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Jemena Limited  
ABN 95 052 167 405

Dr John Tamblyn  
Chairman  
Australian Energy Market Commission  
Level 5, 201 Elizabeth Street  
Sydney NSW 2000

Level 14  
1 O'Connell Street  
Sydney NSW 2000  
Locked Bag 5001  
Royal Exchange  
NSW 1225  
T +61 2 9270 4500  
F +61 2 9270 4501  
[www.jemena.com.au](http://www.jemena.com.au)

By email: [submissions@aemc.gov.au](mailto:submissions@aemc.gov.au)

Dear Dr Tamblyn

**Review into the use of Total Factor Productivity for the determination of prices and revenues**

I am pleased to attach Jemena's comments on the Design Discussion Paper published by the Commission in connection with its review into the use of Total Factor Productivity for the determination of prices and revenues.

Please contact me on 02 9270 4551 if you wish to discuss this submission.

Yours sincerely

A handwritten signature in black ink, appearing to read "Warwick Tudehope".

Warwick Tudehope  
Manager Network Regulation and Compliance



**Jemena**

## **Jemena Limited**

**Comments on the Design Discussion  
Paper published by AEMC in connection  
with its review into the use of Total Factor  
Productivity for the determination of  
prices and revenues**

**30 October 2009**





**Contact Person**

Name Warwick Tudehope  
Manager Network Regulation and  
Compliance  
Phone 02 9270 4551  
Email [warwick.tudehope@jemena.com.au](mailto:warwick.tudehope@jemena.com.au)

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**Jemena Limited**

ABN: 95 052 167 405  
Level 14  
1 O'Connell Street  
Sydney NSW 2000  
Ph: 02 9270 4500  
Fax: 02 9270 4501

## Table of Contents

1	Introduction	1
2	Process for selecting a revenue methodology	1
3	Calculating the TFP growth rate	3
4	Setting the initial cap	7
5	Additional design terms	8
6	Setting the price path under TFP	11

# Comments on the Design Discussion Paper published by AEMC in connection with its review into the use of Total Factor Productivity for the determination of prices and revenues

## 1 Introduction

Jemena has considered the Design Discussion Paper (the Paper) published by the Commission in connection with its review into the use of Total Factor Productivity (TFP) for the determination of prices and revenues. We commend the Commission for preparing a useful Paper and for convening the two industry workshops to discuss the Paper and the issues it raises.

The Paper provides a balanced discussion of the large number of design elements that will need to be considered and resolved in order to establish Total Factor Productivity (TFP) regulation as an alternative to building blocks. As we have noted in previous submissions it is the totality of the TFP alternative that will determine its acceptability to eligible businesses. Some of the elements discussed in the Paper will be more significant than others in shaping the TFP alternative. The quantification of TFP itself is only one, albeit important, element.

We acknowledge the Commission's qualification that the Paper does not represent a preferred design or suggest that the example presented should be adopted. However, the Paper does suggest specific "settings" for a number of elements which provide a firm basis for comment. In that regard, we are pleased to note that one of the settings suggested is that it should be for the service provider alone to choose whether to move from building blocks to TFP and vice versa. As we have said in previous submissions that choice must be a part of any TFP regime. Subject to that proviso, Jemena supports the further development of the TFP alternative.

Our detailed comments follow in the order that matters are raised in the Paper.

## 2 Process for selecting a revenue methodology

The Paper deals with the process for selecting a revenue methodology in section 4.

Jemena supports the proposition that it should be for the service provider alone to choose whether to move from building blocks to TFP and vice versa. Jemena could not support a TFP regime that permitted the service provider's choice to be overridden.

TFP should be introduced only if it conforms to the National Objectives for Gas and Electricity (NGO and NEO) and pricing principles so, from a public policy point of view, the two alternatives should be equally acceptable even though the outcomes for both service providers and consumers will inevitably be different under each.

The choice between TFP and building blocks is one that affects a service provider's entire business and the service provider's appetite for risk will be among the factors that will influence that choice. A binary decision of such significance to the business must be one for the business alone. The alternative of making the choice subject to regulatory review would add a potentially contentious decision step to the price review process and increases uncertainty for the service provider.

The Paper in section 4.2.3 canvasses the question of whether a change in the TFP calculation methodology should flow through to businesses during a regulatory period. Presumably this would only affect businesses that have elected a rolling TFP.

Arguably the change in methodology will be just another source of variation from year to year and if the change in methodology is to produce a more precise estimate then it should flow through. If the methodology was fixed for the duration of each service provider's regulatory period, the entity that performs the TFP calculation would have to maintain multiple methodologies.

This raises a number of questions that aren't considered in the Paper:

- What will the processes be for collecting and publishing data for the TFP calculation?
- Will the calculation be performed centrally and the TFP value(s) published periodically (say annually) or will each service provider be required/permitted to derive and propose the TFP value that should apply to it based on the published data?
- If TFP values are to be calculated centrally, what will be the processes for defining, validating and publishing the calculation model and for reviewing/changing the model?
- If it was open to service providers to derive and propose their own TFP values, what criteria would the AER apply in reviewing those proposals and what discretion would it have to reject a service provider's proposals?
- If there is a change in the TFP calculation methodology and TFP is calculated based on the average for, say, an eight year historical period, should past values be re-calculated so that all relevant historical values are on a common basis, or should the changed methodology only be applied prospectively?

Jemena does not have a particular view on any of these questions at this stage. However, centralised calculation using a single agreed and published calculation

“engine” that is established through consultation and reviewed periodically has some appeal on grounds of administrative efficiency. Price reviews would also be less complex if TFP was determined in this way because the value of TFP and hence X would be a given and not subject to regulatory review.

### 3 Calculating the TFP growth rate

The paper examines elements that go to the calculation of the TFP growth rate in Section 5.

#### *Appropriate methodology (section 5.1)*

The Paper proposes in section 5.1 that TFP be calculated using an index number approach and that the index number method should satisfy the “superlative” criteria. These proposals appear reasonable. The Paper then goes on to suggest that the index number form would be specified by the regulator in [non-binding] guidelines. The reasons for this suggestion are unclear.

In Jemena’s view it would be more appropriate to decide the indexing method in the course of establishing the TFP specification and calculation methodology.

#### *Outputs, inputs and appropriate weights (section 5.2.2)*

Matters relating to model specification are discussed in section 5.2.1. No specific proposal is provided. Instead it is suggested that further consultation is required. The Commission asks the following questions:

- What should be the correct specification of inputs and outputs to be used to calculate the TFP growth estimate?

Model specification has been discussed at length in the course of the work undertaken by the ESC in Victoria. There are essentially two specifications in contention—one proposed by Pacific Economics Group (PEG) and the other by Dr Lawrence of Economic Insights (Lawrence).

As we have noted in our previous submissions in the present consultation (dated 27 February and 11 August 2009) the arguments for and against each specification are technical and appear difficult to reconcile. At the same time the two can produce very different estimates of TFP. Based on a practical consideration of the outputs of a distribution business, and observations about the performance of the PEG formulation in Victoria, Jemena favours the Lawrence approach. (Refer February submission, pp 4-6, and August submission, section 3.)

If TFP is to be calculated and published centrally (see section 2 above) then it would seem logical to develop the model specification through a rule consultation process. The specification would then be written into the rules which should include provision for periodic review of the specification.

- Is the proposed set of criteria to identify the correct specification appropriate?

As an objective the proposed set of criteria appear reasonable. However, some may be difficult to assess.

- Stable index over time:

The quest should be for a specification that produces an accurate estimate of TFP so that if TFP is in fact volatile, then the index should be volatile.

At the same time we agree that price volatility is undesirable. If the index itself is volatile then stability in X can be achieved through selection of an appropriate averaging period and method.

Of course, intuitively, TFP is not volatile so this criterion would appear to favour the Lawrence specification.

- Unbiased:

It is not clear how this criterion could be applied quantitatively. Different specifications will simply produce different estimates.

- Promote efficiency:

We have noted previously that the incentive properties of a CPI-X price path are essentially independent of the value of X. A possible risk is that, if the estimate of TFP is biased on the high side then businesses may receive insufficient revenue to operate efficiently. This possibility reinforces the need for the service provider to be in control of the TFP/building block election.

It is difficult to see how this criterion could be assessed.

- Avoids perverse incentives:

If the incentive properties of a CPI-X price path are essentially independent of the value of X then it is difficult to see how any particular TFP specification would be more likely than another to result in perverse incentives. The ESC has made the point that a single firm cannot influence an industry TFP significantly.

However, there may be other aspects of a TFP regime, for example, off-ramps, where some specifications are more likely to introduce perverse incentives than others.

- Consistent with asset base:

The meaning of this criterion is unclear. If it means delivering Financial Capital Maintenance (FCM) then that is clearly a desirable attribute. Economic Insights have addressed this question in a recent study for the New Zealand Commerce Commission which the AEMC refers to in the Paper and which Dr Lawrence spoke to at the recent workshops. The Economic Insights work suggests some refinements to the way in which a TFP-based X should be determined to take account of sunk assets consistently with FCM. The proposed approach appears to have some merit and warrants further consideration.



- Reporting requirements are proportionate and not onerous:  
As a general proposition we believe that the best specification should be selected and then data collected to support it. We do not support the alternative of tailoring the specification to currently available data. Having said that, the criterion is a reasonable one and some compromises may be inevitable.

#### *Defining the industry (section 5.2.2)*

The Paper canvasses a number of considerations that are relevant to the definition of the “industry” for which TFP should be calculated including whether industry sectors should be divided into subsets. The questions are asked:

- Is a single X factor for all regulated service providers in the sector appropriate?
- Or, would it be necessary to divide the sector into four subsets according to operating environment conditions or customer density?

There are a number of potential difficulties with subdividing sectors including:

- the likelihood of definitional and classification issues and disputes
- determining the relevance of differences in:
  - a) operating conditions which may imply different sustainable rates of productivity growth for different businesses and hence justify subdivision and
  - b) productivity levels (perhaps contributed to by different operating conditions) which may have a bearing on a business’s potential for productivity growth and may or may not justify subdivision
- smaller data sets that are sensitive to data errors and the possibility that a data set will be dominated by a small number of businesses
- increased administrative burden.

Taken together, these considerations suggest that subdivision should be avoided unless clearly justified. Jemena favours a single TFP value for each sector (gas distribution and electricity distribution) at least initially.

#### *Approach to calculating the TFP growth rate (section 5.2.4)*

The question in this section of the Paper is whether the historical average TFP growth should be determined by regression (the approach favoured by Economic Insights) or as the average growth rate between the first and last index values for the averaging period (favoured by PEG). The Paper proposes that the choice should be left to the Regulator.

The TFP estimate produced by the PEG approach will be affected directly by volatility in the TFP index and will be in error to the extent that there are errors in

first and last index values in the series. The sensitivity to errors will vary inversely with the length of the averaging period. Regression, on the other hand, will result in a smoother progression that is less susceptible to the effects of aberrant values.

There is no objective test for choosing between the two approaches. Jemena therefore has reservations about leaving the choice to the Regulator. Consideration should be given to fixing on one or other method and making it part of the specification defined in the rules.

#### *Time period for measurement (section 5.2.5)*

The time period over which the historical TFP should be averaged is problematic.

In previous submissions we have commented on the paradigm shift involved in adopting TFP regulation. The objective is to produce an estimate of TFP that is achievable in future. At the same time, there is implicit acceptance that the estimate will be made by extrapolating from the past rather than by developing a forecast of future TFP growth.

In building blocks, capex, opex and demand forecasts are prepared, justified and reviewed in forensic detail (as required by the rules) to produce a price path whereas in TFP the price path would be set by a single number that is determined by simple extrapolation of the past. Simple extrapolation would rarely be acceptable as a forecasting method for building blocks. History by itself says nothing about the future.

Given that context, the choice of averaging period is somewhat arbitrary and a matter of judgement. Averaging over a longer period will dampen out volatility and short run cyclical variations. However, it also means that the TFP value will be less responsive to changes in the underlying trend. An appropriate compromise appears to be an averaging period of somewhere between five and ten years. We would envisage the length of the averaging period being fixed as part of the overall specification.

#### *Fixed or annually varying weights (section 5.2.6)*

The TFP index is a function of input quantities, output quantities and the weights attributed to each input and output quantity. Quantities will vary from year to year as, no doubt, will weights. There is no apparent reason why the weights should not be updated along with input and output quantities.

The TFP value based on updated weights, inputs and outputs would flow through immediately to service providers on a rolling X. Those on a fixed X would remain fixed until the next scheduled review.

## 4 Setting the initial cap

The Paper discusses how the initial prices for a regulatory period should be set under TFP in section 6. A design example is given in which:

“the initial price (or revenue cap) at the start of the regulatory period would be a building block approach under which the regulator would:

- determine the level of operational and capital expenditure for that year based upon a reasonable assessment of actual costs incurred in the current period;
- calculate the regulatory asset base in accordance with the existing roll forward methodology;
- estimate the efficient rate of return for the duration of the new regulatory period in accordance with the existing methodology; and
- estimate the efficient tax for the initial year in accordance with the existing methodology.”

In Jemena’s view the way in which price re-sets are defined and managed is critical because any error or bias in setting the initial price ( $P_0$ ) for a regulatory period flows directly to the present value of the service provider’s revenue for the period. On the other hand, the effect of an error or bias in determining TFP (and hence  $X$ ) is initially zero and increases with time. The potential for errors and uncertainty in present value revenue associated with setting  $P_0$  are at least comparable to and possibly greater than the errors and uncertainty associated with setting a TFP-based  $X$ .

If  $P_0$  is to be determined by reference to actual costs during the current period then it will be necessary to forecast costs, capital expenditure and demand from the point where actual data is available to the end of the current period. The example also mentions rolling forward the asset base and making estimates of WACC and an allowance for tax. All of these matters are sources of debate in applying the current building block method.

Given its significance, any re-set process is likely to remain contentious for TFP as it is for building blocks. Having said that, there is no obvious alternative to some form of re-set since de-linking prices and costs completely is unlikely to be acceptable to policy-makers.

The Commission asks the following questions:

- What would be the impact on service providers’ incentives to improve performance under this design example?

If the regulatory periods for TFP and building blocks were the same length and revenue/prices were re-set to costs in the manner described, then the incentive properties of the two alternatives are likely to be similar.

- What would be the impact on service providers' ability to recover efficient costs under this design example?

Revenue, and hence the service provider's ability to recover efficient costs, will be determined by the combination of  $P_0$  and  $X$  (as well as demand variations which we understand would be disregarded in a TFP review). If TFP is determined centrally so that  $X$  is known,  $P_0$  will be the principal source of uncertainty. The extent of this uncertainty will be a function of the re-set framework—how actual costs are to be forecast and/or adjusted to arrive at  $P_0$ —and how it is applied. For example if the framework were to direct the regulator to assess "efficient" costs, then it would be perpetuating the issue that is so problematic for building blocks. The right to choose to stay with (or revert to) building blocks will be an important protection for the service provider in this context.

- Should the regulator have the discretion to refer to other information, such as forecast costs, when setting the initial price or revenue cap?

As we have noted above, it seems inevitable that some forecasting will be required to cover the period between actual data and the end of the current period. If the question is whether forecasts for the upcoming regulatory period should be considered, then the answer is probably "no", except to the extent that the regime provides for firm-specific adjustments (see comments on section 8.2.2 below). If there are no firm-specific adjustments and it is still considered necessary to take account of forecast events in the upcoming period then the service provider could elect to stay with (or revert to) building blocks.

## 5 Additional design terms

Section 7 of the Paper discusses a number of elements that could be included in a TFP scheme and be available for the service provider to propose as part of a TFP proposal.

### *Length of the regulatory period (section 7.1.1)*

The question is asked: should a regulatory period longer than five years be set in the NER and NGR for a service provider using a TFP methodology?

Longer regulatory periods are consistent with TFP regulation. Given that the NER and NGR both provide already for longer regulatory periods than five years there should be no need for change.

### *Cost pass through mechanism (section 7.1.2)*

The questions are asked:

- Are any amendments to the current provisions [relating to cost pass through mechanisms] required to ensure compatibility with a TFP based framework?

In Jemena's view it is essential that there be a cost pass through mechanism. It is premature to consider what amendments to current provisions might be required.

- How can the possibility of double counting cost pass through events under a price path with a rolling X be addressed?

While this question (and the discussion in the Paper) refers to service providers on a rolling X, it seems that it is equally relevant to those on a fixed X. To the extent that a change in industry cost structure results in a change in TFP and X, that change will affect those on fixed X from their next re-sets.

Many cost pass-through events are likely to be firm- or jurisdiction-specific and relatively small in relation to total costs. Changes in licence fees are an example. It is hard to imagine that cost pass through events would have anything more than a second or third order effect on an industry TFP and X. Any attempt to adjust for these effects is likely to be complex, especially where the events are firm- or jurisdiction-specific. The possibility of double-counting of cost pass through events should be disregarded, at least in the first instance.

In Jemena's view it is more relevant to consider the potential for double counting associated with price re-sets. All businesses, whether on building blocks or TFP (as proposed), will be subject to re-sets. TFP growth (and X) will increase and future revenues will be reduced correspondingly to the extent that businesses respond to price re-sets by reducing expenditure on inputs. That is, TFP is likely to be a function of the regulatory review process itself as well as the industry's independent actions to improve efficiency in response to the TFP and building block price paths. Once again, the criteria for price re-sets and the way in which they are administered is critical.

### *Capital module (section 7.1.3)*

The Paper suggests that there should be provision for a capital module which would enable the service provider to recover extraordinary capital costs incurred during the regulatory period.

The questions are asked:

- Is a capital module required and, if so, how should such a module be designed for Australia?
- In particular, should the module use agreed (and prudently assessed) forecast or actual expenditure amounts?

In Jemena's view it is desirable that a TFP regime include a capital module. The precise form of the module should be the subject of further consultation. It seems that a critical issue will be how to identify capital that is "in addition to the expenditure covered by the [TFP] growth rate" and therefore eligible for coverage by the module.

#### *Off ramps (section 7.1.4)*

The questions are asked:

- Is there a need for an off ramp mechanism to be included in a TFP methodology?
- Does its use inappropriately reduce incentives?

An off-ramp mechanism appears desirable in that it provides a mechanism for managing risk, especially when combined with longer regulatory periods. Definition of the circumstances that would trigger an off-ramp review, the scope of such a review, and what discretion the regulator will have to vary a service provider's proposals in relation to off-ramps, will be critical.

#### *Form of X (section 7.1.5)*

Two forms of X are considered: a fixed X where X is set for the duration of the regulatory period; and a rolling X where X is updated annually.

- Should a service provider be able to select the form of the X factor?

There is no apparent reason why the service provider should not be permitted to choose between fixed and rolling X.

- Or, does this provide a level of uncertainty that is undesirable in the operation of a TFP methodology?

It is reasonable to assume that a service provider that opts for a rolling X would do so only if it understood and was prepared to accept the risks.

## 6 Setting the price path under TFP

Section 8 of the Paper discusses a number of design elements that relate to the relationship between TFP growth and the value of X in CPI-X.

*Appropriate formula for determining X (section 8.1) and input price index (section 8.2.1)*

The Paper indicates a preference for the “differential of a differential” form of the relationship between TFP growth and X in CPI-X. The Paper also discusses the alternative form proposed in the Victorian rule change proposal, and what published index data might be used as a proxy for economy input price growth and industry input price growth (both of which are required for the differential of a differential form). The paper foreshadows further consultation. As we have mentioned previously, Economic Insights’ recent work for the New Zealand Commerce Commission has some merit and could be considered in this context.

The questions of the formula to be used and data sources are not independent. While a complete and precise specification is desirable, it will be workable only if the data is available to support it.


*Business specific adjustments (section 8.2.2)*

The Paper discusses the possibility of providing for TFP to be adjusted to allow for individual business circumstances including adjustments:

- “to reflect business specific circumstances which may affect the ability of the industry productivity growth rate to reflect the productivity potential of the business;
- to recognise that the industry TFP rate is an average across all businesses and therefore higher performing businesses may be unnecessarily penalised (the converging effect);
- to reflect additional efficiencies which will be generated with the move to a TFP methodology (in North America, this type of adjustment is referred to as consumer dividend); and
- where the starting prices may not reflect efficient unit costs.”

The question is asked: Is the rationale for allowing business specific adjustments to the X factor correct?

Business-specific adjustments have conceptual appeal, and they would be essential if TFP regulation was mandatory. There is less of a case for business-specific adjustments where TFP is offered as an alternative to building blocks and the choice is for the service provider alone to make.



Implementation of adjustments in the first three classes listed above is likely to be complicated at two levels:

- The framework and criteria for applying the adjustments would have to be developed and codified so that stakeholders have some certainty about the way in which adjustments will be made.
- Once codified, the quantification of any adjustment will necessarily involve forecasting and judgement. At the very least this adds complexity and tension to the review process. It would also negate one of the principal benefits claimed for TFP regulation: that it does not rely on forecasting.

The fourth class of adjustment would appear to be redundant if there is to be a  $P_0$  re-set. Once again we question the workability of applying “efficient unit costs” as a criterion re-sets.

On balance, and with TFP available as an optional alternative to building blocks, it may be more efficient to proceed without business-specific adjustments, at least in the first instance.