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# Economic Properties of the FANOC SAU

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## 1. Introduction

This paper provides a description of the rationale underlying the pricing model used in the Special Access Undertaking ('SAU') relating to the hybrid fibre twisted pair network ('HFTP') which the fibre access network operating company ('FANOC') is seeking to have financed and deployed ('HFTP assets').

This document contains information confidential to FANOC and is provided to the ACCC on the express condition that it may not be used for any purpose other than in relation to the FANOC broadband access service SAU without our prior approval.

In developing this paper recourse has been had to:

- § the overarching objective of Part XIC of the *Trade Practices Act 1974* ('TPA') which is to promote the long term interests of end-users; and
- § the assessment criteria specified within sections 152CBD and 152AH of the TPA, the latter of which requires regard to be had to the following matters when determining the reasonableness of particular terms and conditions:
  - (a) whether the terms and conditions promote the long-term interests of end-users of [carriage services](#) or of [services](#) supplied by means of [carriage services](#);
  - (b) the legitimate [business](#) interests of the [carrier](#) or [carriage service provider](#) concerned, and the [carrier's](#) or [provider's](#) investment in facilities used to [supply](#) the [declared service](#) concerned;
  - (c) the interests of [persons](#) who have rights to use the [declared service](#) concerned;
  - (d) the direct costs of providing [access](#) to the [declared service](#) concerned;
  - (e) the operational and technical [requirements](#) necessary for the safe and reliable operation of a [carriage service](#), a [telecommunications network](#) or a [facility](#);
  - (f) the economically efficient operation of a [carriage service](#), a [telecommunications network](#) or a [facility](#).

The remainder of this paper is structured as follows

- § Section 2 provides a description of the objectives/rationale for the pricing model used in the SAU;
- § Section 3 provides a non-technical description of the pricing model (to complement the technical description in the SAU);
- § Section 4 provides a discussion of how the SAU achieves the objectives outlined in Section 2; and
- § Section 5 provides a summary of the perceived advantages of the SAU pricing model (which is applied to a stand alone HFTP owner) compared to an SAU that might be applied to a vertically integrated HFTP owner.

## 2. Objectives of the SAU Pricing Model

The objectives of the SAU pricing model are, consistent with the overarching objective of Part XIC of the TPA, to promote the long term interests of end-users. Specifically, providing incentives for the efficient construction and operation of the HFTP such that:

1. Expenditures incurred in constructing and operating the service are minimised subject to providing appropriate quality of service;
2. Quality of service is maintained at the level that reflects an appropriate balance between the value placed on service enhancements and the costs of providing those enhancements;
3. The cost of financing capital expenditure from the (capital) market is minimised;
4. Pricing of services is efficient, i.e., maximises the usage of the HFTP subject to cost recovery constraints; and
5. Pricing and operational decisions do not discriminate on the basis of which Access Seeker is using the service.

### 2.1. Minimising costs subject to appropriate quality levels being met

Combining the first three objectives results in a single objective, namely, that costs, including finance costs, are minimised without degradation of the quality of the service desired by Access Seekers. Ultimately, this objective is about ensuring that end users receive the level of service that they desire at the minimum achievable cost. The benefits to end users of achieving such an objective are self evident. Least cost delivers the lowest average price to Access Seekers and ultimately to end users - provided competition between Access Seekers is not inhibited by other elements of the access regime and/or ownership structure.

### 2.2. Efficient pricing of the network

The fourth objective recognises that, even if average prices are minimised, the structure of prices will still be important to encouraging the efficient use of the HFTP. The benefits to end users of efficient pricing are often neglected in telecommunications access pricing determinations and we take some time below to describe them.

Once built, the HFTP will have low marginal costs of providing service to new end users connected to any particular node or new services to existing users connected to the node. However, the HFTP owner will still have to recover substantial sunk costs associated with the initial construction of the asset.

The low level of marginal cost, relative to average total cost, of providing access to the HFTP creates a tension between cost recovery and promoting efficient use of the HFTP. Prices above marginal cost will tend to inefficiently deter some potential consumers from using the HFTP (even though they value the service at more than the cost of providing it), however, pricing at marginal cost for all users will not recover fixed costs.

This is a well understood problem in public economics with the optimal solution (the solution that maximises the total value of services provided over the HFTP subject to a total cost recovery constraint) known as ‘Ramsey Pricing’.<sup>1</sup> In technical terms, this pricing rule requires that the mark up above marginal cost for each service be inversely related to the market price elasticity of demand for that service.<sup>2</sup> In general terms, this means that services where customers are willing to pay a higher price should be charged at a higher price – even if the marginal cost of providing each service is the same. In this context, efficient pricing can not be determined by reference solely to costs but must also have regard to customers’ demand for (or valuation of) the service.

This is not achieved purely by regard to cost modelling with constant mark-ups over marginal cost (such as may be associated with standard application of TSLRIC). As noted by Tirole at a recent ACCC conference<sup>3</sup>, TSLRIC is problematic because:

- § It is complex with cost forecasts depending on demographics, offerings,...., forecast of usage; economic depreciation,....;
- § It is not in phase with theoretical benchmark;
- § (Related) marginal cost pricing creates incentive for non-price exclusion by a vertically integrated monopolist and therefore requires heavy-handed regulation.

A simplistic example, can illustrate why, in this context, constant mark ups on marginal cost are inefficient. Imagine that the HFTP owner could only provide one or two services:

- § Service A: a point to point high speed transmission service capable of greater than 12 Mbps (for Access Seekers servicing high demand residential broadband users); and
- § Service B: a point to point high speed transmission service capable of up to 6 Mbps (for Access Seekers servicing moderate demand residential broadband users).

Imagine for simplicity that service A and service B have zero marginal costs of provision with the only difference between the services being that service B has a ‘throttle’ on download speeds imposed by the HFTP owner. That is, in order to provide service B, the HFTP owner must deliberately downgrade the quality from that associated with service A, but this reduction in quality does not reduce costs.

It is tempting to assume that the HFTP owner should not offer service B as it could, at no extra cost, provide the superior service A to all customers. However, this is not in general true for low marginal cost infrastructure providers. Too see why, imagine that total costs were \$100 per year and that the minimum price that could be charged for service A, while still recovering \$100, was \$20 (implying sales of 5 units). However, imagine that there are a further 5 customers unwilling to pay \$20 for service A but willing to pay \$5 for service B. If service B is introduced at \$5 an extra \$25 of revenue will be generated. This would take total revenue to \$125 which is above its total costs.

<sup>1</sup> In other words, where it is necessary to price above marginal cost in order to recover fixed costs, the Ramsey solution minimises the welfare cost of doing so.

<sup>2</sup> Fully specified, Ramsey pricing also takes into account cross price elasticities of demand.

<sup>3</sup> Slide 18, *One-way and two-way access pricing principles in telecommunications*, Jean Tirole, ACCC Melbourne, March 13, 2007.

This would enable prices to all customers to be reduced in order to return total revenue to \$100 - which might involve a \$2.50 reduction in prices. Relative to a scenario where only service A is provided, the introduction of service B improves the welfare of all customers. Customers who purchase service B are better off because they now are able to consume a service that would otherwise be priced out of their reach. Customers who purchase service A are better off because customers buying service B now make a contribution to FANOC's fixed cost (whereas customers buying service A previously financed 100% of this).

This example is summarised in the below table.

**Table 2.1**  
**Summary of Simple Example**

	Price (=margin above marginal cost)	Quantity	Revenue
<b>Service A only</b>	\$20	5	\$100
<b>Service A and B</b>			
Service A	\$17.50	5	\$87.50
Service B	\$2.50	5	\$12.50
Total			\$100.00

This example illustrates in a simple manner why end customers as a group can benefit from more efficient pricing structures - even if the level of revenue recovery is unchanged.

### 2.3. Non discrimination between Access Seekers

The final objective of the SAU is to ensure that the HFTP owner does not favour one Access Seeker over others in relation to:

- § Pricing of services;
- § Quality of services provided;
- § Design of the network, including the technological specification of upgrades to the network; and
- § The timely provision of information that is important to Access Seekers - such as in relation to the network design.

#### 2.3.1. The same prices faced by all Access Seekers

An important objective is to ensure that services available to one Access Seeker are made available to all Access Seekers at the same price. In this regard, ownership structure of the HFTP is important. When determining its downstream competitive strategy, a vertically



integrated firm will rationally ignore published access prices and focus solely on the economic cost of providing access. That is, the published access price becomes merely a transfer payment within the vertically integrated entity - representing an accounting cost to its downstream business (eg, its affiliated ISP business) and an accounting revenue to its upstream (network) business.

Where the economic cost of providing access is less than the published price this will give the vertically integrated firm an advantage in downstream markets. For example, consider a scenario where the HFTP owner only sells high speed access at \$50 per month. Assuming the Access Seekers' ISP costs are \$10 per month, the competitive price for providing high speed products to end users will be \$60 per month.

Non affiliated Access Seekers could, in theory, offer low speed products to end users by purchasing high speed access from the HFTP owner and then throttling the speed at the ISP. However, because doing so would not save them any costs they would be unable to offer the product at a lower price than \$60 - at any lower price the Access Seeker would not cover its costs. Of course, at a price of \$60 there would be zero demand for low speed internet services from end users because they could procure high speed services for the same price.

By contrast, the vertically integrated access provider can profitably offer a low speed service to end users for less than \$60. For it, the \$50 published access price is just an internal (accounting) transfer price. The true cost of it using the HFTP to provide low speed internet access is just \$10 plus the marginal cost of providing access - which is likely to be close to zero.<sup>4</sup> In this case, the vertically integrated monopolist could charge end users \$30 per month for a low speed product and make a profit of \$20 per month on that customer (\$30-\$10-\$0).

This scenario has recent relevant precedent in Telstra's pricing of wholesale ADSL access. In 2004/05, Telstra sold wholesale ADSL access at a single price and a single download speed. However, in its retail offering Telstra sold both fast and slow speed products - with the retail price of the slow speed product below the price it charged its competitors for wholesale ADSL access. This pricing strategy was defended on the basis that Telstra was 'loss leading' in the provision of slow speed retail ADSL and that its competitors could do likewise. In reality, Telstra was not loss leading (because its economic cost of providing access to itself was significantly lower than the published wholesale price) but Access Seekers would have clearly been loss leading had they attempted to match Telstra.

This is an example of a vertically integrated Telstra preferring to price discriminate at the retail level rather than the wholesale level and, in so doing, distorting the downstream competitive playing field in its favour. While the ACCC attempted to deal with this conduct under competition law (Part XIB), the ACCC was hampered by the complexity and ambiguity of bringing a case under those provisions. The end result was that Telstra continued the conduct unimpeded for around 12 months and brokered a nominal settlement.

An important objective of the FANOC proposal is to prevent this type of conduct from occurring again.

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<sup>4</sup> Ignoring any cannibalisation of high speed sales.

### 2.3.2. The same quality of service and information provided to all Access Seekers

Another important objective of the FANOC proposal is that all Access Seekers have access to the same quality of service and information from the access provider. If some Access Seekers are provided with better quality of service then this can distort downstream retail competition in the same way as preferential pricing of access discussed above. It is also important that all Access Seekers are provided with the same information regarding the operational, expansion and technological upgrading plans of the HFTP owner. This information is required so that Access Seekers can efficiently plan their own investments. Preferential access to this information can have a powerful distorting effect on downstream competition.

Strategies involving a failure to provide equal access to quality and information are described in the economic literature as ‘sabotage’. As noted by Mandy and Sappington<sup>5</sup>:

*“In many important industries, regulated suppliers of essential upstream products are capable of operating in unregulated downstream markets. For example, in the telecommunications industry, the Regional Bell Operating Companies (RBOCs) supply access to the local telecommunications network, and they could deliver long distance telephone service if they were permitted to do so. Until recently, though, regulators have forbidden the RBOCs from providing long distance telephone service. A primary rationale for this prohibition is that it prevents the RBOCs from engaging in activities that unduly favor their long distance affiliates at the expense of their downstream rivals. Such activities include: (1) providing inferior service to competitors, perhaps in part by increasing the relative frequency with which their calls are blocked (Bernheim and Willig, 1996, p. 4.10); (2) delaying competitors’ attempts to implement new and improved services (Economides, 1998; Kang and Weisman, 2001); (3) withholding crucial information from competitors about how they might best utilize the network to provide valued services to their customers (Bernheim and Willig, 1996, p. 4.10; Economides, 1998); and (4) structuring services and standards to favor the operations of their downstream affiliates at the expense of rivals (Bernheim and Willig, 1996, p. 4.6; Beard et al., 2001).”*

*“The economic literature refers to activities of this sort that disadvantage downstream rivals as sabotage, and typically assumes that sabotage serves to raise the operating costs of downstream rivals. The literature concludes that by raising the costs of downstream rivals, sabotage generally increases the profit of the downstream affiliate of the vertically integrated producer. This is the case whether downstream suppliers engage in Cournot (quantity-setting) competition (e.g., Economides, 1998; Sibley and Weisman, 1998b; Bustos and Galetovic, 2003) or Bertrand (price-setting) competition (e.g., Weisman, 1995; Beard et al., 2001; Kondaurava and Weisman, 2003)”*

FANOC has no incentive to engage in sabotage, since it is not a vertically integrated entity and so it does not compete with its customers.

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<sup>5</sup> *Incentives for Sabotage in Vertically Related Industries* available at: [bear.cba.ufl.edu/sappington/PDF/Sabotage%202-5-06.pdf](http://bear.cba.ufl.edu/sappington/PDF/Sabotage%202-5-06.pdf)

### 3. Description of pricing model

#### 3.1. Services to be sold

FANOC will sell two high level services:

- § A 'point to point' service from the end customer to the Access Seeker's point of interconnection. This service would allow voice and data specific to an end user to be transmitted to/from the end user's premises to the Access Seeker's network;
- § A 'multipoint' service allowing for the distribution of the same data simultaneously to multiple end users. This service would be used to facilitate the provision of services such as IPTV by Access Seekers.

It is envisaged that Access Seekers will be able to choose from multiple quality grades for the point to point service. These quality grades will be determined by:

- § The type of DSL card being used by the end user and the throttling of the bandwidth within the capability of that card;
- § The level of uncongested capacity made available to the end user;

This might lead to the following standard services being supplied:

- § a point to point high speed transmission service capable of greater than 12 Mbps up to 24/50 Mbps (for Access Seekers servicing high demand residential broadband users);
- § a point to point high speed transmission service capable of up to 12 Mbps (for Access Seekers servicing moderate demand residential broadband users);
- § a point to point high speed transmission service capable of up to 6 Mbps (for Access Seekers servicing low demand residential broadband users);
- § a point to multipoint high speed dedicated transmission service (for Access Seekers delivering IPTV);
- § a point to point low speed expedited transmission service (for Access Seekers delivering voice).

#### 3.2. How prices are set

The pricing model is based on an initial three year Period, with subsequent Periods of four years each. At the beginning of each Period (after the first Period), a forecast will be made of costs which will determine 'Target Revenue'. Costs include a return on prior un-recovered expenditure which is kept track of in the form of a Capital Asset Value which is reset at the end of each 4 year Period. Within each Period prices will be set so that, provided sales are as forecast, FANOC will fully recover (but not over-recover) its Target Revenue (including capital financing costs). The model allows some flexibility in pricing, in that individual prices may vary, provided the weighted average of the prices reduces by (or does not rise by more than) a specified percentage, so that FANOC earns its Target Revenue.

The costs of network construction will be recovered over the long run. The pricing model ensures this occurs by keeping track of the value of unrecovered expenditure, adjusted for the time value of money, during each Period. This gives rise to the concept of the Capital Asset Value (CAV) which is calculated at the beginning of each Period and is equal to the value of past expenditure less past revenue. At the end of the first Period the CAV is calculated as the difference between the present value of actual expenditure up to that point less the present value of actual revenues. At the end of the second Period the CAV is set equal to:

- § The CAV at the end of the first Period carried forward for the time value of money to the end of the second Period (i.e., starting CAV plus the cost of financing this throughout the Period); plus
- § The present value of expenditure during the second Period; less
- § The present value of Target Revenue during the second Period - where Target Revenue is the revenue that FANOC will earn if it achieves sales that are equal to those forecast at the beginning of the Period.

The Capital Asset Value at the end of the third and subsequent Periods is calculated in a similar fashion. To the extent that Target Revenue exceeds expenditure and financing costs then FANOC will, in effect, receive a return of previously invested capital (and the CAV will fall by a corresponding amount). This mechanism ensures that FANOC does not recover the same costs twice.

The model allows FANOC the discretion to determine the schedule for the return of invested capital within a number of constraints. The first constraint is that the more capital is returned, the lower will be the CAV and, therefore, the lower will be future Target Revenue. The second constraint is that the CAV can not become negative. The third constraint is that Target Return of Capital can not, without the prior approval of the Commission, be expected to push the CAV below the level associated with straight line depreciation of the CAV over the last 12 years of the SAU.

If network costs differ from forecast in a given Period then the model adjusts automatically to prevent any over- or under-recovery. For example, if expenditures are lower than forecast then the model reduces prices in future Periods (or vice versa if expenditures are higher than forecast).

After the end of the first Period the CAV is calculated by deducting Target Revenue rather than actual revenue. This means that FANOC's actual revenue may diverge from target revenue without affecting the CAV. If sales are lower than forecast, FANOC will earn revenue that is less than Target Revenue but this loss will not be reflected in a higher CAV - meaning FANOC will absorb the loss. If sales are higher than forecast FANOC will earn revenue greater than its Target Revenue but this additional amount will not be deducted from the CAV - meaning FANOC will receive a financial gain from higher than expected sales. This provides FANOC with the incentive to set prices to maximise usage of the network (and boost sales).

There is one exception to this rule, however: in the first Period there are no forecasts of sales set and, consequently, there is no penalty/reward for deviations in sales from forecast. Different rules apply in the first Period because sales will be relatively more uncertain

compared to subsequent Periods - both because penetration rates will be unknown and because the exact speed of the rollout of HFTP coverage is also uncertain. The information available to FANOC will be insufficient to set reliable forecasts of sales in this initial Period.

In the first Period the determination of pricing is based on long term forecasts of expenditures and service demand on the HFTP, including long term forecasts of broadband penetration on various network platforms.

A bottom up costing of the network has been undertaken by FANOC that we understand is largely consistent with the HFTP proposed by Telstra. FANOC's HFTP network will initially reach 4 million homes in five capital cities using ADSL2+ technology on fibre to the node architecture via 20,000 nodes. We understand capital expenditure is based on vendor pricing for each modelled network element within categories: Nodes (DSLAM, Street cabinets and power systems); Installation; and Fibre Installation (ducts and trenching). Capital asset lives were provided for each category.

We understand operating expenditures are based on a network build program that involves a 3 year build. Operating expenditures allow for maintenance, growth in network to new estates and network management overhead. Cash tax expenditures have also been modelled.

The cost of the ULLS sub loop is based on industry cost modelling and previous regulatory decision making (this was provided by Optus Regulatory). NERA has provided to FANOC an estimate of the cost of capital (on a nominal post tax weighted average basis) based on regulatory precedent for similar risk assets. As discussed below, it is proposed that a competitive process will be used to 'discover' the true cost of capital for the investment.

The pricing for the initial Period is based on forecast demand for the basic access services and standard broadband services ranging in speed from 1.5Mbps to 24Mbps. Total demand for broadband services is expected to grow significantly, and demand for high speed services is expected to displace demand for lower speed services over time. FANOC is assumed to price discriminate on the basis of broadband speed for the standard service. The model targets a non-zero CAV at the end of the undertaking period (15 years). This is consistent with a view that the HFTP will continue to be a regulated network.

An important check on the level and objectives of expenditure is also provided by the requirement that the budget be agreed annually with Speedreach (acting on behalf of Access Seekers). Each year, FANOC's budgeted expenditure for that year will be agreed with Speedreach (acting on behalf of Access Seekers). FANOC can not, without the prior consent of Speedreach, incur expenditures more than a predetermined amount above budget. If a dispute arises between Speedreach and FANOC in relation to the budget, then an independent expert may be engaged to estimate the total capital and operating expenses reasonably required to operate and manage the networks in accordance with legal and prudential standards.

Key elements of the pricing model are summarised below as an adjunct to the technical description of the pricing rules in the draft SAU.

1. The 15 year SAU is divided into four distinct Periods. The first Period will be 3 years in length and subsequent Periods will each be 4 years in length. Within each Period prices

will be set so that, given forecast sales, FANOC will recover its expected costs (including capital financing costs).

2. In the first three year Period the HFTP will be under construction and forecasts of sales will be relatively more uncertain than in later Periods. For this reason, the draft SAU *does* include a correction for any over/under recovery as a result of actual sales deviating from forecast sales in the first Period.
3. With the exception of the first three year Period, there will be no correction if actual sales within a Period differ from forecast sales - leaving FANOC to manage sales risk. New forecasts of sales are agreed between FANOC and Speedreach at the beginning of each Period.
4. In any Period it is likely that FANOC's costs will differ from those forecast at the beginning of the Period. If FANOC's costs are lower than forecast, then any resulting over-recovery will be recorded and will be used to reduce prices in future Periods (or *vice versa* if costs are higher than forecast). Such corrections will include adjustments for the time value of money.
5. Period FANOC will be free to adjust individual prices in order to maximise sales on the HFTP provided that prices, on average, do not exceed a predetermined cap, where that cap is set to equate forecast revenues and Target Revenues at the beginning of each Period (after the first).
6. Each year, FANOC's budgeted expenditure for that year will be agreed with Speedreach (acting on behalf of Access Seekers).

The technical mechanisms by which the above are achieved are described in Schedule 3 of the draft SAU. However, it is useful to describe, in a stylized example, how this would work.

### **3.3. A stylised example**

Imagine in the first Period that, broadly consistent with the FANOC Model, \$4bn was spent in building and operating the HFTP but revenues of only \$1bn were received. If the time value of money were zero then FANOC would need to recover the \$3bn shortfall in future Periods. However, due to a positive time value of money, FANOC will need to recover more than this. The Capital Asset Value (CAV) defined in the SAU takes account of the time value of money and, in effect, calculates the value of FANOC's un-recovered expenditure in previous Periods.

In our example, depending on the WACC and the exact timing of expenditures and revenues, the CAV at the end of the first Period might be \$3.3bn.

#### **3.3.1. Setting average prices in the second Period**

The CAV at the end of the first Period would then be used as an input into setting average prices in the second Period. According to the below formula

$$(\text{Target Revenue Requirement})_t = (\text{end CAV}) * \text{WACC}^6 + (\text{Target Expenditure}) + (\text{Target Return of Capital})$$

A path for average prices in the second Period would then be set to ensure that, based on forecasts sales, revenues will be equal to Target Revenues in present value terms. Average prices may have to fall (increase) by X% from the first to the second Period. If, at pre-existing prices, revenues would exceed Target Revenues then the SAU will require average prices to fall over the Period (and *vice versa*).

Imagine that average prices had to fall by 3% over the Period. However, FANOC will still be able to lower some prices by less than 3% provided that some other prices fall by more than 3% - such that the average fall is 3%. FANOC will have an incentive to introduce differential price movements if it learns that demand for some services are more price responsive than others. If FANOC reduces prices fastest on the services that are most price responsive then it stands to benefit by increasing sales above the forecast levels. As described above, this leads to it earning revenues in excess of Target Revenues - revenues that it is able to 'keep' rather than having them deducted from its CAV.

This gives FANOC a strong incentive to pursue Ramsey efficient pricing (i.e., lowest prices for products that are most price sensitive).

### 3.3.2. Setting the CAV at the beginning of the third Period and beyond

Imagine that, due to efficient pricing, FANOC managed to earn \$2.6bn in revenue in the second Period but Target Revenues were only \$2.5bn (in present value terms at the end of the Period). Also imagine that expenditure in the second Period was \$1.0bn. At the beginning of the third Period the CAV in our example will be set equal to:

- § The \$3.3bn opening value multiplied by  $(1 + \text{nominal WACC})^4$ . This multiplication is required to bring the value to the end of the Period while accounting for the time value of money. If nominal WACC is 8% then this is \$4.5bn; plus
- § \$1.0bn in additional expenditure; less
- § 2.5bn in Target Revenue.

Thus, the new CAV would be \$3.0bn - slightly lower in nominal terms than at the beginning of the second Period. Note this ignores the \$0.1bn in additional revenue gained by FANOC, which it gets to 'keep' as a reward for growing utilisation faster than forecast.

### 3.3.3. Setting average prices in the third Period and beyond

Average prices are set in the third and subsequent Periods in the same way as in the second Period.

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<sup>6</sup> Note that this formulation does not attempt to set return on capital relative to an 'average' CAV within the period. To the extent that the (implicit) CAV is growing/falling within the period it may be thought that this will under/overestimate the true required return on capital. However, this *does not* lead to under/over compensation of FANOC. This is because this formula is only used to set Target Revenue. The CAV at the beginning of the next Period is set by reference to Target Revenue. In other words, a lower Target Revenue (for whatever reason) will result in a higher CAV at the end of the period and *vice versa*.

### **3.3.4. Negotiating a budget with Speedreach**

The SAU Management Principles defines a budget process which requires Speedreach to assist in the development of budgets and Speedreach and FANOC to agree the objectives of the expenditure (including in terms of the coverage of the network). Speedreach can dispute the reasonableness of the level of expenditure FANOC proposes to incur in pursuit of these objectives. If, after good faith negotiations, Speedreach and FANOC do not agree then the relevant component of expenditure (Reviewable Component) will be assessed by either the Commission or an Independent Reviewer and may be disallowed (not recoverable by FANOC).

FANOC must also notify Speedreach if expenditure is to exceed budgeted expenditure by a pre-specified amount. Speedreach has the right to require a Draft Variation to the budget and has recourse to an independent review of the reasonableness of any such Draft Variation.



## 4. How the SAU Achieves its Objectives

The five objectives of the pricing model, explained above, are restated below before we move on to explain how the pricing model achieves these objectives.

1. Expenditures incurred in constructing and operating the service are minimised subject to providing appropriate quality of service;
2. Quality of service is maintained at the level that reflects an appropriate balance between the value placed on service enhancements and the costs of providing those enhancements;
3. The cost of financing capital expenditure from the (capital) market is minimised;
4. Pricing of services is efficient, i.e., maximises the usage of the HFTP subject to cost recovery constraints; and
5. Pricing and operational decisions do not discriminate on the basis of which Access Seeker is using the service.

### 4.1. Expenditure minimisation subject to quality control

The economic effect of the SAU is that Speedreach effectively outsources the provision of network services to the FANOC. The SAU creates a similar relationship between the parties as do other long term outsourcing contracts - such as those that are common in the electricity and gas industries.

Speedreach's function in formulating and agreeing to FANOC's budget helps ensure that FANOC will spend money on providing the services, and service levels, desired by Access Seekers while minimising the expenditures required to achieve those service levels. Under the proposed model, Speedreach will, through the budget process specified in the SAU Management Principles, be able to direct FANOC to:

- § Incur expenditure associated with improving the quality of services offered and/or developing new services that Access Seekers regard as desirable; and
- § Not incur expenditure on activities that, in the view of Access Seekers, do not provide improvements in service levels that would warrant the costs incurred.

By ensuring that Access Seekers can determine FANOC's expenditure profiles, and ensuring that FANOC can recover only those expenditures that are prudently incurred, the SAU provides the appropriate alignment of incentives between the HFTP owner and its users.

We note that such arrangements are commonplace in negotiated commercial arrangements. For example, Envestra, a gas distribution company, outsources most of its operating and capital expenditure under a contract to OEAM, a division of Origin Energy. Envestra discloses aspects of that contract on its website including that Envestra must approve the appointment of OEAM's General Manager, and each year, Envestra must approve OEAM's

Budget as well as its proposed operating activities and key performance indicators. Envestra notes that this gives it the means to “ensure that OEAM performs to acceptable standards”.<sup>7</sup>

It should also be noted that, FANOC’s return on investment under the SAU will closely approximate its actual cost of capital. This means that, unlike scenarios where the regulatory cost of capital is inflated above its true value, FANOC will not have a strong incentive to over-invest in provision of services.

More importantly, FANOC will also have an independent incentive to ensure that Access Seekers are well served through the price cap mechanism. Specifically, FANOC will have an incentive to improve the quality of existing services and introduce new services to the extent that this will increase penetration of the HFTP. This is because higher penetration growth delivers FANOC financial rewards (as explained above and discussed below).

This exposure to demand risk also encourages FANOC to avoid incurring wasteful expenditures. This is because the more efficient is FANOC’s expenditure the lower will be its prices. To the extent that lower prices help to achieve higher penetration FANOC will directly benefit from more efficient expenditure. It is also true that FANOC will wish to invest efficiently because the higher the costs it incurs, the greater the risk that its assets will be stranded by future technology or a simple unwillingness of customers to pay the required amount for broadband services.

#### **4.1.1. Summary**

In summary, the SAU and the pricing model will deliver efficient expenditure for the following reasons:

1. FANOC must agree budget objectives and its budget with Speedreach with disputes settled by an independent reviewer. In these negotiations Speedreach has a clear incentive to ensure:
  - § the objectives reflect what Access Seekers perceive end customers want;
  - § expenditure is at the minimum possible level to deliver services that end users want (and not be incurred in delivering services that end customers value at less than the cost of provision);
2. FANOC’s cost of capital will reflect its true cost of capital giving it no incentive to ‘gold plate’;
3. FANOC has a direct incentive to improve quality of service and innovation in service delivery because this will promote HFTP usage which will provide direct financial benefits to FANOC;
4. FANOC has a direct incentive to lower expenditures (while maintaining quality) because this leads to lower prices which promotes HFTP usage which delivers direct financial benefits to FANOC;

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<sup>7</sup> <http://www.envestra.com.au> 16<sup>th</sup> May 2007

5. FANOC has no incentive to degrade quality in order to lower its expenditures because the SAU allows it to recover actual expenditure. Moreover, quality degradation will penalise FANOC to the extent that it reduces sales;
6. If FANOC perceives a risk of technological bypass, it has an incentive to avoid unnecessary expenditure that will promote this bypass.

## **4.2. Minimising financing costs**

The regulated return on monopoly investments is normally set after the assets have been constructed and the required capital has been raised from finance markets. In the current scenario, the HFTP has not yet been built and the capital has not yet been raised. This provides a rare possibility for the regulator to observe rather than estimate the risk adjusted cost of capital.

In the proposed SAU the weighted average cost of capital (WACC) is not pre-determined but rather it is set as the lesser of:

- a) the maximum WACC that arises from a predetermined formula; and
- b) the actual WACC as determined in a transparent capital raising auction.

### **4.2.1. The Maximum WACC**

The maximum return on investment that FANOC will earn is that consistent with the standard assumptions used by Australian economic regulators for similar natural monopoly assets in the energy sector (specifically, an equity beta of 1.0 and a debt margin of around 120 basis points). At current market interest rates this methodology will result in a post tax nominal WACC of around 9.0%. We understand that Investec has advised the G9 that FANOC will be able to finance the HFTP offering a return on capital that is set using this standard methodology.

In a presentation to analysts in August 2006, Telstra stated that it had negotiated a return on investment with the ACCC of 10.34% (down from 11.02%). This (10.34%) is materially above the maximum return on investment under the SAU.

### **4.2.2. The Actual WACC**

FANOC proposes that the Actual WACC be revealed by investors through a transparent competitive process. One such process is a competitive book build equity raising process. It is anticipated that this will involve an auction process whereby equity in FANOC is initially offered to the capital market, including large superannuation funds and the like, at a particular SAU WACC or, more specifically, at a particular SAU equity premium in excess of the prevailing government bond rate. In the SAU the size of this premium is determined by the SAU equity beta (Actual Equity Beta). In an equity auction the Actual Equity Beta will initially be set low (say 0.3) and then will be gradually raised until the market is prepared to meet FANOC's required level of equity funding.

Put simply, investors are offered the ability to invest equity in the HFTP vehicle at an initially low SAU WACC - where the expectation is that the equity will be undersubscribed at that cost of capital. The SAU WACC is then raised until the required equity is fully subscribed. This mechanism ensures that the SAU cost of capital is the absolute minimum, market

determined, cost of capital required to finance the HFTP. It is, by definition, the efficient cost of capital.

This process will be similar to a standard “book build” process used to raise equity capital in initial public offerings. In this process, equity is initially offered to the market at a high price and gradually lowered until all the shares on offer are sold. The difference in the case of the HFTP equity auction will be that the amount of equity required will be predetermined and the SAU WACC will be increased until that equity is raised. A hypothetical example of how such an auction would work is described in the table below.

### Equity Auction Example

Round of book build	Actual Equity Beta ( $\beta_e$ ) offered in book build	Subscribed equity	Is subscribed equity greater than target equity of, say, \$1bn	Action
1	0.30	Super funds and other investors subscribe for 100m	No	Raise $\beta_e$
2	0.50	Subscriptions rise to \$200m	No	Raise $\beta_e$
3	0.60	Subscriptions rise to \$600m	No	Raise $\beta_e$
4	0.65	Subscriptions rise to \$750m	No	Raise $\beta_e$
5	0.7	Subscriptions rise to \$900m	No	Raise $\beta_e$
6	0.72	Subscriptions rise to \$950m	No	Raise $\beta_e$
7	0.73	Subscriptions rise to \$980m	No	Raise $\beta_e$
8	0.74	Subscriptions rise to \$1.2bn	Yes	Set equity beta in SAU equal to 0.74

All investors receive a SAU WACC based on the revealed Actual Equity Beta of 0.74. All investors who committed funds at an equity beta of less than 0.74 receive their desired subscription of equity in FANOC. The investors who subscribed for the \$40m of equity in the final round have their subscriptions scaled back by 50% (being the proportion of oversubscription in the final round).

In the above example, the Actual Equity Beta in the SAU is set equal to 0.74. The implication of this is that, for the period of the SAU, the return on equity will be set by reference a 0.74 equity beta.<sup>8</sup> The cost of debt will continue to be updated based on market evidence throughout the SAU.

It is also worth noting that the transparency as to the regulatory regime, which is detailed in the SAU, means that investors participating in a book build of this kind will ‘price in’ to the required cost of capital any looseness in the control of prices, gaming opportunities and ability to make unintended returns within the regime. As a result, the competitive auction process will eliminate any expectations of potential for monopoly returns resulting from such

<sup>8</sup> That is, the return on equity is set equal to the prevailing government bond rate plus 0.74 multiplied by 6% (where 6% is the predetermined ‘market risk premium’).

factors. It is also true that, because FANOC can establish the rules of the SAU it can limit the potential for risk from regulatory intervention and, hence, avoid the need for compensation for this risk in the SAU WACC. In undertaking this process, the SAU WACC will be set at the minimum required to raise the necessary capital.

### 4.3. Promoting efficient pricing

Under the pricing model, and as explained above, FANOC will derive a financial benefit if it can increase the growth in utilisation of the HFTP (and will suffer a financial detriment if the opposite occurs). This gives FANOC a strong incentive to price in a manner that ensures the HFTP is efficiently used - subject to the overriding cost recovery constraint.

We note that Laffont and Tirole<sup>9</sup> recognized the need for such incentives and that standard regulatory regimes for vertically integrated monopolies, such as TSLRIC pricing, **do not** encourage efficient pricing. In fact, such regulatory regimes often encourage inefficient pricing and sabotage of downstream competitors.

To solve this problem Laffont and Tirole proposed implementation of a “global price cap” to vertically integrated monopolies. Under a global price cap plan, the regulator includes wholesale access services in the retail price cap plan, and treats them as any other final good in implementing a price cap. According to Laffont and Tirole, a global price cap plan will promote a Ramsey pricing structure

We are unaware of any jurisdictions that have actually implemented a global price cap. It is generally agreed that a properly designed global price cap solves the problems associated with incentives for efficient pricing and sabotage. However, in order to be properly designed a global price cap needs to cover all relevant retail services. This requires the regulator to have an understanding of retail costs and, where there are complementarities between retail services (including through bundling), this becomes especially difficult. It also extends the scope of regulation to retail products when an objective is to remove regulation from the competitive retail level.

However, because FANOC is not vertically integrated,<sup>10</sup> a *wholesale* price cap applied to FANOC would have the desirable theoretical properties of a Laffont and Tirole style *global* price cap without the undesirable administrative aspects. Taking the example in table 2.1 above, FANOC would have the incentive to introduce the more efficient price structure (pricing service B at less than service A) because this promotes higher utilisation of network which, if it exceeds forecast utilization, provides FANOC with a financial benefit.

This is a major potential advantage of the SAU in terms of its ability to promote the objectives of Part XIC of the *Trade Practices Act 1974* (‘TPA’) especially by promoting:

- § competition in telecommunications markets;
- § the economically efficient use of and investment in new and existing infrastructure by which carriage services are provided.

<sup>9</sup> Jean-Jacques Laffont and Jean Tirole, *Competition in Telecommunications*, MIT Press 2000.

<sup>10</sup> The Management Principles in the SAU proposed by FANOC ensure that there is no vertically integrated incumbent.

#### **4.4. Ensuring non-discrimination on the basis of infrastructure ownership**

Under the SAU no single Access Seeker will control FANOC. The SAU requires equal treatment of Access Seekers and there is no incentive for FANOC to behave otherwise. This means that all Access Seekers will have equal access to:

- § Services at the same prices;
- § The same quality of services provided; and
- § The timely provision of information that is important to Access Seekers - such as in relation to the network design.

It also means that the design of the network, including the technological specification of upgrades to the network, will be decided in manner that takes into account all assets currently deployed - by both Telstra and other telecommunication providers. This will help ensure that total industry costs are minimised - rather than, say, total Telstra costs.

## 5. The Importance Of Structural Separation

For the reasons described above, FANOC's SAU has the following advantages relative to any SAU delivered by a vertically integrated infrastructure owner.

1. FANOC will have no incentive to engage in price or non-price sabotage against particular Access Seekers (as no single Access Seeker, or group of Access Seekers, will control FANOC);
2. FANOC will have to engage in efficient pricing at the wholesale level rather than at the retail level (as FANOC will not have any retail operations). This ensures that all Access Seekers face the same true economic wholesale prices;
3. FANOC will be required to provide all Access Seekers with equal access to information important to their planning processes;
4. FANOC will be able to engage in a HFTP specific capital raising - allowing the true cost of capital for the HFTP to be transparently revealed in financial markets;
5. All Access Seekers' are able to have input into FANOC's budget priorities through the Speedreach vehicle - rather than those priorities being determined primarily to suit the vertically integrated arm of the infrastructure owner. This includes ensuring that the build of the HFTP makes the maximum use of existing infrastructure owned by all Access Seekers.

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