

## BENCHMARK ECONOMICS

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Mr. Andrew Staniford  
Commercial Manager  
Envestra Limited  
81 Flinders Street  
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Dear Andrew

**Pacific Economics Group:  
Report on Non-capital costs in the access arrangement for Envestra**

You have requested Benchmark Economics to provide you with some observations on the report prepared by Pacific Economics Group (PEG) for the Essential Services Commission of South Australia (ESCOSA). The report provides an independent, objective analysis of the benchmarking evidence presented in Envestra's access arrangement. Our observations are limited to matters raised in Chapter three of PEG's report and which relate directly to our report on the benchmarking of non-capital costs as contained in the ESCOSA's proposed revisions to the access arrangement.

In general, while agreeing with many of the principles raised by PEG, it is our view that they largely misinterpret the nature and purpose of our cost structure analysis. The points raised are more appropriate to large sample, multi-period data sets, not to the simple analysis of the Australian gas sector operating and maintenance costs. For the Australian gas sector there are 10 observations with data limited to a few years. Different techniques and standards must apply to reflect these differences; it would be unrealistic to expect otherwise.

To assist you in understanding the issues of concern, we have identified the key points which we list below. We then provide more detailed observations in the following section.

### **Key points**

**Definition of benchmarked costs:** We do not agree that market development costs should be included in efficient operating cost analysis. Defining market development costs as an operating cost means that the ESCOSA is unable to test whether operating and maintenance costs, per se, are sufficient to ensure safe and reliable operation of the pipeline as required by the Code.

**Operating conditions and benchmark normalizations:** Gas penetration was used to illustrate the role of resource endowment and energy policy (eg attitude to market development) in raising

capacity utilization and lowering average costs. It was specifically not used as a cost driver in the cost estimations since endowments and policy are not factors intrinsic to the pipelines operating cost structure. Heating degree days, relating mostly to space heating in the household sector, have only a limited use in the analysis of total gas demand which also includes commercial and industrial applications.

**Data:** The use of only one year's data is justified on two grounds. One, the data depicted in the ESCOSA's benchmarking analysis revealed that the data varied little over time. There was no evidence of temporary or one time factors that might bias the results (See Figures 1 and 2). Two, though ESCOSA's analysis purported to represent a time series, it was actually based on line data for one year, and even that year varied between the states. We do not believe there is anything to be gained in using a longer time series if it is flawed. The choice of regulated data in preference to actual data was due to the perceived wisdom of analysing a series consistent with that used by the ESCOSA.

**Benchmarking techniques and results** While we would not dispute the general principles put forward by PEG, the points raised suggest an interpretation of the analysis that goes well beyond its purpose. The objective was to take cost comparisons beyond the simple approach adopted by the ESCOSA and to demonstrate the significant role played by operating conditions in determining relative cost outcomes. By so doing, we were able to demonstrate that the significant and unexplained range between high and low costs in the ESCOSA's benchmarking was due largely to differences in those conditions.

**Standard for evaluating efficiency** The principles raised by PEG in relation to the estimation of efficient cost are not disputed. But again we believe they are not apposite to the actual analysis. The objective was not to identify the superior cost performer, an implausible task given the sample and data limitations. Rather, the objective was to demonstrate the role of business conditions in affecting relative cost positions and to identify an efficient cost outcome appropriate to a business with Envestra's operating environment. It is not realistic to expect a full econometric cost function to be developed from a sample of 10 observations.

**Cost sustainability** Again we would direct attention to the stability of the cost series depicted in Figures 1 and 2. The Envestra data suggests a stable cost level for a period of around 10 years. Given that we estimated the 2004 costs to be somewhat less than an appropriate level, we concluded that carrying this level forward would not provide a sustainable level of operation and maintenance expenditure.

#### **Operating-capital cost allocations**

The analysis of capital expenditure was simply to provide a check that the non-capital cost position of Envestra had not been achieved by shifting items into the capital expenditure budget. We found no evidence of cost shifting. It was not intended to be a discussion on cost allocations per se.

## **Details**

### **1. Definition of benchmarked costs**

BME agrees that marketing costs are controllable by management. However, within the context of the wording and intent of the Code, this is not the issue. The issue is whether such costs are

accurately defined as operation costs. The Code requires the regulator to approve an Access Arrangement only if it is satisfied that it takes into account, inter alia, “the *operation and technical requirements* necessary for the *safe and reliable operation* of the pipeline” and the “*economically efficient operation*” of that pipeline s2.24 (c). It would be difficult to argue that market development costs are necessary for safe and reliable pipeline operation.

The regulator will be unable to satisfy itself that the operation and maintenance cost component meets the required test of maintaining the *safe and reliable operation* of the pipeline if it cannot separate operation and maintenance from market development costs.

Assessing the efficiency of market development costs is not an easy task. In well developed gas markets such as Victoria, the major expenditure on market development is in the past - it cannot be retrieved to test the efficiency of current expenditures. Lacking a comparable level of activity in other businesses to test Envestra SA's expenditures, Benchmark Economics used the gas penetration rate as a proxy for market related expenditures to demonstrate that expenditures which increase capacity utilization deliver lower average costs.

Note that the program based nature of Envestra's proposed market development costs contains its own benchmarks since each program has been subject to a cost/benefit analysis based on the ESCOSA hurdle rate.

## **2. Operating conditions and benchmark normalizations**

Gas penetration rates were identified as cost drivers, but only for explaining the variations in non-capital costs. They were specifically not used in the cost estimation models. This was justified on the basis that market penetration depended on resource endowments and state energy policies (eg market development costs) and as such, did not represent a business operating condition. Only business conditions that would affect the investment in, and use of, pipeline assets (the link between conditions and costs), were included in the estimation models.

BME agrees that the use of heating degree days as an exogenous variable to explain variations in gas uptake and cost outcomes is a widely accepted methodology; it is not in dispute in the right context. Its usefulness in a cost model developed to explain the differences in uptake and cost outcomes for the total gas market, however, must be limited. The total gas market includes not only household consumption where space heating may be relevant, but also commercial and industrial loads where it is less so.

Household consumption represents, on average, only about 30 per cent of total demand. Factors other than space heating drive gas uptake in the remaining 70 per cent of the market. We are of the view that factors that are pertinent to the market are to be preferred to those that may be exogenous but less relevant.

## **3. Data**

While we agree with PEG that, in theory, tests of efficiency would best be conducted on actual rather than regulated expenditures, this does raise a number of issues. Firstly, to avoid charges of data “shopping”, the decision was made to use the same type of data as that used by the regulator in its benchmarking analysis. Next, actual data may vary widely over the regulatory time period as businesses manage expenditures to achieve a range of objectives; this is even more likely in the longer term requiring a more extensive data series. Currently this is not available. Finally, the

range of data available for regulated network businesses is neither extensive nor widely available; this is undesirable, but unavoidable.

For example, there is very little information available on line length data. In its benchmarking analysis the ESCOSA was forced to use only one year's line length data in calculating its performance indicators opex/km and capex/km. This is so even though the data for Envestra SA covered 11 years from 1998/99 to 2010/11 and from 1998/99 to 2006/07 for the rest of the businesses. Moreover, the year for the line data varied; from 2001 for the Victorian businesses to 2003 for NSW and 2005 for Envestra. We would argue that the use of long run data based on one year's line length to test long run efficiency and sustainability is no more robust than the use of one year's data.

Given limitations of the line data, which is a critical input to the Benchmark Economics cost model, the decision was made to use data from one year only. As discussed in our report, this decision was reinforced by the stability of the time series data as depicted in the charts provided by the ESCOSA in its benchmarking analysis (See Figure1).

Figure 1: ESCOSA - Opex/km

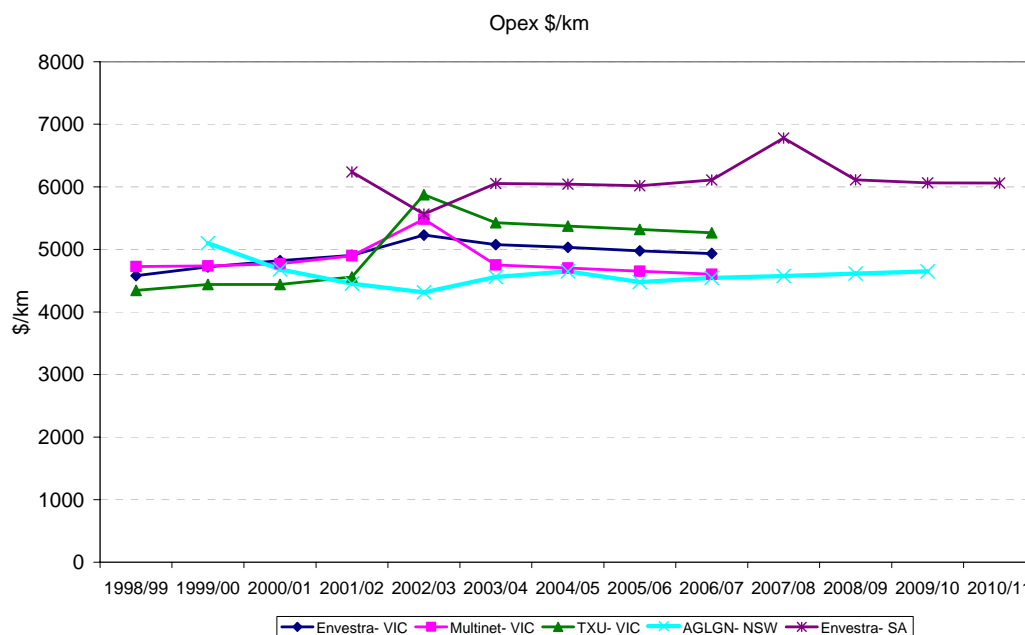


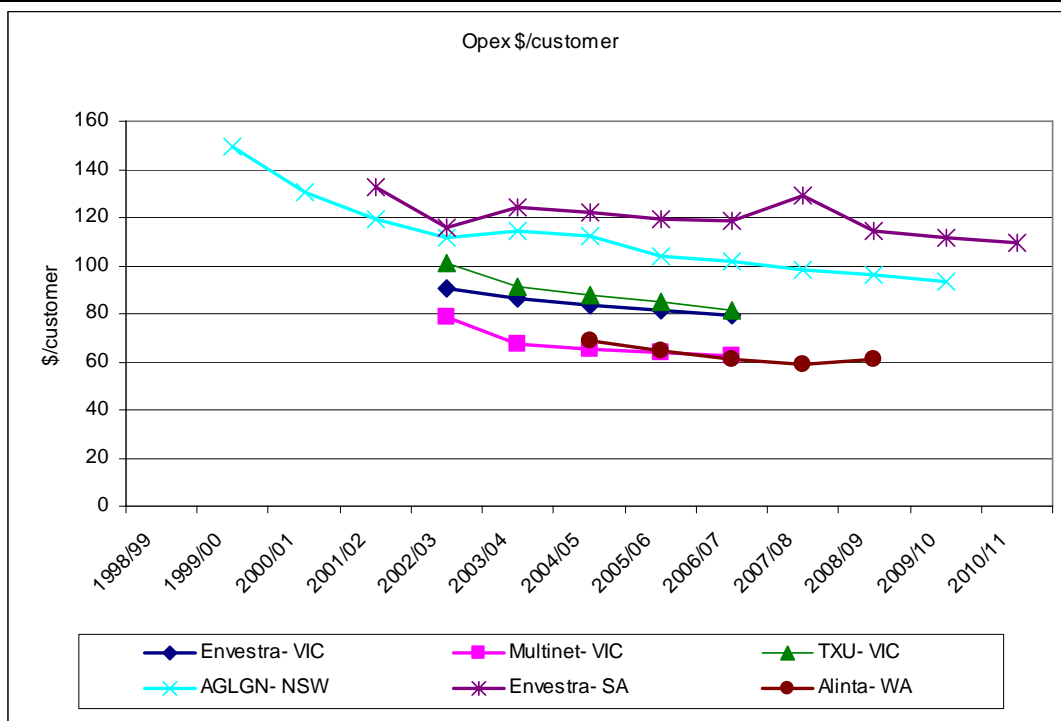
Figure 1 shows that over the period 1999 to 2011 a fairly stable relationship existed between the expenditure levels for the Victorian, NSW, and South Australian businesses. 2003 provides the exception. In isolation of this evident stability we would accept that the use of one year's data would not be ideal. However, we believe that the cost data in Figure 1 speaks for itself; there is no evidence of the temporary or one time factors referred to in the PEG Report that may bias results. Efficiency may be a multi-year concept, but if the pattern is repeated in each year little is lost by analysing only one of those years.

#### 4. Benchmarking techniques and results

The techniques available for comparative cost analysis are extensive, with the choice determined, to a large degree, by the nature of the study. While we would not dispute the general principles put forward by PEG, the points raised suggest an interpretation of the analysis that goes well beyond its purpose. The comments also assume a larger dataset and more comparable sample than that existing for the Australian gas businesses.

The main objective of the analysis was to demonstrate that the benchmarking by the ESCOSA using simple financial ratios was misleading. It could not provide a useful guide to relative efficiency, as was claimed, since it failed to take account of the impact of operating conditions on relative costs. The BME analysis identified key cost drivers and illustrated the role they played in the hierarchical nature of the costs displayed in the ESCOSA's benchmarking charts (See Figure 2).

Figure 2: ESCOSA - Opex/Customer



For example, if we examine the data for the Victorian businesses in Figure 2, we find that in 2004 there was a difference of 18 per cent between the opex/km for TXU and Multinet. We consider that this range is too large to convey useful information on the level of efficient cost as required by the Code.

However, it is possible to explain this range if the operating conditions are included in the analysis. This was the intention of the analysis. The introduction of key business conditions not only provides regulators with a more robust measure of efficient cost levels but it also allows a credible estimate of the appropriate cost level for each type of business. We would point out also that the benefits of this more robust approach would be eroded if non-operating costs such as market development were included in the expenditures.

It is simply not realistic to expect a full econometric cost function to be developed from a sample of 10 observations, with a limited dataset. While we have seen such analysis attempted the less said the better.

The use of charts to illustrate the regressions was intended enable the regulator to make its own judgments as to the strength of the fit and the position of Envestra SA relative to the other businesses. Simply put, the main messages from the analysis, and it appears, previously unknown to ESCOSA are:

1. scale measures provide little explanation of relative cost;
2. the range of costs in the ESCOSA benchmarking charts can be explained by including key business conditions;
3. the relative position of Envestra's costs is dictated by its operation environment. Envestra SA has middle ranking costs in line with its middle ranking density and consumption levels;
4. Envestra's costs are proximate to the appropriate level for a pipeline business with its business condition;
5. there is little margin in Envestra's costs to allow for a reduction and still operate and maintain the pipeline in a safe and reliable manner;
6. the rankings of the businesses largely remain constant across a range of different linkages between costs and business conditions, suggesting an underlying robustness in the explanations offered;
7. gas penetration rates drive capacity utilization and hence lowers average cost.

This type of information provides regulators with a solid knowledge base from which to proceed to the next level of analysis once the problems of the sample size and data limitations are overcome.

#### **8. Standard for evaluating efficiency**

The principles raised by PEG in relation to the estimation of efficient cost are not disputed. But again we believe they are not apposite to the actual analysis. The objective was not to identify the superior cost performer, an implausible task given the sample and data limitations. Rather, the objective was to demonstrate the role of business conditions in affecting relative cost positions and to identify an efficient cost outcome appropriate to a business with Envestra's operating environment.

While PEG provides a survey of efficiency studies to illustrate analyses undertaken to determine average efficiency levels of banking firms, on closer examination we find they are largely irrelevant in the context of the Australian gas industry. Taking just one of these studies, that by, Eisenbeis, Ferrier and Kwan (1999), we find that the sample size was around 1888 observations taken from 59 banks over a period of 9 years using quarterly data.

The eminent economist Robert Solow observed that "*models are an attempt to make impossibly precise statements about an inherently imprecise world*". The precise level of efficient cost in the Australian pipeline industry is not known, nor do we believe, is it possible to statistically estimate it given the extent of current data and knowledge. In the absence of this precision, our analysis defined 'efficiency' as the *level of costs appropriate* to a given set of business conditions

(page ii). The level of appropriate, and hence efficient, costs was derived from the trend estimated by the linear regression models. A range was estimated around the point estimate.

#### **9. Cost sustainability**

Again we would direct attention to the stability of the cost series depicted in Figures 1 and 2. The ESCOSA's analysis demonstrates that Envestra data is stable for a period of around 10 years. On the basis that we estimated the 2004 costs to be somewhat less than an appropriate level, we concluded that carrying this level forward would not provide a sustainable level of operation and maintenance expenditure.

#### **10. Operating-capital cost allocations**

The analysis of capital expenditure was simply to provide a check that the non-capital cost position of Envestra had not been achieved by shifting items into the capital expenditure budget. It was not intended to be a discussion on cost allocations per se. We found no evidence of cost shifting.

Yours sincerely

Margaret Beardow  
Principal