Cost allocation for fixed line services

Gilbert+Tobin

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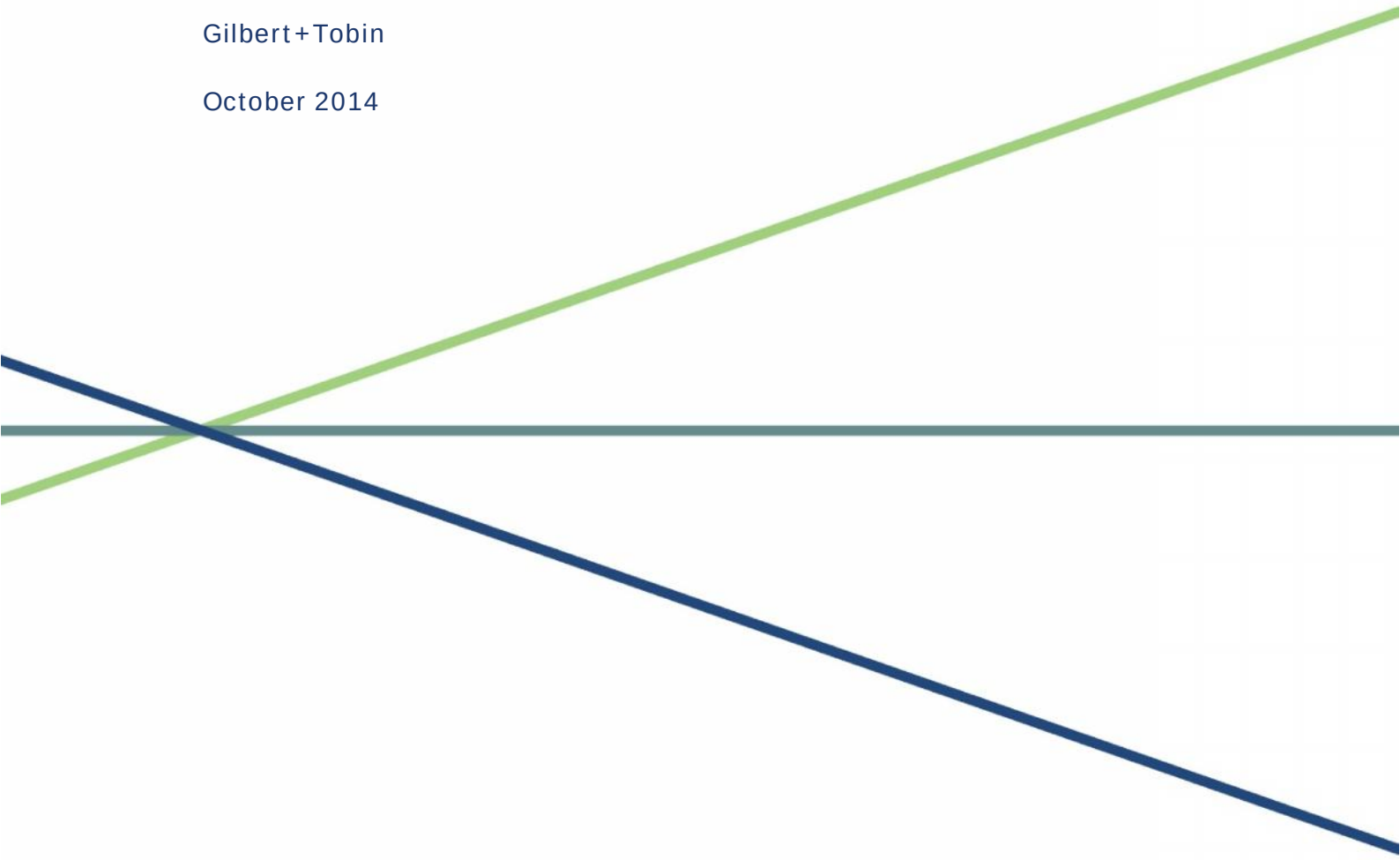

INCENTA
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1. Introduction and overview

1.1 Preliminary matters

1.1.1 Our scope

Incenta Economic Consulting ("Incenta" or "we") has been engaged by Gilbert+Tobin on behalf of Telstra to review whether the "partially allocated cost" approach the Australian Competition and Consumer Commission has described in its recent consultation paper is consistent with the fixed principles applying to the current review and the objects clause to Part XIC of the Competition and Consumer Act 2010 (Cth) and otherwise is appropriate.[1] Telstra has proposed an alternative approach to cost allocation, which the ACCC has referred to as the "fully allocated cost" approach. Our letter of instruction is attached to this report at Appendix B.

1.1.2 Authorship

This report has been prepared by Jeffrey John Balchin, Managing Director of Incenta Economic Consulting. I have 20 years experience in relation to economic regulation across a range of infrastructure sectors, which has included advising regulators, governments, asset owners and major customers. This has included many years of experience with the design and implementation of the "building block" model of regulation in Australia and New Zealand. My curriculum vitae is attached to this report at Appendix C.

I have been assisted in preparing this report by Scott Stacey; however, I take responsibility for all of the report's contents.

I have read, understood and have complied with the Federal Court's guidelines for expert witnesses.

1.2 Context for the advice – a move to the "building block" model

As part of the 2011 final access determinations, the method of setting prices for Telstra's regulated fixed line services changed from one where prices were set in line with the hypothetical current replacement cost of the network (referred to as a TSLRIC+ method), to the method of setting prices employed in other utility industries that is known as the "building block" model (or method or approach or analysis). The "building block" model has a number of standard features, some of the most important of which are as follows:[2]

- The cost of providing the regulated services over the new regulatory period is first forecast, which is referred to (amongst other labels) as the "annual revenue requirement". This cost is calculated by summing a number of components, which are a "return on and return of" the regulatory asset base (RAB), an allowance for operating expenditure and taxation. While the cost forecasts (including capital expenditure, which feeds into the forecast of the RAB) are normally subject to

[1] ACCC (2014), Public Inquiry into final access determinations for fixed line services – primary price terms, Discussion Paper, July, Chapter 3. The "partially allocated cost" method was applied to set prices in the 2011 final access determinations and is described more fully in the 2011 papers.

[2] The nature of each of these steps is consistent with how the ACCC described its intention when implementing the building block model for fixed line services – see ACCC (2011), Public inquiry to make final access determinations for the declared fixed line services: Discussion Paper, April, p.2.

tests of prudence/efficiency, these forecasts are calibrated to be consistent with the actual situation of the regulated business.

- The value for the regulated assets (the regulatory asset base, or RAB) is an important component of this calculation, and the normal application of the building block model involves "locking in" a RAB at the commencement of the regime, and carrying this value forward in a reasonably mechanistic manner, being increased for new capital expenditure and reduced for the capital that has been returned to the investor through regulated charges (i.e., regulatory depreciation).

- Regulated prices are then calculated by dividing the annual revenue requirement by the forecast of usage over the period ahead so that the forecast of revenue equates to the forecast of cost.

- However, prior to that final step, an inquiry is made into whether items included in the calculation of regulated costs – either capital assets or fixed components of operating expenditure – are also used to provide unregulated services or services that are not sold under the principal regulated prices. If so, the portion of the annual revenue requirement is reduce to account for the share of the costs that it is appropriate to assume can be recovered from those other activities. This has the effect of embedding in the regulated prices part or all of the benefit from the economies of scope that are able to be achieved by those other sales including unregulated sales. This penultimate step is referred to as the "cost allocation" step.[3]

This standard application of the building block method as described above has been set out in clause 6 of the fixed principles. The focus of this report is on the appropriate method of cost allocation as described in the last of the points above.

1.3 Summary of conclusions

Implications of the "partially allocated cost" approach

The main outcome of the "partially allocated cost" approach is that Telstra will not have the opportunity to recover its costs (as calculated using the building block model in accordance with the fixed principles) if the use of its fixed line assets is forecast to be lower in the next regulatory period than what the ACCC deems to be the "optimal" use of those assets.[4]

Under the (in my view, plausible) assumption that the yield (in terms of net revenue) from the use of the asset for unregulated and regulated services is similar, then Telstra would only expect to recover the proportion of its costs that is equal to the ratio of the forecast use of the fixed line assets to the ACCC's deemed optimal use of those assets.

This writing down of Telstra's recoverable cost occurs both in relation to the cost associated with Telstra's past investments, and any new capital expenditure, thus creating a strong disincentive against future investment (discussed further below). This loss to Telstra will also apply irrespective of

[3] In practice, the cost allocation step may occur at an earlier time. For example, it is common to apportion operating expenditure between regulated and unregulated activities prior to calculating the annual revenue requirement. However, nothing turns on the sequence with which the steps are performed.

[4] I do not see this outcome as contested – the ACCC makes a number of statements in the discussion paper that make it clear that its intention is that Telstra should not have a reasonable opportunity to recover its costs.

whether the reduction in use of Telstra's assets occurs because other fixed line carriers are bypassing assets that Telstra is required to provide on a regulated basis, or whether it is a consequence of an overall fall in the use of fixed line services.

The ACCC's main reason for dispensing with the "TSLRIC+" approach to setting regulated fixed line prices in favour of the "building block model" was to remove the subjectivity and uncertainty associated by setting prices on the basis of hypothetical circumstances (i.e., the optimal network for today's use). The "partially allocated cost" approach is inconsistent with this objective. A key driver of regulated prices under this approach is the "optimal" use of the network that is in place, so that a decision is again required about a hypothetical circumstance and hence much of the subjectivity and uncertainty that the ACCC said it intended to remove will remain.

Assessment of the cost allocation approaches against the direction from the regulatory regime

The "partially allocated cost" approach is plainly inconsistent with the "fixed principles" that are set out in clause 6 of the 2011 Final Access Determination and also inconsistent with the objectives of the objects clause for the Part XIC regime.

Fixed principles

The fixed principles require the application of what is known as the "building block" model to set the regulated fixed line prices, and provide clear guidance as to how some of the key inputs to that calculation should be derived. The most material areas of inconsistency between the outcomes implied by the "partially allocated cost" approach and the requirements of the fixed principles are as follows:

- *Cost allocation (clause 6.14)* – the fixed principles require costs to be allocated between regulated and unregulated services on the basis of relative use. In contrast, the partially allocated cost approach – when expressed in terms of a standard building block model calculation – results in a much lower proportion of cost being allocated to regulated use and so factored into regulated prices.

- *Demand forecasts (clause 6.11)* – the fixed principles require the demand forecasts used to set regulated prices to reflect the best forecast of the sales of the fixed line services over the regulatory period ahead. However, the partially allocated cost approach – when expressed in terms of a standard building block model calculation – uses the ACCC's deemed "optimal" use of the relevant assets as the denominator when setting prices (which is a forecast that none would expect ever to be achieved).

- *Regulatory asset base* (clauses 6.5 and 6.7) – a "regulatory asset base" means the value of the stock of investments that regulated prices are to be designed to deliver over time. A starting value for the RAB and a formula for updating it over time is prescribed in the fixed principles. However, it is clear that the partial allocation approach will not deliver a stream of cash flows over time with a present value equal to the RAB (this is because the regulated prices will not be consistent with Telstra recovering its building block costs). Accordingly, the "partially allocated cost" approach cannot be said to use the prescribed RAB.

- *"Building block" model (clauses 6.9 and 6.10)* – the term "building block" model (or approach or method or analysis) is used to refer to a method of setting regulated prices such that the regulated business has a reasonable opportunity to recover cost. However, the "partially allocated cost" approach quite clearly does not provide an opportunity for Telstra to recover cost.

In contrast, subject to an assessment of the reasonableness of the selected allocators (which is beyond the scope of this report), the "full allocation" approach reflects a conventional application of the cost allocation step whereby allocators are chosen and applied such that the asset owner expects to recover the shared costs. This is consistent with the application of the "building block" model of regulation and with the use of the RAB that is calculated in the manner that is prescribed in the fixed principles.

Part XIC Objects clause

The relevant aspects of the Part XIC objects clause for this matter are the objectives of:

- Efficient use of and efficient investment in infrastructure that provides the relevant services, with further direction to consider whether incentives for investment exist, and

- The promotion of competition in relevant markets.

It was concluded that the "partial cost allocation" approach would mean that Telstra is unable to earn a commercial return on any new investment in fixed line assets, and that a strong disincentive against such investment would be created. This would appear to be an outcome that is in clear conflict with the objects clause.

It is observed that if prices are kept artificially low for the regulated fixed services then the incentive for investment may increase in some areas, but may decrease in other areas. However, the net effect of these wider factors – and the more relevant question of whether the changes in investment are efficient or inefficient changes – is difficult to determine.

In addition, if Telstra sought to pass through some or all of its unrecovered costs into its price offerings in other markets (rather than being forced just to bear the loss as assumed above), then the rivalry provided by Telstra in those other markets would decline, which in turn could be interpreted as a decline in the level of competition in those other markets. These outcomes, should they occur as an alternative, would also appear to be counter to the clear direction of the objects clause for competition to be promoted.

Consideration of the ACCC's arguments for the "partially allocated cost" approach

The ACCC has presented a number of qualitative arguments in support of the "partially allocated cost" approach, which for the most part are observations about the desirability (in its view) of the outcomes of that approach.

It is noted that the outset that the prescriptive nature and clarity of the fixed principles do not provide an avenue for the consideration of the matters the ACCC has raised. Notwithstanding, I disagree with a number of the qualitative arguments the ACCC raises, a summary of which is as follows.

Regulatory issues from the decline in demand in the presence of cost-based prices

Regulated cost based prices where demand has declined

The ACCC appears to believe that the outcomes for regulated prices under cost based pricing when demand declines is perverse or unintended. I disagree.

Under cost based regulation, the decline in use of Telstra's fixed line assets will translate into higher regulated fixed line prices, which in turn will provide Telstra with the ability to raise its equivalent retail prices by a commensurate amount (subject to competition, discussed below). This outcome – whereby a decline in the demand for a service translates into a higher regulated price – is both a standard and intended outcome of cost based regulation:

- Provided Telstra is able to charge the higher prices, the outcome will be that it is able to recover the cost of historically incurred costs that have not as yet been recovered (and cannot now be reversed). This is intended because providers of regulated services make large investments that are typically recovered over extended timeframes. The *quid pro quo* is that every opportunity is provided by the regulatory regime to recover the costs incurred on this basis.

- However, there is no guarantee that Telstra will be able to charge the higher regulated (and retail) prices. If competition from mobile networks places a limit on fixed line prices then Telstra may not be able to recover its costs regardless of the regulatory regime. This outcome would not imply that cost based regulation is "not working", but rather should lead to a questioning of whether there is a need for regulation.

The ACCC also seems to believe that a fully distributed cost allocation would permit Telstra to charge access prices to its fixed line service competitors that recover costs associated with assets that those competitors are bypassing and providing for themselves, and thus dampening asset-based competition. However, this belief would be incorrect:

- If a fully distributed cost allocation was applied strictly when determining regulated fixed line prices, then only the cost associated with assets that are used for a service would be recoverable through the price for that service. That is, for example, the ULLS price would not seek to recover a share of Telstra's switching or ADSL assets, these costs would be recoverable only from services that use those assets.

- However, Telstra is proposing to continue the current relativity between the lower level access prices (ULLS and LSS) and the wholesale services (LCS, WLR, PSTN OA and TA), under which the access prices for the lower level access services are artificially low compared to wholesale services. Thus, rather than dampening asset-based competition, the previous distortion in favour of asset-based competition will continue (albeit with the materiality of this distortion now obviously affected by the rollout of the NBN).

Who bears the consequence of the decline in demand?

I disagree with the ACCC's view that a fully distributed cost allocation (i.e., cost based pricing) will lead to all of the consequences of the decline in demand for fixed line services being passed onto access seekers. Rather:

- the consequences of the higher unit costs would be expected initially to be shared by all users of Telstra's fixed line network (of which Telstra is the largest party) but, in the absence of competition from other technologies, this increase in unit costs would be expected to be passed on to final customers of fixed line services over time, and

- to the extent that competition from mobile networks places a binding constraint on the ability for retail prices for fixed line products to increase, Telstra would be expected to reduce both its retail and wholesale prices (reducing the latter below the regulated prices) in order to encourage the use of its fixed line networks to be maintained, the effect of which is that Telstra would bear much of the consequences of the decline in demand.

Telstra's assets were historically overbuilt, that was the result of a commercial decision, and such costs could not be recovered in a competitive market

The ACCC has also expressed its view that Telstra's assets were overbuilt in the past, that this was the result of a commercial decision, and that such costs cannot be recovered in a competitive market.

Each of these propositions is either flawed or not made out.

First, the ACCC's analysis of competitive markets is simplistic. Where irreversible investments are made and the costs recovered over a long time frame, it is common for the purchaser to enter into fixed commitments. Under such an arrangement, if demand turns out to be different to what was expected, then the purchaser may well pay for capacity that – as things turned out – was not needed.

Secondly, given that Telstra has been the USO provider where it was under a regulatory obligation to meet all requests for service, it is difficult to maintain that its past investment decisions were a purely commercial decision.

Thirdly, under the previous regulatory regime, Telstra's regulated prices were independent of its actual cost, meaning that it had a very strong incentive to minimise cost where possible. Such a regime would normally give rise to a strong presumption that past expenditure was minimised (and more likely to create concerns that corners were cut).

Fourthly, the ACCC has only established that there is surplus capacity in the network at the present time, it has not shown that this is being recovered now through regulated prices. The RAB values for Telstra's assets are only a fraction of their original cost (as a consequence of applying straight line historical cost depreciation). This would is consistent with much of the cost having been recovered in the past from the beneficiaries of that additional capacity.

Fourthly, even if there was an issue with the extent of past investment that is now being recovered, the "partially allocated cost" approach is a very poor tool for addressing such a concern because it writes down the value of all new investment as well as past investment. There is no justification for this, and the outcome is a strong disincentive towards new fixed line investment.

The regulatory WACC compensated for a decline in demand

A regulatory WACC that is derived in a conventional manner represents the expected return that investors require in order to invest in a particular asset.[5] If a regulated business is to be exposed to a one-sided event, like the consequence of a natural disaster, then additional compensation (in the form of an actuarially fair self-insurance premium) is required to preserve the investment's expected return.

Telstra's the loss of market share over the last regulatory period was a one-sided event (there was no prospect of it even meeting the deemed "optimal" use of the network that was used to set the 2011 prices, let alone outperform this) so that for Telstra to have been exposed to this "risk" and be said to have been kept whole, then an additional compensation beyond a WACC-based return on investment would have been required. It is understood that such an additional allowance was not provided, which means that it cannot be asserted that the loss of market share is the outcome of a risk for which Telstra was compensated in the past.

A fully distributed cost allocation creates regulatory concerns

The ACCC noted that using a fully distributed cost allocation created the possibility that Telstra will not have a strong incentive to minimise cost, and that it would also have an incentive to overstate its costs (which in reality means overstating its expenditure).

Both of these matters are issues with cost-based regulation and not matters that go to the choice of cost allocation methods. In addition, both of these problems are well known to practitioners of cost based regulation and both have well known solutions, such as:

- Incentive schemes to address shortcomings in incentives, and
- Regulatory accounting requirements to ensure that information on actual expenditure is reliable.

1.4 Structure of the remainder of the report

The remainder of the report is structured as follows:

- Chapter 2 describes the "partially allocated cost" approach and its implications and contrasts this with the "fully distributed cost" approach.
- Chapter 3 describes the meaning to a regulatory economist of the fixed principles set out in Principle 6 of the Final Access Determinations. It then assesses whether the "partially allocated cost" approach meets the requirements of the fixed principles
- Chapter 4 addresses the other key arguments the ACCC raises in support of the "partially allocated cost" approach for completeness.

[5] The term "expected" is used to refer to a mathematical expectation, so that the expected return is the average return that an investor would receive across all possible future events, weighted by their probability of occurrence.

2. Meaning and implications of the "partially allocated cost" approach and the "fully allocated cost" approach

2.1 "Partially allocated cost" approach compared with the "fully allocated approach"

The "partially allocated cost" approach is not expressed in the standard form of a cost allocation, under which a total cost is first derived and then it is allocated across services or customers. Rather, the process of applying the "partially allocated cost" approach involves:

- First turning the aggregate cost into a total per unit cost, with the aggregate use used for this step reflecting an assumption that the assets are fully used, and
- Secondly, then deriving the cost to be allocated to each service as the product of the forecast usage of that service and the total per unit cost.

However, it is reasonably straightforward to express the "partially allocated cost" approach in terms that are comparable to a standard process of cost allocation, which is illustrated in the following simple example. It is assumed in this simple example that:

- the total cost associated with the assets and expenses that jointly serve the regulated and unregulated use as derived from the application of the building block approach is 250
- the use of the asset would be 100 if it was optimally used, however
- use is forecast to be 80, of which 60 is from the use of the regulated service and 20 from unregulated use.

Figure 1 – Cost allocation approaches for a simple example

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
	Optimal use	Total cost	Average cost (price) - optimal use	Forecast actual use	Share of use	Allocated cost	Share allocated to each service	Price required to recover cost	Share recoverable from each service	Share recoverable from each service (%)
1. "Partially allocated" cost allocation										
Regulated service	100	250	2.50	60	75%	150	60%	2.50	150	60%
Unregulated use				20	25%	100	40%	5.00	50	20%
Total	**100**	**250**		**80**	**100%**	**250**	**100%**		**200**	**80%**
2. Cost allocation based on relative use										
Regulated service	na	250	na	60	75%	187.5	75%	3.13	187.5	75%
Unregulated use				20	25%	62.5	25%	3.13	62.5	25%
Total		**250**		**80**	**100%**	**250**	**100%**		**250**	**100%**

The top half of Figure 1 shows the application of the "partially allocated cost" approach. As discussed above, this approach involves allocating an amount of cost to the regulated service such that the price for the regulated service will be the same as if the asset was optimally used. That is:

- if the asset were optimally used (i.e., 100, column 1), an average cost / price of 2.5 would result [column 3], given a total cost of 250 [column 2], and

- given that the actual use is lower at 80 [column 4], the desired price of 2.5 will only permit 150 to be allocated to (and therefore recoverable from) the regulated service, with the implication that 100 is assumed to be either recoverable from unregulated use or (more plausibly) not recoverable at all [column 6].

The implications of this are that:

- 60 per cent of the total cost would be allocated to the regulated service, whereas it accounts for 75 per cent of the use [column 7 compared with column 5]

- a price of 5 would be required to be obtainable from the unregulated use, which is twice the price of the regulated service [column 8], and

- under the more plausible assumption that unregulated use generates a commensurate revenue to the regulated service,[6] in which case only 80 per cent of cost would be able to be recovered [column 10].

The lower half of Figure 1 shows how a conventional cost allocation that is based upon relative use of the relative assets – referred to by the ACCC as the "fully distributed cost approach" – would apply to the same set of facts. The commensurate calculation is more straightforward as the optimal use (and the price that would be calculated if there was an optimal use) is no longer relevant. Rather:

- the allocation of costs between regulated and unregulated use reflects the relative use of each [column 7]

- the allocation of costs assumes that the same price is obtainable between regulated and unregulated use, in this case 3.13 [column 8], and

- provided this assumption holds, the allocation of costs is consistent with a full recovery of costs [column 10].

Figure 2 shows how the allocations would change if unregulated use declined without there being any change in the use of regulated services (in the example, it is assumed that unregulated use halves from 20 to 10). This corresponds to one of the trends the ACCC has identified, namely where Telstra retail loses customers to access seekers who bypass parts of Telstra's infrastructure (this is discussed in more detail in section 4.2.2).

[6] The reason this is a plausible assumption is because the unregulated service and the retail equivalent of regulated services are competing services, so that Telstra's retail prices would be expected to be constrained by its regulated access prices.

Figure 2 – Cost allocation approaches for a simple example, lower unregulated use

	[1] Optimal use	[2] Total cost	[3] Average cost (price) - optimal use	[4] Forecast actual use	[5] Share of use	[6] Allocated cost	[7] Share allocated to each service	[8] Price required to recover cost	[9] Share recoverable from each service	[10] Share recoverable from each service (%)
1. "Partially allocated" cost allocation										
Regulated service	100	250	2.50	60	86%	150	60%	2.50	150	60%
Unregulated use				10	14%	100	40%	10.00	25	10%
Total	**100**	**250**		**70**	**100%**	**250**	**100%**		**175**	**70%**
2. Cost allocation based on relative use										
Regulated service	na	250	na	60	86%	214	86%	3.57	214	86%
Unregulated use				10	14%	36	14%	3.57	36	14%
Total		**250**		**70**	**100%**	**250**	**100%**		**250**	**100%**

Under the "partial cost allocation" approach, the reduction in unregulated use would leave the absolute dollar allocations of cost between the regulated and unregulated services unchanged, notwithstanding the change in unregulated use. The consequences of this are that:

- the regulated price would be unchanged, whereas
- for all costs to be recovered, a price that is 4-fold the equivalent regulated price would need to be obtainable for the unregulated service or, more plausibly, only 70 per cent of total cost would now be recoverable.

In contrast, where costs are allocated on the basis of relative use:

- the regulated price would increase (from 3.13 to 3.57) as a greater share of the joint costs would now be allocated to the regulated services, and
- provided that the increase in the regulated price is sustainable – and that a corresponding increase in the price for the unregulated use was also sustainable – then all costs would be recovered.

It is important to note, however, that it is far from certain that the increase in the regulated price (and unregulated equivalent) could in fact be passed through to customers given the potential for this to just accelerate the bypass of Telstra's infrastructure. This issue is addressed in more detail in section 4.2.

Figure 3 shows the last case, which is what happens if there is a reduction in overall use of fixed line services and where sales of the regulated services and unregulated use decline in equal proportions (in this case, a 20 per cent decline in all usage is assumed).

Figure 3 – Cost allocation approaches for a simple example, lower overall fixed line use

	[1] Optimal use	[2] Total cost	[3] Average cost (price) - optimal use	[4] Forecast actual use	[5] Share of use	[6] Allocated cost	[7] Share allocated to each service	[8] Price required to recover cost	[9] Share recoverable from each service	[10] Share recoverable from each service (%)
1. "Partially allocated" cost allocation										
Regulated service	100	250	2.50	48	75%	120	48%	2.50	120	48%
Unregulated use				16	25%	130	52%	8.13	40	16%
Total	**100**	**250**		**64**	**100%**	**250**	**100%**		**160**	**64%**
2. Cost allocation based on relative use										
Regulated service	na	250	na	48	75%	187.5	75%	3.91	187.5	75%
Unregulated use				16	25%	62.5	25%	3.91	62.5	25%
Total		**250**		**64**	**100%**	**250**	**100%**		**250**	**100%**

The outcome of this is similar to the previous example, in that:

- Under the partially allocated cost approach the proportion of costs allocated to the regulated service falls – such that the regulated price remains unchanged – with the total cost that is recovered falling from 80 per cent to 64 per cent (on the assumption that regulated and unregulated use generates equivalent revenue), whereas

- If costs are allocated in proportion to their usage, then the regulated price increases and, provided that the higher regulated price can be sustained and an equivalent increase in the price for unregulated use is possible then costs can be recovered.

Again, however, it is not certain that such an increase in the regulated (and unregulated) price would be sustainable given the potential for this to just accelerate the loss of fixed line customers to mobile networks. This matter is also addressed in more detail in section 4.2.

2.2 Implications of the "partial allocation" and "fully distributed cost allocation" approaches

A number of observations can be made from the discussion above about the implications of the two cost allocation methods.

2.2.1 Are costs allocated in proportion to relative usage?

It is clear that the "partially allocated" cost approach does not result in costs being allocated between regulated and unregulated services in proportion to the relative usage by those services of the assets or expenditure items in question. Rather, whenever the forecast use of the asset in question is below the optimal usage that is assumed by the ACCC when applying the "partially allocated" approach, then the proportion of costs that are allocated to the regulated service will be lower than the relative use by the regulated service of the assets or expenditure items in question. In contrast, the alternative allocation by definition implies an allocation that reflects relative usage.

2.2.2 Is there an opportunity to recover cost (including new investment)?

More fundamentally, whenever the forecast use of the asset in question is below the optimal usage that is assumed by the ACCC when applying the "partially allocated" approach, then Telstra will not be provided with the opportunity to recover its (building block) costs. Rather, on the plausible assumption that the yield from sales of regulated and unregulated services are similar, then Telstra would only have the opportunity to recover a proportion of its costs. Indeed, the ACCC has been quite upfront that it is its intention for the "partially allocated" approach is to preclude Telstra from recovering its full (building block) cost. For example, in relation to switching infrastructure the ACCC remarked as follows:[7]

> *The ACCC therefore considered that Telstra's switching equipment had been over-provisioned for current voice traffic levels and that Telstra should not be permitted to spread the costs of an inefficient level of switching equipment over its remaining customers. The ACCC accounted for the over-provisioning of switching equipment and the declining demand*

[7] ACCC (2014), Public Inquiry into final access determinations for fixed line services – primary price terms, Discussion Paper, July, p.47.

> *for the FOAS and FTAS services by setting the initial cost allocation factor based on the total peak voice traffic volume in 2002-03. The effect of this adjustment was to write down the asset value to remove the over-provisioned part of the switching equipment from the cost base.*

The merits of this argument – including the question of where matters about historical excess capacity are relevant under the new regulatory regime – are addressed further below. However, an important point that is missed in the ACCC's statement as quoted above, is that the costs that implicitly are "written down" under the "partially allocated" cost approach are not merely costs associated with investments that were made in the past and now sunk. Rather, the implicit "write down" the ACCC intends would occur in relation to all costs, meaning that Telstra would also be precluded from recovering its operating and maintenance expenses and making a commercial return on capital expenditure associated with regulated fixed line services.

This outcome is implicit in the simple example above, but is also easily demonstrated algebraically. The objective of the "partially allocated" cost approach is to generate a price for the regulated service as if the relevant assets were used optimally. Thus, if Q is used to denote demand, the superscript * is used to denote demand that is the deemed "optimal" use of the relevant asset, and the subscript R is used to denote the share associated with regulated services (where there is no subscript, the value reflects the total across regulated and unregulated services), then the regulated price is given by:

$$Cost_R = \frac{Cost}{Q^*} \cdot Q_R$$
$$\Rightarrow \frac{Cost_R}{Q_R} = Price^{Regulated} = \frac{Cost}{Q^*}$$

If it is assumed that the unregulated service is sold for an equivalent price, and Q is used to denote the actual (total) usage of the relevant assets, then the total revenue across the services is given by:

$$Revenue = Price^{Regulated}.Q = Cost.\frac{Q}{Q^*}$$

Thus, only a proportion of cost will be recovered, with this proportion reflecting the ratio of the actual use to the optimal use.

In addition, changes in revenue as costs change must follow the same pattern, that is:

$$\Delta Revenue = \Delta Cost.\frac{Q}{Q^*}$$

This means that new investment also will not earn a normal return, but rather only a proportion of the (economic) cost associated with new investment will be recovered, with that proportion again reflecting the ration of the use of the relevant assets to the deemed optimal use. The necessary consequence of this is that a strong incentive against any further investment in assets relevant to the regulated fixed line services would be created.

In contrast, the fully distributed cost allocation will allow Telstra to set regulated prices that would be consistent with the recovery of its costs. However, whether in fact Telstra is able to recover those costs will depend upon the extent to which it is constrained by competition from doing so.

2.2.3 What is the role of the demand forecasts in setting regulated prices?

A further implication of the "partially allocated cost" approach is that the forecasts of demand over the regulatory period ahead are irrelevant to the price that is determined. Rather, if the "partially allocated cost" approach is applied, then the regulated prices would depend solely upon the deemed "optimal" use that is ascribed to each of the relevant assets.

Stated in another way, when the "partially allocated cost" approach is expressed in terms of a conventional application of the "building block" model, the values for demand that are applied to allocate costs and to set prices are not in fact the forecasts of demand over the regulatory period ahead, but rather the optimal usages of each of the assets that the ACCC has deemed.

This outcome is implicit in the simple example provided in section 2.1, but is also easily illustrated algebraically. It was noted above that, with if the "partially allocated cost" approach is used, then:

$$Price^{Regulated} = \frac{Cost}{Q^*}$$

This can be re-expressed as follows:

$$Price^{Regulated} = \frac{Cost}{Q^*} = \frac{Cost \cdot \frac{Q_R^*}{Q^*}}{Q_R^*}$$

The right hand side breaks the calculation of the regulated price into the two steps that are applied in a conventional application of the "building block" model, namely:

- The top line is an allocation to regulated services of a share of the total cost of providing all services, and
- The bottom line then calculates the regulated price by dividing the cost allocated to regulated services (top line) by the assumed demand for those regulated services.

What is clear from this expression is that, when expressed in terms of a conventional application of the building block approach:

- The proportionate allocation of costs between regulated and unregulated services will reflect the assumed share between regulated and unregulated use when the asset is being used "optimally",[8] and

[8] This allocation is a different concept to what is shown in the simple numerical models in section 2.1. In those simple numerical examples it is observed that because the ACCC's assumption about the sales of regulated services exceeds a reasonable forecast of demand (i.e., $Q_R^* > Q_R$) then part of the cost that is allocated to the regulated services will need to be recovered from the unregulated services if it is to be recovered at all. This means that the effective allocated to unregulated services is much higher than their share of the deemed "optimal" use of the relevant assets.

- The regulated price is then calculated by dividing the cost that is allocated to the regulated service by the deemed "optimal" use of the relevant asset for regulated use.

Forecasts of actual demand are neither used to allocate costs between regulated and unregulated services nor to determine regulated prices from the costs that have been allocated to the regulated use.[9]

2.3 Primary observations on the application of the "fixed principles" and Part XIC objects clause

The key conclusion of this report is that, irrespective of the merits of the "partial allocation" approach, this approach is neither contemplated nor authorised by the "fixed principles" determined as part of the 2011 final access determinations. Rather, those "fixed principles" prescribe an orthodox application of the building block approach to setting regulated prices, including an orthodox approach to cost allocation and then the use of forecasts of demand to determine regulated prices from the allocated costs. Indeed, the principles prescribe that costs be allocated between services in proportion to the relative use of the assets in question and emphasise the need for accurate forecasts of demand when setting prices. The alternative approach – described by the ACCC as a fully distributed cost allocation – is the approach that is required by the fixed principles.[10]

Indeed, under the "partially allocated cost" approach, the ACCC's assumption about the hypothetical optimal use of the network is a key input when setting of regulated prices – it is this "hypothetical" optimal use of the relevant assets that is the denominator when calculating regulated prices, not the forecast of actual use. Similarly, the ACCC's assumption about the hypothetical optimal use of the assets relative to actual use will determine the proportion of its (building block) costs that Telstra will be permitted to recover, including the proportion of the "locked-in" RAB that will be recoverable in reality. It follows that if the "partially allocated cost" approach is used, a major area of subjectivity will remain over the outcome for regulated prices – centred around the extent to which assets are considered to be optimally used[11] – which is the same subjectivity that the ACCC's statements during the 2011 inquiry suggest that it intended that the move to the building block model would avoid.

Similarly, one of the key requirements of the object of the regulatory regime (Part XIC of the *Competition and Consumer Act 2010*) is that efficient investment is encouraged, which similarly is an outcome that cannot be said to be met when the partial allocation approach is applied given the expectation that some costs will not be recovered. Accordingly, we address the direction provided by

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9 Thus, if overall fixed line use has fallen compared to the ACCC's deemed optimal use, but Telstra's unregulated use has fallen by a greater extent, then (i) the share of total cost allocated to the unregulated service will be lower than implied by the forecast relative regulated and unregulated use, and (ii) the demand for regulated services used to calculate regulated prices will be higher than the forecast regulated use.

10 We observe that the fixed principles do not mandate how "relative usage" should be defined, and we have not addressed this matter as part of this engagement.

11 The ACCC's analysis of whether assets are "optimally" used today is very simplistic and so understates the potential complexity of such an inquiry. A fall off in use for an asset does not indicate inefficiency – the capacity may well have been required to serve past demand (and indeed may have been the outcome of regulatory obligations) and it may well be the case that the depreciation ascribed to the asset for pricing purposes implies that the current written down cost is commensurate with the remaining demand.

the regulatory regime and the implications of this for the partial allocation approach (as described above) first in Chapter 3.

The ACCC has, however, raised a number of arguments in support of the "partially allocated cost" approach, including the question of how the consequence of reduced demand should affect regulated access prices. While we do not think these matters are relevant to the choice of cost allocation method under the fixed principles – as the principles are prescriptive and clear in this regard – we nonetheless address the merits of the concerns raised. This is undertaken in Chapter 4.

3. Direction from the regulatory regime

3.1 Introduction

There are two elements to the regulatory regime applicable to Telstra's fixed line services that are particularly relevant to the question of how joint costs should be allocated between regulated and other services, which are:

- The "fixed principles" that were determined by the ACCC as part of the 2011 Final Access Determinations, forming clause 6 of those Determinations, and
- The object for Part XIC of the Competition and Consumer Act 2010.

Given the more specific nature of the fixed principles, these are considered first, which is followed by a discussion of the implications of the object of Part XIC for this matter.

3.2 Meaning and implications of the "fixed principles"

3.2.1 Overview of the fixed principles

The "fixed principles" as set out in clause 6 of the 2011 Final Access Determinations describe in clear terms what, in my view, is a conventional application of what is known as the application of the "building block" model to set regulated prices. The key components of clause 6 – which mirror the standard application of the "building block" approach to set regulated prices – includes:

- A prescribed initial RAB for the regulated assets and a formula for updating the RAB at successive price reviews
- A formula for deriving the annual revenue requirement and a reference to the overall method being employed as being the building block method
- Guidance for deriving forecasts of operating and capital expenditure and demand, the context of which imply that these forecasts should reflect the expenditure and demand that is actually expected over the regulatory period, subject to (in the case of expenditure) tests of prudence/efficiency, and
- A recognition that the assets and activities that form the cost of providing the regulated services may jointly provide unregulated services, and so envisages an allocation of costs between the services, which is required to reflect the relative use of the network by the relevant services.

In my experience, many of the terms that are employed in the fixed principles are terms that are used to mean quite specific things in regulatory economics, which I describe in turn below.

3.2.2 Meaning of the "Building block" model

The fixed principles refers to the method of setting prices as a use of the "building block" model in its discussion of operating and capital expenditures.

In my experience, the term "building block" model (or method or approach or analysis) is used to refer to a method of deriving regulated prices that will provide a reasonable opportunity for a regulated business to recover the cost of providing the regulated services. The costs to be recovered include the deemed cost associated with investments in place at the time of the commencement of the regulatory regime (this is the regulatory asset base, or RAB, which is a concept I discuss further below) and the costs incurred, or expected to be incurred, after that time.

I used the qualifier "reasonable opportunity" to refer to the fact that financial incentives for efficiency are typically applied in order to encourage cost efficiency. The outcome of such financial incentives is that the regulated business would be required to meet reasonable hurdles for efficiency in order to recover its costs, but would also have the opportunity to make additional returns if it performed better than expected.

The "building block" model is a reasonable standard approach for giving effect to a higher order objective, namely to ensure that regulated firms have a continuing incentive and capacity to invest in the regulated service. An important outcome for achieving this objective is to provide a reasonable opportunity for costs to be recovered, including a commercial return on new investment, which is how I described the purpose of the "building block" approach above.

I observe that the ACCC has itself previously described the meaning of the "building block" approach in very similar terms to how I have explained the term above:[12]

> *The ACCC, like most other regulators in Australia, makes use of the building block model. This section draws the link between the building block model and the systems of financial incentives which will follow.*
>
> *The building block model is primarily a tool to ensure that the regulated firm is adequately compensated in the long-run. Put another way, the building block model is a tool for amortising large expenditures over time. It is a feature of the building block model that, putting aside any rewards or penalties associated with financial incentives, provided the model is consistently applied in the long-term, and provided the regulator correctly estimates the firm's true cost of capital, the regulated firm will always receive a stream of revenues which is equal, in present value, to the present value of the stream of its expenditures. This result holds true no matter what methodology for depreciation (or path of the regulatory asset base) is chosen.*

In my view, this statement by the ACCC is consistent with the mainstream use of the term "building block" model (or method or approach). Similarly, a key regulatory commentator and advisor to the ACCC, Dr Darryl Biggar, has expressed similar views to mine about the meaning of the term "building block" model and the objective that this model is intended to implement:[13]

> *Public institutions, tasked with controlling the prices or revenues of a firm or enterprise are usually required to pursue some variant of the following two objectives:*
>
> - *First, the regulated firm should expect to receive sufficient revenue to allow it cover all the expected prudent expenditure necessary to maintain a given level of service at each*

[12] ACCC, Draft Decision, Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, 18 August 2004, pp.18-19.

[13] Biggar, D. (ACCC), *Incentive Regulation and the Building Block Model,* 28 May 2004, p.2.

> *period into the future. In this paper I will refer to this objective as "financial capital maintenance".*
>
> - *Second, the regulated firm should be induced to pursue desirable objectives, such as maintaining and improving the quality and quantity of its services, and discovering new ways to provide the same quantity and quality of services at lower cost. The actions of the regulator in pursuit of this objective I will refer to as "incentive regulation".*
>
> *In practice, the first objective is usually pursued through the use of the so-called "building block model" which, as set out below, is a tool for spreading the expenditure of the regulated firm over time. The second objective has been pursued through the use of features such as the five-year regulatory period, and, more recently, through the use of "add-ons" such as the "efficiency carry-over" first adopted by the Essential Services Commission of Victoria.*

Appendix A.1 provides further examples of regulators using the term "building block" model (or method or approach) to mean essentially the same thing, namely as a method of deriving regulated prices that will provide a reasonable opportunity for a regulated business to recover the cost of providing the regulated services.

3.2.3 Regulatory asset base

In my experience, the term "regulatory asset base" is also used to mean a specific thing, which is to represent the value of the investment that the asset owner has made in the regulated business that is, at that point in time, to be treated as unrecovered or outstanding from the point of view of price regulation. The task of setting prices under the building block model is often described as setting prices that provide a stream of cash flows over time that equate, in present value terms, to the RAB.

The computation of the RAB and determination of the annual revenue requirement under the "building block" model go hand in glove. New capital expenditure is added to the RAB at cost, and thereby earns a commercial return over time and is returned to the investor over time through regulatory depreciation. When the annual revenue requirement and RAB roll forward equations are applied in tandem, the incremental revenue generated by capital expenditure will (putting aside the operation of incentive schemes, as discussed above) generate a cash flow that is in present value equal to the cost of the new investment, as intended. Indeed, the ACCC itself has described the link between the RAB and the determination of the revenue requirement as follows:[14]

> *The building block model consists of two equations which are known as the "revenue equation" and the "asset-base roll-forward" equation. These two equations, used together, determine an allowed stream of revenues for each TNSP for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.*

[14] ACCC, Draft Decision, Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, 18 August 2004, p.18.

The Queensland Competition Authority has described the meaning of the RAB as used in economic regulation in equally clear terms:[15]

> *The RAB represents the current regulatory value of the regulated firm's assets. It comprises the total value of assets attributable to a regulated firm at the time of regulatory establishment, plus the allowed value of replacement and additional assets acquired or constructed since establishment, less allowed depreciation (return of capital) and disposals since establishment. In Australia the asset base is also typically indexed by the Consumer Price Index (CPI) so that it is expressed in current, depreciated value terms. Indexation of the RAB by the CPI is consistent with maintaining financial capital from a general purchasing power perspective; that is, in real general inflation-adjusted terms.*
>
> *The regulatory arrangements for many regulated infrastructure businesses in Australia effectively provide strong assurance that the RAB value will be protected. Specifically, investors can be confident that there is minimal, and in most cases no material, risk that the financial value recognised in the RAB will not be fully recovered.*

A specific feature of the normal application of the "building block" model – which is reflected in the fixed principles – is that an initial value is established for the RAB at the time of the commencement of the regulatory regime, and then "locked in" and carried forward from that time in a relatively mechanistic manner (subject to the further comments below). A key reason for locking in a starting RAB and then carrying that value forward in a mechanistic manner is to ensure that clarity is provided as to the returns available from new investment. If the initial RAB was open to be tampered with, then the initial RAB could be altered to offset the impact on prices of new investment (for example, the effect on prices of the need to undertake expensive renewals), which would reduce the returns from – and thereby incentive to make – that new investment.

Notwithstanding the discussion immediately above, I am aware of regulatory regimes where the "building block" model is applied and the regulator has some scope to remove assets from the RAB that are either redundant or to write-down the value of the assets where they are no longer used as fully as expected used. However, where this power is envisaged, I would expect that the regime would:[16]

- be clear that the power for the regulator to adjust the RAB in this manner exists and to provide guidance as to when such a power may be used, and
- recognise that the ability for the regulator to remove assets from the RAB creates an additional risk for which compensation is required.

I observe that the principle related to the updating of the RAB in the fixed principles specifies that the RAB should be updated in a mechanistic manner and does not provide the ACCC with the ability to remove assets from the RAB or to write-down the value of assets that are in the RAB.

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15 QCA, 'Information Paper, 'The Split Cost of Capital Concept', February 2014, p.6.

16 An example of such a regime is in the National Gas Rules (rule 85, "capital redundancy"). The ability to remove redundant assets requires the regulator to announce at the previous price review that such a scheme will operate, and the take account of the risk that such a scheme would create. An equivalent power in relation to electricity networks does not exist.

3.2.4 Forecasts of demand

Where a firm has its prices regulated and the regulatory control applies directly to prices,[17] then an accurate forecast of demand (i.e., sales quantities) is required in order to ensure that the regulated prices that are fixed in the price determination provide the opportunity for the regulated firm to recover its costs (i.e., the revenue requirement). Demand forecasts that overstate future demand will mean that the firm is not able to recover its costs, whereas demand forecasts that understate future demand will mean that the firm is expected to over-recover its costs. Clearly, when prices are capped, the regulated firm bears the risk of demand being different to what was forecast; the goal when forecasting demand is to ensure that they reflect the expected outcome over the period ahead.[18]

Telstra is subject to price caps on its regulated services, and so the forecasts of demand that are used should be critical inputs into the pricing decision. Consistent with this, it is not surprising to see that there is guidance on the setting of demand forecasts in the fixed principles. The guidance for demand forecasts includes that the forecasts be based upon a reasonable forecasting methodology, reasonable assumptions about the drivers of demand, using best available information (including information from history actual demand) and the current demand and economic conditions. This guidance is clear that what is required is the best forecast of the sales of the fixed line services over the regulatory period ahead.

3.2.5 Cost allocation

The "cost allocation" step when applying the "building block" model reflects a recognition that, where the assets or activities that make up the cost base of the regulated services are also used to provide unregulated services, then there may be the capacity for some of the cost to be recovered from those other sales without compromising the capacity and incentive of the regulated firm to provide the regulated services. The cost that is to be recovered through regulated prices is therefore reduced to this extent. However, to be consistent with the overall purpose of the "building block" method, the extent of cost that is allocated to unregulated services must reflect an amount that it is realistic to assume can be recovered from the use of the shared asset for those unregulated services, otherwise a reasonable opportunity to recover the shared costs in total will not exist.

In my experience, the most common approach for allocating shared costs between regulated and unregulated services is to use cost allocators as commonly applied in the accounting field. To the extent that the way in which the unregulated and regulated services use the regulated assets are similar, then a measure of relative usage of the regulated assets would be a reasonable cost allocator. In the context of the overall objective of the building block method this reflects an implicit assumption that it is reasonable to assume that a similar level of net revenue can be earned from using the shared asset in a similar manner when providing an unregulated service as can be earned when providing a regulated service, which in many contexts would be a plausible assumption. I observe that

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17 This is known as a price cap, and means that the outcome of the regulatory determination is a control over individual prices or a weighted average of individual prices. This can be contrasted with a revenue cap, where the regulatory control applies to a firm's revenues, so that the regulated firm is allowed to readjust prices during the regulatory period so that the allowed revenue can be recovered.

18 The term "expected" means a mathematical expectation, which means that the forecast is the average of all possible outcomes, where each outcome is weighted by its probability of occurrence.

this common approach to allocation is the method of allocation that is mandated by the fixed principles.[19]

In the discussion above, I used the term "relative use" to mean relative current and forecast use rather than a historical or hypothetical measure of relative use. Central to the building block method is that the opportunity is provided for actual costs to be recovered (that is, if reasonable hurdles of prudence/efficiency are met). The plausible assumption that I identified that would justify using relative use as the basis for allocating costs between regulated and unregulated services – namely that regulated and unregulated services create a similar yield in terms of net revenue – itself rested on the assumption that use meant current and forecast use. For a hypothetical or historical figure to be appropriate, then there would need to be a reasonable basis for believing that this alternative allocator was consistent with recovering the full cost associated with the shared assets.

Lastly I note that, where the building block approach is applied and shared costs are allocated between regulated and unregulated services, then it is not uncommon for the regulatory regime or regulator to permit there to be a check of whether the costs that are allocated to the unregulated service are in fact recoverable from that service. As an example, the relevant provision in the National Electricity Rules is as follows:[20]

> *the AER may, in a distribution determination for a regulatory control period, reduce the annual revenue requirement for that Distribution Network Service Provider for a regulatory year in that regulatory control period by such amount as it considers reasonable to reflect such part of the costs of that asset as the Distribution Network Service Provider is recovering through charging for the provision of [the unregulated service] [emphasis added]*

In giving guidance as to how to implement this principle, the Australian Energy Regulator has decided to implement a check (referred to as a "control step"), which it described as follows:[21]

> *This section sets out our proposed method for determining shared asset cost reductions. Our proposed method incorporates a primary calculation and a secondary control step. The control step is to estimate the regulated returns to a service provider from its shared assets. Under the NER, cost reductions may not exceed this value.*

I observe that the fixed principles do not include a check that the allocation of costs to the unregulated services is in fact recoverable. This does not concern me because the regulated and unregulated services of telecommunication assets are of a sufficiently similar character that I consider it plausible that the usage-based allocation of cost to the unregulated service will be recoverable from that service.[22] However, this example from the electricity network sector does illustrate clearly that when cost allocations are performed in the context of the building block model of regulation, an important principle is that the allocation of costs to the unregulated activity be consistent with the asset owner recovering the cost of the shared assets.

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19 The fixed principles leave open the matter of how to measure relative use, which is a matter that I have not addressed.

20 Rule 6.4.4(a).

21 AER, 2013, Shared asset guideline, November, p.15.

22 In the electricity network sector, the unregulated use of assets is often for services that are very different to the transport of electricity – for example, supporting high-speed internet cable – and so greater care is required to ensure that costs allocated to unregulated activities are recoverable.

3.2.6 Assessment of the approaches against the fixed principles

In view of the discussion of the effect of the partial allocation model in Chapter 2 and discussion of the relevant aspects of the fixed principles as set out in clause 6 of the 2011 Final Access Determination, it follows quite clearly that the partial allocation model does not meet the requirements of those principles. The most material areas of inconsistency are as follows:

- *Cost allocation (clause 6.14)* – this clause mandates the use of cost allocation factors that reflect the relative use of the network by various services. As I demonstrated in Chapter 2, the application of the partial allocation model does not result in allocations that reflect relative use, where relative use is taken to mean current and forecast use. If other meanings were to be ascribed to "relative usage" in this clause – such as reflecting relative historical use or relative hypothetical use – then that would not be consistent with the application of a cost allocation step as it is commonly understood.

- *Demand forecasts (clause 6.11)* – this clause mandates the use of demand forecasts when setting regulated prices that reflect the best forecast of the sales of the fixed line services over the regulatory period ahead. However, as I demonstrated in Chapter 2, the application of the "partially allocated cost" approach has the effect of using the ACCC's deemed "optimal" use of the relevant assets as the denominator when setting prices and rather than a forecast of expected future use (which is a forecast that none would expect ever to be achieved).

- *Regulatory asset base* (clauses 6.5 and 6.7) – the partial allocation approach will not deliver a stream of cash flows over time with a present value equal to the RAB as calculated in accordance with clause 6.5 and 6.7 and therefore cannot be said to use the prescribed RAB. The reason that the required cash flows do not result is because the revenue that is forecast from sales of the regulated service and the revenue reasonably expected from unregulated services will be less than the calculated annual revenue requirement.

- *"Building block" model (clauses 6.9 and 6.10)* – the application of the partial allocation does not provide an opportunity to recover cost, including new investment, because the total revenue expected from sales of regulated and unregulated services will not exhaust total cost.

In contrast, subject to an assessment of the reasonableness of the selected allocators (which is beyond the scope of this report), the "full allocation" approach reflects a conventional application of the cost allocation step whereby allocators are chosen and applied such that the asset owner expects to recover the shared costs. This is consistent with the application of the "building block" model of regulation and with the use of the RAB that is prescribed in the fixed principles.

3.3 Part XIC objects clause

3.3.1 Components of the objects clause

The object of the Part XIC regime is to promote the long term interests of end-users of telecommunications services, which in turn is to be established by considering (and considering only) the objectives of:

- promoting competition in relevant markets

- the achievement of any-to-any connectivity (which is not relevant to the current matter), and
- the efficient use of and efficient investment in:
  - infrastructure by which listed services are provided, and
  - other infrastructure that may provide listed services.

Further (non-exclusive) guidance is provided as to how the impact on competition and the achievement of efficient use and investment in infrastructure should be assessed, which in relation to efficient investment include the incentives for investment (across the whole supply chain) and the legitimate commercial interests of the supplier of the services.

3.3.2 Assessment of the cost allocation approaches against the objects clause

The most obvious implication of the "partial allocation" approach for the objects clause is the effect of this approach on the incentive for investment in the regulated (fixed line) assets. As discussed in Chapter 2, an outcome of the "partial allocation" approach is that Telstra is unlikely to earn a commercial return on any new investment in these assets and therefore it is unlikely that the incentive for such investment will exist. This would appear to be an outcome that is in clear conflict with the objects clause.

It is acknowledged that if prices are kept artificially low for the regulated fixed services then the incentive for investment may increase in some areas (for example, in investments that make use of fixed line infrastructure), but may decrease in other areas (for example, investments in mobile networks, which are made less competitive as a result against fixed line networks). Even within the fixed line networks investment in other areas may be adversely affected (for example, if the reduction in fixed line charges is felt more in the wholesale services, then the incentive for providers to provide their own switching and other infrastructure in exchanges and so bypass Telstra's equipment may fall). The net effect of these wider factors – and the more relevant question of whether the changes in investment are efficient or inefficient changes – is difficult to determine.

The assumption in the discussion above is that if the "partial allocation" approach was applied then Telstra would be constrained by competition both at the retail level and in other markets (for example, mobiles) to bear the loss. The alternative would be for Telstra to seek to pass through some or all of its unrecovered costs into its price offerings in those other markets. To the extent that this strategy was encouraged, then the rivalry provided by Telstra in those other markets would decline (that is, the constraint it provided on price would come in at a higher price), which in turn could be interpreted as a decline in the level of competition in those other markets. These outcomes, should they occur as an alternative, would also appear to be counter to the clear direction of the objects clause for competition to be promoted.

4. Assessment of the ACCC's arguments in favour of the "partially allocated" cost approach

4.1 The ACCC's arguments

Notwithstanding the conclusions reached in the previous chapter, we address the merits of the ACCC's arguments in favour of the "partially allocated" cost approach. The key concern the ACCC raised was that a fully distributed cost allocation would result in the consequences of the decline in demand being transferred from Telstra to access seekers, which we consider first. The other arguments the ACCC raised were that:

- A return on historically over-built assets is inappropriate and could not occur in a competitive market
- Telstra has already been compensated through the WACC for the structural decline in demand, and
- Fully distributed cost approaches create incentive issues, including a reduction in the incentive to minimise costs and an incentive to inflate the allocation to regulated services.

These two sets of arguments are addressed in turn.

4.2 Consequences of the decline in demand for fixed line services

4.2.1 Trends in demand

The key regulatory issue the ACCC has identified as flowing from the application of a fully distributed cost allocation is that this would have the effect of transferring all demand risk to access seekers, which it considers to be inappropriate. Prior to addressing this issue, it is relevant first to be clear about the trends in demand that have given rise to this concern.

The ACCC has identified two trends in demand, which are as follows.

- First, Telstra retail is losing market share to access seekers who are providing their own equipment and so bypassing (and so competing directly with) a component of the services that Telstra is required to provide on a regulated basis.
- Secondly, there is a general migration from fixed line services to mobile services, and a commensurate drop in use of the fixed line networks.

In relation to the first of these trends, the driver is the bypassing of Telstra's regulated infrastructure through access seekers purchasing the lower level access services (such as the unconditioned local loop service) and providing their own higher level infrastructure. If Telstra retail merely lost customers to access seekers who purchased wholesale services, then there would be a shift of volumes

from unregulated to regulated services, but no change in the overall use of Telstra's network and hence the regulated prices (under either approach to cost allocation) would be unaffected.[23]

Both of these trends, therefore, are the product of strengthening competition, the first of which is competition for the provision of the higher level infrastructure for fixed line services and the second of which is the product of competition (albeit to a much lesser intensity) from mobile networks. The concerns the ACCC has raised with a fully distributed cost allocation in reality are concerns at applying standard cost based regulation in the context where competition exists and/or is strengthening.

Having said that, however, we disagree with the ACCC's concerns that the outcome of a fully distributed cost allocation – i.e., cost based regulation – are either perverse or lead to Telstra passing on all demand risk. We address these points in turn below.

4.2.2 Outcome of cost-based regulation in the presence of emerging competition

The effect of reduced demand for Telstra's fixed line infrastructure under cost based pricing is that the regulated prices will be higher than otherwise. The increase in Telstra's regulated prices for fixed line services means that there will also be scope for Telstra to charge commensurately higher retail prices for its equivalent services, although all may be constrained by competition (this is discussed further below).

To the extent that Telstra is able to charge the higher regulated and retail prices, then the outcome will be that Telstra is provided the opportunity to recover costs that were incurred to serve the historical use of its network, but had not as yet been recovered and cannot now be defrayed[24] (the ACCC also asserts that this capacity was overprovisioned historically – this argument is addressed separately in section 4.3.1 below). Accordingly, the best outcome for Telstra under cost-based pricing is that it is able to recover its costs.

This outcome – whereby a decline in the demand for a service translates into a higher regulated price – is a standard and intended outcome of cost-based regulation. Providers of regulated services make large investments that are typically recovered over extended timeframes. The *quid pro quo* is that every opportunity is provided by the regulatory regime to recover the costs incurred on this basis. However, as implied above, where competition from alternative technologies precludes the recovery of cost then the regulated provider would not have recovered the costs that were recognised under the building block approach unless ex ante compensation had been provided for this source of asset stranding, which would be an unusual case.

As suggested above, cost-based regulated prices will only provide Telstra with the opportunity to recover its regulated fixed line costs, but no guarantee. Competition from mobile networks would be expected to place a limit on the extent to which it is possible and sensible for Telstra to raise its retail and wholesale prices as required to recover its fixed line costs. That is, there will be a point at which

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23 The ACCC's discussion paper describes there as being three trends in demand that are having an effect on regulated prices (p.39), but only two of the three trends affect regulated prices.

24 If Telstra were able to "reverse" unnecessary investments – for example, by selling excess equipment – then this should occur and the RAB reduced commensurately. Regulatory issues only arise where past investment cannot now be reversed.

further increases in its prices would merely accelerate the disconnection of customers from fixed line networks (whether customers are Telstra retail customers or customers of access seekers) in favour of mobile networks.

The implication of reaching the point above (i.e., where Telstra's fixed line retail and access prices are constrained by competition from mobile networks) is that cost-based price control for fixed line access would become irrelevant. The conclusion to draw from this is not that cost-based regulation has therefore become perverse or unworkable, but rather that price control over the wholesale services is unwarranted and should be removed.[25] A further implication is that if competition were to constrain Telstra to set prices below the cost-based level then Telstra would not have the opportunity to recover all of its costs.

Lastly, I note that the ACCC has also appeared to argue that cost-based pricing (i.e., a fully distributed cost allocation) would permit Telstra to recover losses arising from competition within the fixed line services from the carriers who provide this competition.[26] Within the fixed line services,[27] the ACCC's proposition would appear to be that:

- When other carriers purchase access at lower levels (for example, purchasing ULLS or LSS) they bypass some of Telstra's equipment (i.e., transmission, switching equipment, ADSL equipment) and so make that redundant, but

- The access prices for ULLS and LSS nonetheless permit Telstra to continue to recover through the ULLS and LSS prices part of the cost of Telstra's (now redundant) infrastructure.

The assumption behind this line of argument is that the prices for the lower level access services – ULLS and LSS – include part of the cost of assets that are not required to provide service, so that those prices are higher than they would be if those access prices recovered only the cost of assets that were used to provide the relevant access service. However, this assumption is clearly incorrect:

- If Telstra calculated access prices for the next regulatory period by allocating its costs within the regulated fixed line services strictly on the basis of a fully-distributed cost allocation, then the

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25 There may be a concern that Telstra may nonetheless raise the price of its wholesale products in the hope that customers switch to Telstra's retail products rather than to the offerings of the access seekers. While this would be a risky strategy (as there is no guarantee that customers would go to Telstra rather than onto mobile networks) and it is not clear there is a benefit to the strategy in any event, to the extent this is the concern then the appropriate response would be a "retail minus" form of price control for wholesale products rather than attempting to modify the application of cost-based regulation.

26 The ACCC referred to the "partially allocated" approach resulting in "costs which are incremental to Telstra [being] removed from the cost base so that an access seeker does not pay a share of costs that are specific to Telstra retail" (p.39), suggesting that a fully distributed cost allocation would result in access seekers paying for assets that are incremental to Telstra retail. It was observed above that the ACCC's concern is actually about customers having switched to carriers that bypass some of Telstra's assets rather than just switching from Telstra retail (because a switch of a customer from Telstra retail to a reseller does not affect the utilisation of Telstra's regulated fixed line assets). Thus, the concern of the ACCC is interpreted as being that when an access seeker bypasses some of Telstra's assets (for example, it buys ULLS and provides its own switching and DSL equipment etc.), a fully distributed cost allocation will result in access prices that nonetheless recover some of the cost associated with Telstra's assets that the access seeker has bypassed (i.e., Telstra's switching and DSL equipment etc.).

27 The concern of the ACCC must relate to competition from other fixed line carriers – there is clearly no ability for Telstra to recover fixed line costs from mobile network competitors.

ULLS and LSS access prices could not recover the cost of assets that are not required to provide those services, because they would not be allocated any of that cost; however

- Telstra is in fact proposing to continue the current relativity between the suite of access prices (and so adjust those prices equi-proportionately as required to recover the revenue requirement).[28] This will result in ULLS and LSS access prices that are substantially *lower* than they would be if those services recovered a usage-based share of the cost of the assets they use and not higher as the ACCC's theory assumes.

It therefore cannot be maintained that Telstra's proposed cost allocation will result in Telstra recovering from its competitors the "losses" that Telstra bears as a consequence of the competition that is provided.

4.2.3 Who bears the consequences of the decline in demand?

One of the ACCC's key concerns is that under cost-based pricing, Telstra would be permitted to pass all of the consequences of the decline in demand onto access seekers, which would be a fundamental change to how demand consequences are allocated compared to the "partially allocated cost" approach.

The ACCC is correct that cost-based pricing (i.e., a fully distributed cost allocation) would lead to a change in the allocation of the consequences of the reduction in demand compared to the "partially allocated cost" approach. This is because the latter approach allocates all of the consequences of the reduction in demand risk to Telstra, shielding both access seekers and final customers from the increase in the unit cost that is caused when capacity is fixed but demand declines. This was shown in the simple examples set out in Chapter 2, which showed that under the "partially allocated cost" approach, a decline in demand would have no effect on Telstra regulated prices, and on the reasonable assumption that Telstra's retail prices are limited by its regulated wholesale prices, lead to Telstra recovering only a proportionate share of its total cost.

However, the ACCC is incorrect to assert that the fully distributed cost allocation will permit Telstra to pass on all of the consequences of the reduction in demand to access seekers. Rather, it would be expected that:

- While all network users would initially bear this higher cost (of which Telstra is the largest party), if competition mobile networks permitted final retail prices to be increased, then Telstra and the users of Telstra's wholesale services would both increase their retail prices, with the effect that the consequences of the demand reduction would be borne by final customers, and

- To the extent that competition from mobile networks constrained the pricing to final customers, then Telstra would be expected to set its retail prices to meet that competition and in parallel also offer a reduction in the price for its wholesale services (i.e., offer a price below the regulated price). Telstra would offer a reduction in its wholesale price in order to put access seekers in a position where they too could meet the competition from mobile networks in order for Telstra to seek to maintain the use of its fixed line networks. The effect of reducing both the retail and

[28] That is, Telstra is proposing to use a fully distributed cost allocation between regulated and unregulated services, but to adopt the implicit allocation between the regulated fixed line services as currently applies.

wholesale prices as suggested is that Telstra would bear much of the consequences of the reduction in demand.

Thus, under cost based pricing (i.e., a fully distributed cost allocation) it would not be expected that Telstra would transfer to access seekers the consequences of the reduction in demand, as the ACCC suggests. Rather, in the absence of competition from mobile networks, all network users would be expected to pass through the higher unit costs caused by the demand reduction to final customers. In addition, if this competition binds, then Telstra would be expected to shield access seekers from some or all of the increase in unit cost in an effort to maintain the use of Telstra's fixed line network.

4.3 Other arguments presented by the ACCC

4.3.1 A return on historically over-built assets is inappropriate and could not occur in a competitive market

One of the ACCC's arguments is that firms in competitive markets would not be able to recover capacity in past investments that was over-provisioned. The ACCC's statement in this regard is as follows:[29]

> *In the 2011 FAD, the ACCC also considered that the approach it had adopted reduced the risk that building block costs of declared services would include inefficient or over-provisioned assets, such as over-provisioned switching equipment. The ACCC was of the view that Telstra's investment in switching capacity was a commercial decision based on past voice traffic and Telstra's forecasts of future demand. The ACCC noted that the BBM approach is based on allowing the access provider to recover its efficient costs and does not include monopoly profits in prices. In a competitive market, a business would not be able to spread the costs of inefficient or over-provisioned assets over its remaining customers as this would reduce its ability to compete with alternative suppliers. Only a monopolist could recover inefficient costs from its remaining customers by charging prices that include monopoly profits.*

As noted earlier, debates about the efficiency or necessity of current levels of capacity are of no relevance in the current context. Under the current regulatory regime, the debate about whether there is a surplus of capacity – and the implications of this – was a consideration that was relevant to setting the initial RAB, as it has in all other industries where cost-based regulation has been applied with a RAB value that is determined at the start and then updated over time in a mechanistic manner. Applying the "partially allocated cost" approach in order to achieve a write-down of the RAB through indirect means is not something that the fixed principles contemplates and indeed it is inconsistent with the clear requirements as to how the starting RAB is to be updated from one price review to the next.

Putting this aside, however, there are a number of flaws in the ACCC's line of argument.

First, the ACCC's assertion that the cost associated with over-provisioned assets could not be recovered in a competitive market be recovered is simplistic and arguably incorrect.

[29] ACCC, July 2014, p.39.

In "text book" perfectly competitive or contestable markets, the issue of excess capacity never arises. Rather, because all investment is assumed to be fungible or reversible, capacity can be increased or reduced if demand changes, and the unrecovered value of all past investments thereby recovered. Where investments are irreversible and arrangements are struck where the provider recovers its costs (and makes a return) over an extended period, then it is common for long term contracts to be struck and not unusual for the buyer to agree to a pricing scheme that shields the seller from much or all of the long term demand risk.[30] To the extent that demand turns out to be different to what was forecast, then the buyer will in fact be paying for capacity that is not needed.

Secondly, it is incorrect to assume that Telstra made a commercial decision over the amount of the switching and other equipment to install in the past. As Telstra has been the USO provider, this past investment was incurred under a regulatory requirement that required Telstra, in effect, to meet all requests for service.

Thirdly, it is also hard to maintain a presumption that Telstra would have been inefficient in meeting the obligation described above. Until the commencement of the "building block" model of regulation under the 2011 Final Access Determination, Telstra was regulated under a regime whereby its regulated prices were completely divorced from its actual costs, so that its incentive to minimise cost were extremely strong (and as strong as those incentives would be in a very competitive market). Indeed, the power of incentives under the previous telecommunications regime certainly were much stronger than what applies to most price regulated firms (the incentive power under the previous telecommunications regime arguably was 100 per cent, whereas the incentive power in the Australian energy network regulatory regimes is in the order of 30 per cent).

Fourthly, all that the ACCC has shown is that the current capacity of the fixed line network is greater than is required to serve current use, the ACCC has not shown that the charges to access seekers (and, ultimately, final customer) are higher as a consequence of that additional capacity. The RAB values for Telstra's fixed assets (with minor exceptions) reflect the combination of the original cost of the assets and straight line (historical cost) depreciation since that time. As a consequence, the regulatory asset value associated with Telstra's fixed line assets is only a small fraction of their original cost, which is not surprising given that straight line historical cost depreciation provides a comparatively fast rate of depreciation.[31] I note that one of the objectives when depreciating assets for pricing purposes optimally is to align cost-recovery with the size and price sensitivity of use, so that if a future reduction in demand is foreseen less cost is left to be recovered at that time. The substantial depreciation applied to Telstra's assets is consistent with this outcome.

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30 The one inviolable outcome of a competitive market is that firms contemplating investment would only ever do so if they expected to recover their costs and earn a commercial return commensurate with the risk. To the extent that cost recovery was spread over an extended time period, then an investor would either seek to insulate itself from the risk to that cost recovery (such as through a long term contract) or charge a higher price for the risk borne. However, it is unlikely to see some risks borne by a provider – for example, where the risk in question is something over which the buyer has some control (for example, the buyer's use of an asset over the long term) then the seller of the service would demand a large compensation for accepting this risk (i.e., to compensate for the "moral hazard") and the buyer would be expected to find itself better off from agreeing to accept the risk associated with events over which it has some control.

31 As an example, an asset with a 20 year life will have 50 per cent of its nominal value remaining after 10 years, but which translates into only 39 per cent of its real value (assuming a rate of inflation of 2.5 per cent).

Lastly, even if there was a "surplus capacity" issue to be resolved, it follows from the analysis in Chapter 2 that the "partial cost allocation" approach is a very poor regulatory tool for attempting to adjust for (deemed) surplus capacity. The partial cost allocation approach does not only reduce the extent of the past investments that can be recovered, but it also means that the cost associated with new investment also cannot be recovered. There is no justification for precluding the recovery of efficient new investment.

4.3.2 Telstra is compensated through the WACC for the structural decline in demand

The ACCC also asserts that Telstra has already been compensated – via the WACC – for the reduction in the use of its network that has been caused by competition. Its statement is as follows:[32]

> *Therefore, the ACCC considered that it was not appropriate to compensate Telstra for a loss of market share or for reductions in the size of the market. The ACCC considered that Telstra has been appropriately compensated for these business risks through the risk premium included in the commercial rate of return provided by the WACC.*

This statement is incorrect.

The WACC as estimated using conventional approaches compensates investors for the variation in returns around the average (or expected) level (and does so assuming that the investor is fully diversified) the impact of this on the variation in the wealth of a fully diversified investor). The WACC as estimated does not compensate for one-sided liabilities, like losses caused by natural disasters nor for other one-sided liabilities, like the loss of market share to a competitor.[33]

The issue of which sorts of risks or events the regulatory WACC can be said to compensate for, and which it does not, was an issue that was considered at some length when formal cost-based regulation commenced in Australia. One of the early, clear statements on this matter was from the former Office of the Regulator-General in Victoria, who commented as follows:[34]

> *The Office accepted in Consultation Paper No. 4 that the price controls should be designed such that investors can expect to earn the WACC on average, taking into account all potential events. It also noted that it was inevitable that the impact of a number of events would not be taken into account in determining the price controls, and that:*

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32 ACCC, July 2014, p.39.

33 In addition, the WACC as estimated only compensates for systematic risk (which is risk associated with market wide events) and does not compensate for events that are unique to any specific asset. The reason for this is because investors can eliminate the unique risks associated with any asset by holding that asset in a portfolio – and two of the formal assumption of the capital asset pricing model (which is the finance model the ACCC uses to estimate the WACC) is that investors are fully diversified and capital markets are competitive, so that returns expected will only reflect the risk that a fully diversified investor would bear. The loss of market share to a competitor would not be expected to be related to movements in the market overall and hence would be classified as a diversifiable risk.

34 Office of the Regulator-General, 2000, Electricity Distribution Price Review – Final Decision, September, p.135.

> *… [t]he issue for the price review is whether the net effect of the excluded (expected) costs and benefits is likely to be significant, and so lead to the expected return for the regulated activities … being biased upwards or downwards from their regulatory WACCs.*
>
> *Another way of asking whether the investor expects to get the WACC on average is whether the events that have not been taken into account when determining the price controls are symmetric (that is, the expected value of positive and negative events offset each other).*

As suggested above, the loss of market share to competitors for a firm that commences with a dominant position is a downside event that cannot be assumed to have been offset by an equivalent positive event.[35] Accordingly, Telstra could only have been assumed to have been compensated for this risk if:

- it had been identified when prices were previously determined, and
- an actuarially fair compensation amount associated with this liability (akin to a self insurance premium) had been included in Telstra's revenue requirement.

It is understood that such a compensation amount was not included in the revenue requirement and therefore Telstra cannot be said to have been compensated through previous regulated prices for accepting the risk (liability) associated with a loss of market share.[36]

4.3.3 Regulatory issues with fully distributed cost pricing

The ACCC has also argued that there are regulatory issues with the use of the fully distributed cost allocation method, most notably that:

- Fully allocated costs may discourage cost minimisation,[37] and
- Incentives are provided for the allocation of costs to the regulated service to be inflated.[38]

Both of these "concerns" arise with the application of the "building block" approach to set cost-based prices, under which there is a direct link between actual costs and regulated prices.

That is, it is well known (and has been for decades) that tying regulated prices too closely to cost reduces the incentive for firms to be cost-efficient. Incentives for efficiency can be provided – and almost always are provided – under the building block model by setting prices for a defined interval and possibly supplementing this with additional measures (often referred to as "carry-overs" of gains). The first of these incentive schemes is a part of the fixed line regulatory regime.

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35 Moreover, if Telstra's market share had risen, then there is some chance that the benefit from this would have been passed through to customers rather than being retained by Telstra in any event.

36 In my experience, when the "building block" model of regulation is applied, it is rare to expose regulated businesses to material downside risks and to compensate (on an actuarially fair basis) for this liability. Rather, it is more common for such risks consciously to be allocated to customers and for regulated businesses to be compensated in a manner that is consistent with such a risk allocation.

37 ACCC, July 2014, p.43.

38 ACCC, July 2014, p.39.

In addition, it has also been obvious for decades than when regulated prices are set in line with a firm's actual costs then the firm has an incentive to overstate its actual costs if possible. It is for this reason that it would be expected that the ACCC would review the detail of how Telstra proposes to allocate cost, and it is also the justification for requiring assurance over the costs that Telstra reports as the costs it has actually incurred.

5. Declaration

I have has made all of the inquiries that I believe to be desirable and appropriate in the preparation of this report and no matters of significance that I regard as relevant have, to my knowledge, been withheld.

Jeffrey John Balchin
1 October 2014

Appendices

A. Statements by regulators about components of the building block method

A.1 The ultimate objective of the building block method

Office of the Regulator General of Victoria/Essential Services Commission of Victoria

One of the first applications of the building block approach in Australia was by the Office of the Regulator General of Victoria (ORG), which was subsequently called the Essential Services Commission of Victoria (ESC). The ORG/ESC was the economic regulator of electricity networks in Victoria until this role was given to the Australian Energy Regulator (AER).

The ORG, when first regulating electricity distribution businesses in Victoria, made an explicit decision to apply the building block approach. In doing so, it noted that the building block approach establishes prices on the basis of forward-looking revenue benchmarks reflecting the requirements of businesses over the subsequent five years. It notes that these benchmarks are based on assumptions about efficient expenditure levels that businesses would need to incur over that subsequent period.[39]

> *The Office has had regard to the guidance provided by the statutory framework, including the requirement in the Tariff Order to use price based regulation adopting a CPI-X approach rather than rate of return regulation. In adopting CPI-X regulation, the Office has used a 'building block' approach, which establishes the distributors' price controls on the basis of forward-looking revenue benchmarks reflecting the requirements of the distributors over the next five years.*
>
> *These benchmarks are based on assumptions about efficient levels of expenditure that the distributors would need to incur over the 2001-05 period to meet the target levels of service reliability and quality, expected demand growth and the cost of capital financing. They are used to derive 'X' factors which, together with the consumer price index, determine the annual percentage change in average tariffs. That is, average prices for the use of the distribution system will change by the CPI, less the 'X' applying in that year.*

The ORG has also commented explicitly on its approach in the context of distributor and industry viability. On this matter it stated that its benchmarks, which are derived via the building block approach, have been established to allow distributors to earn sufficient revenue to meet predicted electricity demand growth and service performance obligations over the period. It also stated that it considered its approach to be consistent with its objectives relating to the viability of the industry such that the returns to equity holders and debt providers implied by the price caps are within the range that investors expect under (the then) current financial market conditions:[40]

> *The revenue benchmarks used to set the price controls in this Determination have been established to allow efficient distributors to earn sufficient revenue to meet predicted electricity demand growth over 2001-05 and the service reliability targets embodied in the*

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39 ORG, Electricity Distribution Price Determination 2001-05, Volume 1, Statement of Purpose and Reasons, September 2000, p.x.

40 ORG, Electricity Distribution Price Determination 2001-05, Volume 1, Statement of Purpose and Reasons, September 2000, p.xiv.

> *Determination. They reflect assumptions about their capital financing requirements that are consistent with maintaining the financial viability of efficiently managed and financed firms.*
>
> *Throughout the consultation process, the distributors have raised a number of issues related to their financial viability. In particular, a number of distributors questioned whether a one-off price adjustment (as proposed in the Draft Decision) was consistent with the Office's objective to 'facilitate the maintenance of a financially viable electricity supply industry'. The Office believes that this Determination is consistent with its objectives relating to the viability of the industry and with its other statutory objectives, including protecting customers' interests and preventing the exercise of monopoly power. It is confident that the returns to equity holders and debt providers implied by the 2001-05 price caps are within the range that investors expect under current financial market conditions and are capable of sustaining commercially appropriate credit ratings.*

It is also relevant to note that the ORG made a clear distinction between its application of the building block approach and the alternative pure benchmark approach that was proposed by the businesses at the time. The ORG noted in this regard that the pure external benchmark approach was based on the rate of change in prices rather than the cost that underpin them. It found also that the building block approach better reflected the overarching regulatory guidance that prices should be determined on the basis of forward-looking costs: [41]

> *In Consultation Paper No. 1, the Office proposed using a 'building block' approach to the Price Review. The essence of the 'building block' approach is that benchmark revenues for the next regulatory period are established with reference to forecasts of operating, capital expenditure and financing costs for an efficiently-operated distribution business. These benchmark revenues will be sufficient to enable efficient distributors to operate and invest in their networks, to service debts and to remunerate shareholders. A recurring theme of the submissions in response to Consultation Paper No. 1– particularly from the distributors themselves – was a debate over the relative merits of a 'building block' approach compared to an alternative based purely on external benchmarks.*
>
> *Inherent in the pure external benchmarks approach proposed by the distributors at that time is a focus on the appropriate rate of change in distribution prices, rather than the level of costs which underpin them. In that sense, the most recent proposal for a transitional adjustment to prices embraces similar pricing outcomes to those put forward by the distributors in 1998.*
>
> *In finalising its approach to the Price Review, the Office's foremost concern has been to apply the legal and regulatory framework that guides its decisions in a balanced and reasonable manner. Based on these considerations, the Office decided that it would derive forward-looking revenue benchmarks for the Price Review by applying the 'building block' methodology first described in Consultation Paper No. 1. The outcome of that approach is now reflected throughout this Determination.*
>
> *These basic themes of the building block approach are consistent with mainstream international and Australian practice in the regulation of network industries. The approach is*

[41] ORG, Electricity Distribution Price Determination 2001-05, Volume 1, Statement of Purpose and Reasons, September 2000, p.158.

also consistent with the methodology and analysis that underpinned the Victorian Government's initial 1995-2000 price determination for the distributors. More generally, both the national electricity and gas codes embody a strong presumption that regulated prices should be determined on the basis of forward-looking cost and revenue benchmarks. In the electricity sector in particular, both the Australian Competition and Consumer Commission (ACCC) and the Independent Pricing and Regulatory Tribunal (IPART) recently applied a building block approach to determine regulated prices for TransGrid and the NSW distributors respectively.

Australian Competition and Consumer Commission

The Australian Competition and Consumer Commission (ACCC) regulated electricity and gas transmission prior to the creation of the Australian Energy Market Commission (AEMC) and the AER. Like the ORG/ESC the ACCC chose to apply the building block approach when deriving the revenue target for use in setting price controls. The ACCC provided the most comprehensive explanation of the role of the building block approach in its draft decision with respect to a review it undertook on its Statement of Regulatory Principles (or SRP). The ACCC observed that the building block approach is primarily a tool to ensure that the regulated firm is adequately compensated in the long-run, and indicated that when properly applied, the building block approach will provide the regulated firm with a stream of revenues that is equal, in present value, to the present value of the stream of its expenditures:[42]

The ACCC, like most other regulators in Australia, makes use of the building block model. This section draws the link between the building block model and the systems of financial incentives which will follow.

The building block model is primarily a tool to ensure that the regulated firm is adequately compensated in the long-run. Put another way, the building block model is a tool for amortising large expenditures over time. It is a feature of the building block model that, putting aside any rewards or penalties associated with financial incentives, provided the model is consistently applied in the long-term, and provided the regulator correctly estimates the firm's true cost of capital, the regulated firm will always receive a stream of revenues which is equal, in present value, to the present value of the stream of its expenditures. This result holds true no matter what methodology for depreciation (or path of the regulatory asset base) is chosen.

The building block model consists of two equations which are known as the "revenue equation" and the "asset-base roll-forward" equation. These two equations, used together, determine an allowed stream of revenues for each TNSP for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.

Expressed in the simplest form, the building block equations are as follows:

[42] ACCC, Draft Decision, Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, 18 August 2004, pp.18-19.

MAR = return on capital + return of capital + opex + tax

*= (WACC * RAB) + D + opex + tax*

and

New RAB = previous RAB - depreciation + capex

Where:

MAR = maximum allowed revenue

WACC= weighted average cost of capital

RAB = regulatory asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable

Australian Energy Market Commission

On 16 November 2006 the AEMC published its final determination and final rules that set in place a new approach for regulating electricity transmission services in the NEM. In doing so, the AEMC codified the building block approach in the NER.

As part of the development of the final rules the AEMC published an Issues Paper. In that Issues Paper the AEMC consulted on whether the building block approach or alternative approaches, such as external benchmarking or TFP, should be used for the purpose of setting revenue allowances. In describing the building block approach as part of this discussion, the AEMC was clear that the approach was based on an assessment of forward looking estimates of the costs required by a network business to operate on an efficient basis during the regulatory period. It also implied that it considered the building block approach to be well understood given its widespread application throughout Australia and other countries:[43]

> *The basis of the building block approach is the establishment of forward looking estimates of the costs of providing the relevant service. Each cost category – operating expenditure, return on capital, deprecation and tax – is combined to derive a forward looking estimate of the revenue required to operate the network business on an efficient basis during the regulatory period. The building block approach to determining revenue or price controls for regulated infrastructure services has widespread application throughout Australia and other countries.*

[43] AEMC, Review of the Electricity Transmission Revenue and Pricing Rules, Consultation Program, Revenue Requirements: Issues Paper, October 2005, p.24.

In its final determination document the AEMC confirmed its codification of the building block approach. In doing so it specifically commented that the mechanics of the approach are well understood, having been adopted by economic regulators in Australia and internationally:[44]

> *The Commission believes that the mechanics of the building block approach are well understood having been adopted by economic regulators in Australia and overseas for over 10 years. Therefore, there are few, if any, risks to good regulatory outcomes from codifying the components of the building blocks methodology in the Rules.*

New Zealand Commerce Commission

The Commerce Commission recently undertook an extensive review into the approach to economic regulation in New Zealand in order to develop Input Methodologies that are then applied in price regulation. In describing the building block approach, the Commerce Commission observed that a key outcome of the building block approach was that it provided the opportunity for businesses to recover their efficient costs and that this is consistent with the outcomes of workably competitive markets:[45]

> *2.8.5 The matters referred to in s 52T(1)(a) relate to a number of the key components generally included in the 'building blocks approach' to determining or assessing the revenues received from the supply of regulated services. Regulators in overseas jurisdictions—such as Australia and the UK—typically employ building blocks analysis to assist in setting regulated price or revenue caps when implementing CPI-X incentive regulation. Each building block relates to a different type of cost facing a regulated supplier, and regulators aim to provide firms with an opportunity to recover an efficient level of these costs, including the cost of capital, over the forthcoming regulatory period.*
>
> *2.8.6 Appropriately assessing the overall level of revenue required to generate a normal return on investment is a significant step in promoting outcomes that are consistent with those that would be produced in workably competitive markets. Regulators often seek to achieve this by directly estimating the efficient costs faced by a regulated supplier in providing regulated services (for the level of quality demanded by customers). If these costs are not appropriately assessed by regulators, then over time the prices a regulated supplier is authorised to charge will be too high or too low, on average, relative to the supplier's operating and capital costs. As a result, actual returns would not be consistent with normal returns over time (except where unforecast events generated this result). However, as in workably competitive markets, a regulated supplier that achieves superior performance by reducing actual costs below the forecast costs provided for in the price-quality path will benefit from above-normal returns.*
>
> *2.8.7 With this in mind, the building block approach is generally implemented to be consistent with regulated suppliers earning a normal return, applied on an ex ante basis. On an ex post basis, however, superior performers will have achieved an actual ROI greater than a normal return. Application of the building blocks approach assists with specifying price-quality regulation for discrete regulatory periods, recognising that the overall objective is to*

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44 AEMC, Rule Determination, National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 No. 18, 16 November 2006, p.xx.

45 Commerce Commission, Input Methodologies, Electricity Distribution and Gas Pipeline Services, Reasons Paper, December 2010, p.42.

provide the opportunity for normal returns to be earned over time frames that span more than a single regulatory period.

Ofgem (UK)

Ofgem, the energy regulator in the United Kingdom, has used the term building block approach to describe a calculation of the efficient costs of operating the network, as follows:[46]

3.14. In simple terms, an ex-ante price control is calculated by estimating the required efficient costs of operating the network, including any necessary extensions and improvements and the costs of financing this expenditure, for the fixed period. The price control is set so that the net present value of allowed revenue equals the net present value of expected costs for the period. There is also an adjustment for under or over-performance in previous periods.

A.2 The meaning of the "regulatory asset base"

As indicated in the main body of the report, the task of setting prices under the building block model is often described as setting prices that provide an NPV of cash flows that equate to the RAB. This perspective is supported by statements made by economic regulators that apply the building block model.

The ACCC itself has been clear that the approach to rolling forward the asset base and the calculation of the revenue requirement work hand-in-hand. When setting out the approach it would take to electricity transmission regulation it states that these elements, working together, ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm:[47]

The building block model consists of two equations which are known as the "revenue equation" and the "asset-base roll-forward" equation. These two equations, used together, determine an allowed stream of revenues for each TNSP for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.

Another example from the ACCC arises in the context of a handbook it produced on the approach to rolling forward the regulatory asset base for the various Australian utilities it regulated.[48] In this case the ACCC recognises that as long as the rate of return on the residual RAB value at any point in time is expected to be achieved, the NPV of expected cash flows will equate to the RAB:

Rolling forward the RAB serves two purposes:

1. to establish the asset base on which a rate of return must be earned in any period; and

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46 Ofgem, 2007, Regulating Energy Networks for the Future: RPI-X@20 – History of Network Regulation, February, pp.23-24.

47 ACCC, Draft Decision, Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper, 18 August 2004, p.18.

48 ACCC, 'Post-tax revenue handbook', October 2001, p.10.

> *2. to form the basis for calculating the depreciation expense over any period.*
>
> *For consistency the depreciation in a period must equal the difference between the RAB at the start and end of the period. Further, as depreciation is intended to represent the return of capital expenditures over the life of the asset, accumulated depreciation should not exceed the initial actual capital cost of the infrastructure. Apart from this requirement not to double count, the time path for depreciation can be viewed as arbitrary. As long as the rate of return on the residual RAB value at any point in time is expected to be achieved, the NPV of expected cash flows will equate to the RAB.*

Other regulators have also made similar statements to those made by the ACCC. One of the first applications of the building block approach in Australia was by Victoria's Office of the Regulator-General, which was subsequently known as the Essential Services Commission. On this matter it notes that, in the context of a discussion on the WACC, the task is to provide a cash flow to the regulated assets that has a net present value equal to the regulatory value of the assets.[49]

> *Generally estimates of WACC are used to determine the net present value of a set of projected cash flows, and therefore to estimate the value of the asset that is producing those cash flows. The regulatory use of WACC involves a reversal of the direction of causation. That is, the value of the regulated assets is known, and the task is to provide a cash flow to the regulated assets that has a net present value equal to the regulatory value of the assets, which in turn requires a WACC to be estimated.*

The Queensland Competition Authority recently considered whether there was a case for a split cost of capital approach to apply.[50] In doing so it reflected on the current approach to the economic regulation of infrastructure businesses in Australia. The QCA recognised in its summary of the current approach that NPV=0 is a key principle of regulatory economics and requires that the present value of expected net revenues equals the value of the initial investment.[51]

> *A fundamental proposition in regulatory economics is the 'Net Present Value(NPV) = 0' principle, which requires that the present value of the regulated firm's expected net revenue stream equals the value of the initial investment, when those cash flows are discounted at the risk-adjusted, regulatory cost of capital. This principle is also known as the financial capital maintenance (FCM) principle, which in effect allows economic depreciation (the reduction in asset values between two periods) to be recovered in capital cost charges. Following directly from this principle, the regulated price should compensate the firm for its expected efficient costs, including its risk-adjusted opportunity cost of capital and a return of capital (Schmalensee 1989; Lally 2012).*

The QCA is also clear that the approach to regulation in Australia provides a strong assurance that the RAB will be fully recovered by the business through revenues earned:[52]

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49 Office of the Regulator-General, Victoria, '2001 Electricity Distribution Price Review, Cost of Capital Financing, Consultation Paper No. 4', May 1999, p.22.

50 A split cost of capital approach is a concept that seeks to recognise different components of investment may have materially different risks. In this review, the QCA found that there was not a strong case for a split cost of capital approach to apply at this time and further analysis is required.

51 QCA, 'Information Paper, The Split Cost of Capital Concept', February 2014, pp.4-5.

52 QCA, 'Information Paper, The Split Cost of Capital Concept', February 2014, p.6.

The RAB represents the current regulatory value of the regulated firm's assets. It comprises the total value of assets attributable to a regulated firm at the time of regulatory establishment, plus the allowed value of replacement and additional assets acquired or constructed since establishment, less allowed depreciation (return of capital) and disposals since establishment. In Australia the asset base is also typically indexed by the Consumer Price Index (CPI) so that it is expressed in current, depreciated value terms. Indexation of the RAB by the CPI is consistent with maintaining financial capital from a general purchasing power perspective; that is, in real general inflation-adjusted terms.

The regulatory arrangements for many regulated infrastructure businesses in Australia effectively provide strong assurance that the RAB value will be protected. Specifically, investors can be confident that there is minimal, and in most cases no material, risk that the financial value recognised in the RAB will not be fully recovered.

B. Letter of instruction

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30 September 2014

By email

Mr Jeff Balchin
Managing Director
Incenta Economic Consulting
Email jeff.balchin@incenta.com.au

Confidential and privileged

Dear Mr Balchin

Price review for Telstra declared fixed line services - cost allocation

We act for Telstra Corporation Ltd (**Telstra**), and are currently advising Telstra in relation to a review of pricing for declared fixed-line services.

As you may be aware, the Australian Competition and Consumer Commission (**ACCC**) is currently conducting a review of pricing for Telstra's declared fixed-line services (the Unconditioned Local Loop Service (**ULLS**), Line Sharing Service (**LSS**), Wholesale Line Rental (**WLR**), Local Carriage Service (**LCS**), Fixed Originating and Terminating Access (**FOAS / FTAS**), and Wholesale ADSL). At the conclusion of this inquiry the ACCC will publish final access determinations (**FADs**) for each of these services which will include (among other things) revised service prices.

In July 2014, the ACCC published a Discussion Paper in relation to its determination of revised service prices for the declared fixed line services. One of the issues raised in the Discussion Paper is the approach to be taken to cost allocation in determining the revised service prices.

Telstra is seeking your expert advice on certain issues raised in the Discussion Paper in relation to the cost allocation issue.

Background

The ULLS, LSS, WLR, LCS, PSTN OTA and WADSL are each declared services under Part XIC of the Competition and Consumer Act 2010 (Cth) (**CCA**), and as such certain access obligations apply to these services. Each of these services is also subject to FADs made by the ACCC under section 152BC of the CCA, which specify (among other things) the price terms on which Telstra is to comply with its access obligations for each service.

The current FADs for each of the declared fixed-line services were due to expire on 30 June 2014. The ACCC has therefore commenced an inquiry into making new (replacement) FADs for each of these services, and has extended the current FADs until such time as the replacement FADs take effect.

In making the replacement FADs the ACCC must take into account the matters set out in section 152BCA of the CCA, including whether its determination will promote the object of Part XIC of the CCA. The object of Part XIC of the CCA is to promote the long-term interests of end-users of carriage services or of services provided by means of carriage services.

Each of the current FADs contain fixed principles provisions, which must be maintained in any replacement FAD, at least until their nominal expiry date (30 June 2021). These fixed principles are set out in Attachment A (**FAD Fixed Principles**). The FAD Fixed Principles prescribe a 'building block model' approach to determining prices for the declared fixed-line services, and set out certain principles to be applied in giving effect to that pricing approach.

The ACCC Discussion Paper raises the issue of what approach to cost allocation should be adopted in determining revised services prices for inclusion in the replacement FADs. The Discussion Paper states that in determining current service prices, the ACCC adopted a 'partially allocated cost approach'. The Discussion Paper also noted that Telstra has proposed a different approach to allocation for the purposes of determining revised service prices – Telstra has instead proposed a 'fully allocated cost approach'.

Scope of work

We would like you to review the issues raised in relation to cost allocation in the ACCC Discussion Paper, and prepare a report setting out your expert opinion on the following matters:

1 Is the 'partially allocated cost approach' consistent with a conventional application of the 'building block model'?

2 Does the 'partially allocated cost approach' comply with the requirements of the FAD Fixed Principles?

3 Is the 'partially allocated cost approach' consistent with the object of Part XIC of the CCA?

4 Please comment on the ACCC's arguments in favour of the 'partially allocated cost approach', as set out in the Discussion Paper.

Guidelines for preparing your report

The Guidelines for Expert Witness in the Federal Court of Australia are attached to this letter (Attachment B). Telstra is seeking a rigorously prepared independent view which may be used in the context of regulatory decision making and in any subsequent review of the ACCC's final decision. Therefore you are requested to follow the Guidelines to the extent reasonably possible.

In particular, as part of any report please:

(a) identify your relevant area of expertise and provide a curriculum vitae setting out the details of that expertise;

(b) only address matters that are within your expertise;

(c) where you have used factual or data inputs please identify those inputs and the sources;

(d) if you make assumptions, please identify them as such and confirm that they are in your opinion reasonable assumptions to make;

(e) if you undertake empirical work, please identify and explain the methods used by you in a manner that is accessible to a person not expert in your field;

(f) confirm that you have made all the inquiries that you believe are desirable and appropriate and that no matters of significance that you regard as relevant have, to your knowledge, been withheld from your report; and

(g) please do not provide legal advocacy or argument and please do not use an argumentative tone.

Timing

We require a final report by 3 October 2014.

If you have any questions, please do not hesitate to contact us.

Yours sincerely

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Attachment A: FAD Fixed Principles

6. Fixed principles provisions

6.1 This clause 6 sets out fixed principles provisions that apply to the six FADs contained in this document.

6.2 The six FADs contained in this document must not be varied so as to alter or remove any of the fixed principles provisions in this clause 6 except when the ACCC is satisfied that:

(a) there is a manifest and material error in these fixed principles provisions;

(b) any information on which these fixed principles provisions was based was false or misleading in a material respect; or

(c) such amendment or adjustment is necessary or desirable to avoid an unintended consequence of these fixed principles provisions.

6.3 The below fixed principles provisions come into force on 1 July 2011.

6.4 The nominal termination date for the fixed principles provisions is 30 June 2021.

6.5 The opening regulatory asset base (RAB) for the calculation of prices for the relevant declared fixed line services is $15,515,621,288 as at 1 July 2011 (in nominal terms).

6.6 The opening tax asset value for the calculation of prices for the relevant declared fixed line services is $10,144,121,785 as at 1 July 2011 (in nominal terms).

6.7 Roll-forward mechanism

(a) The RAB is to be rolled forward each year according to the formula below:

$RAB_{t+1} = RAB_t + capex_t – depreciation_t – asset\ disposals_t$

where RAB_{t+1} = opening RAB for the next regulatory year

RAB_t = opening RAB for the current year

$capex_t$ = forecast capital expenditure during the current year

$depreciation_t$ = regulatory depreciation during the current year

$asset\ disposals_t$ = asset disposals during the current year

(b) Land asset values will be indexed by the Consumer Price Index (CPI) where it is available or by the forecast for the CPI used in the Fixed Line Services Model (FLSM) where actual CPI is not available. This will account for appreciation over time in land values.

(c) To roll forward RAB values in nominal terms, any variables that are specified in real terms will be indexed by the actual CPI where it is available or by the forecast for the CPI used in the FLSM where the actual CPI is not available.

(d) Any variables that are specified in nominal terms will not be indexed, with the exception of land values as specified above.

(e) In these fixed principles provisions 'the FLSM' means the FLSM as it may be varied from time to time or similar model used by the ACCC for the calculation of prices for the relevant declared services.

6.8 The annual revenue requirement for each regulatory period will comprise:

(a) a return on the RAB calculated by multiplying the Weighted Average Cost of Capital (WACC) by the opening RAB for the regulatory year;

(b) a return of the RAB, that is regulatory depreciation, for that regulatory year;

(c) operating expenditure forecast to be incurred in that regulatory year; and

(d) an allowance for tax liabilities.

6.9 Under a building block model (BBM) approach, forecast operating expenditures should reflect prudent and efficient costs. The following matters are relevant to whether forecast operating expenditures reflect prudent and efficient costs:

(a) the access provider's level of operating expenditure in the previous regulatory period;

(b) reasons for proposed changes to operating expenditure from one regulatory period to the next regulatory period;

(c) any relevant regulatory obligations, or changes to such obligations, applicable to providing the relevant declared fixed line services; and

(d) any other matters relevant to whether forecast operating expenditures reflect prudent and efficient costs.

6.10 Under a BBM approach, forecast capital expenditures should reflect prudent and efficient costs. The following matters are relevant to whether capital expenditure forecasts reflect prudent and efficient costs:

(a) the access provider's level of capital expenditure in the previous regulatory period;

(b) reasons for proposed changes to capital expenditure from one regulatory period to the next regulatory period;

(c) whether the access provider's asset management and planning framework reflects best practice;

(d) any relevant regulatory obligations, or changes to such obligations, applicable to providing the relevant declared fixed line services; and

(e) any other matters relevant to whether forecast capital expenditures reflect prudent and efficient costs.

6.11 Demand forecasts should:

(a) be based on an appropriate forecasting methodology;

(b) be based on reasonable assumptions about the key drivers of demand;

(c) be determined utilising the best available information before the ACCC, including historical data that can identify trends in demand; and

(d) be determined taking into account current demand and economic conditions.

6.12 Weighted average cost of capital

(a) A vanilla WACC is used to estimate the return on capital.

(b) The cost of equity is estimated using the Capital Asset Pricing Model.

6.13 Tax liabilities

(a) The tax rate used in estimating tax liabilities in the FLSM will be set equal to the corporate tax rate specified in subsection 23(2) of the *Income Tax Rates Act 1986* (Cth) as amended from time to time.

6.14 Cost allocation factors

(a) The allocation of the costs of operating the PSTN should reflect the relative usage of the network by various services.

(b) Direct costs should be attributed to the service to which they relate.

The cost allocation factors for shared costs should reflect causal relationships between supplying services and incurring costs.

(c) No cost should be allocated more than once to any service

(d) The determination of cost allocation factors should reflect the principles in 6.14 (a) – (c) above except where reliable information is not available to support the application of the principles.

6.15 The matters set out in the fixed principles provisions at clauses 6.7 – 6.14 inclusive are subject to assessment, calculation, implementation and/or application, as relevant, by the ACCC in making interim and final access determinations for the relevant declared services.

Attachment B: Federal Court guidelines for expert witnesses

Practice Note CM 7: Expert witnesses in proceedings in the Federal Court of Australia

Guidelines

1. General Duty to the Court[1]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert's Report[2]

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and

(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and

(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and

(d) identify the questions that the expert was asked to address; and

(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and

(f) set out separately from the factual findings or assumptions each of the expert's opinions; and

(g) set out the reasons for each of the expert's opinions; and

(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[3]; and

(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the Court."

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[1] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

[2] Rule 23.13.

[3] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[4].

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[5].

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

[4] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

[5] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

C. Curriculum vitae for Jeffrey John Balchin

Jeff Balchin

Managing Director

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Jeff is the Managing Director of Incenta Economic Consulting. Jeff has 20 years of experience in relation to economic regulation issues across the electricity, gas, ports, airports, rail, water and telecommunications sectors in Australia and New Zealand. He has advised governments, regulators and major corporations on issues including the development of regulatory frameworks, regulatory price reviews and issues around the introduction and measurement of competition (including franchise bidding). His particular specialities have been on the application of finance principles to economic regulation, the design of incentive compatible regulation and efficient tariff structures and the drafting and economic interpretation of regulatory instruments.

In addition, Jeff has substantial experience with the application of economic and finance principles to pricing and investment appraisal and associated commercial disputes in unregulated infrastructure and non-infrastructure markets. He has also assisted with applying economic principles to transfer pricing.

Jeff has undertaken a number of expert witness assignments.

Past positions

Jeff previously was a Principal at PwC in its economics and policy team for almost 4 years, prior to that a director and partner at the Allen Consulting Group for over 13 years, and prior that he held a number of policy positions in the Commonwealth Government. In this latter role, he was on the secretariat of the Gas Reform Task Force (1995-1996), where he played a lead role in the development of the National Gas Code.

Relevant experience

A. Economic regulation of network / monopoly activities

Assistance to parties during price reviews/negotiations

- Regulatory valuation of telecommunications local loop assets (Client: Chorus, 2014) – prepared a report advising on the appropriate valuation of local loop assets for the purpose of deriving a TSLRIC price for unbundled local loop access.
- Design of incentives for operating expenditure efficiency (Client: ElectraNet, 2012-13) – provided expert advice on the detailed application of the incentive arrangements for operating expenditure, including the link between the incentive scheme and the forecasting method.
- Regulatory depreciation (Client: APA, 2012-13) – provided expert reports on the economic principles relevant to the depreciation method that is applied to set gas transmission charges.
- Regulatory cost of debt (Clients: Powerlink, ElectraNet and Victorian gas distributors 2011-2012) – provided a series of reports addressing how the benchmark cost of debt should be established pursuant to the National Electricity Rules and on the appropriate benchmark allowance for debt and equity raising costs.
- Real cost escalation (Client: Energex, 2009-10) – advised Energex on appropriate escalators to apply to forecasts of operating and capital expenditure over the regulatory period.

- Strategic advice, Victorian electricity distribution review and NSW gas distribution review (Client: Jemena Electricity Networks, 2009-2011) – retained as strategic adviser during the review and also provided advice on a range of technical regulatory economic issues, including on regulatory finance matters, service incentives, party contracts, allocation of costs between regulated and unregulated activities and forecasting of expenditure.
- Regulatory cost of debt (Client: Powercor Australia Limited, 2009-2010) – provided a series of reports addressing how the benchmark cost of debt should be established pursuant to the National Electricity Rules.
- Service incentive scheme (Client: Powercor Australia Limited, 2010) – assisted Powercor to quantify the financial effect that would have flowed if the former service performance incentive scheme had continued. Also prepared an expert report pointing to a material inconsistency in how the AER intended to close out the old scheme and the parameters for the new service performance incentive scheme, which was accepted by the AER.
- Input methodologies for NZ regulated businesses (Clients: Powerco NZ and Christchurch International Airport, 2009-2012) – advised in relation to the Commerce Commission's development of input methodologies, focussing asset valuation, the regulatory cost of capital, the use of productivity trends in regulation and the design of incentive-compatible regulation. Also assisted in briefing counsel in subsequent reviews.
- Commercial negotiation of landing charges (Client: Virgin Blue, 2009-2012) – economic advice to Virgin Blue during its commercial negotiation of landing charges to a number of major and secondary airports.
- Equity Betas for Regulated Electricity Transmission Activities (Client: Grid Australia, APIA, ENA, 2008) – Prepared a report presenting empirical evidence on the equity betas for regulated Australian electricity transmission and distribution businesses for the AER's five yearly review of WACC parameters for these industries. The report demonstrated the implications of a number of different estimation techniques and the reliability of the resulting estimates. Also prepared a joint paper with the law firm, Gilbert+Tobin, providing an economic and legal interpretation of the relevant (unique) statutory guidance for the review.
- Economic Principles for the Setting of Airside Charges (Client: Christchurch International Airport Limited, 2008-2013) – Provided advice on a range of economic issues relating to its resetting of charges for airside services, including the valuation of assets and treatment of revaluations, certain inputs to the cost of capital (beta and the debt margin) and the efficiency of prices over time and the implications for the depreciation of assets and measured accounting profit.
- Treatment of Inflation and Depreciation when Setting Landing Charges (Client: Virgin Blue, 2007 2008) – Provided advice on Adelaide Airport's proposed approach for setting landing charges for Adelaide Airport, where a key issue was how it proposed to deal with inflation and the implications for the path of prices over time. The advice also addressed the different formulae that are available for deriving an annual revenue requirement and the requirements for the different formulae to be applied consistently.
- Application of the Grid Investment Test to the Auckland 400kV Upgrade (Client: Electricity Commission of New Zealand, 2006) - As part of a team, undertook a review of the Commission's process for reviewing Transpower's proposed Auckland 400kV upgrade project and undertook a peer review of the Commission's application of the Grid Investment Test.

- Appropriate Treatment of Taxation when Measuring Regulatory Profit (Client: Powerco New Zealand, 2005 2006) - Prepared a series of statements on how taxation should be treated when measuring realised and projected regulatory profit.
- Application of Directlink for Regulated Status (Client: Directlink, 2003-2004) – Prepared advice on the economic efficiency of the conversion of an unregulated (entrepreneurial) interconnector to a regulated interconnector and how the asset should be valued for pricing purposes.
- Principles for the 'Stranding' of Assets by Regulators (Client: the Independent Pricing and Regulatory Tribunal, NSW, 2005) - Prepared a report discussing the relevant economic principles for a regulator in deciding whether to 'strand' assets for regulatory purposes (that is, to deny any further return on assets that are partially or unutilised).
- Principles for Determining Regulatory Depreciation Allowances (Client: the Independent Pricing and Regulatory Tribunal, NSW, 2003) - Prepared a report discussing the relevant economic and other principles for determining depreciation for the purpose of price regulation, and its application to electricity distribution. An important issue addressed was the distinction between accounting and regulatory (economic) objectives for depreciation.
- Methodology for Updating the Regulatory Value of Electricity Transmission Assets (Client: the Australian Competition and Consumer Commission, 2003) - Prepared a report assessing the relative merits of two options for updating the regulatory value of electricity transmission assets at a price review - which are to reset the value at the estimated 'depreciated optimised replacement cost' value, or to take the previous regulatory value and deduct depreciation and add the capital expenditure undertaken during the intervening period (the 'rolling-forward' method). This paper was commissioned as part of the ACCC's review of its Draft Statement of Regulatory Principles for electricity transmission regulation.
- Application of Murraylink for Regulated Status (Client: Murraylink Transmission Company, 2003) – Prepared advice on the economic efficiency of the conversion of an unregulated (entrepreneurial) interconnector to a regulated interconnector and how the asset should be valued for pricing purposes.
- Proxy Beta for Regulated Gas Transmission Activities (Client: the Australian Competition and Consumer Commission, 2002) - Prepared a report presenting the available empirical evidence on the 'beta' (which is a measure of risk) of regulated gas transmission activities. This evidence included beta estimates for listed firms in Australia, as well as those from the United States, Canada and the United Kingdom. The report also included a discussion of empirical issues associated with estimating betas, and issues to be considered when using such estimates as an input into setting regulated charges.
- Treatment of Working Capital when setting Regulated Charges (Client: the Australian Competition and Consumer Commission, 2002) - Prepared a report assessing whether it would be appropriate to include an explicit (additional) allowance in the benchmark revenue requirement in respect of working capital when setting regulated charges.
- Pricing Principles for the South West Pipeline (Client: Esso Australia, 2001) - As part of a team, prepared a report describing the pricing principles that should apply to the South West Pipeline (this gas transmission pipeline was a new asset, linking the existing system to a new storage facility and additional gas producers).
- Likely Regulatory Outcome for the Price for Using a Port (Client: MIM, 2000) - Provided advice on the outcome that could be expected were the dispute over the price for the use of a major port to be resolved by an economic regulator. The main issue of contention was the valuation of the port

assets (for regulatory purposes) given that the installed infrastructure was excess to requirements, and the mine had a short remaining life.

- Relevance of 'Asymmetric Events' in the Setting of Regulated Charges (Client: TransGrid, 1999) - In conjunction with William M Mercer, prepared a report (which was submitted to the Australian Competition and Consumer Commission) discussing the relevance of downside (asymmetric) events when setting regulated charges, and quantifying the expected cost of those events.

Major roles for regulators

- Aurizon Network price review (Client: Queensland Competition Authority, 2013-14) – advised the QCA on the appropriate rate of return (discount rate) for the Aurizon Network business, which included an assessment of the relative risk of Aurizon Network compared to other infrastructure sectors, advice on the appropriate benchmark gearing level and on the benchmark debt interest rate.
- Victorian Gas Distribution Price Review (Client: the Essential Services Commission, Vic, 2006 2008) - Provided advice to the Essential Service Commission in relation to its review of gas distribution access arrangements on the treatment of outsourcing arrangements, finance issues, incentive design and other economic issues.
- Envestra Gas Distribution Price Review (Client: the Essential Services Commission, SA, 2006) - Provided advice on several finance related issues (including 'return on assets' issues and the financial effect of Envestra's invoicing policy), and the treatment of major outsourcing contracts when setting regulated charges.
- DBCT price review (Client: QCA, Qld, 2004-2006) – advice on a number of finance related issues, including the calculation of IDC for a DORC valuation, cost of debt and equity beta.
- Victorian Electricity Distribution Price Review (Client: the Essential Services Commission, Vic, 2003 2005) - Provided advice to the Essential Service Commission on a range is economic issues related to current review of electricity distribution charges, including issues related to finance, forecasting of expenditure and the design of incentive arrangements for productive efficiency and service delivery. Was a member of the Steering Committee advising on strategic regulatory issues.
- Victorian Water Price Review (Client: the Essential Services Commission, Vic, 2003 2005) - Provided advice to the Essential Services Commission on the issues associated with extending economic regulation to the various elements of the Victorian water sector. Was a member of the Steering Committee advising on strategic regulatory issues, and also provided advice on specific issues, most notably the determination of the initial regulatory values for the water businesses and the role of developer charges.
- ETSA Electricity Distribution Price Review (Client: the Essential Services Commission, SA, 2002 2005) - Provided advice on the 'return on assets' issues associated with the review of ETSA's regulated distribution charges, including the preparation of consultation papers. The issues covered include the valuation of assets for regulatory purposes and cost of capital issues. Also engaged as a quality assurance adviser on other consultation papers produced as part of the price review.
- Victorian Gas Distribution Price Review (Client: the Essential Services Commission, Vic, 2001 2002) - Economic adviser to the Essential Services Commission during its assessment of the price caps and other terms and conditions of access for the three Victorian gas distributors. Was responsible for all issues associated with capital financing (including analysis of the cost of capital and assessment of risk generally, and asset valuation), and supervised the financial modelling and derivation of regulated charges. Also advised on a number of other issues, including the design of

incentive arrangements, the form of regulation for extensions to unreticulated townships, and the principles for determining charges for new customers connecting to the system.

- ETSA Electricity Distribution Price Review (Client: the South Australian Independent Industry Regulator, 2000 2001) - As part of a team, prepared a series of reports proposing a framework for the review. The particular focus was on the design of incentives to encourage cost reduction and service improvement, and how such incentives can assist the regulator to meet its statutory obligations. Currently retained to provide commentary on the consultation papers being produced by the regulator, including strategic or detailed advice as appropriate.
- Dampier to Bunbury Natural Gas Pipeline Access Arrangement Review (Client: the Independent Gas Pipelines Access Regulator, WA, 2000 2002) - Provided economic advice to the Office of the Independent Regulator during its continuing assessment of the regulated charges and other terms and conditions of access for the gas pipeline, including a review of all parts of the draft decision, with particular focus on the sections addressing the cost of capital (and assessment of risk generally), asset valuation and financial modelling. Represented the Office on these matters at a public forum, and provided strategic advice to the Independent Regulator on the draft decision.
- Goldfield Gas Pipeline Access Arrangement Review (Client: the Independent Gas Pipelines Access Regulator, WA, 2000 2004) - Provided economic advice to the Office of the Independent Regulator during its continuing assessment of the regulated charges and other terms and conditions of access for the gas pipeline, including a review of all parts of the draft decision, with particular focus on the sections addressing the cost of capital (and assessment of risk generally), asset valuation and financial modelling. Represented the Office on these matters at a public forum, and provided strategic advice to the Independent Regulator on the draft decision.
- Victorian Electricity Distribution Price Review (Client: the Office of the Regulator General, Vic, 1999 2000) - Economic adviser to the Office of the Regulator General during its review of the price caps for the five Victorian electricity distributors. Had responsibility for all issues associated with capital financing, including analysis of the cost of capital (and assessment of risk generally) and asset valuation, and supervised the financial modelling and derivation of regulated charges. Also advised on a range of other issues, including the design of incentive regulation for cost reduction and service improvement, and the principles for determining charges for new customers connecting to the system.
- Victorian Ports Corporation and Channels Authority Price Review (Client: the Office of the Regulator General, Vic, 2000) - Advised on the finance related issues (cost of capital and the assessment of risk generally, and asset valuation), financial modelling (and the derivation of regulated charges), and on the form of control set over prices. Principal author of the sections of the draft and final decision documents addressing the finance related and price control issues.
- AlintaGas Gas Distribution Access Arrangement Review (Client: the Independent Gas Pipelines Access Regulator, WA, 1999 2000) - Provided economic advice to the Office of the Independent Regulator during its assessment of the regulated charges and other terms and conditions of access for the gas pipeline. This advice included providing a report assessing the cost of capital associated with the regulated activities, overall review of all parts of the draft and final decisions, with particular focus on the sections addressing the cost of capital (and assessment of risk generally), asset valuation and financial modelling. Also provided strategic advice to the Independent Regulator on the draft and final decisions.
- Parmelia Gas Pipeline Access Arrangement Review (Client: the Independent Gas Pipelines Access Regulator, WA, 1999 2000) - Provided economic advice to the Office of the Independent Regulator during its assessment of the regulated charges and other terms and conditions of access for the gas pipeline, including a review of all parts of the draft and final decisions, with particular

focus on the sections addressing the cost of capital (and assessment of risk generally), asset valuation and financial modelling. Also provided strategic advice to the Independent Regulator on the draft and final decisions.

- Victorian Gas Distribution Price Review (Client: the Office of the Regulator General, Vic, 1998) - Economic adviser to the Office of the Regulator General during its assessment of the price caps and other terms and conditions of access for the three Victorian gas distributors. Major issues addressed included the valuation of assets for regulatory purposes, cost of capital financing and financial modelling. Principal author of the draft and final decision documents.

Development/Review of Regulatory Frameworks

- Review of the Australian energy economic regulation (Client: Energy Networks Association, 2010-2012) – assisting the owners of energy infrastructure to engage in the current wide-ranging review of the regime for economic regulation of energy infrastructure. Advice has focussed in particular on the setting of the regulatory WACC and on the regime of financial incentives for capital expenditure efficiency, and included strategic and analytical advice, preparation of expert reports and assistance with ENA submissions.
- Review of the Australian electricity transmission framework (Client: Grid Australia, 2010-2013) – assisting the owners of electricity transmission assets to participate in the wide-ranging review of the framework for electricity transmission in the national electricity market, covering such matters as planning arrangements, the form of regulation for non-core services and generator capacity rights and charging. Has included analytical advice on policy choices, facilitation of industry positions and articulation of positions in submissions.
- Implications of greenhouse policy for the electricity and gas regulatory frameworks (Client: the Australian Energy Market Commission, 2008-2009) – Provided advice to the AEMC in its review of whether changes to the electricity and gas regulatory frameworks is warranted in light of the proposed introduction of a carbon permit trading scheme and an expanded renewables obligation. Issues addressed include the framework for electricity connections, the efficiency of the management of congestion and locational signals (including transmission pricing) for generators and the appropriate specification of a cost benefit test for transmission upgrades in light of the two policy initiatives.
- Economic incentives under the energy network regulatory regimes for demand side participation (Client: Australian Energy market Commission, 2006) – Provided advice to the AEMC on the incentives provided by the network regulatory regime for demand side participation, including the effect of the form of price control (price cap vs. revenue cap), the cost-efficiency arrangements, the treatment of losses and the regime for setting reliability standards.
- Implications of greenhouse policy for the electricity and gas regulatory frameworks (Client: the Australian Energy Market Commission, 2008) - Provided advice to the AEMC in its review of whether changes to the electricity and gas regulatory frameworks is warranted in light of the proposed introduction of a carbon permit trading scheme and an expanded renewables obligation. Issues addressed include the framework for electricity connections, the efficiency of the management of congestion and locational signals for generators and the appropriate specification of a cost benefit test for transmission upgrades in light of the two policy initiatives.
- Application of a 'total factor productivity' form of regulation (Client: the Victorian Department of Primary Industries, 2008) - Assisted the Department to develop a proposed amendment to the regulatory regime for electricity regulation to permit (but not mandate) a total factor productivity approach to setting price caps – that is, to reset prices to cost at the start of the new regulatory

period and to use total factor productivity as an input to set the rate of change in prices over the period.

- Expert Panel on Energy Access Pricing (Client: Ministerial Council on Energy, 2005 2006) - Assisted the Expert Panel in its review of the appropriate scope for commonality of access pricing regulation across the electricity and gas, transmission and distribution sectors. The report recommended best practice approaches to the appropriate forms of regulation, the principles to guide the development of detailed regulatory rules and regulatory assessments, the procedures for the conduct of regulatory reviews and information gathering powers.
- Productivity Commission Review of Airport Pricing (Client: Virgin Blue, 2006) - Prepared two reports for Virgin Blue for submission to the Commission's review, addressing the economic interpretation of the review principles, asset valuation, required rates of return for airports and the efficiency effects of airport charges and presented the findings to a public forum.
- AEMC Review of the Rules for Setting Transmission Prices (Client: Transmission Network Owners, 2005 2006) - Advised a coalition comprising all of the major electricity transmission network owners during the new Australian Energy Market Commission's review of the rules under which transmission prices are determined. Prepared advice on a number of issues and assisted the owners to draft their submissions to the AEMC's various papers.
- Advice on Energy Policy Reform Issues (Client: Victorian Department of Infrastructure/Primary Industries, 2003 ongoing) - advice to the Department regarding on issues relating to the transition to national energy market arrangements, cross ownership rules for the energy sector, the reform of the cost benefit test for electricity transmission investments and the scope for lighted handed regulation in gas transmission.
- Productivity Commission Review of the National Gas Code (Client: BHPBilliton, 2003 2004) - Produced two submissions to the review, with the important issues including the appropriate form of regulation for the monopoly gas transmission assets (including the role of incentive regulation), the requirement for ring fencing arrangements, and the presentation of evidence on the impact of regulation on the industry since the introduction of the Code.
- Development of the National Third Party Access Code for Natural Gas Pipeline Systems Code (Client: commenced while a Commonwealth Public Servant, after 1996 the Commonwealth Government, 1994-1997) - Was involved in the development of the new legal framework for the economic regulation of gas transmission and distribution systems, with advice spanning the overall form of regulation to apply to the infrastructure and the appropriate pricing principles (including the valuation of assets for regulatory purposes and the use of incentive regulation), ring fencing arrangements between monopoly and potentially contestable activities, and whether upstream infrastructure should be included within the regime.

Licencing / Franchise Bidding

- Competitive Tender for Gas Distribution and Retail in Tasmania (Client: the Office of the Tasmanian Energy Regulator, 2001 2002) - Economic adviser to the Office during its oversight of the use of a competitive tender process to select a gas distributor/retailer for Tasmania, and simultaneously to set the regulated charges for an initial period.
- Issuing of a Licence for Powercor Australia to Distribute Electricity in the Docklands (Client: the Office of the Regulator General, Vic, 1999) - Economic adviser to the Office during its assessment of whether a second distribution licence should be awarded for electricity distribution in the Docklands area (a distribution licence for the area was already held by CitiPower, and at that time, no area in the state had multiple licensees). The main issue concerned the scope for using

'competition for the market' to discipline the price and service offerings for an activity that would be a monopoly once the assets were installed.

Assessments of the degree and prospects for competition / need for regulation

- Transmission connection assets (Client: Grid Australia, 2012) – prepared an assessment of the degree of competition in the provision of transmission connection assets, which included advice on the market within which the service is provided and an assessment of the degree of rivalry (including the prospects for entry) in that market.
- South East network (Client: Kimberley Clarke, 2011) – advised whether the gas pipeline from which it is supplied would pass the threshold for regulation.
- Pilbara rail access (Client: BHP Billiton) – assisted in the preparation of expert evidence on whether the Pilbara rail infrastructure passed the test for declaration of essential infrastructure, with specific focus on the analysis of whether there would be a promotion of competition in other markets from the granting of access.
- Need for regulation of gas transmission pipelines (Client: SA Government) – advised as to whether the Moomba to Adelaide pipeline was likely to pass the threshold required for regulation under the Gas Code, focussing upon an assessment of the degree of competition for its services.

B. Pricing in non-infrastructure markets

Assessment of competition in energy retail markets

- Assessment of retail competition in Victoria and South Australia (Client: Australian Energy Market Commission) – assisted the Commission to quantity and interpret information on margins for retailers and to draw inferences about the level of competition. Also provided a peer review of the Commission's overall assessment of the level of competition, including the Commission's overall analytical framework and the other indicators it considered.

Default/transitional regulated prices for retail functions

- ACT transitional tariff review (Client: ICRC, ACT, 2010) – advised the regulator on an appropriate method to derive a benchmark wholesale electricity purchase cost for an electricity retailer, including the relationship between the wholesale cost and hedging strategy.
- South Australian default gas retail price review (Client: the Essential Services Commission, SA, (2007-2008) – derived estimates of the benchmark operating costs for a gas retailer and the margin that should be allowed. This latter exercise included a bottom-up estimate of the financing costs incurred by a gas retail business.
- South Australian default electricity retail price review (Client: the Essential Services Commission, SA, 2007) - estimated the wholesale electricity purchase cost for the default electricity retail supplier in South Australia. The project involved the development of a model for deriving an optimal portfolio of hedging contracts for a prudent and efficient retailer, and the estimate of the expected cost incurred with that portfolio.
- South Australian default gas retail price review (Client: the Essential Services Commission, SA, 2005) - As part of a team, advised the regulator on the cost of purchasing gas transmission services for a prudent and efficient SA gas retailer, where the transmission options included the use of the Moomba Adelaide Pipeline and SEAGas Pipeline, connecting a number of gas production sources.

Market Design

- Options for the Development of the Australian Gas Wholesale Market (Client: the Ministerial Committee on Energy, 2005) - As part of a team, assessed the relative merits of various options for enhancing the operation of the Australian gas wholesale markets, including by further dissemination of information (through the creation of bulletin boards) and the management of retailer imbalances and creation of price transparency (by creating short term trading markets for gas).
- Review of the Victorian Gas Market (Client: the Australian Gas Users Group, 2000 2001) - As part of a team, reviewed the merits (or otherwise) of the Victorian gas market. The main issues of contention included the costs associated with operating a centralised market compared to the potential benefits, and the potential long term cost associated with having a non-commercial system operator.
- Development of the Market and System Operation Rules for the Victorian Gas Market (Client: Gas and Fuel Corporation, 1960) - Assisted with the design of the 'market rules' for the Victorian gas market. The objective of the market rules was to create a spot market for trading in gas during a particular day, and to use that market to facilitate the efficient operation of the system.

Transfer pricing

- Application of a netback calculation for infrastructure under the Minerals Resource Rent Tax (Client: BHPB, 2011-13) – advised on how the arms-length price for the use of downstream infrastructure should be determined, including the valuation of assets, weighted average cost of capital and on the implications for the price of incentive compatible contracts.

Pricing strategy

- Pricing for telephone directory services (Sensis, 2012) – as part of a team, advised on how margins could be maximised for the telephone directory business in the context of falling print advertising and a very competitive digital market, informed by the application of econometric techniques.
- Effectiveness of promotional strategies (Target, 2011-12) – as part of a team, applied econometric techniques to assess the effectiveness of Target's promotional strategies, with tools developed for management to improve profitability.
- Optimal pricing (Client: Coles, 2011-12) – applied econometric techniques to assist Coles to set relativities of prices within "like" products and developed a method to test the effectiveness of promotional strategies.

C. Regulatory due diligence and other finance work

- Sale of the Sydney Desalination Plant (Client: a consortium of investors, 2011-12) – Prepared a regulatory due diligence report for potential acquirer of the asset, including a review of the financial modelling of future pricing decisions.
- Sale of the Abbot Point Coal Terminal port (Client: a consortium of investors / debt providers, 2010-11) – Prepared a regulatory due diligence report for potential acquirer of the asset, including a review of the financial modelling of future pricing decisions.
- Private Port Development (Client: Major Australian Bank, 2008) - Prepared a report on the relative merits of different governance and financing arrangements for a proposed major port development that would serve multiple port users.

- Sale of Allgas gas distribution network (Client: confidential, 2006) – Prepared a regulatory due diligence report for potential acquirer of the asset.
- Review of Capital Structure (Client: major Victorian water entity, 2003) - Prepared a report (for the Board) advising on the optimal capital structure for a particular Victorian water entity, taking account of the likely impact of cost based regulation.

D. Expert Witness Roles

- Abbot Point Coal Terminal Pricing Arbitration (Client: Adani, 2013) – Prepared a number of expert reports for the arbitration on economic issues arising from the application of the cost-based formula in the pricing agreement, including the economic meaning of key terms, the valuation of assets (and specifically the role and calculation of interest during construction), the quantification of transaction costs of raising finance and the calculation of the required rate of return (most notably, the benchmark cost of debt finance).
- New Zealand Input Methodologies (Clients: Powerco and Christchurch International Airport Limited, 2009-2012) – Prepared expert report for both clients on a range of economic issues, including the valuation of assets, weighted average cost of capital, cost allocation, the regulatory treatment of taxation and interpretation of the new purpose statement in the Commerce Act. Appeared as an expert before the Commerce Commission in the key conferences held during the review. Also assisted the clients in their subsequent merit reviews of the Commission's decision.
- Victorian gas market dispute resolution panel (Client: VENCorp, 2008) – Prepared a report and was cross examined in relation to the operation of the Victorian gas market in the presence of supply outages.
- Consultation on Major Airport Capital Expenditure Judicial Review (Client: Christchurch International Airport, 2008) - Prepared an affidavit for a judicial review on whether the airport consulted appropriately on its proposed terminal development. Addressed the rationale, from the point of view of economics, of separating the decision of 'what to build' from the question of 'how to price' in relation to new infrastructure.
- New Zealand Commerce Commission Draft Decision on Gas Distribution Charges (Client: Powerco, 2007 08) - Prepared an expert statement about the valuation of assets for regulatory purposes, with a focus on the treatment of revaluation gains, and a memorandum about the treatment of taxation for regulatory purposes and appeared before the Commerce Commission.
- Sydney Airport Domestic Landing Change Arbitration (Client: Virgin Blue, 2007) - Prepared two expert reports on the economic issues associated with the structure of landing charges (note: the evidence was filed, but the parties reached agreement before the case was heard).
- New Zealand Commerce Commission Gas Price Control Decision – Judicial Review to the High Court (Client: Powerco, 2006) - Provided four affidavits on the regulatory economic issues associated with the calculation of the allowance for taxation for a regulatory purpose, addressing in particular the need for consistency in assumptions across different regulatory calculations.
- Victorian Electricity Distribution Price Review – Appeal to the ESC Appeal Panel: Service Incentive Risk (Client: the Essential Services Commission, Vic, 2005 2006) - Prepared expert evidence on the workings of the ESC's service incentive scheme and the question of whether the scheme was likely to deliver a windfall gain or loss to the distributors (note: the evidence was filed, but the appellant withdrew this ground of appeal prior to the case being heard).
- Victorian Electricity Distribution Price Review – Appeal to the ESC Appeal Panel: Price Rebalancing (Client: the Essential Services Commission, Vic, 2005 2006) - Prepared expert

evidence on the workings of the ESC's tariff basket form of price control, with a particular focus on the ability of the electricity distributors to rebalance prices and the financial effect of the introduction of 'time of use' prices in this context (note: the evidence was filed, but the appellant withdrew this ground of appeal prior to the case being heard).

- New Zealand Commerce Commission Review of Information Provision and Asset Valuation (Client: Powerco New Zealand, 2005) - Appeared before the Commerce Commission for Powerco New Zealand on several matters related to the appropriate measurement of profit for regulatory purposes related to its electricity distribution business, most notably the treatment of taxation in the context of an incentive regulation regime.
- Duke Gas Pipeline (Qld) Access Arrangement Review – Appeal to the Australian Competition Tribunal (Client: the Australia Competition and Consumer Commission, 2002) - Prepared expert evidence on the question of whether concerns of economic efficiency are relevant to the non price terms and conditions of access (note: the evidence was not filed as the appellant withdrew its evidence prior to the case being heard).
- Victorian Electricity Distribution Price Review – Appeal to the ORG Appeal Panel: Rural Risk (Client: the Office of the Regulator General, Vic, 2000) - Provided expert evidence (written and oral) to the ORG Appeal Panel on the question of whether the distribution of electricity in the predominantly rural areas carried greater risk than the distribution of electricity in the predominantly urban areas.
- Victorian Electricity Distribution Price Review – Appeal to the ORG Appeal Panel: Inflation Risk (Client: the Office of the Regulator General, Vic, 2000) - Provided expert evidence (written and oral) to the ORG Appeal Panel on the implications of inflation risk for the cost of capital associated with the distribution activities.

Qualifications and memberships

- Bachelor Economics (First Class Honours) University of Adelaide
- CEDA National Prize for Economic Development