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Dr John Tamblyn
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27 February 2009

By email to: submissions@aemc.gov.au

Review into the use of Total Factor Productivity for the determination of prices and revenue Framework and Issues Paper, December 2008

Dear Dr Tamblyn

EnergyAustralia welcomes the opportunity to comment on the above framework and issues paper (the review paper). We support reviews of the existing regulatory framework or consideration of new approaches that will further promote the national electricity objectives (NEO) and revenue and pricing principles (RPP) laid down in the National Electricity Laws (NEL).

We note that your review paper invites response on three main issues. Namely whether a TFP based method will, or is likely to, promote the NEO and RPP; whether a TFP method can be applied today considering the current regulatory environment; and how should a TFP based method be designed and implemented.

We consider that it is important to properly identify the issues/problems with the current regulatory framework, consider possible solutions and assess the merits of each potential solution. This must be done prior to committing to development of an alternative regulatory framework. It is not clear that the current review has considered these fundamental issues.

We have found it difficult to provide considered and meaningful responses to the issues raised in the review paper, particularly in the absence of a specific TFP model upon which to comment. There are many policy and practical issues related to the use of TFP method that remain unresolved or have not yet been considered. Because of this limitation, we are unable to express a definitive view on whether the use of a TFP method to determine regulated prices/revenues would promote the NEO and RPP.

In order to promote the NEO and RPP, a TFP based method must demonstrate that it will afford a network service provider a reasonable opportunity to earn at least its efficient costs and commensurate returns. To the extent possible, our responses have drawn on our own specific circumstances and on how a TFP method would apply to us. On this basis, we are not persuaded that using a TFP based method to determine prices/revenue would allow us to recover at least our efficient costs and earn a commensurate return.

We note that the pre-conditions for a robust application of a TFP method are that the industry needs to be in a "steady state" and that accurate and consistent data (both over time and across businesses) is available. We consider that these essential prerequisites do not currently exist in the Australian regulatory environment, or least in the New South Wales electricity sector.
EnergyAustralia cautions against mandating the use of TFP as a benchmarking tool in the Rules. Whilst it is not clear what specification is being proposed by AEMC to be included in the Rules, TFP is still being considered and debated as a concept, and we therefore consider, it to be too early to recommend any amendments to the Rules in this regard.

Finally, we therefore consider it premature for the Commission to recommend to the Ministerial Council on Energy draft rules to allow a TFP based method for an individual or group of service providers. We recommend that a "straw man" TFP model be defined and designed so that stakeholders' view on its design and application can be sought.

If you have any questions or would like to discuss any aspect of this submission in greater detail, please do not hesitate to contact Ms Catherine O'Neill on (02) 9269 4171.

Yours sincerely,

TREVOR ARMSTRONG
Executive General Manager – System Planning & Regulation

Submission on the AEMC's total factor productivity review

February 2009

1 Overview

EnergyAustralia has reviewed the Australian Energy Market Commission's (the Commission) framework and issues paper (the review paper) relating to the use of total factor productivity (TFP) for the determination of prices and revenue.

We note that the review paper canvassed numerous issues, ranging from the primary threshold issue of whether to introduce a TFP based approach through to the detailed design of TFP based approaches. The review paper contains a considerable number of questions on which the Commission is seeking stakeholders' views. Mainly, these questions are:

1. Should TFP be applied? Can it promote the national electricity objectives (NEO) and revenue and pricing principles (RPP)?
2. Can TFP be applied today? Are the necessary pre-conditions for the robust application of TFP currently present?
3. How should a TFP methodology be designed?

Our submission addresses the above questions in turn. In principle, we support the consideration of existing regulatory frameworks or new approaches to regulatory frameworks that will, or are likely to, promote the NEO and the RPP as well as promote good and efficient regulatory practice. The success of any regulatory approach against the objectives and principles will depend on the detailed design of that approach in terms of robustness, transparency, accuracy and flexibility.

Of importance, we consider that a TFP based approach must demonstrate that it:

- will afford a network service provider (NSP) with a reasonable opportunity to recover at least the efficient costs in providing the services; and
- will allow a return commensurate with the regulatory and commercial risk involved in providing the services.

Having assessed the review paper, we note that there are still numerous practical obstacles in applying a TFP based approach to determine revenues or prices. There are also a considerable number of policy issues and considerations that must be taken into account before any definitive decision can be made.

EnergyAustralia notes that the specific details and design of a TFP based approach is being debated and considered by all stakeholders. The purpose of this review paper is to seek stakeholders' view on the various issues relating to the design and implementation of a TFP based approach.

We find it difficult to provide meaningful and considered responses to many of the detailed issues raised because of the absence of a specific model upon which to comment. To the extent possible, we have responded to these issues by drawing on our own specific circumstances and on how a possible TFP based approach might apply to our business. The review and our comments highlight the need to have a TFP model to review, examine and critique so that practical issues/problems can be further identified and considered. We do not consider it appropriate that important detailed design of this new regulatory approach be given to the AER to develop through guidelines but should involve industry consultation at a detailed level.

EnergyAustralia considers that detailed design issues and obstacles need to be resolved and overcome before a definitive view can be formed on whether a TFP based approach will or is likely to promote the NEO or RPP. We therefore consider it is premature to recommend to the Ministerial Council on Energy (MCE) draft Rules to allow a TFP based methodology for an individual or group of services providers. Instead we would recommend that a "straw man" TFP model be defined and designed and stakeholders' view on the application of this model be sought.

Our recommendation would allow each individual business an opportunity to investigate the TFP based method and consequently assess suitability for its own business specifically and for the Australian regulatory framework generally. It would also allow the NSP a better opportunity to form an opinion on whether a TFP

based approach would indeed promote the NEO and RPP and if so how a TFP based approach should be encapsulated in the Rules.

2 Should TFP be applied? Can it meet the national electricity objectives/revenue & pricing principles.

The review paper focused on issues relating to using a TFP based method to determine allowed prices or revenues (i.e. full application). The paper also noted that TFP can be used as a benchmarking tool and asked whether more prescription of the application of TFP as a benchmarking tool is required in the National Electricity Rules (Rules).

2.1 Full application of TFP

2.1.1 Practical difficulties in meeting NEO or RRP

EnergyAustralia supports the AEMC's objectives for this review and also supports the AEMC's decision to apply the NEO and RPP as well as principles of good regulatory design and practice to this review.

In this respect, we note clause 7A(2) of the NEL which states:

> *A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in providing direct network control services and complying with a regulatory obligation or requirement or making a regulatory payment.*

We have identified some practical difficulties relating to the application of a TFP method that would hinder the capacity/ability of TFP to allow a sufficient return or recovery of efficient costs. These difficulties include the following:

- TFP methodology sets the X factor (or increases in prices) with reference to an "industry" growth rate. EnergyAustralia considers that it will be difficult to select a set of comparable businesses to form an "industry" benchmark against which businesses are penalised/rewarded for relative performance. This is further discussed in section 3.1.2 below.
- TFP is referenced to an industry growth factor and uses historical growth factor as a proxy to set future increases in prices. Historical growth factors may not be reflective of future growth. Therefore the setting of future prices (or revenues) with reference to historical growth rates may not allow the network business a reasonable opportunity to recover at least the efficient costs in providing distribution services. This is further discussed in sections 4.3 and 3.1.2 below.
- There is a disconnect between the costs of providing network services and the revenue received. Under TFP based approach, there is a de-coupling of regulated prices from the actual costs. There may be instances where costs are being efficiently and prudently incurred and yet these costs are not recouped under the TFP as the "output" produced by these expenditures is not recognised by the model. For example, costs incurred to meet "duty of care" obligations such as oil containment, fencing security and environmental protection are not likely to be recognised by TFP.
- There seems to be an inherent difficulty in incorporating qualitative output measures under the TFP approach, such as reliability and system security. Such qualitative measures, and the associated costs required to achieve these measures, are typically legislative and regulatory obligations that a network service provider must meet. It is important that businesses receive adequate revenue to allow it to meet these mandated requirements.
- It is not known whether the required data is currently available or standardised enough to have an accurate and robust application of TFP.

As stated above, EnergyAustralia considers that a practical review and "trial" application of a TFP method/model would allow us to make a better informed opinion on whether the full application of a TFP based methodology to determine allowed revenue or prices will or is likely to contribute to the achievement of the NEO or the RPP. Of significance, we consider that a TFP based methodology would need to demonstrate that it will afford a NSP with a reasonable opportunity to recover at least the efficient costs incurred in providing network services and ensure that prices allow for a return commensurate with the regulatory and commercial risks involved in providing network services.

In this regard, we recommend that the Commission establish an industry working group to develop a straw man TFP model to consider the policy and practical issues surrounding the use of TFP based approaches in regulatory determinations.

2.1.2 TFP vs building block

The review paper identified the following benefits of a TFP based approach as compared to the building block. These benefits are:

- lower regulatory costs;
- less likelihood of disputes (provided there is a generally accepted TFP methodology); and
- helps regulator overcome information asymmetry.

While we accept that this may be a reason to move to TFP if these benefits were proven, there is insufficient evidence to support such a conclusion at this stage. In relation to the benefits identified by the Commission, EnergyAustralia offers the following observations:

- the application of a TFP based method requires a robust and consistent national dataset. We submit that such a dataset does not currently exist and significant costs would be incurred to establish and maintain such a dataset;
- the benefit of less likely disputes is based on the existence of a generally accepted TFP method. However, due to the numerous policy and practical issues that are outstanding with respect to the design of a TFP based method, we do not consider that a generally accepted TFP method exists and therefore question whether there will be any reduction in regulatory disputes. In fact, given the absence of detail, we consider disputes be more likely to increase rather that decrease if a TFP methodology was implemented;
- In relation to the problem of information asymmetry, we note that under the current regulatory framework the AER has the power to serve a regulatory information notice on a business. In the case of EnergyAustralia's recent regulatory proposal, the regulatory information notice contained a considerable amount of detailed information. We consider the power of the AER to serve a regulatory notice on a business addresses the issue of information asymmetry to some extent.

EnergyAustralia concurs with the Commission's view that[1]:

> *The current framework for revenue regulation is well understood and provides a degree of certainty for investors.*

In contrast, we do not consider that the same can be said of the TFP methodology. As discussed further below, there is considerable uncertainty surrounding:

- definition of an appropriate industry;
- availability and quality of dataset and associated costs in collecting and maintaining this dataset;
- definition and measurement of inputs and outputs, especially in relation to qualitative measures;
- the "stableness" of the industry (i.e. whether the industry is in a "steady state");
- the length of the regulatory period; and
- the detailed design of off-ramps etc.

[1] The Review paper, page 37.

As a threshold issue, we consider it appropriate that any proposed change to the current regulatory framework should seek to:

- firstly identify the issues/problems with the current framework;
- examine the possible solutions; and
- analyse the merits of each solution.

It is not clear that the current review underway has considered these threshold issues. The review has not considered whether TFP is the only viable option of resolving the issues/problems identified with the building block approach. We caution against introducing and implementing a TFP based approach based on perceived problems with the building block approach whilst the detailed design and operating of a TFP based approach has yet to be debated and is no way resolved. Until these detailed issues are determined, the relative benefits of a TFP approach cannot be clearly established.

2.1.3 Two forms of regulation: TFP and building block

In the review paper, the Commission stated that it is not considering whether the use of TFP should replace the building block approach. EnergyAustralia concurs and considers that TFP should not replace the building block approach. Further we are firmly of the view that any amendment to the Rules to allow for the application of TFP needs to include provisions clearly stating that a TFP based method cannot be imposed upon a business by the regulator. That is, the business must have the sole discretion whether to apply TFP.

EnergyAustralia considers that there will be an additional administrative burden and cost imposed on all NSPs deemed to be within the "industry" in order to provide data for the application of TFP even if that NSP has chosen not to apply TFP. In addition, the regulatory burden on the AER is likely to increase with two models operating concurrently.

2.2 TFP as a benchmarking technique

In the review paper the Commission stated that:[2]

> *With respect to the use of TFP indices as a benchmark to inform the building block methodology, the question for the review is not whether Rules should be made to permit this application but instead whether more specification on this application is needed in the Rules.*

Whilst it is not clear what specification is being proposed to be included in the Rules, EnergyAustralia cautions against mandating the use of TFP as a benchmarking tool in the Rules. The application of TFP within the Australian regulatory framework is still being considered as a concept. We do not consider it appropriate to apply TFP indices to a building block framework until an appropriate set of indices has been developed and has been shown to work. We would not support the use of TFP indices if those indices have not been developed, tested and evaluated in an open and transparent framework.

Clause 88B of the NEL requires the AEMC to consider the revenue and pricing principles in making a Rule with respect to TFP as a tool to inform and assist the AER in analysing the application of the building block approach. EnergyAustralia therefore considers that these fundamental threshold issues (the indices and whether they work) must be met prior to any amendment to the Rules or further specification of TFP in the Rules can be considered.

The National Electricity Rules specifies that the AER, in assessing the forecast expenditure, must have regard to the benchmark expenditure that would be incurred by an efficient service provider[3]. The Rules, however, do not specify how benchmarking would apply and therefore already allows flexibility for the application for a range of benchmarking techniques. EnergyAustralia also considers that this flexibility should not be diminished by amending the Rules to allow for a more detailed specification of the application of TFP as a benchmarking tool.

On a general point, we consider that benchmarking has inherent limitations and benchmarking results are informative at a high level at best. Benchmarking results are not definitive and cannot determine the relative

[2] Section 1.3.1 of the Review paper.
[3] Clauses 6.5.6(e)(4) and 6.5.7(e)(4) of the general and transitional chapter 6 of the NER.

efficiency of a business but rather should serve as a prompt for further investigations. We concur with the view expressed in appendix B of the review paper that[4]:

> *Benchmarking is only a tool and cannot substitute for judgements based on a wider range of evidence, including assessment of the business's own cost forecasts. Also, it depends heavily on the robustness of the methodology used in calculating the external benchmark and the ability of the benchmark to capture business conditions adequately.*

3 Can TFP be applied today?

For TFP to be successfully applied, certain pre-conditions must exist. These conditions relates to:

- The availability and integrity of the required data.
- Industry characteristics in terms of investment profiles and "maturity".

3.1.1 Data requirements

The review paper states that[5]:

> *Having data that is accurate and consistent – both over time and across businesses – is an essential prerequisite (for the application of TFP).*

The review paper further states that[6]:

- *It is clear that a comprehensive list of outputs and inputs is desirable for an accurate estimation of TFP growth. However, whether such a data set for the national energy markets is currently available is debatable, and whether data that may exist are sufficiently robust and consistent is far less certain. There are also likely to be differences in the data available across jurisdiction; (and)*
- *It is crucial that the data set has been compiled using the same definitions and measurement methodologies across all the participating service providers.*

EnergyAustralia submits that currently a national dataset (that is robust and consistent) required for the application of TFP does not exist to the extent that is required for an accurate and transparent calculation of TFP growth.

The Commission also expressed the view that[7]:

> *The most appropriate means to collect this dataset would be through the AER's powers to gather information under the NEL.*

We note that the AER has recently embarked on the development of a full national cost database for the distribution businesses.[8] We understand that there are numerous issues that have been identified by stakeholders on the reporting templates proposed by the AER. Some of these issues are:

- whether the regulatory information order proposed by the AER complies with the NEL requirements in relation to the making of a regulatory information order;
- increase in regulatory burden and costs (both initial and ongoing);
- overlapping of and inconsistency between national and jurisdictional requirements; and
- difficulties in translating past data into required format and robustness of the translated data as well as the costs involved in reconstructing historic data.

Establishing a robust and reliable dataset is a prerequisite for application of a TFP based method; hence ensuring the results are creditable and accurate. EnergyAustralia submits that for as long as such dataset is not available,

[4] Appendix B of the Review paper, page 67.
[5] The Review paper, page 17.
[6] The Review paper, pages 18 and 20.
[7] The Review paper, page 46.
[8] The AER submission to the AEMC on 20 August, 2008 "Rule change proposal – Total factor productivity".

any application of a TFP based method is likely to lead to disputes about the results of TFP calculations and therefore likely to undermine confidence in the regulatory framework as well as its integrity.

"Cleaning" the data

The review paper also poses a question on whether the AER should be permitted to "clean up" data. This issue had arisen in Victoria where the ESC and its consultant had made adjustments to the audited actual information which has made it impossible for the business to replicate and understand the results. EnergyAustralia submits that such adjustments to audited data are inappropriate. Allowing the AER to adjust audited data undermines confidence in the determination process and the regulatory framework. It also brings into question the validity and integrity of the assurance and reporting processes used by individual businesses.

Overseas data

Another aspect of the data requirements is the breadth of the dataset. This refers to both the number of businesses to be included in the dataset and the length of the sample period.

The number of businesses to be included in the dataset is inherently linked to the issue of how to define an appropriate industry; i.e. what are the comparable businesses that should be included in the dataset? The review paper suggested that a lack of comparable businesses can be overcome by supplementing Australian data with data from overseas.[9]

EnergyAustralia considers such supplementation is inappropriate. The inherent differences between each of the different Australian businesses have already made it difficult to identify an appropriate industry for the purpose of applying TFP. This problem should not be further exacerbated by including overseas data which is unlikely to be comparable due to differences in accounting policies, tax laws, reporting requirements, corporate structures, design standards, exchange rates, and labour rates.

Confidentiality

The Commission noted that the data required for calculating TFP growth can be sourced from the public domain, or from the business' regulatory proposal or directly from the business. The Commission raised the issue of whether confidential data previously provided by a business should be used for calculating TFP.[10]

As a general rule, EnergyAustralia considers that it would not be appropriate for the regulator to use confidential information for other purposes than that originally intended by the provision of the confidential information. In such instances, we consider it appropriate that the business should be consulted so that it can understand the intention and context under which the confidential information is proposed to be used and gauge whether its proposed future use is appropriate, or whether further information needs to be provided.

3.1.2 Industry characteristics

Under TFP, the X-factor is set by using historical growth which means that historical TFP growth is used as a proxy for future growth. For historical growth to be an appropriate measure of future growth, the industry is required to be in a "steady state".

EnergyAustralia submits that the "steady state" prerequisite for the accurate application of a TFP based method does not currently exist in the NSW electricity sector. EnergyAustralia is entering a period of significant capital replacement. We are implementing a significant program of asset renewal that is expected to take 15 to 20 years. We understand that other NSW distribution businesses will also enter a similar capital renewal phase in the next few years. The AER in its draft decision for the NSW DNSPs for the 2009-14 regulatory control period noted that[11]:

> *(the) capex proposed by the NSW DNSPs is 94 per cent above the (capex) spent in the current regulatory control period.*

In addition to the significant capital investment program being implemented in the next regulatory periods, there are major policy developments in the energy sector that will significantly impact on the 'maturity' of the industry. Some of these developments relate to initiatives to combat climate change and the roll out of smart meters.

[9] The Review paper, page 19
[10] The Review paper, page 45.
[11] The AER's draft decision for EnergyAustralia, Integral Energy and Country Energy – published on 28 November 2008, page125.

Such significant asset replacement programs to be implemented in the foreseeable future and other potential fundamental market developments cast doubt on whether a TFP historical growth rate is an appropriate and adequate measure for setting future prices/revenues (i.e. the X factor). EnergyAustralia is not confident that the X factors set by using a TFP historic growth rate will result in the recovery of efficient costs and commensurate returns. We are unconvinced that the application of a TFP based approach in the current environment will promote efficient investment in the network.

4 Designing TFP based approaches

Chapter 3 of the review paper discusses the issues involved in designing a TFP based methodology. The Commission identified two broad issues, namely:

1. the method for deriving the TFP growth estimates;
2. the design of the TFP based approach for setting revenue and prices

4.1 Appropriate method for determining TFP growth

The Commission noted that there is not one common method used to estimate TFP growth. The two methods commonly referred to are the index number approach and the econometric approach; each with advantages and disadvantages.

EnergyAustralia notes the Brattle report which reviewed the use of TFP in overseas regulatory jurisdictions. Of note is the use of the econometric-based TFP in gas regulation in Ontario, Canada. The Brattle report notes that[12]:

> *The case illustrates a particular problem with econometric-based TFP methods: the result can be sensitive to the precise specification of the model, which means that the results may not be robust, and can be difficult or impossible for other parties to reproduce, which makes it less likely that agreement can be reached on the results.*

It appears that no individual method is universally accepted as the definitive method for estimating TFP growth and each different method has its own advantages and disadvantages. These observations might indicate the imprecise nature of the TFP based approach.

The Commission noted that the index method is also used to determine TFP. This method is based on the weighted average of change in outputs and inputs quantities. Therefore, weights must be determined and assigned to each input and output, which also need to be determined. However, the Commission also noted that there is ongoing debate about the appropriate method for determining the appropriate weights for inputs and outputs under the index method[13]. These issues identified by the Commission convince us that further work is required before any informed view can be formed on the merits of a TFP based approach.

4.2 It is difficult to define an appropriate industry

Under the TFP methodology, the X factor is the TFP growth rate of an industry. Therefore, an industry needs to be defined; that is, a group of comparable businesses (the industry) need to be selected so that the industry growth rate can be measured.

In its review paper, the AEMC sought comments on:

1. what would be the correct industry definitions for each sector?
2. In determining an industry definition for a TFP based approach, would adjustments for operating environment conditions be necessary, and if so, under what conditions?

[12] The Brattle Group, *Use of Total Factor Productivity Analyses in Network Regulation – Case Studies of Regulatory Practice, October 2008,* page 42.
[13] Section 3.1.3 of the Review paper and Appendix B of the Review paper, page 71.

EnergyAustralia considers that it is difficult, if not impossible, to select a group of comparable service providers to constitute an industry for the purpose of deriving the industry growth rate. Even though all the businesses are involved in the core function of electricity distribution, there are inherent differences in the characteristics of each to render this selection of comparable businesses difficult. These differences relate to:

- The geography of the network: EnergyAustralia's network covers the Sydney CBD, surrounding urban, waterways, rural and coastal areas.
- Energy demand profile/ load density: EnergyAustralia's customers range from Australia's largest industrial companies to CBD, urban, rural and remote customers.
- Physical attributes of the network and characteristics of the assets: EnergyAustralia operates the largest distribution network in Australia. It also owns and operates a transmission network which is in the same order of size and value as the transmission networks in South Australia and Tasmania.
- Operating conditions: EnergyAustralia's network covers the Sydney CBD and surrounding urban areas. These areas are characterised by high population density and congestion which requires the use of underground assets. These assets are generally more expensive to install than overhead assets. They are also costly to repair when they fail. EnergyAustralia's network operating condition results in higher expenditure compared to other distribution businesses which require less underground assets and/or can install overhead assets instead of underground assets.

  There is also a cost premium attached to building and maintaining a network in a densely populated environment. These costs include the high cost of land and easements, high cost of labour, high costs of accessing assets (traffic management, overnight work and larger crew size) and high costs associated with occupational health and safety issues. EnergyAustralia has completed modelling that proves that in some parts of our network, there are decreasing economies of scale to delivering energy to customers because of the premiums paid for land in densely populated areas.
- Ownership/organisational structures: EnergyAustralia has a retail business and a distribution business. Despite them being ring-fenced, the costs of Executive management, board, billing etc is shared. Similarly, other distributors are parts of larger businesses with overseas parents or service arms. The cost allocation between businesses and appropriate ring-fencing is critical to be able to accurately measure both inputs and outputs.
- Network services provided: the application of TFP to EnergyAustralia is further complicated by the fact that we are both a Distribution and Transmission services provider. This gives rise to issues such as the apportionment of data between Distribution and Transmission; how to account for asset changing classification (i.e. from Distribution to Transmission and vice versa) and how to identify "comparable" transmission businesses.
- Regulatory environment: Electricity businesses in Australia are subject to different state based legislation, and different licence conditions which can drive different levels of costs.
- Accounting practices: Differences in accounting practices will also impact on the comparability of the businesses. For example, EnergyAustralia recently had a change in capitalisation policy with respect to pole replacement. There are also year end adjustments (superannuation etc), which must be accounted for under TFP.
- Service standards: Although common service standards are applied to all NSW DNSPs the requirements vary across the network based largely on customer density. Therefore changes in density impact on comparisons between businesses. Likewise, inclusion of businesses operating under different service standards is problematic.

In essence, the differences in relativities between TFP output measures (even assuming appropriate output measures can be identified) such as line lengths, transformer types and numbers, customer types and numbers, load factors, reliability levels and quality of supply levels, mean that establishing an industry base and comparing a business' TFP results against that base does not necessarily provide measures of relative performance.

The characteristics of each individual business are unique and reinforce the Commission's view that[14]:

> *In reality, it may be extremely difficult to find a group of comparable businesses operating under identical conditions.*

The wide ranging operating conditions of Australian utilities would therefore require adjustments be made to account for these differences (normalisation). The Commission correctly notes that normalisation give rise to issues of:

- The appropriate basis for normalising the data.
- The transparency of the method for normalisation.

To overcome the differences in operating environments, the Commission suggested that an alternative would be to divide the sector into sub groups, e.g. by rural, by urban or by jurisdiction. EnergyAustralia considers such an alternative will give rise to another set of difficulties such as:

- Can costs be disaggregated by location i.e. CBD, urban, rural. If not, what would be the appropriate cost allocation method? Currently, EnergyAustralia is unable to report capital and operating expenditure by asset location, i.e. CBD, urban, rural etc.
- Definitions of CBD, urban and rural: These definitions need to be consistent with those used in state based legislation, i.e. in EnergyAustralia's case, the definitions used by the Department of water and energy.
- Even where definitions are consistent, growth of networks mean that areas that previously had characteristics of a rural environment can quickly change and become more urban. Would costs transfer between categories and between periods be necessary?

The review paper also suggested that Australian utilities could be grouped by jurisdiction. EnergyAustralia believes there is some merit in this approach in that it at least group businesses that are subject to the same state based legislations together, which would normalise some of the issues listed above. However, as pointed out in the review paper, such segmentation raises the risk of the TFP growth being unduly influenced by one business. A possible solution to this suggested by the review paper is to supplement the dataset with overseas data. However, this solution brings with it other difficulties such as data comparability (see section 3.1.1 above).

Due to the inherent difficulty in defining an appropriate industry, EnergyAustralia is strongly of the opinion that an "industry" growth rate is informative at best. The inherent different characteristics of each business renders it difficult for the industry growth rate to be an accurate reflection of the increases in prices (or revenue) required to cover the efficient costs of operating the network or to provide a return commensurate with regulatory and commercial risks.

It is clear that possible solutions to defining an industry give rise to other problems/issues and therefore cast doubts on the appropriateness and effectiveness of a TFP based approach.

4.3 Disconnect between input and outputs

The change in TFP is measured by the proportional change in output quantity divided by the proportional change in input quantity. Therefore it is necessary to specify the inputs and outputs that are to be included in the measurement of TFP growth.

Appendix E to the review paper outlines Essential Service Commission (ESC) list of necessary and desirable inputs and outputs. This appendix also provides a list of inputs and outputs considered by Dr Dennis Lawrence as required for the calculation of TFP growth. Generally, these input and output variables are similar or the same as those required under the building block approach or are currently provided in the annual regulatory accounts (e.g. opex, capex, customer numbers etc).

[14] The Review paper, page 14

EnergyAustralia's considers its fundamental obligation to be provision of energised connections that are safe, reliable and available (i.e. our "output"). This output remains constant through various network topographies but the costs of meeting it varies. The building block methodology takes account of this variation.

EnergyAustralia notes the list provided by Dr. Lawrence includes line and cable length by voltage level as both input and output variables. We consider that while line length goes some way to measuring the amount of physical assets installed, it may not represent the relative value of the assets installed, particularly in networks that operate in a high density environment. It is not clear how the simple line length measure takes account of higher cost characteristics such as undergrounding assets and therefore, how it avoids penalising operators in densely populated environments.

Furthermore, it is also unclear how issues such as supply quality, security, or reliability are taken into account using these measures. EnergyAustralia is subject to design, reliability and performance (DRP) licence conditions imposed by the NSW Minister of Energy which establish minimum performance levels, network back up capacity and limits for load at risk. These licence conditions are major drivers of our capital expenditure and impact our operating expenditure. These qualitative "outputs" do not appear to be accounted for in a TFP based method for determining prices/revenue. This is concerning as all stakeholders have an interest in ensuring appropriate supply quality.

EnergyAustralia has legislative and regulatory obligations to operate and maintain its infrastructure in a manner that is safe for its workers, the general public and the environment. Some of these obligations do not contribute to increases in customer numbers or peak demand or energy consumption per se but are critical in the safe operation of the network. For example, oil containment for a transformer does not improve the transformer's technical performance, therefore does not result in "outputs" under the TFP framework. Other examples of costs that do not increase "outputs" under a TFP based approach are those relating to management of asbestos and asset security. Similarly, a large portion of operating expenditure does not relate to these outputs measure (i.e. customer numbers etc).

Additionally, EnergyAustralia's network is the oldest in Australia and has been built over a period of 100 years. Some of these assets were built to meet standards at the time however do not comply with current standards (especially in relation to fire prevention and infrastructure security). Expenditure is therefore required to ensure that these assets meet current infrastructure standards and yet there are no "ouputs".

These are efficient and prudent costs that must be incurred to meet EnergyAustralia's legislative and regulatory obligations and yet under a TFP based approach produce a perverse outcome, i.e. high cost and lower outputs. Businesses such as EnergyAustralia that incurs substantial expenditure to produce qualitative outputs could be "penalised" under a TFP method even though these outputs are highly valued by customers. A TFP method implicitly assumes that all costs of electricity distribution relate to one of the output parameters (i.e. number of customers, peak demand etc) when in fact substantial capital investment is a reflection of asset utilisation. This means that prices set by a TFP method would not track the underlying costs.

The review paper correctly identifies the difficulty in incorporating measures relating to availability, quality and reliability of supply in TFP calculations. The review paper further states that[15]:

> *Due to these difficulties, most regulators have omitted quality from TFP calculations, and have sought to regulate quality through side constraints and separate service quality incentive mechanisms.*

It is unclear from the paper what the "side constraints" and "separate service quality incentive mechanisms" that can be applied to account for qualitative measures might be. Until we are able to assess the specific design of a TFP model, including how qualitative outputs can be accurately measured and accounted for, EnergyAustralia is not persuaded of the merits of a TFP based approach and whether it would meet the NEO or RPP.

4.4 Firm specific X factor

The Review paper raised the question of whether the X-factor calculated from the industry TFP growth rate should be applicable to all businesses within the industry or whether business specific adjustments to this industry growth rate should be allowed to account for specific business characteristics.

[15] The Review paper, page 15.

As noted above, EnergyAustralia is uncertain that an industry TFP growth rate would result in an X factor that would allow a business to recover the efficient costs and earn a commensurate return. We therefore consider that firm specific adjustments to the industry TFP growth rate must be allowed.

We also note that TFP does not explicitly accommodate a return on investment. TFP based price/revenue regulation would produce revenue increases and decreases based on relative output performance whereas costs will increase and decrease based on a myriad of factors including asset age, asset condition, reliability levels and environmental impacts. TFP therefore would give rise to variable profit outcomes for businesses which are not related to efficiency, prudent expenditure or performance.

This raises many questions regarding the benefits of using a TFP based approach to set prices/revenue as compared to the current regulatory framework when adjustments are likely to be required to account for business specific circumstances. The current regulatory framework focuses specifically on each business, and therefore is more likely to allow the business a reasonable opportunity to recover its efficient costs and earn a commensurate return, particularly in circumstances of high levels of investment.

4.5 Determining the initial price or revenue cap

EnergyAustralia notes that the TFP based method only determines the X factor (or price/revenue increases). The initial price/revenue still needs to be established and this is proposed to be done by using the block approach. Moreover, under a TFP approach, a periodic assessment of a business' costs is required to ensure that the TFP method adequately reflects the costs of the businesses. If this methodology is implemented, it appears that a TFP based approach will be overlayed by a building block methodology or some other methodology that sets the initial price/revenue.

As noted above, we are unable to provide fully considered response to some of the issues raised by the review paper due to the absence of a proposed TFP model with specific details available for assessment. However, we have the following observations on this issue of determining the initial price/revenue at this juncture:

- Does this mean that there will be a 'hybrid' method, i.e. a combination of a TFP based method and a build block method or some other method?
- Will there be an ex-post assessment of a business' expenditure in determining the initial price/revenue?

Additionally, the rule change proposal advocated by the Victorian Department of Primary Industries recommended that a one year building block methodology be performed to recalibrate the initial price/revenue for each regulatory period. This indicates that the building block methodology is likely to be a more accurate method of determining prices/revenues.

4.6 Length of the regulatory period and off ramps

The review paper noted that[16]:

> *While a longer regulatory control period would strengthen the incentives to improve performance, the potential for exogenous costs or events (that were not contemplated at the time the revenue or price path was set) to impact on the service provider's achieved returns increases…. a longer period would increase the exposure of the service provider and regulatory to risk that the X factor is set at an incorrect level.*

In relation to off ramp, the review paper noted that[17]:

> *The objective of an off ramp is to provide a mechanism where service providers and the regulator can manage exogenous situations that arise during the regulatory period.*

The Commission seeks stakeholders' view of what the length of the regulatory control period should be and how or whether off ramps should be used under a full application of a TFP approach.

[16] The Review paper, page 27
[17] The Review paper, page 27

Taking into account the significant capital investment currently underway, which will proceed for the next few regulatory periods and other potential fundamental changes to energy sector related to climate change, EnergyAustralia considers that any application of TFP must:

- maintain the current regulatory control period of a minium of 5 years; and
- incorporate off ramps to manage events that have significant impact on the price/revenue of the businesses.