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By email: submissions@aemc.gov.au

Dear Dr Tamblyn

2 March 2010

Review into the use of Total Factor Productivity for the determination of prices and revenues – Preliminary Findings

Thank you for the opportunity to comment on the Preliminary Findings that the Commission has made in its review into the use of total factor productivity (TFP) for the determination of process and revenues.

The Preliminary Findings document provides a valuable insight into the Commission's current thinking on the wide range of issues that are relevant to any decision to proceed with TFP regulation. On the basis of those findings there appears to be a case for developing the TFP alternative further. Having said that, and as we have stated in previous submissions, it is only when the TFP alternative is fully specified and understood that businesses will be able to make an informed decision whether TFP is an attractive option.

Our position throughout the consultation has been and continues to be that the decision to opt in to TFP regulation must be one for the regulated business alone to make because the change from building blocks is potentially so significant for a business. We are pleased that the Commission's Preliminary Findings support that position.

The Commission refers to the possibility that service providers' perceptions of TFP may be affected by the changes that are likely to occur in the industry before TFP can be implemented, and the possibility that no service provider may opt in. The Commission goes on to suggest that it may be appropriate to consider whether there are amendments, or other alternatives, to the current form of the building block approach that could address its deficiencies and improve regulatory outcomes. The Commission invites comments on a report by the Brattle Group which outlines some of the amendments and alternatives that might be considered.

Jemena supports the orderly evolution of energy regulation in ways that advance the national gas and electricity objectives, and the Brattle Group report describes a number of options that warrant consideration. Jemena referred to one of those options-the glide-path-in a previous submission. However, the industry and other stakeholders are still coming to terms with the most recent changes to the gas and electricity regimes and so, in Jemena's view, it is premature to be considering another wholesale review. Any issues that arise in the meantime can be dealt with through existing governance structures and rule change processes.

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As to the specifics of the Commission's Preliminary Findings, our principal observations can be summarised as follows:

- In Jemena's view, the analysis presented in section 2.1 of the Preliminary Findings document does not necessarily support the Commission's unqualified conclusion that a TFP methodology will increase the incentive for service providers to be innovative and seek cost efficiencies compared to the current building block approach. Further analysis and some qualification appears warranted.
- The consequences of an error in setting the initial price for a regulatory period can be at least as significant in present value terms as an error in setting X. We encourage the Commission to clarify its position on the criteria and process that should be used to determine the initial price for a regulatory period under TFP.
- If it is accepted that 8 years' data is required before TFP can be offered as an option, there is no need to proceed now to develop rules to enable implementation of TFP. Phase 2 of the review can and should be deferred for at least five years.
- We have concerns about the Commission's preliminary findings in relation to regulatory depreciation where the Commission suggests that the introduction of TFP could require changes to the way in which depreciation is managed under building blocks.

These and other matters are discussed in detail in the attached submission.

Yours sincerely

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Submission in response to AEMC Preliminary Findings on application of Total Factor Productivity regulation

26 February 2010

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Jemena submission in response to AEMC Preliminary Findings on applicability of Total Factor Productivity regulation

1 Introduction

Jemena makes this submission in response to the Preliminary Findings paper published by the AEMC in connection with its review into the use of total factor productivity (TFP) for the determination of process and revenues.

The Preliminary Findings document provides a valuable insight into the Commission's current thinking on the wide range of issues that are relevant to any decision to proceed with TFP regulation. On the basis of those findings there appears to be a case for developing the TFP alternative further. Having said that, and as we have stated in previous submissions, it is only when the TFP alternative is fully specified and understood that businesses will be able to make an informed decision about the TFP option.

In the submission that follows we comment on a number of specific aspects of the Preliminary Findings under the following headings:

- Preconditions for earning a reasonable rate of return and recovering efficient costs under TFP
- Incentive properties of TFP regulation
- Basis for setting the initial price cap at each review
- Information asymmetry
- Reliance on forecasts
- Timing of Phase 2
- Enabling data collection
- Standardised depreciation
- Application to transmission.

Preconditions for earning a reasonable rate of return and recovering efficient costs under TFP

The Commission, in summarising the TFP methodology, makes the statement that:

Under a TFP methodology, if the:

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- initial cap is set to recover the efficient level of costs (including capital funding costs), and
- historical TFP growth rate reflects productivity growth that can be expected going forward,

then the service provider should be able to earn a reasonable rate of return and recover efficient costs.¹

We agree in principle with the two pre-conditions that the Commission sets for a service provider to earn a reasonable rate of return and recover efficient costs under TFP regulation. However, we believe they should be refined as follows:

- initial cap is set to recover <u>at least</u> the efficient level of costs (including capital funding costs), and
- historical <u>industry average</u> TFP growth rate reflects the <u>industry</u> <u>average</u> productivity growth that can be expected going forward

The Commission makes the case in its Preliminary Findings that the first two pre-conditions can be satisfied by a properly designed TFP regime leading to the conclusion that a TFP regime can satisfy the National Objectives. However, even with the changes suggested above, the statement cannot hold for all service providers. Given that the historical industry average TFP growth rate is an average for all businesses in the data pool, there must be some businesses that have a lower growth rate than the average and others with growth rates above the average.

Given that the statement is specific to "the service provider", this suggests a need to consider adding a third pre-condition, or replacing the second pre-condition with:

 it is reasonable to assume that the service provider is in a position to achieve productivity growth at least equal to the historical industry average TFP growth rate.

¹ Preliminary Findings, p3.

The Commission recognises this requirement, and the possibility that it may not be satisfied for individual businesses, on pages 37 and 38 of the Preliminary Findings document. The question of whether a particular business can satisfy the requirement is clearly business-specific and so cannot be analysed in general in the way that the first two pre-conditions can.

It is likely that there will be particular businesses which, because of their operating environments, the technology that is embedded in their sunk assets or other factors, and despite their best endeavours, are unable to match let alone out-perform the industry average growth rate. It follows that it would be inconsistent with the National Objective and Pricing Principles for such businesses to be subject to TFP regulation.

While off-ramps and firm-specific adjustments may go some way to addressing the problem, the solution is to ensure that the decision to opt in to TFP regulation is one for the regulated business alone to make. It should also be for the business alone to make the decision to revert to building blocks. If that is not the case, and the decision to permit a business to revert to building blocks is to be made by the regulator, then that decision must be reviewable.

3 Incentive properties of TFP regulation

The Commission reaches an unqualified conclusion that:

A TFP methodology will increase the incentive for service providers to be innovative and seek cost efficiencies compared to the current building block approach.²

This conclusion follows from the analysis reported in Section 2.1 of the Preliminary Findings document and provides the basis for the overall preliminary finding that the review should proceed to Phase 2.

In Jemena's view the analysis reported in Section 2.1 should be extended and the conclusion qualified. In particular, outcomes for service providers, and hence the incentive properties of TFP regulation, will be determined by the overall design of the scheme. For example, when the simplified examples considered by the Commission in Section 2.1 are extended to include price re-sets over several regulatory cycles it is not difficult to envisage situations where mechanistic application of TFP will result in prices being driven below cost. Depending on how businesses respond in those circumstances, the result could be apparent TFP improvements (as opposed to real improvements) that put further pressure on prices. More generally, the nature of price resets and the way in which regulated businesses

² Preliminary Findings, pp x and 11.

(including those on building block regulation whose data is included in the TFP database) respond to them will affect the TFP trend.

These matters are discussed in greater detail in Attachment 1.

These observations highlight once again why it is that Jemena and other businesses have reservations about the TFP alternative at this early stage of its development. Only when it is fully specified and understood will it be possible for businesses to make an informed assessment.

4 Basis for setting the initial price cap at each review

Much of the debate to date on the TFP alternative has focussed on how to define and measure TFP and then translate that value into a value of X. In Jemena's view the criteria and process for setting the initial price cap are an equally important aspect of the TFP design because the present value of revenue for a regulatory period is directly proportional to the initial price. An error in the initial price affects every year of the regulatory period uniformly whereas the effect of an error in TFP/X is initially zero but compounds from year to year. The consequences of an error in setting the initial price for a regulatory period can be at least as significant in present value terms as an error in setting X.

In point 8 below we note that setting the initial price for a regulatory period will necessarily involve an element of forecasting. Throughout the Preliminary Findings document the Commission routinely refers to the reset as a "reset to efficient costs" ³ although that is not reflected in the reset mechanism described in the example TFP design except in the return on capital and tax components of cost. ⁴ As we have noted in previous submissions, use of the term "efficient costs" presents particular difficulties.

The Commission's example in Box 2.1 highlights the issue. In that example, the subject business has lagged behind its peers in implementing a productivity improvement but is about to act to catch up. If the subject business undergoes a review during the period that it is lagging, will its price be reset to its own costs (potentially a price increase) or will the regulator be empowered or required to adjust the price to reflect the fact that the business is demonstrably less efficient than its peers (a price reduction)? (We have analysed the Box 2.1 example in greater detail in Attachment 1.)

Jemena acknowledges that specifying the reset mechanism in a way that will satisfy service providers is likely to be particularly difficult. Critical factors will be:

³ For example at Preliminary Findings pages 15, 19, 23, 27-28, 56, 90, 102

⁴ Preliminary Findings, p102.

- the principles that will govern the determination of the initial price
- the criteria and method for forecasting to the end of the current period
- how actual costs incurred during the current period to date will be taken into account and the basis for any adjustment of those costs
- the extent of the regulator's discretion
- ensuring that the regulator's decisions on initial price are reviewable.

5 Timing of Phase 2

Jemena agrees that any TFP regime will require as its basis, a consistent complete and reliable data set. The Commission suggests that a minimum of 8 years' historical data is required before TFP regulation can be offered as an option. If that is accepted, then implementation of TFP is at least that far away and there is no urgency to proceed to Phase 2 of the Commission's review—the development of rules for implementing the TFP methodology. A deferral of at least five years seems possible and desirable. During that time:

- all stakeholders will have further experience of the operation of the current, relatively new, gas and electricity regimes under the AER
- implementation of advanced metering and smart grids will be further advanced
- climate change responses will be in place and their consequences better understood
- the RPI-X@20 review currently being undertaken by Ofgem in the UK will have been completed, perhaps providing further insights and options for consideration
- the theory and application of TFP regulation might also be further developed and better understood.

There is no need to develop rules now to define a process that will be implemented in 8 years' time at the earliest. In fact there is value in deferring the development of those rules for as long as possible.

6 Standardised depreciation

The Commission discusses depreciation in section 6.7.

There are two principal alternatives being considered for quantifying capital inputs to the TFP calculation: "monetary" and "physical". Depreciation would

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be a primary input for the calculation of TFP using the monetary approach in that depreciation is an input to the calculation of the quantity of capital used by the business. However, depreciation is not a primary input for the physical approach. Depreciation would be a secondary input to the TFP calculation under either approach if the annual user cost of capital (used in weighting capital and O&M inputs) is calculated on an exogenous basis.

Economic Insights discuss depreciation, as a component of the user cost of capital, at pages 18 and 19 of their paper.

The amortisation charges typically derived under building blocks regulation that involve return on and return of capital elements [satisfy the requirement that the net present value of the amortisation charges less final scrap value equals the initial purchase cost]. Since these charges are currently widely used and they satisfy FCM it makes sense to continue to use these charges as the annual cost of capital inputs (or amortisation charge) under TFP–based regulation.⁵

While there are exceptions, the depreciation schedule most commonly adopted in building block decisions is real straight line which is a back-ended profile at least when compared to historic cost straight line. The AER has endorsed this profile as recently as February 2010:

The [real] straight line method of depreciation is appropriate when demand is forecast to grow relatively consistently over the access arrangement period.⁶

The Commission suggests that depreciation profiles should be reviewed at the time a service provider opts in to TFP regulation and that the profile should be locked in for any subsequent move back to building blocks. The rationale for these proposals is unclear given that:

- the principle of TFP regulation is that prices are de-linked from costs
- the quantification of TFP (as proposed) will be based on data provided by all industry participants including those that remain on building blocks.

It would not be acceptable if the introduction of TFP required or resulted in changes to the rules that govern depreciation under building blocks. NGR s89 gives service providers some flexibility in the way they approach depreciation for tariff setting purposes and we assume that the same will be the case under TFP. It may be necessary to examine in greater detail how these differences between service providers might affect the measurement and application of TFP.

⁵ Economic Insights, Total Factor Productivity Index Specification Issues,7 December 2009, p19

⁶ AER, Jemena Access arrangement proposal for the NSW gas networks, February 2010, p84.

Under TFP regulation, depreciation will continue to be an important component of cost in establishing P_0 and in rolling forward the asset base. It will also be relevant in assessing whether firm-specific provisions such as off-ramps have been triggered. It will be necessary to consider further how these requirements will be met.

7 Information asymmetry

The Preliminary Findings document puts considerable weight on the potential of TFP regulation to reduce reliance on forecasts and hence avoid the undesirable consequences of information asymmetry. We suggest this benefit of TFP is over-stated.

We note that the AER now has extensive powers under both the NEL and the NGL to require service providers and related providers to keep and produce information. Depending on how those powers are used, information asymmetry in relation to historical data can be all but eliminated.

As to forecasts, businesses may have a clear picture of what they can achieve in the next 1 to 2 years but, beyond that, forecasts will be increasingly inaccurate and there will always be different views. Whether those differences can be attributed to information asymmetry is a moot point.

Given the rules around forecasting, the knowledge that regulators now have of the businesses they are dealing with, and the regulator's power to obtain information, seek advice and substitute its own view (and the track record of regulators in doing just that) it is difficult to argue that outcomes are (or can be) influenced significantly by information asymmetry.

8 Reliance on forecasts

We acknowledge that forecasting is a significant, resource-intensive and contentious aspect of building block regulation and that it is forecasting that is most likely to be affected by information asymmetry to the extent that is an issue. However, the need for forecasting is not eliminated under TFP regulation. There are at least four places in the Commission's example TFP design where business-specific forecasting will be relevant:

- setting the starting price for the next regulatory period
- making adjustments under a capex module
- making the case for firm-specific adjustments
- making the case to revert to building blocks.

In each case there will be a lot at stake for the service provider so the rules around those elements, including the definition of the regulator's discretion and ensuring that decisions are reviewable, will be important.

9 Enabling data collection

The Commission suggests in section 5.1.3.2 of the Preliminary Findings document that rule changes are required to enable specification and collection of the data that is necessary to support the calculation of TFP. In Jemena's view, changes of the type proposed by the Commission should not be necessary if, as the Commission suggests, the data required to support TFP would also support the more effective application of the building block approach. The AER's current powers to require that information be kept and produced, and the processes around the exercise of those powers should be adequate. We note the Commission's comment that the AER has already commenced development of periodic reporting regimes for gas and electricity.

10 Application to transmission

Throughout the Preliminary Findings document the Commission considers the differences between the transmission and distribution sectors and how those differences might affect the application of TFP regulation to each. Invariably the Commission concludes that the characteristics of the transmission sector are such that there would be difficulties in applying TFP regulation to that sector.

In Jemena's view the evidence supports a decision now that TFP regulation is not suitable for the transmission sector and that the application of TFP regulation to that sector should not be considered further.

ATTACHMENT 1

Analysis of the incentive properties of TFP regulation

The analysis in section 2.1 of the Preliminary Findings document forms the basis for the Commission's conclusion that:

A TFP methodology will increase the incentive for service providers to be innovative and seek cost efficiencies compared to the current building block approach.⁷

It is not clear to Jemena that this unqualified statement is justified. The statement is based on the analysis in section 2.1 of the Preliminary Findings and illustrated by examples set out in Box 2.1 and Figure 2.1. In Jemena's view the analysis is incomplete and does not necessarily support the Commission's conclusion. In particular:

- the Box 2.1 example does not consider how the subject firm would have fared during the period preceding the analysis period, when the peer group was undertaking the efficiency improvements that the subject firm is about to undertake
- neither example considers the significant effect that features of the TFP design other than X, and especially price resets, can have on outcomes over the longer term.

In the following analysis, we extend the Commission's Box 2.1 and Figure 2.1 examples.

Industry acts in unison - no re-sets

Firstly, consider the case where, initially, all firms are equally efficient, revenues are set equal to cost, and the trend TFP growth rate is zero. After a period of zero TFP growth all firms embark on an efficiency improvement program which results in every firm achieving 1% TFP growth per annum for 10 years. At the end of the 10 years all firms revert to trend TFP growth of zero. Assuming that volumes are constant i.e. revenue growth is equal to price growth, then, in the absence of price resets, the relationship between costs and prices/revenues will be as shown in Figure A.

⁷ Preliminary Findings, p x. There are similar statements about the relative incentive properties of TFP and building blocks on pages 9 and 11.



Price/revenue curves are shown for:

- fixed X, where X is set at the 8 year average TFP at the beginning of the review period and remains constant for the review period and
- rolling X, where X for each year is the average TFP growth for the 8 preceding years.

All firms enjoy a period of above average profits because of the lag between cost reductions and resultant price adjustments. The effect is greater in the fixed X case where there is a longer lag.

The premise of the Commission's example in Figure 2.1 is that the industry increases its rate of productivity growth for a period to something above trend. That growth "spurt", coupled with the lag in the price response under TFP, can lead to a firm on TFP regulation enjoying higher profits for a longer period than a firm on building blocks, as shown in Figure 2.1. However, the situation becomes more complex when the analysis is extended to cover a number of review periods.

Industry acts in unison - with re-sets

Consider the following case where the analysis in Figure A is extended to include price resets.



Assuming that the productivity growth spurt is forecast accurately in the price review process, firms on building block regulation can expect the present value of revenues to be at least equal to the present value of the cost curve. For firms on TFP, however, price resets may reduce the present value of above normal profits by 80 per cent or more relative to no resets and, if the scheme is applied mechanistically, prices may be driven below cost. If that occurs, the result will be below normal profits, perhaps for an extended period.

If reversion to building blocks or firm-specific adjustments are unavailable or disallowed by the regulator, firms may respond to the prospect of below average profits by reducing expenditure below the efficient level in order to maintain profitability. In that case there would be further undesirable consequences. If the TFP calculation is performed mechanistically, the "scheme-induced" reduction in expenditure will translate to an apparent TFP improvement which will in turn lead to further price/revenue reductions (not shown in the graph). That is, industry's response to conditions that threaten below average profits may produce an apparent increase in TFP growth thereby exacerbating the situation. Note that, in this context, "industry" is all businesses whose data is used in the calculation of TFP. As proposed, that would include businesses that elect to remain on building block regulation.

More generally, it is possible that features of the TFP and building block schemes, such as price re-sets, will lead to (possibly sharp) reductions in expenditure

resulting in an apparent increase in the calculated TFP growth rate. Such "scheme-induced" TFP increases will feed back as increased pressure on businesses to reduce expenditure further.

Single firm lagging behind peers

In the Commission's Box 2.1 example, the subject firm acts out of step with industry: it has deferred taking action that its peers have taken already. Assuming that the subject firm's actions do not have a significant effect on industry TFP, the efficiency improvements of the peer group will have led to increased industry TFP growth and lower prices so the subject firm will have faced price reductions (and hence reduced profitability) during the deferral period as a result of the actions of its peers.



Only by implementing the improvements will the subject firm catch up to its peers and restore itself to a position of normal profitability. Contrary to the Commission's conclusion in Box 2.1, the subject firm will not necessarily enjoy above normal profitability as a result of implementing the improvement and the deferral is potentially costly in present value terms. The incentive is a stick rather than a carrot.

The analysis in Figures B and C above assumes that price resets will be to the firm's actual cost – for example, the subject firm in Figure C would receive price increases in years 23 and 30. The Commission suggests strongly that price resets under TFP should be made by reference to estimated efficient costs. ⁸ If that is the case then, in the Commission's Box 2.1 example, the regulator could be expected

⁸ See Preliminary Findings, pp 15, 19 and 23, and section 3.1.3.

to impose P_0 adjustment(s) during the deferral period to eliminate the subject firm's assessed inefficiency relative to its peers. In that case, the subject firm in Figure C would suffer price reductions rather than increases in years 23 and 30. And, if price resets were based on estimated efficient costs for the peer group as well, then arguably resets would be deeper and prices lower than in Figure C, further eroding the opportunity for them to enjoy above average profits.

Single firm leading peers

The Commission's Box 2.1 example assumes that the subject firm lags behind its peer group. If, instead, the subject firm implements the improvements ahead of its peers, and its actions do not significantly affect the industry TFP, then it will enjoy above average profits until the peer group begins to catch up. But, once again, the actual outcome for the subject firm will be determined by the overall design of the TFP option. Resets will reduce the present value of the benefit to the subject firm and, if the TFP methodology is applied mechanistically, the subject firm's revenues could be driven below cost for an extended period as/when the peer group catches up.



Conclusion

These observations highlight the significant part that the scheme design and price resets in particular, play in determining the outcome of a TFP scheme. In our view it is not possible to say without qualification, that "A TFP methodology will increase the incentive for service providers to be innovative and seek cost efficiencies compared to the current building block approach." We generally agree with the Brattle Group:

Compared on this ["all else equal"] basis there is a negligible difference in the strength of incentives between TFP and building-blocks. The difference only arises because, in principle, the regulator could use information on outturn costs in the previous period to set X for the forthcoming period. In our view this difference is marginal and is not something which can be quantified through modelling (although it perhaps might be explored through a detailed review of how regulators in practice set X in Australia). In our view, the strength of incentives under TFP and building blocks is similar for any practical design of TFP scheme. ⁹

The Brattle Group mentions the possibility that the regulator will use information on out-turn costs in the previous period to set X. The Commission also cites this possibility as a point in favour of TFP:

The key advantage of a TFP methodology is that the regulator cannot use the service provider's actual costs in setting the X factor going forward. Under the current arrangements, the service provider does not know how the regulator will exactly set the X factor going forward. There is a possibility that the regulator decides to extrapolate the efficiency trend into the future or make greater use of benchmarking information.¹⁰

In the gas regime, forecasts must be made on a basis that is "reasonable" and "best possible in the circumstances". ¹¹ As this criterion is currently applied, simple extrapolation would only be accepted for components of cost and/or volume forecasts and certainly not for the price of the business's entire output. Yet, as we have noted previously, extrapolation is precisely what is proposed for setting the business's whole price under TFP. What the service provider does know under building blocks is that, irrespective of the value of X, P_0 will be set so that the combination of P_0 and X allows recovery of forecast "efficient" costs (at least) over the regulatory period.

The debate in building blocks is, of course, about the level of efficient costs which, as we have stated previously, cannot be known by analysis or inspection. That is why incentive regulation was devised: so that firms will reveal their efficient costs in the course of responding to the incentives. The debate about the level of efficient costs will be perpetuated under TFP if the reset criteria include reference to estimated efficient costs as the Commission suggests they might. The outcome for a service provider is at least as sensitive to the potential errors and uncertainty in setting P_0 as it is to potential errors and uncertainty in setting the value of X by reference to TFP.

⁹ Brattle Group, Review of Incentive Power and Regulatory Options in Victoria, December 2009, p 7.

¹⁰ Preliminary Findings, p15

¹¹ National Gas Rules, s74