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Comparison of the Australian Fixed Network Cost Model and the TEA Model

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Executive Summary

Within the Telecommunications industry, the terms and conditions of access for a Declared Service[1], including pricing, are subject to Australian Competition and Consumer Commission (ACCC) regulation. The pricing principles applied by the ACCC are designed such that access prices mimic the pricing behaviour of a supplier who faced effective competition in the market. The ACCC considers Total Service Long Run Incremental Cost (TSLRIC) to be an appropriate cost-based pricing framework.

The ACCC commissioned Analysys Mason Limited to develop the Australian Fixed Network Cost (AFNC) model; a cost model of the Australian fixed telecommunications network which follows the TSLRIC framework. The ACCC will use the AFNC model as an input into the process of determining pricing principles and indicative prices for declared fixed line services[2]. Following a consultation process, the AFNC model is being finalised.

In 2008, Telstra lodged an undertaking for its Unconditioned Local Loop Service (ULLS) which is a Declared Service. To support this undertaking, Telstra lodged its own implementation of the TSLRIC framework, the Telstra Efficient Access (TEA) model. Both the TEA model and the AFNC model develop price estimates for two Declared Services, ULLS Band 2 and Wholesale Line Rental (WLR). However, the models produce quite different access price estimates depending on the inputs and assumptions that are used. Table A below illustrates this for ULLS Band 2.

Table A: ULLS Band 2 monthly access price estimates

	Telstra Simulations	ACCC Simulations
TEA Model	***$46.54***	$18-$21
AFNC Model	$37.46**	***$17-$18****

Source: ACCC and Telstra

Note: *AFNC model estimate was run using default Analysys inputs. The ACCC have yet to finalise their preferred inputs into the AFNC model.
**Indicative estimate developed by Telstra using a combination of its preferred inputs and assumptions and default Analysys inputs and assumptions.

The table above also shows how both Telstra and the ACCC have endeavoured to explain the differences between the two models. For example, the ACCC ran a simulation using the TEA model under their own preferred inputs and assumptions. The estimated access price from this simulation ($18 - $21) is very similar to the estimated access price developed using their own model ($17-$18). The inputs and assumptions in the TEA model altered by the ACCC under this simulation provides some explanation as to why there is such a large disparity in the estimated access prices produced by both models.

Given the importance that both models have in the process of determining access prices, Telstra engaged KPMG Econtech to provide a view as to whether there is a requirement for an expert review of the AFNC and TEA models.

[1] Specifically, suppliers of a Declared Service are subject to the provisions under Part XIC of the Trade Practices Act 1974 (Cth) (TPA).

[2] ACCC, "Analysis Cost Model for Australian fixed network services", December 2008

All economic problems involve the allocation of scarce resources against competing uses. The aim of both the TEA model and the AFNC model is to estimate the price of specific Declared Services in a manner such that the estimated prices replicate the outcomes of a supplier facing effective competition in the market. The underlying assumption applied by both models to achieve this objective, is to design the network in a way which minimises the cost of providing the telecommunications service to all customers at a particular level of quality, whilst still remaining within the bounds of practical, real-world constraints.

In forming a view as to whether an expert review of the two models would be beneficial, KPMG Econtech has undertaken a preliminary, high-level analysis that focuses on each model's documented underlying principles. The actual files which make up the models have not been reviewed. An expert review is likely to deliver a more detailed technical assessment of both models.

To form a view on whether an expert review of the two models would be beneficial, three issues must be considered.

- First, whether the application of the two models has led to significantly different results.
- Second, whether there are differences in how each model implements the economic modelling framework described above.
- Third, whether one model implements the framework more thoroughly than the other.

Following a verbal briefing by Telstra[3], analysis of both written model documentation and major reports which analyse the two models, KPMG Econtech observes the following.

- *The application of the models has led to significantly different results*. For example, as shown in Table A, Telstra using the TEA model produces an access price estimate of $46.54 for Band 2 ULLS, whilst the ACCC using the AFNC model produces an access price estimate of around $17 - $18.
- *There are differences in how the economic modelling framework is applied in both models*. This is part of the reason why the models produce different access price estimates. The other reason would be the inputs used in the simulation.
- *In some instances, the TEA model and the AFNC model apply the framework more thoroughly than the other*. This is summarised in Table B below. Table B also shows the impact that a more thorough implementation of the different components of the economic modelling framework would have on prices.

[3] KPMG Econtech approached the ACCC with a request for a meeting at which they would supply KPMG Econtech with information that the ACCC considered relevant for forming our third-party view. The ACCC did not agree to meet with KPMG Econtech and their response to our meeting request is contained in Attachment A.

Table B: Summary of Analysis

	TEA	AFNC	Effect on Prices
Identification of Customers	✓		↑
Flexibility in Optimisation*		✓	↓
Allowance for Constraints	✓		↑
Network Scalability	-	-	-
Conversion of total cost to price	-	-	-

Source: KPMG Econtech
Note:*Although the AFNC model has greater flexibility in optimisation, as required in the TSLRIC framework, the definition of ULLS means that Telstra can only provide this service over copper.

Interestingly, the two components of the framework where the TEA model is relatively more thorough than the AFNC have a tendency to push up the access price. The issues surrounding the location and demand database used in the AFNC model means that a more accurate identification of customers is likely to lead to an increase in the access price. Furthermore, by properly adhering to geographic and engineering constraints, network structures must work around physical barriers such as lakes or railway lines; this has the potential to increase the length of the cable deployed in the network and thus increase cost. Conversely, the component of the framework where the AFNC model is relatively more thorough than the TEA model has a tendency to push down the access price. For example, a greater range of cost-saving technology and designs are allowed in the AFNC model.

The tilted annuity method used in the AFNC model allows for future increases in the cost of the asset. However, it is not clear that participants in a competitive market, facing the future threat of technological bypass would push out cost recovery of the asset, and may instead use a flat annuity. The question of whether a tilted or flat annuity should be used deserves further analysis. Similarly, a more in-depth analysis of network scalability to falling customer numbers, in light of fixed and variable costs would be beneficial.

The cost models play an important role in access price determination. Given that the outcomes of the two cost models are likely to lead to different results which may affect pricing to wholesale customers, KPMG Econtech considers that a thorough review of both models should be undertaken by a third party who is a recognised expert in the area of cost modelling, particularly in a regulatory context.

A model with strengths across all components listed in the table above is more likely to produce an efficient access price estimate compared to a model which has strength in only one or two components. An expert review of both models may lead to the development of such a model. Indeed, given the countervailing impact the components have on access prices, a model which has strengths across all components is likely to produce an access price estimate which is between the range given by the current versions of the ANFC model and the TEA model.

In addition, engaging an expert reviewer is the most efficient means of resolving the debate over the most appropriate cost model to be used when valuing the telecommunications network. Appointing an expert who is independent of the AFNC model and the TEA model to review both models, lifts the likelihood of developing a cost model which could be accepted by both Telstra and the ACCC.

1 Introduction

In December 2008, the Australian Competition and Consumer Commission (ACCC) released a Discussion Paper which sought comment on the Australian Fixed Network Cost (AFNC) model developed by Analysys Mason Limited. The AFNC uses a Total Element Long Run Incremental Cost (TELRIC) framework as a proxy for a Total Service Long Run Incremental Cost (TSLRIC) framework to provide cost estimates for providing Declared Services on the Australian fixed network. The ACCC will use the AFNC model as an input into the process of determining pricing principles and indicative prices for declared fixed line services[4]. Following a consultation process, the AFNC model is being finalised.

In March 2008, Telstra lodged an ordinary access undertaking relating to matters, including pricing, for its Unconditioned Local Loop Service (ULLS). To support this undertaking Telstra lodged its own implementation of the TSLRIC framework using the Telstra Efficient Access (TEA) model.

Both the TEA model and the AFNC model develop estimates for the monthly ULLS Band 2 access price and Wholesale Line Rental (WLR) price. However, the models produce quite different access price estimates depending on the inputs used. Given the importance that both models have in the process of determining access prices, Telstra engaged KPMG Econtech to provide a view as to whether an expert review of the AFNC and TEA model is required. This report also provides guidance on the possible terms of reference for such a review.

Our recommendations are objective and based solely and entirely on the findings set out in this report. Our findings are based on version 1.3 of the TEA model and version 1 of the AFNC model.

This report has been prepared as outlined in the Engagement Letter from KPMG Econtech to Telstra dated 21 April 2009.

1.1 Report Structure

This report is structured as follows.

- Section 2 provides a brief description of the services whose cost is estimated by both models. This section also discusses the access price determination process, and the importance of these access prices for Telstra, the telecommunications market and end-users of telecommunications services.

- Section 3 outlines the key principles underlying the TSLRIC framework and how this framework is implemented in practice.

[4] ACCC, "Analysis Cost Model for Australian fixed network services", December 2008

- Section 4 presents our analysis of the key issues which supports our finding that a review of both models by an expert reviewer is required.

- Section 5 discusses the potential terms of reference for an expert review.

2 Background

The AFNC model develops cost estimates for several fixed line services. These include:

- public switched telephony network originating and terminating access service (PSTN OTA);
- unconditioned local loop service (ULLS);
- local carriage service (LCS);
- wholesale line rental (WLR); and
- line sharing services (LSS).

The current version of the TEA model, version 1.3, provides costs estimates for only two of the above services, that being the ULLS Band 2 and WLR. Hence, to allow for a fair comparison of both models, this report focuses only the development of cost estimates for these two services. This section provides a brief description of these two Declared Services and an outline of how access prices for these two services are determined.

2.1 Modelled Services

Unconditioned Local Loop Service

ULLS provides other telecommunications carriers/carriage service providers with access to Telstra's existing copper wire network. Under ULLS, Telstra's competitors take over the connection to an end customer. The copper wire linked to the customer's premises is disconnected from Telstra's network at the exchange and connected to the competitor's own interconnection equipment. ULLS allows Telstra's competitors to provide customers with voice and/or DSL broadband services without having to establish their own copper network infrastructure.

The wholesale price of ULLS varies between four location bands; ranging from the highest line density locations (Band 1) through to the lowest line density locations (Band 4). These four location bands are as follows:

- Band 1: Central Business District area of Sydney, Brisbane, Adelaide, Melbourne and Perth.
- Band 2: Urban areas of capital cities, metropolitan regions and large provincial centres.
- Band 3: Semi-urban areas including outer metropolitan and smaller provincial towns.
- Band 4: Rural and remote areas.

Wholesale Line Rental

The WLR allows Telstra's competitors to resell the basic phone line rental. This line rental service allows the telecommunications end-user to connect to the public switched telephony

network. In other words, it allows the end user to make and receive voice calls and have a telephone number.

2.2 Access Price Determination

ULLS and WLR are Declared Services and hence, suppliers of these services are subject to:

- The provisions of Part XIC (Telecommunications Access Regime) of the TPA.
- Unless otherwise agreed via commercial negotiations, the ACCC setting the terms and conditions of access which includes pricing.

The terms and conditions of access, including pricing, under which the Declared Service is provided can be determined in the following two ways.

- A carrier or carriage service provider can lodge an undertaking with the ACCC pursuant to which the carrier or carriage service provider undertakes to comply with the terms and conditions specified in the undertaking in relation to applicable standard access obligations. If the access undertaking is accepted by the ACCC, the terms and conditions specified in the undertaking are binding on the carrier or carriage service provider and on the ACCC in arbitration of any relevant access dispute.
- If no access undertaking is in place, the relevant parties can agree upon the terms and conditions of access in commercial negotiations. If the parties cannot come to an agreement, one party can notify the ACCC of an access dispute. The ACCC can then arbitrate and make a determination to resolve the dispute.

The ACCC's arbitral and undertaking decisions must be based on whether or not the terms and conditions of access conform to the legislative criteria. The estimates provided by the cost models are only one input into this decision process. In its Final Decision on Telstra's 2008 Undertaking the ACCC notes that "cost estimates are supporting material to an undertaking and that what is of relevance is whether on balance the undertaking satisfies the legislative criteria."[5] A discussion of the role that various cost models have played in access pricing decisions can be found in sub-section 3.3.

These access prices determined through arbitration or undertakings are important for several stakeholders, including Telstra and its competitors in the telecommunications market, and consumers of telecommunications services.

For Telstra, a significant proportion of shareholder value is determined by the commercial return it earns on investments, including its Customer Access Network (CAN) which is used to provide Declared Services. The ACCC has estimated that Telstra would receive an additional

[5] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009, p. 48.

$97 million in revenue each year had the ACCC accepted Telstra's 2008 Undertaking for ULLS Band 2[6].

Access prices also influence competitiveness in the telecommunications market as they are effectively the wholesale prices Telstra charges its competitors for access to the services provided by Telstra's network infrastructure. Hence, these prices are as important in determining the financial and competitive performance of Telstra's competitors as they are to Telstra. Indeed, when determining whether or not the terms and conditions of access set out in the undertaking are reasonable, the ACCC must consider, amongst other issues, whether or not they support both the legitimate business interests of Telstra and competition in the market for telecommunication services[7]. An access price which is higher or lower than what it would cost an efficient provider to supply these services would distort the choices and result in welfare loss. For example, if prices were higher, this would hinder the ability and incentive for Telstra's competitors to compete in both the wholesale market and the market for downstream services. Conversely, if prices were lower then this would reduce the incentive for both Telstra and its competitors to invest in infrastructure as they would not receive an adequate return on their investment[8].

Importantly, when assessing whether the terms and conditions of access promote competition in the telecommunications market, the TPA obliges the ACCC to have regard to the extent to which the terms and conditions of the undertaking will remove obstacles to final consumers (retail businesses and household customers) accessing telecommunications services. In fact, the overall object of Part XIC of the TPA is to promote the long term interests of end-users of the service. The impact of these access prices is far-reaching. According to the ACCC, the ULLS in Band 2 areas alone cover 70 per cent of the Australian population[9]. A reduction in the level of competition in the telecommunications market is likely to increase the prices and lower the quality of telecommunications services available to end users. In addition, greater competition is likely to foster innovation in the market, increasing the choice of products available to end-users[10].

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[6] Ibid.

[7] Ibid.

[8] Harris. R.G. and Fitzsimmons. F., "An Assessment of Telstra's TEA Cost Model for use in Costing and Pricing of Unconditioned Local Loop Services (ULLS)", November 2008

[9] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

[10] ACCC, "Access Pricing Principles – Telecommunications, a guide", July 1997

3 Total Service Long Run Incremental Cost

The pricing principles applied by the ACCC when determining access prices for Declared Services in the telecommunications market are designed such that access prices mimic the pricing behaviour of a supplier who faces effective competition in the market. The four broad principles are as follows[11].

- Access prices should be cost based.
- Access prices should not discriminate in a way which reduces efficient competition.
- Access prices should not be inflated to reduce competition in dependent markets.
- Access prices should not be predatory.

With regard to these principles, and particularly the first dot point above, the ACCC considers Total Service Long Run Incremental Cost (TSLRIC) to be an appropriate cost-based framework for determining the access price for Declared Services in those instances where:

- the service is well developed;
- the service is necessary for competition in dependant markets; and
- the forces of competition or the threat of competition work poorly in constraining prices to efficient levels.

Both ULLS and WLR fall within this criteria[12].

The remainder of this section outlines the theoretical foundations underlying the TLSRIC framework. It then discusses the issues associated with the implementation of the framework. Finally, we present a brief history of Long Run Incremental Cost (LRIC) models in Australia. The most recent of which are the AFNC and the TEA model.

3.1 Theoretical Foundations

The TSLRIC framework was first developed in the late 1970s and early 1980s to deal with issues surrounding the application of common cost concepts to firms producing more than one product or service[13]. The cost estimate developed using a TSLRIC framework shows the cost a firm would avoid in the long-run if it no longer provided the service being costed, holding all of its other production activity constant.

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[11] ACCC, "Access Pricing Principles – Telecommunications, a guide", July 1997

[12] Ibid.

[13] CoRE Research, "Comparing TSLRIC and TELRIC", July 2003

Key principles

The key principles underpinning TSLRIC is as follows.

- The service to be costed is the total service provided as opposed to a single unit of service
- Since it is a long run cost concept, all factors of production (such as capital and labour) used in producing the service can be varied.
- The technology underpinning the cost concept can be historical, current or forward looking. In a regulatory context, forward-looking technology is used.

If a firm earned TSLRIC for all its services then it would not recover common costs as it is a service-specific cost concept. In a regulatory context, a portion of common costs is allocated to the product. The ACCC allows both common and indirect costs not directly attributable to the service to be incorporated into TSLRIC, otherwise known as TSLRIC+[14]. From a pure economic perspective, common fixed costs should be allocated in a way which minimises distortion. Hence, the allocation of fixed costs should, in theory, be based on each product's elasticity or responsiveness of demand to price changes. That is, those products whose demand is highly responsive to price changes should bear less of the common cost compared to a product whose demand is relatively insensitive to price changes[15].

To determine the TSLRIC+ of a service where common costs exist, it is necessary to identify other services which may share common costs with the main service being costed. If these other services are not identified then the cost estimated for the main service will not be TSLRIC as it will include common costs attributable to the omitted services.

3.2 Practical Implementation

Implementing TSLRIC+ is difficult in practice and some modifications and simplifications to the theoretical framework is usually applied. This is discussed in further detail below.

Technology

In terms of the technology underlying the cost estimate, several simplifications are applied. The main simplification made is that the forward-looking technology that is costed is based on the 'best in use' technology as opposed to 'best available' technology. This simplification is adapted for two reasons. First, this approach means that suppliers are not penalised if they do not adopt the most recent technological breakthrough. Second, a costing based on 'best

[14] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

[15] CoRE Research, "Comparing TSLRIC and TELRIC", July 2003

available technology' is not likely to be accurate given that the cost properties are not well known[16]. The ACCC has accepted the 'best in use' approach as it is less speculative[17].

Optimisation

When implementing the framework, a decision needs to be made on the degree of flexibility in optimisation that is available when designing the network. In practice, what is generally used in TSLRIC models is a scorched node approach where certain key network structures are kept constant. For example, in the AFNC model, local exchanges are kept at their current location. The ACCC considers the scorched node approach as accounting for real world conditions[18]. This can be contrasted with a scorched earth approach, where you can vary the location of network structures. The scorched earth approach assumes that there is no existing network and bases the network design on the location of customers and expected demand.

Common Costs

In practice, implementing TSLRIC+ is time consuming computationally. For example, one approach of identifying common costs would be to estimate the incremental costs of each relevant service, then subtracting the sum of incremental costs across all services from total cost. What remains are costs that are associated with at least two services[19]. The difficulty involved in identifying common costs is one of the main reasons the AFNC model uses a Total Element Long Run Incremental Cost (TELRIC) framework.

In addition, the allocation of common costs across services is usually done through mark-ups[20]. The ACCC has generally adopted equi-proportionate mark-ups to allocate common costs[21].

Annualising and Unitising Total Cost

As discussed previously, the TSLRIC+ framework provides a revenue floor for the service provider. For regulatory purposes the total cost estimated using this framework needs to be converted to a price for each unit of service.

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[16] Ergas, H., "TSLRIC, TELRIC and Other forms of Forward Looking Cost Models in Telecommunications: A Curmudgeons Guide", November 1998

[17] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

[18] Ibid.

[19] CoRE Research, "Comparing TSLRIC and TELRIC", July 2003

[20] Ergas, H., "TSLRIC, TELRIC and Other forms of Forward Looking Cost Models in Telecommunications: A Curmudgeons Guide", November 1998

[21] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

In broad terms, costs are comprised of capital costs as well as operating and maintenance costs. Capital costs include both the opportunity cost of funds used to finance the investment and the depreciation of capital. An annual figure for the cost of capital is derived by applying the Weighted Average Cost of Capital (WACC) to the total cost of the asset. In terms of depreciation, the relevant measure is economic rather than accounting depreciation. Economic depreciation measures the cost associated with holding the asset in that period. That is, it measures the change in the value of the asset over that period[22]. These annual measures of capital costs are designed to spread the cost of the asset over its economic lifetime.

3.3 History of LRIC models in the Australian Telecommunications Industry

NERA Model

National Economic Research Associates (NERA) was commissioned by the ACCC to develop a model which would estimate Telstra's cost of providing originating and terminating interconnection services within a TSLRIC framework. The model was developed during 1998 and following industry consultation, was finalised by NERA in January 1999.

The model is described as following a "bottom-up" approach of modelling[23]. The model estimates the cost of efficiently re-building Telstra's network using a forward looking approach whilst assuming that the network must carry Telstra's current traffic levels at the current grade of service. Additionally, the assumption is made that the network is operated efficiently within its current architecture and node[24] locations. The optimisation choice applies only to equipment within and between the nodes.

The NERA model was employed by the ACCC to estimate local loop prices as part of the process in assessing Telstra's 1999 PSTN Undertaking[25]. The original NERA model was then modified by the ACCC to estimate the cost of supplying ULLS in the Commission's 2002 report on ULLS pricing principles. Since then, the methodology underlying the model has become out of date and the ACCC does not regard the model as relevant for assessing Telstra's most recent (2008) Undertaking for ULLS Band 2[26].

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[22] Ergas, H., "TSLRIC, TELRIC and Other forms of Forward Looking Cost Models in Telecommunications: A Curmudgeons Guide", November 1998

[23] NERA, "Estimating the Long Run Incremental Cost of PSTN Access", January 1999

[24] A node is a connecting point at which several cables come together.

[25] ACCC, "Pricing of unconditioned local loop services (ULLS)", March 2002.

[26] ACCC, "Telstra's Band 2 ULLS Undertaking – Request for access to NERA model", March 2009.

PSTN Ingress and Egress Model

Telstra did not have access to a working version of the NERA model. In response, Telstra developed the PSTN Ingress and Egress (PIE) model to verify the cost estimates developed using the NERA model. The PIE model also allowed Telstra to examine the impact of its own preferred assumptions and parameter values on cost estimates, and to compare this to the ACCC's preferred assumptions and parameter values[27]. Both NERA and PIE's physical asset counts are based on input assumptions.

The PIE model was used to support Telstra's 1999 PSTN Undertaking.

PSTN Ingress and Egress Model 2

Following from the PIE model, Telstra developed the PSTN Ingress and Egress 2 (PIE2) model in 2001/02. Similar to the PIE model, the PIE2 model uses a TELRIC framework to estimate the cost of efficiently providing PSTN interconnection. The PIE2 model develops cost estimates for the following declared services: PSTN OTA, LCS and ULLS for all Bands.

The PIE2 model uses detailed geographic information on customer locations from the Telstra network database as its starting point for modelling an efficient PSTN. This address database covers those customers Telstra currently services, has serviced or intends to service in the next six months. Various mathematical algorithms determine the assets needed to service these customers.

Telstra first lodged the model with the ACCC in January 2003 in support of its undertakings for PSTN OTA and ULLS. In addition, the model was also used by Telstra to estimate the cost of efficiently providing ULLS as part of its 2005 Undertaking[28]. The ACCC has used the PIE2 model (with the ACCC's preferred inputs) to estimate the level of ULLS costs; most recently in its March 2008 arbitration determinations[29,30,31].

Australian Fixed Network Cost Model

The ACCC commissioned Analysys Mason Ltd to develop a cost model able to estimate the long run efficient cost of providing telecommunications services on the Australian fixed network. As discussed previously, the model provides annual cost estimates between 2007 and 2012 for PSTN OTA, ULLS, LCS, WLR and LSS. The ACCC released a discussion paper on

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[27] ACCC, "Telstra's Undertaking for Domestic PSTN Originating and Terminating Access: Discussion Paper", October 1999

[28] ACCC, "Assessment of Telstra's ULLS monthly charge undertaking: Final Decision", August 2006

[29] ACCC, "Chime – Telstra ULLS final determination – Statement of Reasons", March 2008

[30] ACCC, "Optus – Telstra ULLS final determination – Statement of Reasons", March 2008

[31] ACCC, "PowerTel – Telstra ULLS final determination – Statement of Reasons", March 2008

the AFNC model in December 2008. Following an industry consultation process in early 2009, the model is being finalised and the final version is scheduled for release in June 2009. The ACCC intend use the AFNC model as an input into the process of determining pricing principles and indicative prices for declared fixed line services[32].

The AFNC uses a TELRIC framework as a proxy for a TSLRIC+ framework. As previously mentioned, the TELRIC framework has been used due to the complexity associated with measuring common costs and the heavy computational burden in a TSLRIC+ framework. The ACCC notes that a well-designed TELRIC model is able to produce similar results to a TSLRIC+ model, depending on how closely each model allocates common costs. Similar to the NERA model, the AFNC models the network using a bottom-up approach[33]. In contrast to the NERA model, in the AFNC model, the only existing network infrastructure held constant is the location of the local exchanges. Additionally, physical asset counts are determined by mathematical algorithms, similar to the methodology applied in the PIE model.

The AFNC model was one source of information used to support the ACCC's decision on Telstra's 2008 ULLS Undertaking. The AFNC was used as a preliminary check on the cost estimates provided by Telstra as part of the undertaking. The ACCC notes that although the AFNC is not intended as a benchmark, large disparities between estimates developed using the AFNC and another model "may suggest further investigation into the other models underlying assumptions and parameter values is required."[34] However, given that the AFNC model is not yet finalised, and the default input and parameter values in the model do not necessarily reflect the ACCC's preferred values, the ACCC has given less weight on these estimates in assessing Telstra's 2008 Undertaking[35].

Telstra Efficient Access Model

The Telstra Efficient Access (TEA) model was developed in-house by Telstra with the assistance of external consultants. The current version of the TEA model, version 1.3, has been designed mainly to estimate the cost of providing ULLS in Band 2 areas efficiently, although there is also a WLR (or basic access) option in the model[36].

The underlying database of the TEA model is based on Telstra's actual engineering records on the location of network structures, customer demand and customer locations. Physical asset counts in the TEA model is determined by Telstra's operations data. However, the network design has been optimised for efficiency. For example, when there are multiple cable routes

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[32] ACCC, "Analysis Cost Model for Australian fixed network services", December 2008

[33] Ibid.

[34] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009, p83.

[35] Ibid.

[36] Telstra, "Telstra Efficient Access Model Overview", December 2007

available, the model only selects those cable routes which minimise distance. Unlike the AFNC model, the TEA model holds several network structures constant, not just the location of the local exchange. The network structures that are held constant include:

- distribution area boundaries;
- pillar locations;
- customer locations; and
- distribution and main cable routes.

The TEA model was the major piece of supporting evidence to Telstra's 2008 ULLS Undertaking which was first lodged with the ACCC in March 2008.

4 The TEA Model and the AFNC Model

There are several key areas to consider when developing an economic model. All economic problems involve the allocation of scarce resources against competing uses. They involve optimising the outcome of a particular objective against various constraints. The aim of both the TEA model and the AFNC model is to estimate the price of Declared Services such that the estimated prices mimic the pricing behaviour of a supplier who faces effective competition in the market.

The underlying assumption applied by both models to achieve this objective, is to design the network in a way which minimises the cost of providing the telecommunications service to all customers at a particular level of quality, whilst still remaining within the bounds of practical, real-world constraints. Given the role of these models in the regulatory process, as discussed in Section 3.3, both models must also convert the total cost of the service to a unitised price. In addition, as with all models, consideration must be given to the underlying data used to develop the models.

In forming a view as to whether an expert review of the two models may be beneficial, three issues were considered. First, whether the application of the two models has led to significantly different results. Second, whether there are differences in how each model implements the economic modelling framework described above. Third, whether one model addresses the areas of data, optimisation, constraints or unitisation more thoroughly than the other.

In forming a view as to whether an expert review of the two models would be beneficial, KPMG Econtech has undertaken a preliminary, high-level analysis that focuses on each model's documented underlying principles. The information used to conduct this analysis is set out in section 4.1. However, the views expressed in this report are not intended to pre-empt or supplant the outcome of the recommended expert review of the TEA Model and AFNC model. An expert review is likely to deliver a more detailed technical assessment of both models and consider additional materials, and so might legitimately reach a different view on specific modelling issues as a result.

The remainder of this section analyses in greater detail the three issues discussed above.

4.1 Information on the Models Provided to KPMG Econtech

In conducting this analysis we were provided with the following information:

- verbal briefing by Telstra;
- written model documentation for both the AFNC and TEA models; and
- major reports which analyse the two models.

The actual files which make up the models have not been reviewed. This is beyond the scope of Telstra's Terms of Reference as this is considered to be the role of an expert reviewer, if such a

review were to be conducted. Hence, KPMG Econtech does not comment on the input values used in either model. Rather, our analysis focuses on each model's underlying principles.

KPMG Econtech approached the ACCC with a request for a meeting at which they would supply KPMG Econtech with information that the ACCC considered relevant for forming our third-party view. The ACCC did not agree to meet with KPMG Econtech and their response to our meeting request is contained in Attachment A.

4.2 Cost estimates from the TEA model and the AFNC model

One important consideration in determining whether an expert review of the model may be beneficial is whether or not the application of each model leads to significantly different results in terms of cost estimates and hence, access price estimates. If each model produced significantly different estimates, this would strengthen the case for an expert review, given the importance of access price estimates to stakeholders.

Both models provide cost estimates for ULLS and WLR. Cost estimates for ULLS Band 2 developed under each model and with inputs considered appropriate by Telstra and the ACCC are readily available as the ACCC has recently released its Final Decision on Telstra's 2008 ULLS Undertaking. The various cost estimates are summarised in the table below.

Table 4.2: ULLS Band 2 monthly access price estimates

	Telstra Simulations	ACCC Simulations
TEA Model	***$46.54***	$18-$21
AFNC Model	$37.46**	***$17-$18****

Source: ACCC and Telstra

Note: *AFNC model estimate was run using default Analysys inputs. The ACCC have yet to finalise their preferred inputs into the AFNC model.
**Indicative estimate. Telstra have used its preferred inputs for certain variables and corrected some of the errors they believe are contained in the AFNC model. It has left default inputs for those variables which it believes are applied incorrectly as a result of the model's structure.

The table above also shows how both Telstra and the ACCC have endeavoured to explain the differences between the two models. Telstra's indicative estimate of prices are an attempt to fix the errors it believes are contained in the AFNC model, as well as changing some inputs to values it believes are more appropriate. The table below outlines how Telstra has come to its indicative price estimate using the AFNC model.

Table 4.3: Telstra changes to AFNC model

Model Change	Price Estimate ($)	Price Change for Each Element ($)
Model as filed	14.67	
Engineering Changes*	17.98	3.31
Change SIO count	19.74	1.76
Remove sharing phantom core duct	20.61	0.87
Base Sharing on Distribution Duct Cost	20.88	0.27
Take Sharing to 50%	21.04	0.16
Include Road Crossings	22.91	1.87
Correct Tilt to 3% Commission	24.62	1.71
Commission Return	26.27	1.65
Change O&M factors	28.52	2.25
Change OH amounts	31.06	2.54
Eliminate Tilt	37.46	6.40

Source: Telstra
Note: *Engineering changes incorporated include: crossover to 13km, only 2400 pair cables in a main conduit and copper building terminal size raised from 49 to 100.

Similarly, the ACCC's set of input assumptions into the TEA model have been an attempt to "overcome the inherent inconsistency in Telstra's application of the hypothetical operator.[37]" and includes the following changes in inputs and assumptions:

- trenching of only turf;
- WACC of 9.64 and post-tax vanilla WACC of 8.83;
- tilt to the ducts and pipes of 3 per cent;
- $0 for lead ins; and
- taking account of the fall in Operations and Maintenance (O&M) costs by $2.51[38].

The ACCC also notes that Telstra have not addressed the ACCC's concerns surrounding O&M and indirect costs outlined in the Draft Decision on Telstra's March 2008 Undertaking. According to the ACCC, had these concerns been addressed, a further decrease in the estimated access price could be expected. The estimated access price from the ACCC's simulation using the TEA model ($18 - $21) is very similar to the estimated access price developed using the AFNC model ($17-$18). The inputs and assumptions in the TEA model altered by the ACCC under this simulation goes someway in explaining why there is such a large disparity in the estimated access prices produced by both models.

Depending on the underlying assumptions and inputs, the TEA model and AFNC model produce vastly different estimates for ULLS Band 2 prices. For example, using Telstra's

[37] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009, p62

[38] Ibid.

preferred set of inputs in the TEA model gives an access price estimate of $46.54. The AFNC model model gives a price estimate of between $17-$18. The differences in the price estimates are driven by both differences in the model's underlying assumptions and the inputs introduced into the models.

4.3 Identification of Customers

A key component of each model is the underlying data source used to develop the model. Inaccurate or incomplete data would mean that, regardless of whether or not the underlying principles of the model are sound, the output from the model would not be robust. An important dataset needed for providing access price estimates under both the TEA model and the AFNC model is the location and demand of customers.

For the location of customers, the AFNC uses the Geocoded National Address File (G-NAF) which is a listing of all physical addresses in Australia along with the geographic location (latitude and longitude) of each address, as a starting point[39]. The location database is a particularly important component of the AFNC as it is used to create the first building block of the network, the Distribution Point clusters[40]. The TEA model uses Telstra's database of actual end-user locations derived from Telstra's engineering records.

The G-NAF database does not have a demand associated with each location. For example, the G-NAF database does not distinguish between business and residential customers. Hence, the AFNC uses a proxy of customer demand that has been developed using data from the Australian Bureau of Statistics, ExchangeInfo, and the Record Keeping Rule accounts. In contrast, the TEA model uses Telstra's database of customer demand by address. The level of customer demand is a key piece of information needed by both models to determine the capacity of the network. Also, the AFNC model uses customer demand as a basis for deciding the location of pillars which is a key network structure[41].

The location and demand of customers data underlying the AFNC model is less accurate than the dataset used in the TEA model as it is only an approximation of customer location and demand, as opposed to actual customer location and demand. For example, the AFNC model has difficulty identifying multi-building locations such as residential communities and commercial complexes[42].

The AFNC model uses a top-down approach, deriving inputs into the model based on a sample of Exchange Service Areas[43] (ESAs) in order to reduce computation time. However, there are

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[39] PSMA Australia Limited, http://www.psma.com.au/products/gnaf.cfm

[40] ACCC, "Analysys cost model for Australian fixed network services", December 2008

[41] Analysys, "Fixed LRIC cost model documentation", December 2008

[42] Telstra, "Initial Response to the ACCC's cost model", April 2009

[43] Refers to an area serviced by a particular local exchange.

doubts over the accuracy of the sampling process. The TEA model on the other hand, models demand within each Band 2 ESA individually and hence has no associated sampling issues.

4.4 Flexibility in Optimisation

The optimisation framework that both the TEA model and the AFNC model attempt to implement, is how to design a telecommunications network which serves all customers to a sufficient standard of quality whilst minimising cost. The resulting network design depends upon the flexibility allowed in the optimisation process. One important aspect, particularly when designing a telecommunications network is technological flexibility. The TSLRIC framework requires 'best-in-use' technology to be deployed as this is consistent with a forward looking costing framework. As discussed previously, adhering to such a framework is likely to result in access prices which replicates the prices which would be achieved in a competitive market. Another important aspect when designing the optimised network is the degree of scorching assumed in the model. The degree of scorching limits the ability to efficiently align network structures with the locations of demand.

In terms of technology, both the TEA model and the AFNC model allow deployment of various technology options when designing the network. The Declared Service definition for ULLS means that the service can only be provided over a copper cable. Hence, when pricing ULLS, the TEA model deploys only copper cables in the network[44]. However, in general, when the model is not used to price ULLS[45], the model allows other technology (fibre cables) to be deployed along with copper[46]. The AFNC model on the other hand allows for fibre, copper and wireless technology when pricing ULLS. The technology deployed in the network depends on the geographical area (Bands) and cost[47].

In terms of scorching, the AFNC model keeps only the current location of the local exchange constant, all other network structures are re-designed. In addition to the location of the local exchange, the TEA model keeps the location of other network structures constant, including DA boundaries, pillar locations and distribution and main cable routes. For example, in the hypothetical network designed by the TEA model, pillars are located in the same place as they are in Telstra's current network and Telstra's existing cable routes forms the base set from which the optimisation process can begin.

The lack of choice in technology and the extent of scorching in the TEA model limit the degree of flexibility available in the optimisation process compared to the AFNC model. The ACCC

[44] Telstra, "Telstra Efficient Access (TEA) Model Overview", December 2007

[45] Fibre is used in the basic access version of the model.

[46] Telstra, "Telstra Efficient Access Model Documentation", August 2008

[47] Wireless is only used in rural areas in the AFNC model. The TEA model does not allow for wireless technology.

have criticised the TEA model's implementation of TSLRIC+ in pricing ULLS[48]. By not allowing for other technology options or a different network design, the ACCC found that the cost estimates developed using the TEA model are neither efficient nor forward-looking.

KPMG Econtech considers that the ACCC's conclusion is fair in the theoretical context of TSLRIC. Deploying technology other than copper could be cost minimising in certain circumstances and by not allowing the deployment of other technology, the TEA model would fall short of designing an efficient network.

However, the service description contained in the ULLS declaration defines ULLS by reference to use of a 'copper based wire forming part of a public switched telephone network[49]'. As such, the telecommunications access regime obliges Telstra, as an access provider, to supply ULLS (as described in the service declaration) upon request by a service provider. Allowing other technology options in the pricing of ULLS would push down the price of the service. The price developed by such an approach is likely to mean that Telstra would receive less compensation for providing the service, since Telstra must supply ULLS as per the declaration service description, that is, via a copper based wire.

Promoting competition in the telecommunications market means not only supporting competition amongst Telstra's competitors but also between Telstra and its competitors. For this to occur, compensation must be given to Telstra through some channel for the obligations it has.

4.5 Allowance for Constraints

Careful consideration of the constraints inherent in developing a network is as important as having flexibility in the optimisation process. In its Final Decision on Telstra's March 2008 Undertaking, the ACCC notes that although the TSLRIC+ framework uses the concept of a hypothetical efficient operator, it is also important to take into account the practical realities. Hence, in the context of constructing a telecommunications network, there is a need to consider both geographical constraints and engineering constraints.

The network designed using the TEA model would inherently adhere to geographic constraints, as its starting point for optimisation is Telstra's existing network, compiled from Telstra's actual engineering records[50]. In contrast, the AFNC model places network structures without regard to legal rights of way or the practicalities of operations and maintenance. As discussed previously, the starting point for optimisation in the ANFC model is the location of the existing local exchanges and the location of customers. The layout of the trench and cabling in the network is then determined using mathematical algorithms. Without further adjustments, the model

[48] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

[49] ACCC, "Declaration inquiry for the ULLS, PSTN OTA and CLLS – Final Determination" July 2006

[50] Telstra, "Telstra Efficient Access (TEA) Model Overview", December 2007

designed by such algorithms would not have regard to legal rights of way or practicalities of operations and maintenance. For example, there are instances where the network designed by the AFNC model cuts through physical constraints such as houses, creeks and railway lines. The AFNC model attempts to adjust the straight-line distances into 'street aware' distances (which would be longer than the straight-line distances) using a p-function. The adjustment made is also based on the particular geographical classification (geotype) of the ESA. However, this adjustment is not applied to all the routes in the network and further analysis is required to determine how effective it is in accounting for geographic constraints.

Concerns have also been raised regarding the lack of engineering rules applied in the AFNC model[51,52]. In contrast, Ovum, a consultant engaged by the ACCC to review the TEA model, found that "the engineering rules described in the documentation are extensive and detailed and, on the whole, represent good engineering practice.[53]" Ovum also notes that v1.2 of the TEA model consistently implements the model's documentation[54].

4.6 Network Scalability

The costs involved in providing telecommunications services are largely fixed as opposed to variable. In other words, the magnitude of most costs associated with providing the telecommunications service does not change with the volume of service produced. In this case, the volume of service produced is closely related to the number of customers serviced. The substantial fixed cost of building a telecommunications network acts as a barrier to entry. This barrier is one of the main reasons why, prior to the declaration of services, Telstra held a monopoly over the telecommunications market. Associated with large fixed costs is the opportunity to reap the benefits of economies of scale. If fixed costs are a substantial component of total costs then cost per unit of service falls as the number of customers increase.

The AFNC model and the TEA model differ in their treatment of economies of scale. The network designed by the TEA model is developed so that cable routes efficiently meet current demand. Changes in demand are addressed using the model's engineering rules. For example, both the main and distribution networks are built with spare capacity to allow for changes in demand either as a result of movement in customer locations or migration of services[55]. The TEA model makes an allowance for the network to respond to increases in demand through spare capacity, but no allowance is made for reductions in demand. However, once the optimal network design has been finalised, and given the nature of network assets, the scope for cost

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[51] Harris, R.G., "An Expert Evaluation of the ACCC Cost Model and its Use in the Pricing of ULLS", March 2009

[52] Telstra, "Initial Response to the ACCC's Cost Model", April 2009

[53] Ovum Consulting, "Review of the network design and engineering rules of the Telstra Efficient Access cost model. A report to the ACCC", August 2008.

[54] Ovum Consulting, "Telstra Efficient Access cost model – engineering issues. An Advisory note to the ACCC", February 2009.

[55] Hatzenbuehler, F., "TEA Model – Route Optimisation Process", Confidential Statement to Telstra, November 2008

reduction as a result of a fall in demand is limited. For example, if demand in a particular street fell by half, there would still be a need to place a copper cable down that street to serve the remaining half and Telstra would continue to incur trenching costs. Thus, the TEA model treats most CAN costs, such as trenching, as fixed. Trenching costs do not change with increases in demand (since spare capacity is built into the network), nor do they change with a fall in demand.

Notably, if there was an opportunity to re-optimise following the fall in demand, it may be the case that there is a more cost-efficient network design[56]. Responding to substantial changes in demand is allowed for in the TEA model, but this involves re-running the model using updated information from Telstra's engineering and operations database. Since the TEA model's optimisation process is based on Telstra's actual network, a re-optimisation of the network would use Telstra's actual network and customer demand locations, at that particular point in time, as a base. This means that the extent to which the TEA model accounts for changes in demand, depends on how this change in demand is reflected in the updated network information.

The AFNC model scales the network dimension to ensure consistency with projections of demand[57]. Specifically, average values from sample ESAs of a particular geotype are used to extrapolate the total volume of assets required for that particular geotype, given demand in a particular year. A single AFNC model simulation re-optimises the network each year based on projected demand for that particular year. In this way, the AFNC model allows the designed network to respond to annual increases and decreases in demand.

Dimensioning network assets using extrapolation means that the AFNC model does not adequately distinguish between fixed and variable assets, and hence fixed and variable costs. This approach can understate costs when demand is falling. If demand is falling, it is not necessarily the case that cost falls in a proportional fashion as some costs are fixed. Conversely, if demand is increasing it is not necessarily the case that cost increase in a proportional fashion.

On this initial analysis it would appear that neither methodology used by the TEA model and the AFNC model adequately addresses the issue of network scalability in light of fixed and variable costs. We consider that a more in-depth analysis into the issue of network scalability in light of fixed and variable costs should be undertaken by the expert reviewer.

4.7 Conversion from Total Cost to Unit Price

As previously discussed, when used in a regulatory context, the total cost measure developed under the TSLRIC framework needs to be converted into an annual cost measure. To spread the cost of the asset over its economic lifetime, a measure of economic depreciation is required. However, economic depreciation is difficult to measure and most models use annuities as a

[56] This would depend mainly on the distribution of demand.

[57] Analysys, "Fixed LRIC cost model documentation", December 2008

proxy. The TEA model uses a method closely approximating a flat annuity[58] and the AFNC model uses a tilted annuity.

A flat annuity recovers the present value of an asset through a constant level of payments over the asset's life, whilst a tilted annuity does so using a stream of payments which increase or decrease at the same rate each year. Hence, a flat annuity is a special case of a tilted annuity where the tilt or rate of increase is zero. The conversion from a total cost to an annualised cost is a particularly important step in determining the access price, given the long lifetimes of network assets. As shown in Table 4.3, it is estimated that changing the assumption of a positive tilt in the AFNC model to a flat annuity increases the monthly access price estimate by $6.4 or over 40% of the initial model estimate of $14.67.

Telstra's concern with the use of a positively-tilted annuity is two-fold. First, because a tilted annuity pushes out or back-end loads the cost-recovery of an asset[59], Telstra considers that this increases the risk that it may not be able to pass on the increase in prices to access seekers. The risk increases as new technologies are introduced which would make the ULLS technology (copper cables) obsolete. Secondly, Telstra claims that the price of network assets are not increasing.

The ACCC however, considers that using a tilted annuity can account for those instances where the asset's value is expected to change and where the asset is re-valued regularly (as is the case with optimal assets under the regulatory framework)[60]. Where the value of an asset is expected to increase over time, a positive tilt should be applied. Conversely, where the price of an asset is expected to fall over time, a negative tilt should be applied. Given that the ACCC also considers that key network assets such as duct and pipes will be increasing at slightly above consumer price inflation; the Commission believes applying a positive tilt for these assets is appropriate[61].

Indeed, when considered from a pure cost perspective, it is appropriate to assume that network assets would increase in cost. This is particularly true for those elements that are highly labour intensive in their production with limited scope for productivity improvements. However, the overall aim of a TSLRIC framework is to develop access prices which would be the outcome of a competitive market. It is not clear that participants in a competitive market, facing the future threat of technological bypass, would push out cost recovery of the asset. The question of whether a tilted or flat annuity should be used deserves further analysis by an expert reviewer.

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[58] NERA Economic Consulting, "Does Telstra's TEA model Provide a Reasonable Estimate of the TSLRIC+ of Supplying ULLS?", January 2009

[59] This is because, under a positively tilted annuity, the payments under such an annuity are lower compare to the payments from a flat annuity in the early years of the asset's life. The situation is then reversed in the later years of the asset's life.

[60] ACCC, "Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking: Final Decision", April 2009

[61] Ibid.

5 Recommendations

In Section 4, we outlined three issues to be considered when determining whether to recommend an expert review of both the AFNC model and the TEA model. First, whether the application of the two models has led to significantly different results. Second, whether there are differences in how each model implements the economic modelling framework and finally, whether one model implements the framework more thoroughly than the other. From the discussion in Section 4, the following observations can be made.

- *The application of the models has led to significantly different results*. This is illustrated in Table 4.2.

- *There are differences in how the economic modelling framework is applied in both models*. This is part of the reason why the models produce different access price estimates. The other reason is the inputs used in the simulation

- *In some instances the TEA model and the AFNC model apply the framework more thoroughly than the other*.

Hence, KPMG Econtech recommends that an expert third party undertake a thorough review of both models. This is primarily because there is a difference in access prices estimated by the two models which is important to a wide range of stakeholders. A summary of our findings as to which model has addressed the economic modelling framework more thoroughly are shown in the table below.

Table 5.1: Summary of Analysis

	TEA	AFNC	Effect on Prices
Identification of Customers	✓		↑
Flexibility in Optimisation*		✓	↓
Allowance for Constraints	✓		↑
Network Scalability	-	-	-
Conversion of total cost to price	-	-	-

Source: KPMG Econtech
Note:*Although the AFNC model has greater flexibility in optimisation, as required in the TSLRIC framework, the definition of ULLS means that Telstra can only provide this service over copper. Deployment of technology other than copper could be cost minimising in certain circumstances.

Table 5.1 also shows the impact a more thorough implementation of the different components of the economic modelling framework would have on prices. Interestingly, the two components of the framework where the TEA model is relatively more thorough than the AFNC have a tendency to push up the access price. The issues surrounding the location and demand database used in the AFNC model means that a more accurate identification of customers is likely to lead to an increase in the access price. Furthermore, the TEA model takes better consideration of the geographic and engineering constraints that would be faced by an operator when designing the network. This would also have a tendency to push up access prices as it restricts the way in which the network is designed. For example, by adhering to geographical constraints, network

structures must work around physical barriers such as lakes or railway lines which has the potential to increase the length of the cable deployed and hence, increase cost.

Conversely, the component of the framework where the AFNC model is relatively more thorough than the TEA model have a tendency to push down the access price. The AFNC model is more flexible in its optimisation choice both in terms of technology and network structures. That is, a greater range of cost-saving technology and designs are allowed in the model, and this would tend to place downward pressure on prices.

By using a positively tilted annuity, the AFNC model pushes out the cost recovery of the asset and this lowers the access price over the early years of an asset's life compared to what would be the case with a flat annuity. In addition, dimensioning network assets using extrapolation means that the AFNC model has the potential to understate costs when demand is falling[62]. The opposite is true for the TEA model's approach to scaling the network; implicitly assuming most assets are fixed would tend to increase cost when demand is falling.

As discussed in Section 2 and Section 3, the cost models play an important role in access pricing. A model with strengths across all components listed in Table 5.1 above is more likely to produce an efficient access price estimate compared to a model which has strength in only two components. An expert review of both models may provide such an outcome. Indeed, given the countervailing impact the four components have on access prices, a model which has strengths across all components is likely to produce an access price estimate which is between the range given by the current versions of the ANFC model and the TEA model.

Further, we consider that engaging an expert reviewer is the most efficient means of resolving the debate over the most appropriate cost model to be used when valuing the telecommunications network. Historically, this debate has led to one party developing a cost model, to which the other party responds to by developing their own cost model. For example, as discussed in Section 3.3, the ACCC commissioned the development of the NERA model in 1999. Telstra then responded by developing the PIE model and the PIE 2 model. Ten years on, the debate continues with the development of the two models discussed in this report, the ACCC-commissioned AFNC model and Telstra's TEA model. Appointing an expert who is independent of the AFNC model and the TEA model to review both models lifts the likelihood of developing a cost model which could be accepted by Telstra and the ACCC.

It is important to note that if an expert review were to take place, then the reviewer would need full access to both models to conduct a thorough analysis.

The remainder of this section broadly outlines the proposed terms of reference of such as review.

[62] Telstra informs KPMG Econtech that within the AFNC model files there is an assumption that demand is falling.

5.1 Proposed Terms of Reference

KPMG Econtech considers that, at minimum, the following areas should be analysed as part of an expert review of the models.

- *Accuracy of data underlying the models.*
  The location and demand of customers' data underlying the AFNC model could be more accurate. The reviewer should focus on whether there are possible alternative data sources or additional information, which could be made available to Analysys to improve the accuracy of the AFNC model. There may also be other data manipulation techniques which could also improve the accuracy of the AFNC model's underlying location and demand databases. Following the implementation of either an improved data source or data manipulation methodology, a consistency check should be applied to test whether the database adequately represents actual consumer location and demand.

- *Flexibility in the optimisation process.*
  The AFNC model has greater flexibility in the optimisation process compared to the TEA model, both in terms of technology and network design. Although the TSLRIC framework calls for 'best in use' technology, consideration should be given to the additional obligations which are imposed on Telstra. Accordingly, the review process should address effective measures which make sure that the process is fair and reasonable for all stakeholders.

- *Adherence to practical constraints.*
  The AFNC model relies on mathematical algorithms to design the telecommunications network. It is important that this hypothetical network adheres to practical constraints such as geographic and engineering constraints. Although the AFNC model does make an adjustment to allow for 'street awareness' it is uncertain as to how successful this method is in practice. The reviewer should determine whether the adjustments made by the AFNC model are adequate at capturing geographical constraints, and if not, an alternative methodology should be proposed. In addition, a thorough analysis of the engineering rules underlying both models needs to be undertaken. The reviewer should form a view as to whether the engineering rules contained in both the TEA model and the AFNC model represents 'best practices'.

- *Converting total cost to unit cost.*
  The reviewer should determine whether it is appropriate to use a tilted annuity or a flat annuity to convert total cost to unit cost.

- *Network Scalability.*
  More in-depth analysis into the issue of network scalability to falling customer numbers in light of fixed and variable costs should be undertaken by the expert reviewer.

- *Model Implementation.*
  Importantly, the reviewer should test whether the models have been correctly implemented in practice. This would involve checking the underlying model files. The reviewer should also determine whether the models have been implemented efficiently, in a clear logical manner. Given that the models will be used by a number of parties, another important consideration is whether or not the model is easy to use.

- *Recommend input values.*
  Once the reviewer is satisfied that the models have addressed the issues of underlying data accuracy, flexibility in optimisation and adherence to real-world practicalities, the reviewer should also propose a set of recommended inputs.

KPMG Econtech has conducted a preliminary analysis of the two model's documented underlying principles. Hence, the above is not an exhaustive list of the areas which should be analysed. The review should also include other areas which the expert reviewer considers to be important.

Attachment A: ACCC Response to KPMG Econtech

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25 May 2009

Mr Chris Murphy
Principal
KPMG-Econtech Pty Ltd
20 Brindabella Circuit
Brindabella Business Park
CANBERRA AIRPORT ACT 2609

Dear Mr Murphy

Re: Telstra commissioned telecommunications model review

I refer to your email of 8 May 2009 to Mr Robert Wright requesting discussions with the Australian Competition and Consumer Commission (ACCC). I understand that you are a consultant commissioned by Telstra.

On 11 May 2009 you provided the ACCC with the Terms of Reference on which you were engaged by Telstra. These terms state, inter alia,:

> *Telstra is seeking a third party opinion on whether there is a requirement for an independent comparative review to be undertaken of Telstra's TEA model and the ACCC's access pricing model.*
>
> *The ACCC currently uses its own model in implementing government regulatory policy for telecommunications services. The ACCC's decisions affect Telstra, its competitors and users of telecommunications services.*
>
> *Telstra is of the opinion that its own TEA model is superior to the ACCC model in important ways.*
>
> *This study will assess whether a comparison of the two models raises sufficient doubts about whether it is reasonable to use the ACCC model in*

> *implementing government policy, for there to be a requirement for an independent comparative review of the two models.*
>
> *The study will not consider the merits of the government regulatory policy or of the TSLRIC (total service long-run incremental cost) principle underlying both models. Rather, it will focus on whether there is a requirement for an independent comparative review of the two models.*

Firstly, I am concerned that the Terms of Reference do not accurately reflect the ACCC's current regulatory practice. Secondly, there are a number of issues not addressed in your Terms of Reference in respect of the existing independent review processes available to parties subject to ACCC decisions.

The ACCC is an independent regulatory body with responsibilities under the *Trade Practices Act (1974)* and the *Telecommunications Act (1997)*. The Objects of these provisions is the long term interests of end-users of telecommunications services.

Carriers who are dissatisfied with ACCC decisions have various statutory rights to independent review of the ACCC's decision by either the Australian Competition Tribunal or the Federal Court.

The only statutory process to date in which the Analysys Cost Model has been considered is the assessment of the ULLS undertaking. That assessment used multiple sources of information, with the Primary source of information being Telstra's own TEA model.

On 22 April 2009 the ACCC made a decision to reject a ULLS undertaking lodged by Telstra. Telstra had lodged their TEA model in support of their undertaking price of $30 for the ULLS in metropolitan areas. In assessing the Undertaking the ACCC assessed the TEA model in a public consultation process in as open and transparent a manner as could be done given the confidentiality restrictions that Telstra placed on public access to the TEA model by parties other than the ACCC and its consultants.

In the course of that assessment process submissions were given to the ACCC indicating that regard should be had to the Analysys Cost Model in assessing the Telstra Undertaking. The ACCC concluded:

> *...whilst the Analysys model is a relevant source of information, less weight can be placed on estimates from the Analysys model until its finalisation, than on other sources of information for the purposes of assessing whether the price term in the 2008 Undertaking reflects the efficient cost of supplying the ULLS*[1].

On 13 May 2009 Telstra lodged an application with the Australian Competition Tribunal for an independent merits review of the decision by the ACCC to reject the ULLS undertaking. That Review is expected to commence shortly. The role of the ACCC in that Review is to provide assistance to the Tribunal should it be required.

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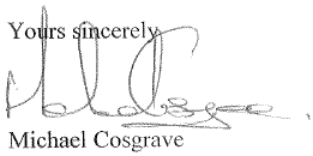
[1] ACCC (2009), *Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking - Final* , p83 – published 28 April 2009.

In conclusion, there are independent review processes underway before the Australian Competition Tribunal involving the TEA model, and the ACCC is currently finalising the Analysys Cost Model. Given both these factors, the Commission considers that it would not be appropriate to engage in the Telstra commissioned review that you are undertaking.

Yours sincerely



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