:
 - If the facilities required for interconnection are not a bottleneck, then the interconnection should not be subject to cost-based pricing for any service;
 - If, however, the facilities required for interconnection are a bottleneck, then they should be subjected to cost-based pricing for well-established interconnect services that require the use of those facilities, but not for interconnect services which are not well established.
- 2.2. A **bottleneck** may be defined as:

The control by a single or limited number of producers over the supply of an essential input or over the process used to produce an output. Those

³⁶

See section 85 of the *Communications and Multimedia Act 1998*.

controlling the bottleneck asset or process cannot be challenged by those who do not have access to it.

- 2.3. Box 1 below identifies a number of facilities which are considered as a bottleneck.

Box 1: Facilities which are considered as a bottleneck

Local loop

For call termination, the local loop should be classified as a bottleneck. The local loop is likely to remain a bottleneck for call termination for the foreseeable future. The deployment of multiple local loops does not reduce the bottleneck nature of local loops with respect to call termination.

For call origination, the local loop should currently be considered a bottleneck. However, this may be reviewed for subscribers who have a choice of three or more access providers with number portability between them.

For leased line services, the local loop should be considered a bottleneck, except for customers where there is a choice of three or more local loop providers which are capable of delivering the type of leased line in question.

Transmission network components

Transmission network components that connect tandem exchanges to local exchanges, or between local exchanges (i.e., junction transmission) and tandem exchanges to Mobile Switch Centres (MSCs), should be classified as bottlenecks.

Trunk transmission – defined as transmission between tandem exchanges, between tandem exchanges and an international gateway, or between MSCs in mobile networks – should be classified as a bottleneck in all areas except the following states (and federal territory):

- Perlis, Kedah, Pulau Pinang, Perak, Selangor, Kuala Lumpur, Negeri Sembilan, Melaka and Johor (collectively referred to as the listed states).

Nevertheless, trunk transmission between tandem exchanges, MSCs and international gateways in the listed states should not be considered as a bottleneck, provided that the switch in question is available as a point of interconnection (POI). Transmission to and from any switch which is not available as a POI is a bottleneck, regardless of the location.

- 2.4. A service should be considered as '**well-established**' if it has a well-established demand characteristic, and the investment required to provide it is therefore legitimately regarded as not being an unusually high -risk investment.
- 2.5. This well-established demand characteristic may be determined by the existence of similar services in Malaysia, or by the known success of those services in other markets comparable to Malaysia. A service which is initially not classified as being 'well-established' should be classified as 'well established' once the demand characteristic is well established.
- 2.6. The widespread introduction of the services for which the bottleneck is required by other operators in the market can be regarded as an indication that the service has a well-established demand characteristic.
- 2.7. Box 2 below identifies a non-comprehensive list of services which should be regarded as well-established.

Box 2: Services which are considered as well-established (not comprehensive list)***Ancillary services***

Emergency services, the inclusion of customer numbers in telephone directories, and access to the database of all customer numbers for the resolution of directory enquiries, should be offered as cost-based interconnect services. Should operators wish to make electronic information available by having it entered into the electronic database of another operator (or operators), instead of making their own database accessible to others, then this should be undertaken on a commercial basis.

Advanced services

Integrated services digital networks (ISDN), virtual private networks (VPNs) and Centrex should be regarded as 'well-established'.

Private circuit completion

Private circuits should be regarded as a well-established service.

3. Methodology for determining cost-based interconnection charges

3.1. Cost-based interconnection charges should be set at a level which covers:

- The additional economic cost (including the cost of capital, economic depreciation, and operating and maintenance cost) which the access provider can reasonably be expected to incur in the long run because of the increase in demand (referred to as 'the increment') which the access provider must accommodate in order to provide the relevant service or class of services; and
- A reasonable contribution to the joint and common costs of the access provider which have a causal relationship to the increment.

3.2. Cost-based interconnection charges should not exceed the fully distributed cost to the access provider of providing the relevant interconnection service.

DISCUSSION

On 11 August 2000, the Commission issued a discussion paper entitled *Access List Determination Under Section 146 of the Communications and Multimedia Act 1998 – Discussion Paper*. In the discussion paper, interested parties were invited to provide submissions on the following matters:

- Under what circumstances should access prices be based on cost?
- Where access prices are to be based on cost, should they be based on incremental cost or fully allocated cost? How should incremental cost be determined?
- Should access prices include a contribution to fixed (i.e., non-incremental) cost?
- Should costs be determined on a forward looking basis or a backward looking (historical) basis?
- How regularly should access prices be reviewed? Where access prices are set for an extended period, should access prices be indexed to a price index for measuring inflation? Should access prices be indexed to a rate of expected technological progress? Should access prices be regulated as a basket of wholesale services under an overall price cap?
- Should benchmark access prices be set? If so, which service should benchmark prices be set for? How should these benchmark prices be set?
- What other matters should the Commission address in its regulatory statements?

Submissions on the above matters were provided by Celcom (Malaysia) Sdn Bhd, Celcom Transmission (M) Sdn Bhd, DiGi Telecommunications Sdn Bhd, Maxis Communications Bhd, TT dotCom Sdn Bhd, Time Reach Sdn Bhd and Time Wireless Sdn Bhd (collectively referred to as Celcom et al) and Telekom Malaysia.

Criteria for the application of cost-based access prices

Submissions from interested parties

Telekom Malaysia strongly endorses the Analysys approach that only 'well established services' utilizing 'bottleneck facilities' should be subject to cost-based interconnect charging.

Celcom et al argue that cost-based prices should apply to any serviced or facility on the access list which has the characteristics of:

- a bottleneck;
- a natural monopoly;
- an effective monopoly; or
- is not subject to effective competition.

Furthermore, they appear to argue that cost-based prices should apply in relation to bottleneck facilities, even if the relevant service is not 'well established'.³⁷ However, where the relevant service is 'new and innovative', Celcom et al consider that the risk associated with developing and investing in these services should be recognized by way of a premium in the mark-up above long run incremental cost.

Discussion and preliminary views

The Commission notes that there appears to be broad support for cost -based interconnect charges to apply to services falling within the category of 'well -established services utilizing bottleneck facilities'. This is consistent with the recommendations of Analysys in their report *Interconnection and Universal Service: Arrangements for a Competitive Market* (11 December 1997). According to Analysys:

*Where bottleneck facilities exist, those controlling the bottleneck possess excessive negotiating power in any commercial negotiation for interconnect service that requires the use of the bottleneck. There is a danger that this negotiating power will be used to achieve excessive profits, or to exert control over the market. To prevent this, it is necessary to regulate, or have the possibility of regulating, the price of interconnection to such facilities at a price which represents a reasonable, but not excessive return. This price is based on the cost of providing the facility, but must also include a reasonable rate of return on capital employed.*³⁸

It is not clear to the Commission in what way the criteria 'natural monopoly' and 'effective monopoly' argued for by Celcom et al adds to the 'bottleneck facility' concept. These terms appear to have arisen from slightly different context and may well have different shades in meaning.³⁹ However, they all appear to relate to notions of excessive market power and the perceived need to regulate the exercise of such market power. The concept 'not subject to effective competition' appears to have a related meaning, albeit that it perhaps connotes a state of competition which is slightly more competitive than a natural or effective monopoly.

The Commission would conclude that it is appropriate to rely on the concept 'bottleneck facility' for the purpose of assessing whether access prices should be based on cost. However, this does not mean that there is no role for other economic concepts in shedding light on the issues at hand.

In relation to the concept 'well-established', Analysys explained that:

One criticism leveled at cost-based regulation of pricing for all possible bottleneck services is that it may deter network operators from investing in expensive new infrastructure which is required to deliver new services. A requirement to offer cost-based interconnect prices for such services would deny operators the ability to benefit, in the form of higher than normal returns, from

³⁷ In their second submission, Celcom et al appear to have confused two distinct issues: (i) the criteria for including a service in the access list, and (ii) the criteria for applying cost-based interconnect charging to a service included in the access list.

³⁸ Analysys (December 1997), p 13.

³⁹ The terms 'natural monopoly' and 'effective monopoly' appear to have arisen from the discipline of economics, while the concept of a 'bottleneck facility' seems to have its roots in anti-trust jurisprudence in the United States.

*their innovation or risk investment. However, once a service becomes **well established**, it is reasonable to expect cost-based, price-regulated interconnection to be made available to other operators...*⁴⁰

*... the 'well established' criterion was introduced to encourage innovation and risk taking. [Analysys does] not believe that such protection from cost-based interconnection is required for all investments; rather, it should be reserved for high-risk investments.*⁴¹

The Commission accepts the rationale for the 'well-established' criteria and the need to encourage innovation and optimal risk taking. However, the Commission also notes that, in theory, it is possible to compensate an operator making a high-risk investment by allowing a higher rate of return than would be included in a cost-based interconnect price.⁴² Consequently, for services which are not yet 'well-established' some form of cost-related charging for that service may be appropriate, provided that it includes a rate of return or mark up which is commensurate to the risk. However, the Commission believes that more work needs to be done before it is in a position to form a view on what pricing methodology should apply in the case of services that are not yet well-established.

Methodology for determining cost-based interconnection charges

Submissions from interested parties

Telekom Malaysia acknowledges there are some benefits of using incremental cost models, but is concerned that a failure to allow a sufficient mark-up over long run incremental cost (LRIC) to cover joint and common costs, cost of capital and economic depreciation profiles can seriously undermine investment incentives. Telekom Malaysia would support a fully distributed cost (FDC) methodology that allows joint and common costs to be apportioned across the carrier's services, thereby ensuring that all costs are covered. Telekom Malaysia is concerned that a narrow adaptation of LRIC (with an inadequate level of contribution to joint and common costs) will jeopardize long term investment in the Malaysian communications sector. Telekom Malaysia also argued that the introduction of incremental cost based charges without substantial tariff rebalancing (or mechanisms such as the Local Access Fund and the retail price floor) may have detrimental effects on Telekom Malaysia's revenues and profitability.

According to Celcom et al, it is widely accepted that LRIC based charges (i.e., all direct costs plus a commercial return on investment) provide the correct price signals for efficient build or buy decisions. Celcom et al submit that forward looking LRIC costs are most consistent with encouraging efficient investment in networks because:

- Forward looking costs most closely reflect the investment choice that a new operator would face today when deciding whether to build a new network or buy

⁴⁰ Analysys (December 1997), p 13.

⁴¹ Analysys (December 1997), p 14.

⁴² Indeed, Analysys notes that 'if the definition of 'cost-based' includes an acceptable rate of return on capital ..., then an operator whose new investment is made available at 'cost-based' interconnect prices will indeed be receiving an acceptable rate of return for that investment.' Analysys (December 1997), p 14.

services from an existing operator. They also reflect the investment choice of the incumbent access provider in upgrading or extending an existing network to provide a new service.

- Incremental costs also most accurately reflect the investment choice that an operator would face in deciding whether to build or buy the service in question.

Celcom et al argue that fully allocated costs are not preferred because they may not provide efficient pricing signals and may result in new entrants bearing the cost of past inefficient investment decisions and any operating inefficiencies within the incumbent.

Telekom Malaysia appears to acknowledge that '[t]here is a growing global consensus regarding the benefits of forward based costs in calculating interconnection charges in an environment characterized by major structural adjustment and rapid technological change. The orthodox view is that the use of forward looking rather than historic costs will result in the more efficient use of, and investment in, network infrastructure'.⁴³ However, Telekom Malaysia expressed a number of concerns on the practicability of modeling forward looking costs. Telekom Malaysia point out that forward looking costs are not necessarily lower than historic costs.

Discussion and preliminary views

The Commission's key concern is that cost-based access prices should be set at a level which:

- Promotes efficient build or buy decision on the part of new entrants to downstream markets;
- Whilst at the same time maintaining optimal incentives to invest in facilities or services which are subject to cost-based pricing.

The Commission believes that the choice of the costing methodology and the application of that costing methodology should address these principles.

To promote efficient build or buy decisions whilst maintaining optimal investment incentives, the Commission believes that cost-based access prices should be set in the following manner:

- As far as possible, access prices should be set equal to incremental cost – i.e., the change in total costs (including capital costs) resulting from an increase in output by a discrete increment. For a conveyance service, this would be the additional cost incurred by the access provider to accommodate the increase in demand associated with the conveyance service. For an access service, this would be the additional cost incurred by the access provider to provide the access service.⁴⁴ (See Figure E1 below for a depiction of the relevant cost categories.) Setting access prices equal to incremental cost would promote efficient build or buy decisions.

⁴³ Telekom Malaysia's Second Submission, p 29.

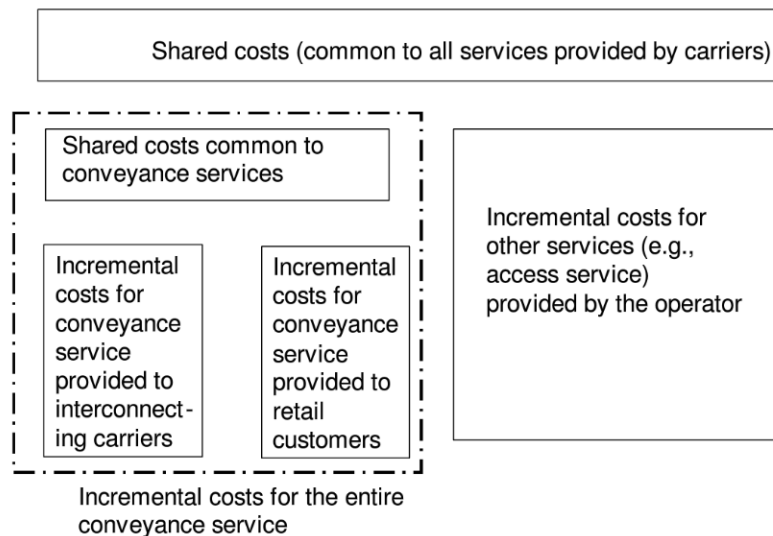
⁴⁴ Note that the term 'access' used in this discussion has two different meanings depending on the context. The term 'access price' refers to the price an access seeker pays to acquire access to services or facilities included in the access list. However, the term 'access services' refers to services which enable retail customers to gain access to, amongst others, conveyance services provided by the access provider and the access seeker.

- The relevant costs should be the ongoing costs of providing the relevant service in the future using the most efficient means possible and commercially available. In practice this often means basing costs on the best -in-use technology and production practices and valuing inputs using current prices.⁴⁵ Cost valuation based on the best -in-use technology (rather than historical costs) provides stronger incentives for appropriate investment decisions through rewarding/penalizing the access provider for good/poor investment decisions.
- However, access prices should include a contribution to joint and common costs that are causally related to the conveyance or access service in question – i.e., costs which would need to be incurred if the service was provided on a stand-alone basis.

The Commission notes Telekom Malaysia's preference for costs to be determined on a fully distributed basis, but is concerned that it would not promote efficient build or buy decisions, or maintain optimal investment incentives because:

- costs which are not causally related to the service in question may be included in access prices, thereby distorting efficient build or buy decisions;
- historical costs may result in inefficient build or buy decisions as they do not reflect the actual economic cost of the relevant conveyance or access service; and
- historical costs guarantee a normal commercial return to the access provider independently of the quality of its investment decisions; consequently investment incentives would be suboptimal.

Figure E1: Depiction of incremental and common costs



⁴⁵

Best-in-use technology may often be best -in-commercial-use.

The Commission acknowledges Telekom Malaysia's concern that access prices should include a reasonable contribution to joint and common costs, and believes that this concern is addressed by the cost-based access pricing approach outlined above. The Commission also believes this approach addresses Telekom Malaysia's concern that the cost of capital and economic depreciation be included in access prices.

Access deficit and Local Access Funding mechanism

The Commission notes that the cost-based access pricing approach outlined above has not addressed the question of what is generally referred to as the access deficit. This refers to the deficit that arises when the incumbent operator is constrained by retail tariff regulations from increasing rental and connection charges to cover the incremental cost of access services. The deficit must therefore be recovered from call revenues. This may include revenues from retail services (such as local calls, long distance calls, fixed to mobile calls, international calls, toll free calls) as well as wholesale services (including interconnection services). The theory of multi-product pricing implies that efficient recovery of the fixed cost entails spreading of the burden on all services (wholesale as well as retail). Each service should contribute towards the coverage of the fixed cost in a way that minimizes the economic distortion from the markups.

However, Analysys has argued against the notion of an access deficit. In part, this seems to arise from a concern that including a contribution to an access deficit in interconnection charges may have the effect of entrenching the current retail tariff structure. Analysys also argues that the notion of an access deficit is predicated on the principal that individual 'lines of business' within a telecoms operator should be able to, individually, make an identifiable profit. According to Analysys, this does not take account of the fact that many of the customers on which the access loss is made are highly profitable for other lines of business, such as long-distance and international calls. Analysys recommended instead a Local Access Funding (LAF) mechanism 'to fund any increase in the net cost of universal service provision arising from the introduction of indirect and equal access'.⁴⁶

Analysys however points out that this increased cost of universal service provision is not the same concept as, nor of a similar value to, a notional loss on local access services (i.e., the access deficit). The increased costs of universal service provision relate only to customers that become loss making as a result of equal access and to customers in loss-making areas, whereas an access deficit would include notional access losses relating to customers that are in fact profitable overall.

The Commission does not, at this stage, have a view on whether there should be a contribution to the access deficit, or whether the LAF mechanism should be retained. In the interim, the Commission believes it may be appropriate for the LAF mechanism to continue; however there should be no contribution to the access deficit while the LAF mechanism is in operation.

⁴⁶ Analysys (December 1997), p xxii.

Price setting approaches

Submissions from interested parties

Celcom et al support establishing benchmark prices for certain core facilities and services that are included in the access list, namely fixed origination and termination services, and mobile origination and termination services. They also propose that the Commission should publish guideline prices for all other services on the access list, based on an international benchmarking of the prices for similar services in other countries. According to Celcom et al, these guideline prices would assist industry operators in reaching commercial agreements and could also be used by the Commission to set reasonable prices in the dispute resolution process.

Telekom Malaysia does not consider it appropriate for the Commission to publish guideline prices based on international benchmarks. Telekom Malaysia is concerned that the international benchmarks will not be specific to Malaysia's needs.

Celcom et al suggest that benchmark prices should be set through a cost modeling exercise, based on the incumbent's network. They recommend that this exercise build on the cost models developed by Analysys. Celcom et al do not support the proposal that an access provider could propose prices which would be subsequently reviewed by the Commission. They believe that the Commission needs to develop its own models to enable assessment of the access provider's submitted cost. They also express concerns that relying on the access provider to develop its own costs would be a lengthy process and point to the Australian experience which has so far taken three years.

Telekom Malaysia cautions that the calculation of forward looking costs is complex. Telekom Malaysia asserts that forward looking cost models developed to date have typically understated the true costs of an efficient operator.

Discussion and preliminary views

The Commission notes that modeling forward looking costs is a complex exercise and involves a degree of subjective judgment, particularly in relation to forecasts about future traffic levels.⁴⁷ However, the Commission also notes that various well developed forward looking costing models are available internationally and have been used in many jurisdictions around the world. The Commission believes that the economic benefits of using forward looking costing approaches (in particular, promoting efficient build or buy decisions while fostering optimal investment incentives) outweigh the costs of undertaking such cost studies.

The Commission also believes that it is important for any such costing exercise to be undertaken in an open and transparent manner, subject to the incumbent operator's legitimate expectation that its commercial interests in respect of confidential information is protected. In the Commission's view, this would give market participants and potential new entrants confidence that interconnection charges are being set in a competitively neutral manner. The Commission believes that confidence in the costing process would promote efficient build or buy decisions and foster optimal investment incentives. The Commission intends to hold discussions with Telekom Malaysia and other interested

⁴⁷ The lumpiness of investments in telecommunications networks implies that it is often efficient to install equipment and use it below capacity for some extended period of time. If one were to approximate forward looking incremental cost by some form of cost average, one must foresee its likely usage over the element's lifetime.

parties on what processes should be instituted to cost the incumbent operator's network.⁴⁸

The Commission envisages that the costing process would result in a set of benchmark prices for some (or perhaps all) facilities or services included in the access list. These benchmark prices could then be used as a reference point in commercial negotiations over the terms and conditions of access. The costing process may also include costing a contribution to the access deficit and costing the designated universal service provider's cost of providing universal services to uneconomic customers and uneconomic areas.

The benchmark prices could be reviewed every two years or so (with a costing exercise at every review); alternatively they could be set for an extended period subject to an adjustment mechanism to take account of inflation and expected technological progress. The Commission believes further consultation is required on this matter.

Other issues

Both Telekom Malaysia and Celcom et al have raised a number of other issues in their submissions. They include:

- *The position of access seekers who are not network facilities provider and network services providers:* Celcom et al submit that cost-based access prices should only be available to licensed network facilities providers and network services providers who are subject to the universal service contribution. Telekom Malaysia shares similar views on this matter.
- *The charging structure:* Celcom et al submit that the charging structure should reflect the underlying cost structure, but argue that access charges to wholesale customers should be flat-rate per unit charges. According to Celcom et al, while it is theoretically optimal to separate charges for call set-up and call duration, this approach will be complex to implement. Telekom Malaysia submit that Celcom et al attempts to have the 'best of both worlds' by arguing for per second interconnect charging but at the same time not supporting charges for call set up. Telekom Malaysia notes that notwithstanding Celcom et al's continual references to Australia in their submission, they do not acknowledge that Australia has a call set up charge.
- *Reciprocity of charges:* Both Celcom et al and Telekom Malaysia support the principle of reciprocity of charges. Celcom et al point out that reciprocity of charges is administratively simple and practical.

In addition, Celcom et al recommend that the Commission determines an initial access code in accordance with section 96 of the Act. Telekom Malaysia does not support the 'very intrusive and prescriptive' approaches endorsed by Celcom et al. Telekom Malaysia envisages that the work of the access forum is likely to begin before the year end and Hari Raya Aidelfitr.

The Commission does not believe it is necessary to form a view on all of these issues at this stage. With respect to the position of access seekers who are not network facilities

⁴⁸ For mobile interconnection services, the costing exercise would not necessarily be based on any one operator's network.

providers or network service providers, the Commission notes the arguments of put by Telekom Malaysia and Celcom et al but would like to hear the views of other potential access seekers before forming a view on this matter. That said, the Commission accepts that it is possible that the terms and conditions of access need not be the same for all access seekers, subject to the standard access obligation that access should be provided on an equitable and a non -discriminatory basis.⁴⁹

With respect to the charging structure, the Commission's preliminary view would be that the charging structure should generally reflect the underlying cost structure, and this may mean that any call set up costs should be reflected in the charging structure. The Commission would seek to consult further on this matter, and would approach this on a case by case basis, depending on the service or facility in question. The charging structure would not necessarily be the same for all services or facilities.

Malaysian Communications and Multimedia Commission
21 December 2000

⁴⁹ See subsection 149(2) paragraph (b).

