

Expenditure Forecast Assessment Guidelines

Working Group meeting No. 13

Summary of meeting – 2 May 2013

Economic benchmarking – measurement of TNSP outputs and environmental factors

On 2 May 2013, the AER, as part of its Better Regulation package, hosted a working group meeting on the economic benchmarking component of the development of the Expenditure forecast assessment guidelines (the Guidelines).

A full attendee list can be found at Attachment A.

This summary outlines the key topics and themes of the meeting, including views expressed at the meeting, without ascribing particular comments to any one individual or organisation.

1 *Introductions*

AER staff noted this workshop was part of phase two of the AER's consultation on the use of economic benchmarking.

In this workshop, AER staff sought feedback from stakeholders on issues relating to the measurement of outputs and environmental variables for economic benchmarking of transmission network service providers (TNSPs).

The AER's consultant, Economic Insights, summarised its briefing notes on measurement of outputs, provided a short list of data requirements and examples of different output specifications.

The briefing notes and slides used in the presentation are available at:

<http://www.aer.gov.au/node/19508>

2 *Major issues for discussion and feedback from the workshop*

Model specification

Economic Insights commenced by outlining the three approaches to forming weights used to combine different output quantities into a measure of total output for use in efficiency analysis. These were the use of econometric cost functions, the results of previous studies and obtaining information directly from TNSPs.

Stakeholders requested clarification on how the appropriate output weights are derived from cost function estimation.

Economic Insights noted it would depend on the cost function that was used. As an example Economic Insights identified the Leontief function which regresses total costs against the outputs to provide direct output cost share information and, if more data were available, flexible functional forms such as a translog cost function where output cost shares are derived from the ratio of the relevant first order output coefficient to the sum of those coefficients.

Stakeholders asked how the AER might determine the most appropriate weighting for the variables. Economic Insights noted that referring to other studies and the businesses' own costs of providing services would also provide supporting evidence. Economic insights indicated that sensitivity analysis could be applied to test the effect of different weightings. If all outputs grow at a similar rate then productivity information would be less sensitive to the choice of output weights than if output components grow at significantly different rates.

A stakeholder noted OFGEM used customer numbers, energy demand and throughput as outputs (in DNSP analysis) and applied respective guestimated weightings of 50% 25% and 25% in the absence of relevant evidence. Stakeholders noted that these weightings would not be relevant for TNSPs which do not serve end customers directly.

Stakeholders noted that if the businesses were to provide the weights, they were each likely to allocate them differently.

Economic Insights noted that the cost allocation for economic benchmarking purposes should be consistent with the allocation rules being developed in the category analysis workstream. AER staff noted that there will be a workshop discussing cost allocation issues on 16 May 2013.

Stakeholders noted that the costs the business incurs do not directly relate to the functional outputs nominated for economic benchmarking and there is a many-to-many relationship between cost items and outputs. That is, individual cost items generally do not relate directly to individual outputs. Hence it would be difficult to allocate costs to outputs.

Economic Insights noted that while some direct costs can be allocated easily, appropriate drivers would have to be developed for the allocation of shared costs, as is normally the case with fully distributed cost allocation models.

AER staff noted that an alternative approach would be to use customer valuations. However it was noted that customer valuation studies often rely upon the results of subjective surveys.

Outputs data requirements

Revenue

Stakeholders noted that the tariff structure was not a one to one relationship with the costs of the functional outputs nominated. Stakeholders asked why it was necessary to have disaggregated revenue data.

AER staff noted that disaggregated revenue data could be used to provide information on appropriate weighting of some of the outputs used in a functional specification (where there was cost reflective pricing) and would be necessary to allow the AER to apply a billed outputs specification for sensitivity analysis.

Stakeholders noted that the list of disaggregated revenue did not link closely to the nominated functional outputs and noted the complication that elements of both throughput-based or demand-based charges could be imposed depending on the situation.

It was noted that SP AusNet did not have the final say in pricing its network services as this was done by AEMO. After some discussion it was agreed that relevant parts of AEMO's operations would need to be added to those of SP AusNet to provide a more like-with-like comparison with the other TNSPs' coverage and responsibilities for economic benchmarking purposes. The AER may need to establish an information gathering mechanism to obtain relevant information from AEMO.

System demand

Stakeholders noted that the AER was not requesting weather normalised peak demand data. The AER noted that normalisation techniques for peak demand differed across networks. For economic benchmarking it would be preferable to collect the raw data and undertake consistent weather normalisation or other smoothing as appropriate across all jurisdictions. It was also noted that weather data are being collected and would be included as an operating environment factor. Care would thus be needed not to double count for weather effects. However, it was noted that the inclusion of weather in an economic benchmarking model would not be done in the same way as weather normalising for peak demand.

AER staff stated that they would be happy to also collect weather normalised data and including this as an output could be an alternative to including unadjusted outputs and weather operating environment factors.

A stakeholder asked if most recent forecast, forecast determination or AEMO forecast peak demand would be used.

Economic Insights noted that actual peak demand is quite volatile and forecast peak demand from previous regulatory determinations had been suggested at the previous workshop as being more appropriate. However, it was noted this may provide an incentive for TNSPs to overstate forecast peak demand at future determinations. Economic Insights suggested smoothing of actual peak demand may be the best option.

There was some confusion surrounding the transmission system planned capacity variables. AER staff noted that this measure may not be the best measure of forecast peak demand and Economic Insights agreed that it should potentially be removed from the data requirements.

AER staff noted that, if current forecast peak demand data are used, then AEMO's forecast peak demand may be the most appropriate forecast measure.

Stakeholders noted that forecast peak demand changes each year. A stakeholder noted that it should ideally be the peak demand measure used at the time of investment decisions – hence warranting a delayed forecast peak demand measure. After some discussion there was some agreement that it may not be worthwhile collecting forecast peak demand. However, AER staff noted that consumers value supply at peak demand and wanted to ensure all perspectives are canvassed in the data.

Stakeholders also noted that the proposed peak demand measure did not currently capture the peak demand of interconnectors and that these should be included. Economic Insights agreed that the contribution of interconnectors should be recognised in the measure.

System capacity

A stakeholder noted data was requested for a range of line voltage classes but they could only provide data on the subset of voltage classes they actually have.

Economic Insights noted that businesses should respond with data for their relevant voltage classes and, if there were cases of unusual voltage classes not covered, these should be either combined with the nearest requested voltage class or else reported separately.

AER staff noted that transmission businesses had less independence to plan their own network capacity and there was hence less likely to be an incentive to provide excess capacity as may be the case in distribution. Therefore, system capacity may be a superior measure in the case of transmission compared to using peak demand as a proxy for required capacity.

A stakeholder noted that generation connected transformer capacity was not included and that connection of generation to the network was a function of TNSPs.

AER staff noted that it was worthwhile getting the data on connected generation transformer capacity and it should have the same definition as the customer side.

A stakeholder asked why transformer capacity for end-user owned capacity was required.

Economic Insights noted that there were separate measures of system capacity and asset capacity – system capacity is used for the output side and asset capacity is used for the input side. The current output data list contains all data required for both measures. On the output side the measure of system capacity is the product of line length and all (directly connected) downstream transformation capacity. Hence, it is necessary to have an estimate of all directly connected downstream transformation capacity, regardless of whether it is owned by the TNSP or the directly connected downstream user, to measure the TNSP's system capacity.

Stakeholders noted that the alternate measure listed of capacity of directly connected downstream transformation capacity owned by users may be more readily provided. This relates to the summated maximum non-coincident demand for those users.

Stakeholders asked whether the capacity should be measured in terms of the thermal ratings of assets. Economic Insights expressed a preference for thermal ratings.

A stakeholder asked how would transformation step ups and step downs within the transmission system be included as the issue was similar to the network complexity issue identified for distribution networks.

Economic Insights noted that this was already included in the data list and this capacity would appear on the input side where all transformer capacity is relevant, not just that on the downstream connection side.

Reliability

Economic Insights noted that it had included the four STPIS service indicators in the short list of TNSP outputs. Two of these - average outage duration and loss of supply event frequency – relate directly to the impact on end-customers while the other two - average circuit outage rate and proper operation of equipment – are lead indicators of potential reliability problems and hence important secondary deliverables.

A stakeholder questioned the relevance for STPIS measures for economic benchmarking for transmission and suggested the simpler measure of system minutes lost as an appropriate alternative.

A stakeholder argued that the value of revenue at risk under the STPIS did not relate directly to consumer value of energy not supplied and, while it provided an incentive to businesses, it was not appropriate for benchmarking and the number of system losses should be the reliability output.

Another stakeholder also noted that topology drives reliability.

And another stakeholder noted that the same event may impact businesses differently, for example depending on whether a business had a meshed or radial network.

A stakeholder asked what is the expectation for TNSPs to do if they appear to be poor performers on the reliability outputs suggested.

Economic Insights noted that the transmission system plays a critical role in electricity supply and, while current reliability performance is relatively good, it was important to ensure that remained the case. Economic Insights noted that while system minutes may capture the duration of direct impacts on end customers, it did not capture the frequency of outages affecting customers. Several separate interruptions over several days will inconvenience customers considerably more than the one interruption of equal total duration. Economic Insights also noted that while current reliability performance is good it was important to ensure TNSPs did not allow their systems to run down, particularly in response to other incentives they may be responding to, thus compromising future reliability performance. The lead indicators reflected important secondary deliverables, namely ensuring the future integrity of supply. This was analogous to the network health indicators used by Ofgem. After some discussion, most stakeholders agreed that a lead indicator such as average circuit outage rate had a role to play in economic benchmarking. The point was made that the proper operation of equipment STPIS indicator reflects particular targeted measures, and is not a comprehensive indicator of secondary deliverables.

AER staff raised the possibility that secondary deliverable measures may be more readily incorporated in the category analysis workstream.

Stakeholders noted that the latest STPIS reliability data may be currently unavailable for most TNSPs. AER staff noted that the current STPIS will be progressively applied to all TNSPs and they will be required to provide several years of historic data using the new indicators as part of the scheme.

Stakeholders asked how the value for the volume of lost load would be obtained. AER staff noted that the volume would be the quantity of lost load and the price would be the VCR. Stakeholders noted that this is not minutes lost.

It was noted that the value of VCR would change over time and would depend on the study undertaken. AER staff flagged the potential calculation of VCR for specific networks based upon the customer characteristics of each network. However, this is often not visible at the transmission level. Stakeholders considered that a consistent measure across all TNSPs would be less complicated and fit for purpose in the short run.

AER staff noted there appeared to be broader support for customer side measures of reliability than leading indicators of reliability. Some stakeholders noted they had been persuaded that there was a role for leading indicators as well.

Economic Insights noted that the VCR had been suggested as the price of outages in the briefing notes, regardless of whether the outage led to customers being interrupted. Economic Insights noted this may place too high a weight on such a measure and asked stakeholders to provide suggestions for a more appropriate price for this type of reliability output.

The discussion then turned briefly to more general issues.

General Issues

In response to questions about data availability, AER staff stated that economic benchmarking will be applied into the future and the data set will be published annually to the maximum extent that confidentiality requirements permit.

A stakeholder noted that the efficiency of the business in doing what was forecast is important and, given that the length of the network was unlikely to change, actual peak demand smoothed could be the best output measure.

Economic Insights noted that this would disadvantage long systems in efficiency comparisons across TNSPs.

A stakeholder noted that the best measure of the service to the competitive wholesale market provided by networks may be the total cost of constraints. Stakeholders noted that measuring the total cost of constraints is better than marginal cost; however this would be a major exercise. It was noted that the measurement of the total cost of constraints is complex and should potentially be the focus of a future work program.

It was noted that cross sectional comparisons of transmission networks would require adjustment for environmental factors. However, time series analysis, particularly of a single business with itself would not require as much adjustment for environmental factors. AER staff noted that both cross sectional and time series analysis would be undertaken.

Energy delivered

AER staff noted that energy delivered was not a major driver of costs and noted that this issue was raised by stakeholders previously.

Stakeholders questioned the need to provide energy delivered disaggregated by type of user and type of tariff. AER staff noted that this was for the possible application of a billed outputs specification as sensitivity analysis as well as possibly assisting with the derivation of functional outputs weights.

Stakeholders suggested that energy *transmitted* rather than *delivered* may be more readily available and also recognised that the difference might only be a few per cent.

Operating environment factors data requirements

Stakeholders posited that only three of the fourteen suggested operating environment factors had been incorporated into Economic Insights' revised short list. Economic Insights stated that the proposed short list made a start in addressing six of the operating environment factors nominated by TNSPs and another five on the TNSP list were more appropriately addressed in the measurement of outputs and inputs. Stakeholders suggested circulation of a further explanation of how the operating environment factors were captured could be useful.

AER staff noted that the businesses needed to provide more information on the materiality of their suggested operating environment variables. This included quantification of the effects of various operating environment factors.

Stakeholders noted that operating environment variables would be difficult to quantify and may differ with the type of network.

Stakeholders noted the utilisation factor of networks could be an important environmental factor.

AER staff noted that the number of environmental variables that can be incorporated directly in economic benchmarking is limited, particularly given the small number of observations available for TNSPs. AER staff noted that operating environment factors can nonetheless help with the explanation and qualification of efficiency results outside of the economic benchmarking quantitative analysis.

Stakeholders expressed a preference that operating environment factors be incorporated directly wherever possible as other stakeholders and analysts tend to just look at published charts and not at accompanying explanations.

Economic Insights noted that it was important to see which variables were the most material and to focus on them first.

It was noted that the measurement of the number of hot days might not be sufficient on its own. The time and context of the hot days (ie whether they follow other hot days and whether they were on a working day or not) should also be considered.

Stakeholders noted that their 'technical envelop' requirements referred to in the NER include things relevant to maintaining the quality of supply. While material, it was agreed they were hard to measure and unlikely to be suitable for inclusion in economic benchmarking.

Application of economic benchmarking

Stakeholders requested clarification on several issues relating to the application of economic benchmarking.

A stakeholder noted that readers may draw conclusions from the benchmarking results even if the AER did not draw any specific conclusions.

AER staff noted that it would give TNSPs an opportunity to comment on the benchmarking results prior to publication.

A stakeholder questioned how economic benchmarking would assist the regulation of transmission network investment as it involves the benchmarking of capital stocks which are long lived and cannot be changed immediately.

AER staff said it had to consider the relative efficiency of the network and to assess future capital requirements. Economic benchmarking would provide contextual information for decisions regarding proposed opex and capex. The AER also now has a requirement to publish annual benchmarking reports documenting network performance.

Stakeholders noted that TNSP expenditure was driven by long term decisions and that changes could not be seen in a five year regulatory period. They noted that there would be a large difference if the network was built today but it is not necessarily efficient to change to even in the long run.

AER staff noted that implementation issues would be discussed in the 22 May workshop and that it would also be open to bilateral meetings with stakeholders.

Attachment A: Attendee list

Melbourne office

Name	Organisation
Andrew Kingsmill	TransGrid
Anh Mai	SP AusNet
Bill Jackson	ElectraNet
Bruce Mountain	CME
Frank Montiel	Australian Energy Market Operator
Michael Seddon	Transend Networks
Anthony Seipolt	AER
Lawrence Irlam	AER
Andrew Ley	AER
Jason King	AER
Kevin Cheung	AER
Denis Lawrence	Economic Insights
John Kain	Economic Insights