Expenditure Forecast Guidelines: Response to Issues Paper

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March 2013

Expenditure forecast assessment guidelines for electricity distribution and transmission, Issues Paper, Australian Energy Regulator

Revision Log

Rev	Revision Status	Date	Prepared by:	Checked	Authorised
A	Preliminary	08/03/2013	Rohan Harris		
B	Final	17/03/2013	Jeremy Rothfield		

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1. Background

In December 2012, the AER released an Issues Paper as a preparatory step in its development of expenditure forecast assessment guidelines for electricity distribution and transmission[1]. The Issues Paper formed part of the AER's broader 'Better Regulation' programme of work.

The purpose of this paper is to describe the techniques and associated data requirements that will underpin the AER's approach to determining efficient capital spending (capex) and operating expenditure (opex) allowances in accordance with the objectives, criteria and factors in the National Electricity Rules (NERs).

2. Purpose and Caveat

The purpose of this submission is to present United Energy's perspective on a number of the issues outlined in the AER's Issues Paper. For clarity, it should be noted that:

- The responses provided at this stage are merely indicative and are not intended to validate the proposed techniques or the choice of a particular model. Rather, they should be seen as a starting point for further discussion and consultation with the AER;
- The responses provided only focus on the electricity distribution sector; and
- The responses provided should be read in conjunction with the ENA submission that has been submitted in response to the AER's Issues Paper[2], as well as the submission on behalf of the Victorian DNSPs prepared by Castalia Strategic Advisors[3]. United Energy (UE) endorses both of those submissions.

3. Structure of Submission

As the submission by the Energy Networks Association, (ENA), provides responses to many of the specific questions asked of respondents by the AER in the AER's Issues Paper, UE has structured this submission around what it considers to be the key high level issues underpinning the development of an economic benchmarking regime, and more broadly, the development of a set of Guidelines which underscore the assessment of businesses expenditure forecasts.

These key issues are:

- Objective and scope of the Guideline.
- Role of economic benchmarking, including its interaction with incentive schemes.
- Process to be adopted.

[1] AER (2012), Better Regulation, Expenditure forecast assessment guidelines for electricity distribution and transmission, Issues paper, Australian Energy Regulator, December 2012.

[2] ENA (2013), Response to issues paper, expenditure forecast assessment guidelines for electricity distribution and transmission, Energy Networks Association, 8th March 2013.

[3] Castalia (2013), Submission on the AER expenditure forecast assessment guidelines for electricity distribution and transmission, a report for the Victorian DNSPs, prepared by Castalia Strategic Advisors, March 2013.

- Issues pertaining to the choice of input variables.
- Issues pertaining to the choice of output variables.
- Issues pertaining to the choice of environmental variables; and
- Expenditure classification.

4. Objective and scope of the Guideline

The National Electricity Rules (NER) stipulate that the expenditure assessment guidelines (the Guidelines) should specify the approach that the AER proposes to use to assess the expenditure forecasts that form part of the regulatory proposals submitted by Distribution Network Service Providers (DNSPs).

Having regard to this, UE agrees with the thrust of the ENA's submission that whilst the Issues Paper raises a number of very important matters for consideration, many of the issues raised may have only tangential relevance to actually establishing the Guidelines, and most deal with matters that can only be applied to expenditure assessments beyond the upcoming round of reviews. As a result, the Issues Paper provides a useful primer on various techniques, but is not useful in enabling stakeholders to understand what will be the likely content of the future Guidelines, and how that content will influence the AER's performance of its regulatory functions.

UE therefore supports the ENA's position that first and foremost, the Guidelines should provide relevant stakeholders with a sound understanding of:

1. How the AER interprets the relevant National Electricity Law (NEL) and NER provisions,

2. How the AER proposes to assess expenditures against those provisions, and

3. How the AER's assessment approach promotes the NEL objective and delivers long term benefits to consumers.

The first component cannot be underestimated. Regulated businesses and the AER have historically devoted a significant amount of time and resources to presenting their respective interpretations of the NEL (e.g., the NEO and the Revenue and Pricing Principles) and the NER (e.g., the capex and opex criteria). In many cases, the interpretation has changed over time - even between the Draft and Final Decisions in some cases. A coherent articulation of the AER's interpretation would be the cornerstone to any Expenditure Guideline.

Following on from this, the objective of the Guideline should be to assist in framing the discussion around the analytical tools and tests that the AER may use in the short to medium term, to assess the extent to which the incentive properties underpinning economic regulation of DNSPs (which UE considers to be the cornerstone of the regulatory regime) are assumed to have worked as intended (i.e. whether they have encouraged businesses to reveal their efficient costs).

Following on from this, if the relevant tests are deemed to indicate that a business has not appropriately responded to the underlying incentives to reveal their efficient costs, the Guideline should also frame the approaches, or at least the evaluation criteria that will be used by the AER to assess various approaches. These particular methods will be used to generate base year forecasts that differ from costs that may have been revealed during a previous regulatory period. In future, the approaches will include economic benchmarking techniques however UE would be surprised if the AER was in a position to apply economic benchmarking at a more granular level in advance of the finalisation of the Guideline by November 2013. More generally, UE does not consider that economic benchmarking methods are sufficiently refined as to enable the application of such methods at a more disaggregated level.

The Guidelines should also provide theoretical and practical examples in support of the adoption of different assessment techniques with regards to forecast changes relative to what have been deemed to be efficient base year operating expenditure forecasts. The examples should not just be focused on the typical input drivers (e.g., labour escalators, materials escalators), but should also concentrate on how proposed step changes in the level of

service may be assessed, given the AER's interpretation of the NER and the NEL, and the burden of proof that the AER considers is necessarily required to justify step changes. The Guidelines should also articulate the types of information, methodologies and supporting documentation that the AER would expect to receive from businesses in support of capex programmes.

In many respects, the Guidelines should in part, reflect a justification for those parts of the RIN that relate to capex and opex. That is, regulated businesses should be able to make a clear linkage between the requirements placed on them in relation to the RIN, and the views put forward by the AER in their Guideline as to the techniques and associated data requirements that they will use in determining efficient capex and opex allowances in accordance with the NER and the NEL. That said, the RIN should not be seen as the only instrument that can be applied to the task of collecting data. For economic benchmarking purposes, the AER should use other less onerous data collection mechanisms so as to facilitate the participation of DNSPs.

The submission on behalf of the Victorian DNSPs also outlines in some detail the features of good quality guidelines[4].

5. Role of economic benchmarking, including its interaction with incentive schemes

United Energy has reservations with regards to the contribution that the AER considers that economic benchmarking may make to the overall regulatory review process in the future, and moreover, with the view that the AER may, in future, be able to place less emphasis on incentive schemes. For example, the AER states in its Issues Paper that[5]:

> *"However, as we progressively increase the use of benchmarking assessment techniques to form a view about proposed expenditure, the need to use a carryover mechanism to counteract the incentive for NSPs to shift operating expenditure to the base year will decrease. This is because we will be less reliant on the revealed costs of an individual NSP in assessing and making adjustments to its forecast expenditure".*

In short, UE holds the view that in the short to medium term at least, economic benchmarking will *at best* supplement the "bottom-up" analytical process, rather than replace it.

Like the ENA, UE agrees with the Productivity Commission's comment that[6]:

> *"At this stage aggregate benchmarking models are ill suited to setting regulatory revenue models. However benchmarking is: - a useful diagnostic tool that can help assess the reasonableness of bottoms-up proposals."*

UE says this for two reasons:

- The regime set out in the NER is grounded in incentive regulation, and therefore, primary reliance should be placed on using incentive mechanisms to encourage businesses to reveal their efficient costs; and

[4] Castalia (2013), Submission on the AER expenditure forecast assessment guidelines for electricity distribution and transmission, a report for the Victorian DNSPs, prepared by Castalia Strategic Advisors, March 2013; pages 3 to 19.

[5] AER (2012), Better Regulation, Expenditure forecast assessment guidelines for electricity distribution and transmission, Issues paper, Australian Energy Regulator, December 2012; page 48.

[6] Productivity Commission (2012), Electricity Network Regulatory Frameworks, Draft Report, Canberra, October 2012 page 269.

- Whilst the lack of a consistent reporting framework - which is mentioned by the AER as an impediment to the current use of economic benchmarking - is pertinent, UE believes that the larger impediment is the uncertainty with regards to the ability of benchmarking techniques to normalise for all the known external cost drivers that are beyond the reasonable control of DNSPs.

In relation to the first point, quite simply, UE considers that primary reliance should be placed on the use of incentive schemes to encourage businesses to reveal their efficient costs, seek out efficiency gains in the longer term, and to encourage allocatively efficient outcomes[7]. This is not to say that the AER should, in all cases, be constrained to use incentive mechanisms, however the primacy of these methods should not be diminished without substantial evidence.

Following on from this, where the AER considers that the incentive mechanisms are not working as intended, then first and foremost, investigation should be undertaken as to how those incentive schemes could be enhanced (i.e., designed better) in order to better encourage businesses to reveal their efficient costs, or alternatively, whether additional/alternate incentive schemes need to be developed and implemented in order to encourage efficient outcomes. UE does not believe that the NER or NEL place any constraint on the AER with regards to extending or enhancing the incentive mechanisms that apply to regulated DNSPs, except to the extent that the schemes must be consistent with the NEO. To this end, extending or enhancing incentive mechanisms will have benefits (e.g., dynamic efficiency) and costs (e.g., short term reduction in allocative efficiency; administrative costs), whilst other more deterministic arrangements will also have benefits and costs. A reasonable interpretation of the NEO would suggest that the relative benefits and costs of each approach should be assessed, such that the most efficient means of achieving the NEO is adopted. The method could theoretically, involve placing different levels of reliance on different approaches for different businesses.

In relation to the second point, as will be touched upon in latter sections of this submission, the definition of input, output and environmental variables is an incredibly complex task in the context of distribution businesses (particularly electricity). For example, many of the outputs are underpinned by the probability of certain events happening, and by the consequence of those events for a DNSP's customers, and other stakeholders. The probabilistic nature of outputs, and the disconnect between the need to incur inputs, and the extent to which end customers directly benefit from those inputs (and the timeframe over which those benefits are captured), significantly complicates the process of establishing appropriate inputs and outputs for inclusion in the economic benchmarking model. In short, United Energy considers that a significant amount of work will need to be done over an extended period of time before economic benchmarking could ever be considered as a replacement for "bottom-up" analysis – particularly for electricity distribution businesses.

6. Expenditure assessment process to be adopted

In principle, UE supports the 'first-pass' process – namely the issuance of an Issues Paper outlining the areas of concern with DNSP expenditure forecasts 40 business days after the lodgement by DNSPs of their regulatory proposals. The benefit of this approach is that it provides all stakeholders with early notification of areas of concern

[7] Allocative efficiency is predominantly driven by the provision of cost reflective prices for network services. An example of a more cost reflective price would be a form of dynamic peak price that charged customers based on their demand during critical peak periods of the year. Cost reflective, in this sense, is a forward looking concept, and generally represents the long run marginal cost of supply. Referencing prices to long run marginal costs, and not the short run marginal costs, may conflict with the desired outcomes of economic benchmarking techniques, if, *ceteris paribus*, any move towards cost reflective prices reduces the outputs measured under the economic benchmarking model (e.g. peak demand), without delivering corresponding reductions in short term costs. Such an outcome would result in a reduction in the measured productivity of a business in the short term, which would potentially dampen the incentive for that business to actually seek out allocatively efficient outcomes.

with the businesses' expenditure forecast and, therefore, allows all stakeholders to focus on providing evidence in relation to the targeted areas.

That said, the 'first-pass' approach will only be beneficial if the timelines allow for the review to be undertaken with sufficient rigour and published with sufficient supporting information to not mislead consumers. As is discussed in the ENA submission, a first-pass analysis that is too brief or not sufficiently considered may be misleading[8].

7. Issues pertaining to the choice of input variables

7.1. Criteria for selecting input variables

In its Issues Paper, the AER outlines two key criteria that it will have regard for when selecting input measures. These are that input measures should be:

- Reflective of the production function; and
- Consistent with the NEL and the NER.

United Energy considers both to be non-controversial. The only comment that United Energy would make is to emphasise the need to ensure that the consideration of inputs reflects the decisions made on outputs – that is, they need to be considered in a holistic manner, not in isolation of each other. Therefore, the inclusion of a certain output (e.g., reliability) measure should be given due consideration when selecting the input variables, and more importantly, the different measurement techniques for those input variables (e.g., physical quantities versus value based).

7.2. Input variables

As stated previously, the combination of inputs, outputs and environmental variables selected is important because the results of economic benchmarking are sensitive to the inputs and outputs selected. Incorrect classification of, or valuation of, an input (and output and environmental) variables within the economic benchmarking model will lead to spurious results.

UE notes that in the case of input variables, the less contentious issue is the identification of what the core input variables are (generally, labour, capital, materials etc.), whereas the more contentious issue is how those inputs are measured. In particular, a cornerstone decision is whether physical or value based measures are adopted (particularly for capital inputs). This decision depends on, in part, whether or not assets are assumed to experience little or no diminishment in their performance over their useful life (the 'one-hoss shay' assumption).

Having regard to the above, UE makes the following high level comments on the issue of how to value the capital stock underpinning the delivery of outputs for distribution businesses:

[8] ENA (2013), Response to issues paper, expenditure forecast assessment guidelines for electricity distribution and transmission, Energy Networks Association, 8th March 2013; page 14.

- It is recommended that further, detailed analysis be undertaken before any decision is made as to the prevalence of the 'one-hoss shay' assumption for all asset classes, or the extent to which it may apply 'in the main'. The same applies to the extent to which there may or may not be a portfolio effect. This is said, mainly because UE is not aware of any comprehensive empirical study having been done on these issues for Australian distribution businesses, and moreover, because depreciation represents a cornerstone issue that needs to be answered definitively prior to making any decision in relation to which input measurement approach should be adopted.
- Further to the above, in completing the above study, UE would caution that the AER should not only have regard for the extent to which physical performance deteriorates over the life of the asset or asset classes, but the AER should also consider how the probability of failure of those assets changes, which in turn affects decisions with regard to how those assets are operated, maintained, and replaced.
- Notwithstanding the above, UE makes the following initial comments:
    - Even if analysis shows that the 'one-hoss shay' assumption applies "*in the main*", this still leaves the issue of the impact on the economic benchmarking outcomes of any deterioration of assets that occur over time, particularly towards the end of their useful life. This deterioration is likely to be managed through operating and maintenance programmes, and/or replacement programmes. It will also impact upon the level of both external insurance and self-insurance. The exact timing as to when an asset is replaced (instead of relying on, say, increased maintenance) is a complex decision, and will depend upon, amongst other things: The forward looking costs of operating and maintaining the asset; the probability of failure; and the consequence of failure. However, what can be said is that the literal use of physical measures of capital inputs may, when combined with value measures of operating and maintenance, lead to spurious results in the economic benchmarking, as it ascribes a deteriorating productivity position to a business, simply because it has a greater proportion of its assets in the back end of their useful lives (relative to a business that has a younger asset base). This may consequently lead to inefficient capex/opex trade-off decisions occurring, given the relative treatments of operating/maintenance expenditure versus capital expenditure on a like-for-like replacement.
    - If physical quantities are used as the means of valuing the stock of capital used by DNSPs, this needs to be focused at levels that are consistent with the attributes that lead to changes in the provision of the outputs utilised for the purposes of the economic benchmarking approach. For example, route kilometres of line is a measure of physical inputs; however, a better split may be route kilometres of overhead and underground line, as these have different service attributes; whereas, an even better split may take into account things such as the amount of Aerial Bundled Cable and the kilometres of SWER line, again, because these have different service attributes. In summary, there is a risk that incorrect definition of inputs, in combination with a physical quantity measure, in part drives the servicing solution adopted, which is counter to the intention and purpose of economic benchmarking.
- UE agrees with the AER that the use of capex as the measure of capital inputs is not appropriate, because it would not necessarily reflect the *annual* contribution that the asset makes to providing outputs; and
- UE contends that the use of the RAB (or some derivative of the RAB) to value a business' sunk capital stock is unlikely to provide a reasonable basis, as the methodology used to derive the original starting value is (in some jurisdictions) likely to have deviated away from a cost based approach (e.g., DORC). This would skew the results of the economic benchmarking from the outset. Since then, the RABs of different businesses will also have been affected by the regulatory lives adopted by those businesses, in particular, the extent to which these reflect engineering/useful lives, as well as the approach adopted for things such as customer contributions. Both will have impacted the RAB over time, yet the outputs will not have been affected by these decisions, thus the overall results of the economic benchmarking will be affected by these decisions.

8. Issues pertaining to the choice of output variables

8.1. Criteria for selecting output variables

The AER proposes the following criteria to select output variables:

- The output aligns with the NEL and NER objectives;
- The output reflects services provided to customers; and
- The output is significant.

Our initial view is that the AER's proposed criteria appear non-controversial. The only subtlety that UE believes may need to be considered is whether customers should be broadened to the 'community'. The reason for advancing such a proposition is that the replacement of assets (and, particularly, electricity assets) may be underpinned by not just the need to provide electricity services directly to customers, but also the risk to the broader community of an asset failing (e.g., bushfire risk). This issue is discussed in more detail in later sections.

Furthermore, UE would consider that the ultimate empirical performance of the particular output variable in econometrically estimated cost functions, or in other models, should also be an explicit criterion. Regard should be had for econometric issues such as multi-collinearity and other disturbance problems.

8.2. Output variables

The AER's Issues Paper outlines a number of the advantages and disadvantages of using different output measures. UE particularly agrees with the concerns expressed by the AER over the use of energy (throughput) as an output, given that this is not a material cost driver, and given that recent empirical evidence illustrates the risk of declining (or at least plateauing) energy consumption in combination with increasing demand and therefore augmentation related capital expenditure. UE also agrees that the use of network capacity, or peak demand, in isolation, may risk sending the wrong incentives to businesses. It also agrees with the implied focus of the AER to wherever possible, focus on the value of outputs to customers.

However, there are four comments that UE makes on the AER's discussion in the Issues Paper. These revolve around the following four issues:

- Value of 'Energy at Risk';
- Risk of asset failure;
- Use of the S-Factor to derive the value of reliability improvements; and
- Output weights.

8.2.1. Value of Energy at Risk

UE notes that in its Issues Paper, the AER discusses what it considers to be a number of fairly blunt output measures, such as peak demand, network capacity and system security. At a conceptual level, the problem with these measures is that none are probabilistic in nature, despite the fact that the economic decision underpinning the provision of electricity services is in the main, probabilistic (e.g., probability of failure underpins replacement; probability of losing energy underpins the need for augmentation).

Having regard to this, UE's initial view is that in theory, the 'value of energy at risk' could conceptually be considered a key output provided by electricity businesses. Whilst there may be some significant practical implications associated with its inclusion (e.g., the ability to calculate it for an entire network), it is postulated that if

it were able to be incorporated into the economic benchmarking approach adopted by the AER, then it would align what is a core output of the benchmarking approach with:

- The actual methodology used by some (at least Victorian) businesses to derive much of their augmentation capital expenditure program[9] in the first place (thus, the approach to economic benchmarking would better align with the broader basis for price regulation); and
- Underlying economic rationale that should underpin the need for undertaking augmentation related capex in the first place (i.e., that the benefits outweigh the costs).

Furthermore, by converting it to a value based metric (i.e., using the 'value of energy at risk' as opposed to just the 'amount of energy at risk'), it would incentivise inputs only if the value of the output that is created from the consumption of those inputs, exceeds the measured value of the input – which is entirely consistent with economic theory. Furthermore, it overcomes the issues identified by the AER with the use of 'blunt' outputs such as network capacity (which may, in some instances, make businesses that have inappropriately invested in increasing network capacity, appear more efficient) and peak demand (which may provide a disincentive to businesses to spend money to undertake demand side management, or to pay for embedded generation).

Furthermore, assessing the value of energy at risk allows for different values to be ascribed to different user types (e.g., residential customers may have a different value ascribed to their usage relative to commercial customers, who may have a different value to industrial customers). This provides for more granularity in the measure of outputs underpinning any approach to economic benchmarking.

So in short – adopting 'the value of energy at risk' as an output could theoretically encourage efficient use of demand side and network related means by which to balance supply and demand at peak times, and furthermore, it aligns the economic benchmarking output with the economic decision to augment or not augment.

That said, UE notes that engineering calculations of the value of energy at risk are complicated by the many combinations and permutations of energy flows across different segments of the network, and multiple scenarios of potential asset failures, with the result therefore being that significant further work would need to be done before confirming whether such an approach (even a scaled back version of existing approaches) could, in practice, be used to calculate a business wide energy at risk amount (noting that UE is unable to undertake a whole of network calculation of the value of energy at risk at present). Furthermore, even if it could be undertaken in practice, consideration would need to be given to those parts of the distribution network whose augmentation is not underpinned by energy at risk calculations, and also, those networks where deterministic standards are in place.

8.2.2. Risk of Asset Failure

The other key potential output variable that does not appear to have been discussed in detail by the AER in its Issues Paper is the risk of asset failure, most notably illustrated by the risk of an asset failing and then starting a bushfire. The risk of asset failure is the main factor that spearheads replacement expenditure.

In particular, the economic basis underpinning replacement expenditure is not just related to the need to maintain the existing levels of service that the customer sees directly (e.g., SAIDI, CAIDI) – and which should be able to be captured as an output measure in any approach to economic benchmarking - but also the risk around the failure of those assets on the broader community. Take for example, a situation whereby a business adjusts up its consequence of failure (in dollars per incident) as a result of the outcomes of a recent bushfire (e.g., it increases the consequence of failure in the risk models that underpin its replacement decisions). *Ceteris paribus*, this will increase its replacement program relative to historic levels, even without changing any other single parameter in its replacement model. Whilst this may have minor benefits in terms of reliability which, as stated previously, may be captured as an output in the economic benchmarking methods employed by the AER, the main output or benefit

[9] Sub transmission, zone sub-station and HV distribution feeder augmentation plans.

that accrues to the community is the reduction in the risk of failure, and therefore, the risk of starting a bushfire in this particular example. If this is not adequately captured in the economic benchmarking model, then there will be a misalignment between the results from the economic benchmarking model, and the underlying economic analysis that underpins investment decisions.

More broadly, as was mentioned earlier, if a business is required to invest more in replacing its assets just to maintain existing levels of reliability, relative to another business, because of say the average age of its network, this may not be captured in the economic benchmarking methodology (particularly as this does not appear to be an 'environmental variable' that is under consideration by the AER). This obviously assumes that the input variable is measured as a dollar value, not in a physical quantity. UE note that if the latter applies, this is not as relevant, although as is discussed in the previous section, the use of simple measures of physical quantities, in conjunction with a reliability output may also lead to spurious results, as a business might adopt a higher spec replacement solution, leading to improvements in reliability, but with no difference in the amount of inputs measured for the purposes of the economic benchmarking calculation, because physical quantities are being used.

In summary, if risk drives replacement expenditure, yet the value (benefit) of that risk reduction is not captured in full as an either an output in the economic benchmarking approach employed by the AER, or as an Environmental Variable, then the outputs will not provide for robust and accurate benchmarking results being obtained.

8.2.3. Use of S-Factor to derive the value of reliability improvement

While UE agrees with the AER that reliability may be an important output, the firm thinks that there may be other ways to think about its inclusion as an output measure. In particular, the service target performance incentive scheme, (STPIS), represents a proxy for the direct value that consumers obtain from increases in the levels of service of the underlying components of that scheme. It would appear that if this calculation is already undertaken, for the purposes of deriving financial incentives for businesses to undertake efficient investment in reliability improvements, then this too may be able to be used in the measure of the outputs (or at least, the coefficients which underpin that calculation may be able to be used).

8.2.4. Output weights

Another final, general comment is that the AER's Issues Paper appears to focus primarily on the definition of the output variables, not how weights would be ascribed to those output variables. That said, the Briefing Paper prepared by Economic Insights does touch on this issue. In particular, it states that:

> *"Economic benchmarking studies have used one of two alternative approaches to establishing the weights used in combining the various output quantity measures into a measure of total output. Some studies have used simple observed revenue shares while others have used estimated output cost shares on the grounds that pricing structures in many network industries have evolved on the basis of historical accident or convenience rather than on any strong relationship to underlying relative costs. In some cases important dimensions of network output are not explicitly charged for which means these outputs would not be included if only observed revenue shares were used.*
>
> *In practice economic benchmarking studies using a functional outputs approach have formed estimates of cost–reflective output weights from econometric cost function models. This is done by using the relative shares of output cost elasticities in the sum of those elasticities because the cost elasticity shares reflect the cost of providing relevant output components."*

UE agrees with Economic Insights, in that the absence of prices that reflect costs necessitates a move away from simple revenue shares as the basis for weighting the outputs. In no way is this likely to be a true representation of either the value to the end customer of a particular output, or the cost to the business of providing that output.

UE note that a proxy for this would be to derive a marginal cost for each of the key cost drivers, and use this as the shadow price, thus outputs would be effectively weighted by their marginal cost to derive the output values.

However, UE note that using the s-factor outputs, and/or the value of energy at risk would essentially weight these outputs by the value that customers place on those outputs (e.g., the value of customer reliability, in the case of energy at risk, and the marginal incentive rates, in the case of the s-factor).

9. Issues pertaining to the choice of environmental variables

9.1. Criteria for selecting environmental variables

The AER has proposed the following criteria for selecting operating environment factors:

- The variable must have a material impact;
- The variable must be exogenous to the DNSP's control; and
- The variable must be a primary driver of DNSP costs.

United Energy's initial view is that it does not see that there is any major issue with the AER's proposed criteria.

9.2. Environmental variables

The AER identify the following environmental variables in its Issues Paper:

- Customer Density
- Energy density and customer mix
- Climate
- Terrain
- Peak Demand.

UE also note that Economic Insights Briefing Paper recommends that the following short list be considered for use as DNSP operating environment factors in economic benchmarking studies:

- Customer density
- Energy density, and
- Climatic effects.

Economic Insights also state that:

> *"While terrain effects are also a potential candidate for inclusion, it is unlikely a satisfactory summary measure can be developed reflecting the overall effect on costs for a DNSP."*

Our initial view is that there appears to be an absence of any specific reference to regulatory obligations/levels of service as an Environmental Variable. In brief, a business could be entirely efficient, but it may have different regulatory / legislative obligations relative to other peer firms. This may affect their inputs, without leading to offsetting benefits in the outputs that are measured for the purposes of deriving the results under the economic benchmarking approach. This is particularly pertinent if the primary driver of the regulatory standard is to facilitate the provision of benefits to the broader community – for example, changes in vegetation management requirements have historically been primarily underpinned by the need to reduce the risk of igniting fires, not to enhance the direct level of service (e.g. reliability) provided to customers.

Following on from this, UE would reiterate many of the comments that it made in the previous section regarding risk, namely that if risk drives replacement expenditure, yet the value (benefit) of that risk reduction is not captured in full as either an output in the economic benchmarking approach employed by the AER, or the driver underpinning that risk is not captured as an Environmental Variable, then the outputs will not provide for robust and accurate benchmarking results being obtained.

Finally, UE notes that the extent to which 'energy density' (as defined by the AER and Economic Insights) is an environmental factor will depend on whether energy is an output variable. If 'energy throughput' is not considered for inclusion as an output variable, then it would appear to UE at least that this may not be a particularly relevant environmental factor.

10. Expenditure classification

UE makes the following high level comments in relation to the expenditure classification section of the AER's Issues Paper:

- The expenditure drivers listed in Attachment B: Section 2.1 appear reasonable. UE does, however, note that there are likely to be some (negative) correlations between some of those drivers, for example, increased vegetation management costs should in part, reduce the impact of weather events. Although less material, such activity may also lead to lower costs associated with wildlife interference and asset condition, with the latter being as a result of its impact on the probability of certain events being caused by a failure (e.g., vegetation management practices may reduce the probability of a bushfire, which may reduce the level of expenditure required to undertake inspections/maintenance/replacements). More broadly, UE notes that the magnitude of expenditure under some expenditure drivers will be influenced by the broader environmental factors affecting the DNSP (e.g., vegetation management will be influenced by topography and climate), as well as the legacy decisions pertaining to capital investment (e.g., undergrounding impacts the extent to which expenditure will be incurred in response to weather events, wildlife interruptions and actions of third parties).
- UE broadly agrees with the network segments outlined for both *non-extension augmentation works* and *system growth capex* outlined on page 100 and 103 of the Issues Paper, namely: *sub-transmission lines; sub-transmission substations; zone sub-stations; high voltage feeders (by region); distribution substations; and low voltage feeders (by region).* However, UE notes that the two primary outputs of the Augex model mentioned on page 103, namely '*costs per MVa of added capacity*' and '*ratios of capacity added to demand growth*' would need careful interpretation before they could be used as even an indicator of the need for further, more detailed, engineering analysis. For example, existing levels of spare capacity will significantly impact on the '*ratio of added capacity to demand growth'*. This in in turn requires that a spatial dimension be considered, given that spare capacity is likely to differ across different geographic regions within a network business' area. Furthermore, comparing historical costs over time, and across jurisdictions, will require careful consideration of the appropriate deflator to be used, as well as the impact that exogenous events may have had on historical cost outcomes (e.g., exchange rate fluctuations) and the scale efficiency sought by the business as part of the overall augmentation solution. For example, in relation to the later, a business' view of the risk around forecast demand eventuating may have affected its historical capacity augmentation decision – with greater levels of risk around demand leading to it adopting less scale efficient, but more flexible, demand augmentation solutions. The cost of capital may also affect the extent to which businesses are adopting more flexible, yet less scale efficient solutions, relative to less flexible, but more scale efficient solutions. In both cases, the more flexible, but less scale efficient solution may have been the most efficient outcome, although this may not be indicated in the AER's Augex model.

- UE broadly agrees with the asset types outlined on page 105 for use in the Repex model. However, it considers that the outputs of the Repex model would need careful interpretation before they could be used as even an indicator of the need for further, more detailed, engineering analysis. Again, the extent to which the Repex model can capture all of the drivers of the replacement decision for a specific business is, to be frank, somewhat questionable. The consequences of failures will have varying impacts on the replacement decisions adopted by different businesses – and the impacts will change over time, as businesses improve their knowledge of the impact of those failures; as exogenous factors change (e.g., bushfire risk); and as the opportunity cost of not replacing (and continuing to operate and maintain) changes.
- UE questions the benefit of disaggregating operating expenditure to the level of granularity outlined on page 107 – 108 of the Issues Paper (particularly around different types of maintenance activities). UE also notes that the AER should give further consideration to the Efficiency Benefit Sharing Scheme which provides an incentive for a business to develop the least cost solution. A more fulsome discussion of this is contained in the ENA submission[10].
- UE also questions the assessment of vegetation management in the Issues Paper. As the ENA submission points out, benchmarking of vegetation management expenditure across the measures will be severely limited, given the variability of factors such as different regulatory obligations (e.g. a buffer zone); tree growth rates; tree density/terrain and contract arrangements[11]. In light of this, trend analysis on a total expenditure basis could be considered, although even then there can be significant variability in expenditure from year-to-year due to the change in weather which would need to be accounted for.
- UE considers that overheads should be separately reported and due to the differences between DNSPs they should be assessed and reported at an aggregated level.

[10] ENA (2013), Response to issues paper, expenditure forecast assessment guidelines for electricity distribution and transmission, Energy Networks Association, 8th March 2013; page 5.

[11] ENA (2013), Response to issues paper, expenditure forecast assessment guidelines for electricity distribution and transmission, Energy Networks Association, 8th March 2013; page 7.