



Transco Capex/Opex Review

REVIEW OF TRANSCO'S OPERATING AND
MAINTENANCE EXPENDITURE FORECASTS

-
- 14 August 2005



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1. Executive Summary

This is an internal report to LECG Ltd and their client The National Transmission Corporation (TransCo) to assist in the preparation of the five year operating and maintenance expenditure (Opex) forecast as part of TransCo's submission to the Electricity Regulatory Commission (ERC).

Sinclair Knight Merz (SKM) has benchmarked TransCo's recent historical operating and maintenance expenditure against a small group of international transmission businesses. In all expenditure measures, TransCo benchmarks positively.

SKM has inspected the condition of a range of TransCo's assets and reviewed various maintenance manuals and procedures. SKM is of the view that the current level of maintenance is appropriate and reasonable.

The operating and maintenance expenditure forecasts for 2005 and the next five year regulatory period (2006-2010) have been reviewed. This forecast is based on a continuation of the current levels of activity and resources with minor increases only envisaged. The forecasts incorporate some substantial increments in staff remuneration. These increments are supported by the Mercer HR survey of remuneration within the Philippines Energy Industry. These increments increase the total budget requirements significantly.

This review of the opex forecasts is able to demonstrate increasing labour efficiencies over the forecast period. However, the review finds that economic efficiency declines over this period. This is reflected in the benchmarking against international businesses where TransCo slips from being a low cost leader to being an average to poor performer over the forecast period.

The review also considers the impact of the forecast opex on the reliability performance of the TransCo network. It concludes that the forecast opex budget will maintain the current levels of performance which is in line with the expected performance targets set under the Philippine Grid Code.



2. Introduction

Sinclair Knight Merz has been commissioned by LECG Ltd to assist The National Transmission Corporation (TransCo) in the preparation of forecasts of capital expenditure and operating and maintenance expenditure as part of TransCo's submission to the Electricity Regulatory Commission (ERC) for the current regulatory re-set.

This report focuses on the operating expenditure forecast.

The Transmission Wheeling Rate Guidelines (TWRG) require the operating and maintenance expenditure (Opex) forecast to be provided in a format defined in ERC's Issue Paper (September 10, 2004). SKM's brief is to assist TransCo to articulate why the Opex forecast is necessary and reasonable or to prepare revised forecasts that meet these criteria.

Specifically, SKM is required to comment on whether the Opex forecasts are:

- 1) Reasonably efficient;
- 2) Sufficient to support forecast growth;
- 3) Sufficient to allow TransCo to achieve or exceed the target levels of performance.



3. Recent Trends

3.1 Historical Expenditure

Historical Opex expenditure has been provided for 2003 and 2004.

Table 1: Historical Opex

Opex Category and Sub-Category	2003 (Php Mn)	2004(Php Mn)
Payroll		
Network Operations Supervision & Eng'g Staff	379	379
Network Operations Other Staff	419	419
Network Plannig Supervision and En'g Staff	29	29
System Operations Supervision & Eng'g Staff	183	183
Admin, HR, Finance Corporate & Regulatory Staff	626	584
Easements owned by the Regulatory Entity		
Sub-total Payroll	1636	1594
Network Related		
Network Operations	287	398
Network Maintenance	694	962
Plant & Equipment Insurance	118	247
System Operations	79	174
WESM Compliance		
Sub-total Network Related	1178	1781
Non-Network Related		
Bad Debts	44	50
Internal & External Audit Functions		12
Regulatory liaison & compliance		
Corporate & central office	52	158
IT licenses, operations & maintenance	19	8
Lease payments		
Net foreign exchange (either loss or gain)		
Property maintenance	65	77
Property insurance	20	23
Others		
Sub-total Non-Network Related	200	328
Total Operating & Maintenance Expenditure	3014	3703

There was a considerable increase (approximately 23%) in expenditure in 2004. This increase was mainly in non-labour network operations and maintenance expenditure. Other large percentage increases have been seen in Corporate and Central Office expenditure but from a quite low base.



The 2004 expenditure has been benchmarked against several international transmission businesses with quite positive results. Please see section 5.2 where this is discussed further.

3.2 Maintenance Standards

SKM has reviewed a number of documents related to maintenance policies, procedures and practices (including “Power Systems Reliability Enhancement Program – Implementing Guidelines and Working Procedures”, “Maintenance Manual on Substation Equipment”, “Maintenance Manual on Transmission Lines” plus a range of Circulars covering reliability reporting procedures). The documents reviewed appear to provide a consistent framework for maintenance management of the TransCo assets

SKM personnel have also visited a number of TransCo sites to inspect existing assets and have interviewed maintenance supervisors in regional areas. Asset condition has been discussed at every opportunity with substation operating personnel, and visual inspection of all major substation plant conducted at each substation visited.

A substantial report was produced as part of SKM’s Valuation of the TransCo assets addressing suitable asset live in the Philippines. This report concluded:

“From inspection of test records, limited site inspections and discussions with maintenance managers from the Luzon regions, SKM believes that TransCo maintenance standards compare well with those of other countries.”

SKM is of the view that the level of maintenance being performed on the network is reasonable.

3.3 Reliability Performance

Reliability performance is a function of a number of parameters. The primary driver is the network design, particularly the level of in-built redundancy. For example, the majority of the Transmission networks in western countries are designed to provide N-1 security – that is, a single contingency or loss of a single network element will not result in a loss of supply to any customers because alternate supply routes are available. For this reason, few transmission entities (or regulators) find that the traditional reliability measures of SAIDI and CAIDI are applicable. These measures are generally applied in distribution systems where outages causing loss of supply are more common. Instead for Transmission, measures like circuit availability etc are finding favour. It is understood that while 500/230kV substations have been designed for N-1 security, generally the remainder of the network has not been so designed. There are plans in place to gradually increase the major plant redundancy at voltage levels below 500kV.

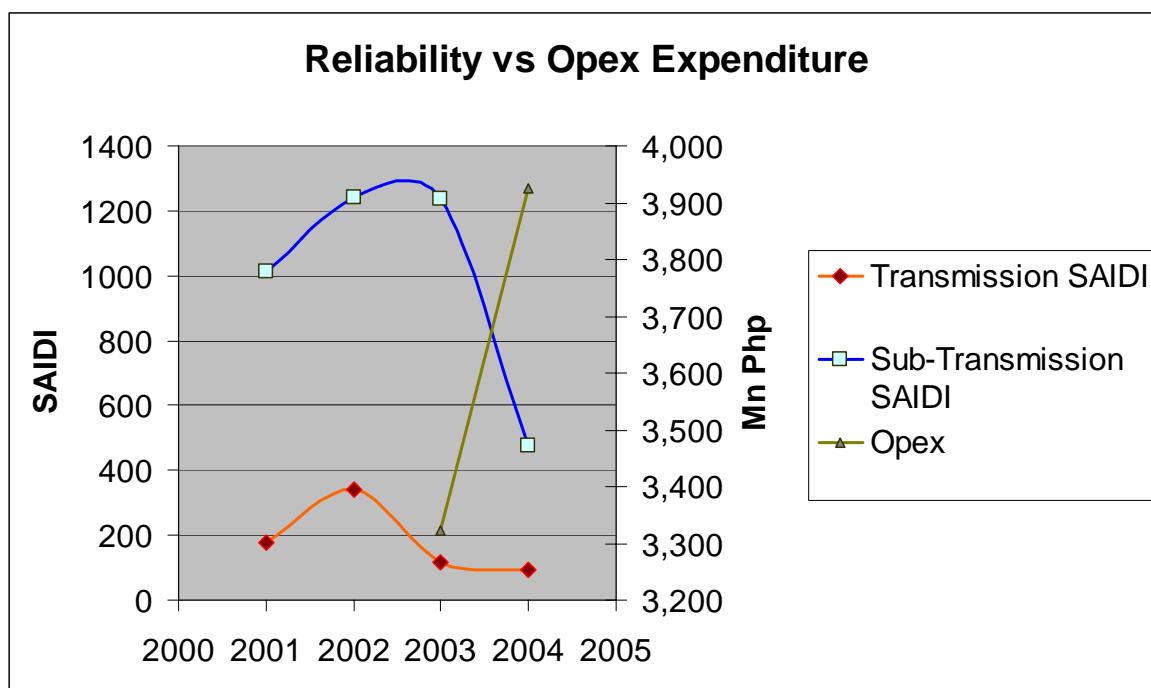
The environmental conditions, including climate (temperature, rainfall, humidity etc), density and rate of vegetation growth, seismic activity etc, are also key determinants of reliability performance.



The age of the network and the level of maintenance applied will also influence the reliability performance but these elements are probably of secondary significance in comparison to those mentioned above. The TransCo network is comparatively young in comparison with many transmission networks in other countries. The value weighted average age of the network is approximately 14 years. However, the harsh environment results in lower asset lives for many asset categories. The value weighted average remaining life appears to be approximately 29 years. The other major impact that opex has on reliability measures is its impact on restoration times. The availability of emergency response personnel and equipment will govern this variable.

Having made this point, it is still pleasing to note that the increase in network opex seen from 2003 to 2004 coincides with a clear improvement in network reliability – see the chart below.

■ **Figure 1 SAIDI and Opex**



It is unclear whether the apparent improvement results from the increased maintenance spend or represents the normal weather driven fluctuations in this performance measure.

The reliability performance of the TransCo network is poor in comparison to transmission networks in western countries, but SKM is of the opinion that this performance is driven by network design and the tropical environment of the Philippines rather than a lack of maintenance. Network reliability is discussed further in section 7 of this report.



3.4 SKM Commentary

In SKM's view, the current operating and maintenance expenditure, based on the 2004 actual expenditure, is at reasonable level.



4. Expenditure Forecast Provided

4.1 Opex Forecast

The TransCo forecast of operating and maintenance expenditure for the current year and the five year regulatory period is shown in Table 2.

Table 2: Opex Forecast (PHP Mn)

Opex Category and Sub-Category	2005	2006	2007	2008	2009	2010
Payroll						
Network Operations Supervision & Eng'g Staff	417	702	1,151	1,345	1,475	1,626
Network Operations Other Staff	460	775	1,188	1,411	1,546	1,711
Network Planning Supervision and Eng'g Staff	32	52	84	96	106	116
System Operations Supervision & Eng'g Staff	201	315	524	600	658	722
Admin, HR, Finance Corporate & Regulatory Staff	1,289	934	1,389	1,665	1,905	2,180
Easements owned by the Regulatory Entity						
Sub-total Payroll	2,399	2,779	4,335	5,118	5,690	6,355
Network Related						
Network Operations	454	457	497	510	534	554
Network Maintenance	1,098	1,149	1,403	1,470	1,552	1,636
Plant & Equipment Insurance	267	194	202	210	218	227
System Operations	187	196	248	262	279	295
WESM Compliance						
Sub-total Network Related	2,007	1,997	2,349	2,452	2,583	2,713
Non-Network Related						
Bad Debts	42	45	47	47	51	52
Internal & External Audit Functions	36	36	36	36	36	36
Regulatory liaison & compliance	0	0	0	0	0	0
Corporate & central office	391	455	401	414	429	445
IT licenses, operations & maintenance	10	11	11	12	12	13
Lease payments	9	9	10	10	10	11
Net foreign exchange (either loss or gain)	0	0	0	0	0	0
Property maintenance	2	2	2	2	2	2
Property insurance	42	54	55	56	56	57
Others	3	3	3	3	3	4
Sub-total Non-Network Related	535	615	565	579	601	619
Total Operating & Maintenance Expenditure	4,941	5,391	7,250	8,149	8,874	9,687

Table 3 provides the year to year increases in the individual line items and totals.



Table 3: Annual growth in Forecast Opex

Opex Category and Sub-Category	2005	2006	2007	2008	2009	2010	Total increase over 2004	Average growth pa
Payroll								
Network Operations Supervision & Eng'g Staff	10.0%	68.5%	63.8%	16.9%	9.7%	10.2%	328.9%	27.5%
Network Operations Other Staff	9.9%	68.4%	53.3%	18.8%	9.5%	10.7%	308.4%	26.4%
Network Planning Supervision and Eng'g Staff	8.8%	65.2%	60.9%	14.7%	9.8%	9.8%	299.8%	26.0%
System Operations Supervision & Eng'g Staff	10.1%	56.2%	66.4%	14.5%	9.7%	9.8%	294.8%	25.7%
Admin, HR, Finance Corporate & Regulatory Staff	120.7%	-27.5%	48.6%	19.9%	14.4%	14.4%	273.2%	24.5%
Easements owned by the Regulatory Entity								
Sub-total Payroll	50.5%	15.8%	56.0%	18.0%	11.2%	11.7%	298.7%	25.9%
Network Related								
Network Operations	14.1%	0.8%	8.7%	2.7%	4.6%	3.8%	39.3%	5.7%
Network Maintenance	14.2%	4.6%	22.0%	4.8%	5.6%	5.4%	70.0%	9.3%
Plant & Equipment Insurance	8.1%	-27.3%	4.0%	4.0%	4.0%	4.0%	-8.0%	-1.4%
System Operations	7.5%	4.8%	26.3%	5.7%	6.4%	6.1%	69.8%	9.2%
WESM Compliance								
Sub-total Network Related	12.7%	-0.5%	17.6%	4.4%	5.3%	5.0%	52.3%	7.3%
Non-Network Related								
Bad Debts	-16.0%	7.1%	4.4%	0.0%	8.5%	2.0%	4.0%	0.7%
Internal & External Audit Functions	200.7%	-0.1%	0.0%	0.0%	0.0%	0.0%	200.9%	20.2%
Regulatory liaison & compliance								
Corporate & central office	147.7%	16.2%	-11.8%	3.0%	3.9%	3.5%	181.5%	18.8%
IT licenses, operations & maintenance	30.8%	5.0%	4.0%	4.0%	4.0%	4.0%	60.4%	8.2%
Lease payments		5.0%	4.0%	4.0%	4.0%	4.0%		
Net foreign exchange (either loss or gain)								
Property maintenance	-98.0%	4.8%	3.9%	3.9%	3.9%	3.9%	-97.6%	-46.2%
Property insurance	82.4%	29.7%	1.2%	1.2%	1.3%	1.3%	148.6%	16.4%
Others		4.6%	3.7%	3.7%	3.7%	3.7%		
Sub-total Non-Network Related	63.2%	15.0%	-8.1%	2.5%	3.8%	3.0%	88.8%	11.2%
Total Operating & Maintenance Expenditure	33.4%	9.1%	34.5%	12.4%	8.9%	9.2%	161.6%	17.4%

The non-network related costs represent a relatively small component of the total expenditure. Apart from a high growth in expenditure associated with Corporate and Central Office in 2005, increases throughout the forecast period are relatively modest.

After the significant rise in Network Related (expenses) costs in 2005 and 2007, subsequent rises in this area are also quite modest and, generally, in line with the increasing quantity of assets in service over the forecast period. The increase in costs in 2007 appears to be associated with the flow on of forecast increases in salaries into the costs of services provided by contractors and



contract personnel. The expected increase in the replacement cost of the assets in service is expected to average approximately 3.6% pa over this period. In real terms, expenditure in this area per installed assets declines slightly over the forecast period.

The most significant increases in forecast expenditures are in the labour related area. The forecast increase in the number of employees is quite modest averaging approximately 0.9% pa from 2004 to 2010. The large increases in this area are due to proposed increases in salary rates, bonuses and other financial benefits. These increases are discussed further in section 4.2 below.

In Section 5 of this report, the Opex forecast is analysed in conjunction with movements in the primary drivers of operational and maintenance expenditure.

4.2 Mercer Remuneration Survey

TransCo was a participant in the 2004 Mercer HR Philippines Energy Industry Survey of salary scales and total remuneration. In this survey, the remuneration provided to TransCo staff was found to be significantly below the market rates generally applicable in this industry. A copy of the Mercer Report is attached as Appendix A. The general finding of this survey was that, in 2004, on average, TransCo base salaries would need to be lifted by 93% to meet median market rates. On average, TransCo total remuneration would need an increment of 115% to meet the market.

There is general concern within the Corporation that a continuation of these low levels of remuneration will result in the loss of key staff and difficulty in recruiting replacements. Anecdotal evidence has been related of technical linespersons being recruited to work in Australia and other international locations. However, no data has been provided to demonstrate that staff turnover is excessive.

There is also a general belief that any substantial increments to address the problem highlighted by the Mercer Survey should be introduced prior to the expected sale of assets to private concessionaires. For this reason, there are large step increases in salary rates and other benefits, especially in 2007.

Much of the increment in total payroll expenses in 2005 results from staff accessing attractive government service termination benefits that are to be significantly reduced in subsequent years.

The increases in payroll expenses in the years following 2007 are based on an extrapolation of the Mercer market salary projections of approximately 10% pa.

4.3 SKM Commentary

The proposed increases in labour rates may be justified on the basis of the Mercer survey. However it would be expected that as the cost of this input rises so dramatically, new strategies



would be implemented to reduce the impact by replacing labour with other inputs, reducing manning levels to contain the cost increases. Manpower levels within TransCo are considered to be high by western standards. While wages are relatively low, relatively labour intensive work practices may be economically efficient and there is limited incentive to reduce staffing numbers. However, the proposed increases in payroll costs might be expected to change this situation. The current forecast does not demonstrate a management response to the forecast increases in labour costs.

The continuation of salary increases post 2007 that are well in excess of inflation does not appear to be sustainable in the longer term.

The justification of the proposed increments would be supported if clear evidence was available that the turn-over rate in key areas was becoming excessive.

Despite the justification of the Mercer survey, SKM is concerned that the ERC may not feel able to accept the proposed increments and its impact on revenue requirements and may wish to have any salary increases phased in over a longer time period. Financial modelling may indicate whether the required revenue increment can be accommodated within expected side constraints.



5. Performance Indicators

5.1 Suitable Performance Measures

The primary driver that defines Opex requirements is the quantity of asset that needs to be maintained. Secondary drivers include the age and condition of the assets, the environment in which they operate, the level of utilisation and the targeted performance.

The Replacement Cost of the network assets is a de-facto measure of the quantity of assets and is used when it is available. Unfortunately, this data is often not available in the public domain. A less suitable alternative is to use the regulated asset base (RAB) because it is more readily available. The indicator of Opex/RAB can be expected to increase as the asset ages. This will tend to unfairly disadvantage older networks. Despite this weakness, this is a measure in common use.

Other measures of asset quantity include kilometres of line and MVA of transformer capacity.

Other indicators commonly used relate to network deliverables such as GWH energy throughput and MW maximum system demand. These are also de-facto measures of network utilisation.

In the following sections, all these measures are used to develop indicators of TransCo's Opex efficiency.

In addition to the economic efficiency of the opex spend, it is also beneficial to consider labour efficiency. This is more difficult to compare across entities because manpower levels can vary greatly depending on the use of external contractors and consultants. The western entities used for comparison have implemented control systems and working methods over many decades to reduce the labour requirements in their networks. These initiatives are not short term strategies. However, indicators of labour efficiency are useful for comparisons within a single business over time and these indicators are used here for that purpose.

5.2 International Comparisons

In the following charts, TransCo's performance has been compared with transmission businesses in Australia and the United Kingdom. Summary details of these companies are provided in Table 4 below.

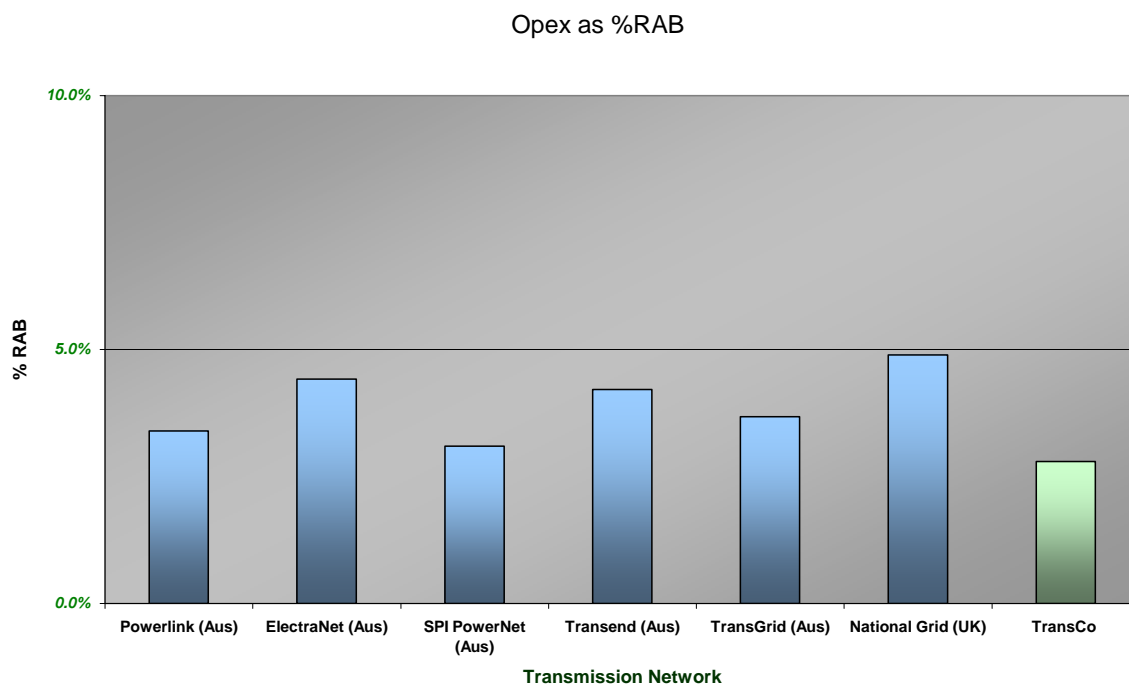


Table 4: Transmission Businesses

UTILITY	Route km	RAB (local currency)	GWhr	MW (Peak)	OPEX (local currency)	OPEX (Php m)
Powerlink (Aus)	11,600	2,631	45,625	7,934	90	3,871
ElectraNet (Aus)	5,579	842	12,336	2,607	37	1,609
SPI PowerNet (Aus)	6,533	1,833	49,111	8,500	57	2,457
Transend (Aus)	3,537	593	10,186	1,691	25	1,081
TransGrid (Aus)	12,446	3,180	69,736	12,500	117	5,060
National Grid (UK)	13,786	4,517	303,100	53,200	221	21,668
TransCo	19,134	136,437	47,703	9,160	3,703	3,703

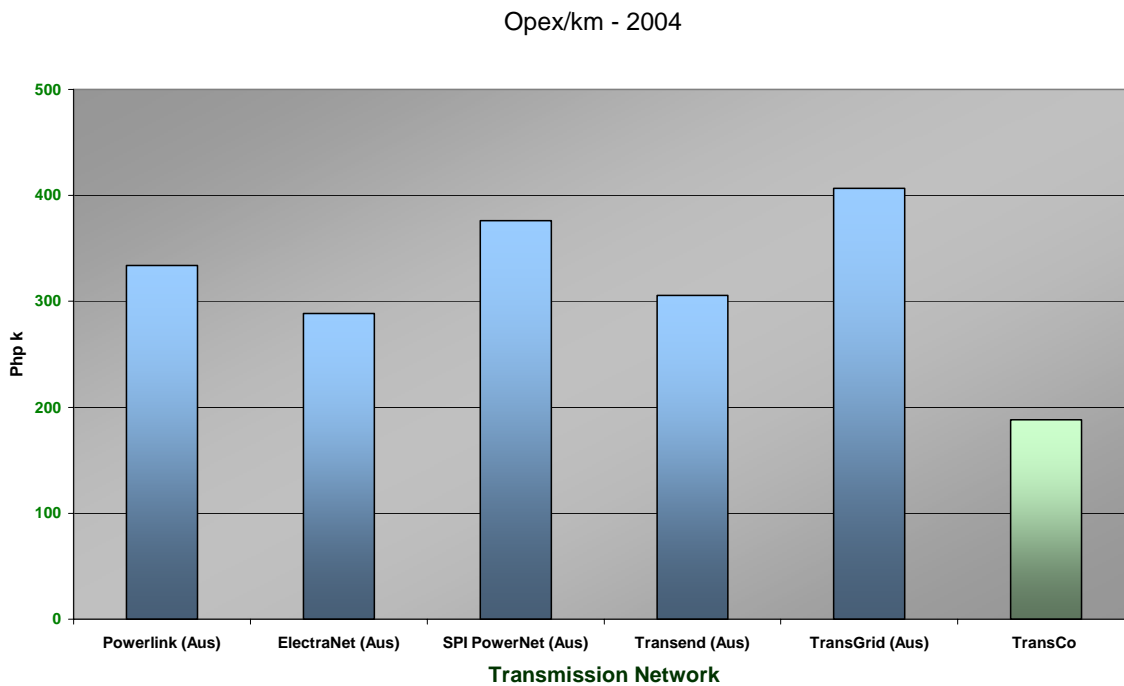
The indicators used are Opex spend per RAB (%), Opex spend per circuit kilometre of line, Opex spend per GWH energy throughput and Opex spend per MW of system demand. For each of the international businesses, the opex spend has been converted from the local currency to Philippine Pesos using current exchange rates. No adjustments have been made to reflect different purchasing parities.

■ **Figure 2 Opex as %RAB**

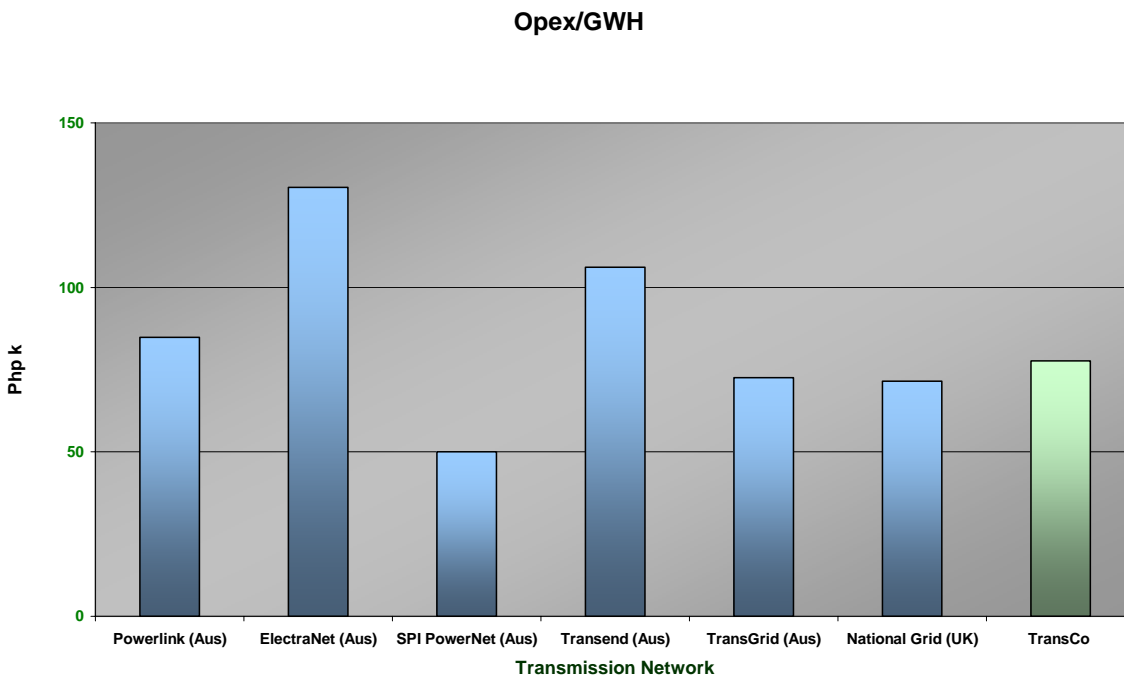




■ Figure 3 Opex per Circuit km of line

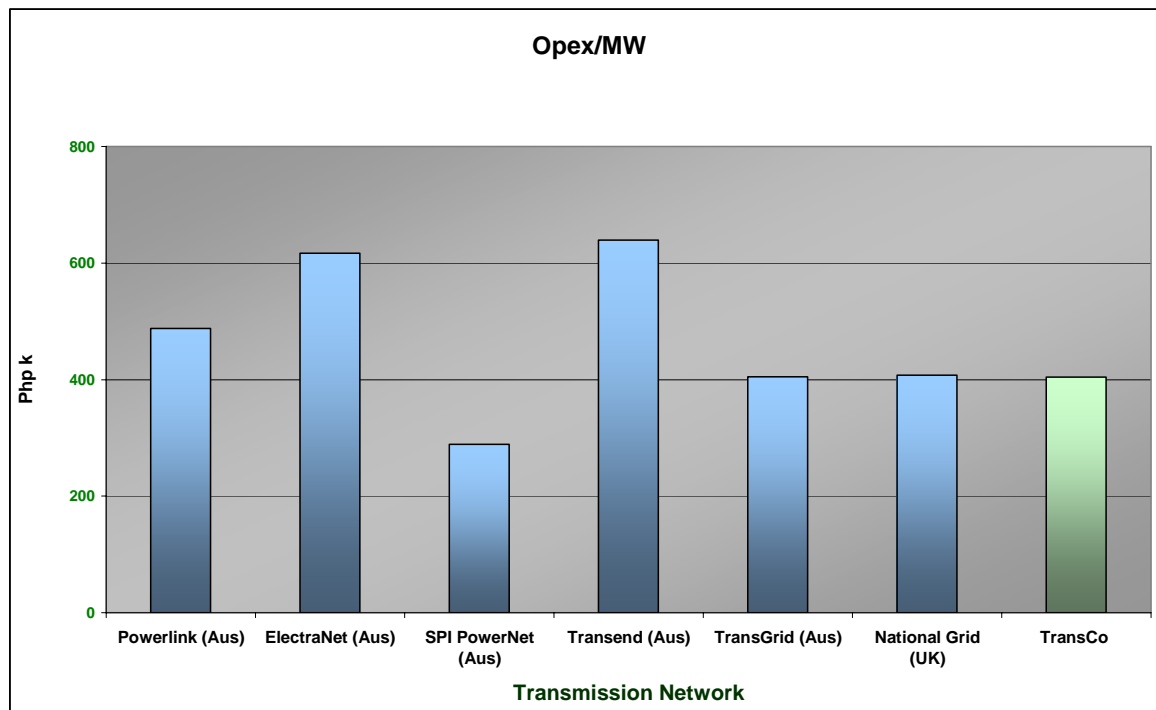


■ Figure 4 Opex per GWH





■ Figure 5 Opex per MW peak demand



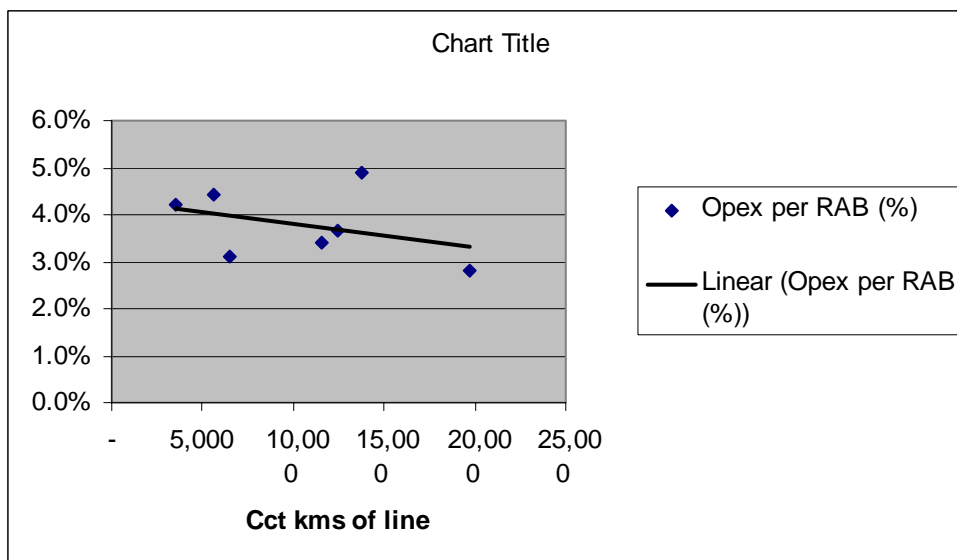
In the indicators that address the effect of asset quantity (Opex per RAB and Opex per km), TransCo is shown to be the low cost leader. This reflects the lower labour rates applicable in the Philippines and the relatively young age of the network. Note that the opex per km measure for the National Grid (UK) was excluded. The relatively high value for the National Grid suggests a network of relatively short but heavily loaded transmission lines with a relatively large proportion of underground feeders.

TransCo also performs well in terms of Opex per GWH and Opex per MW, though is less obviously a cost leader.

There is some evidence to suggest that economies of scale exist in the maintenance of assets – that is the costs per asset decline as the quantity increases. See Figure 6 below.



■ **Figure 6 Relationship between Opex per RAB and Cct kms of lines**



The comparisons provided above would suggest that TransCo is currently performing well when benchmarked for economic efficiency against comparable businesses in other countries.

5.3 Movements of Indicators over Forecast Period

A key requirement under the TWRG is to demonstrate improvements in operational efficiency and productivity over the forecast period. The impact of the forecast discussed in section 4 on the apparent operational efficiency is considered in the following sections. Based on the capital works forecast, the Replacement Cost generated in the recent valuation has been extrapolated through the forecast period. Similarly, the additional length of lines and additional MVA of transformer capacity installed over this period have been included in the calculations. The MW peak demand forecast that has been used is based on a preliminary lower forecast for Luzon which is yet to be approved by TransCo. Financial indicators generally are based on “real” Pesos, expressed in 2005 currency.

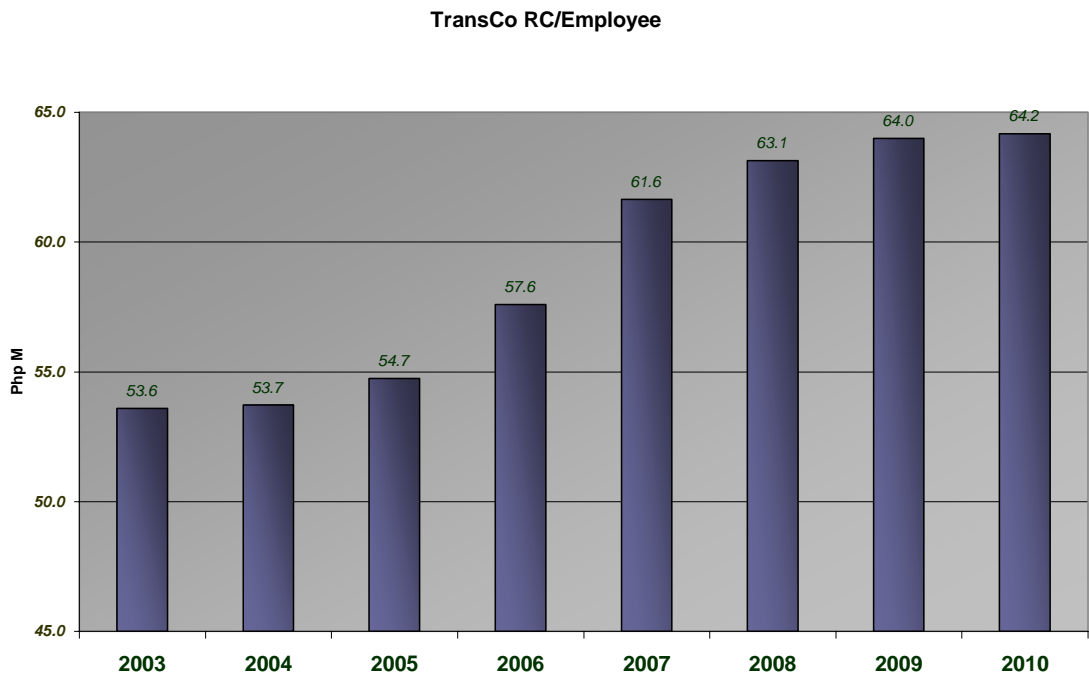
5.3.1 Labour Efficiency

It is possible to differentiate between labour efficiency and economic efficiency. The indicators of labour efficiency used here are Replacement Cost per employee, MW peak per employee, MVA installed capacity per employee and circuit kilometres per employee.

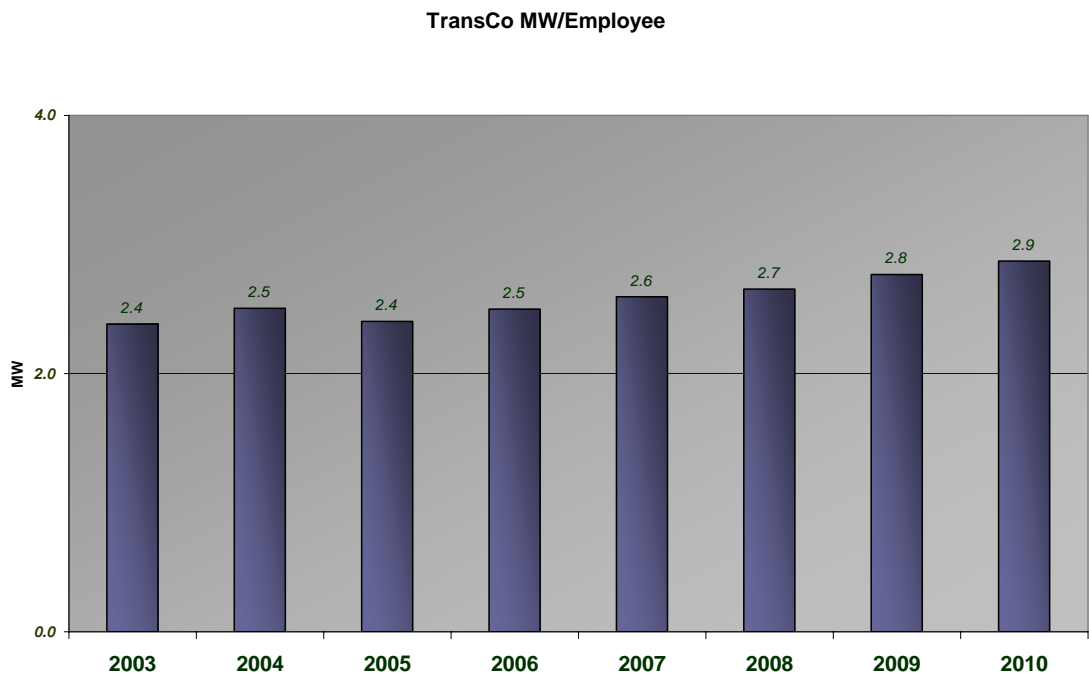
These indicators are plotted in the following graphs.



■ **Figure 7 Replacement Cost per employee**



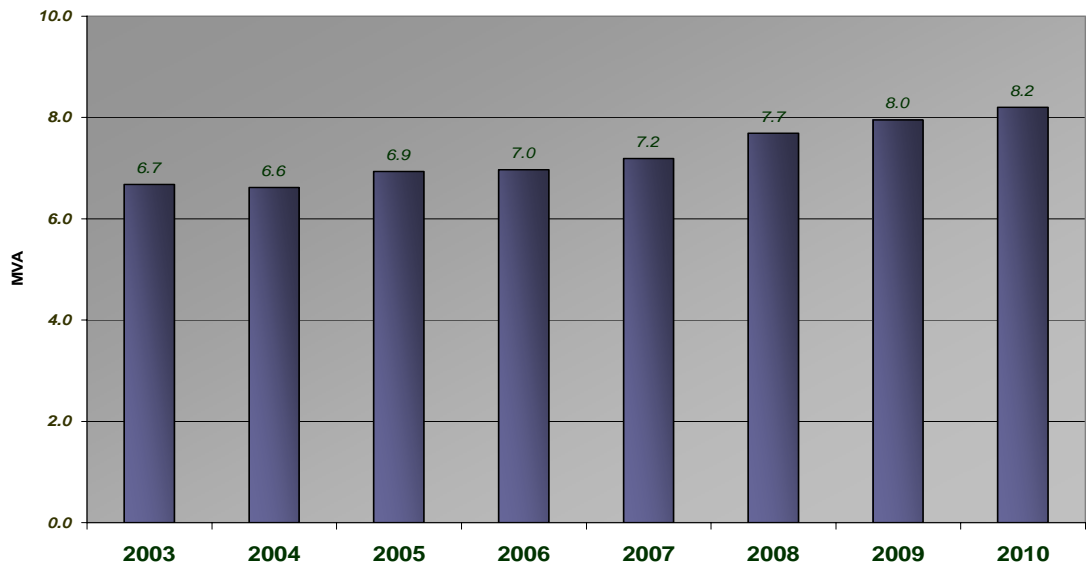
■ **Figure 8 MW demand per employee**





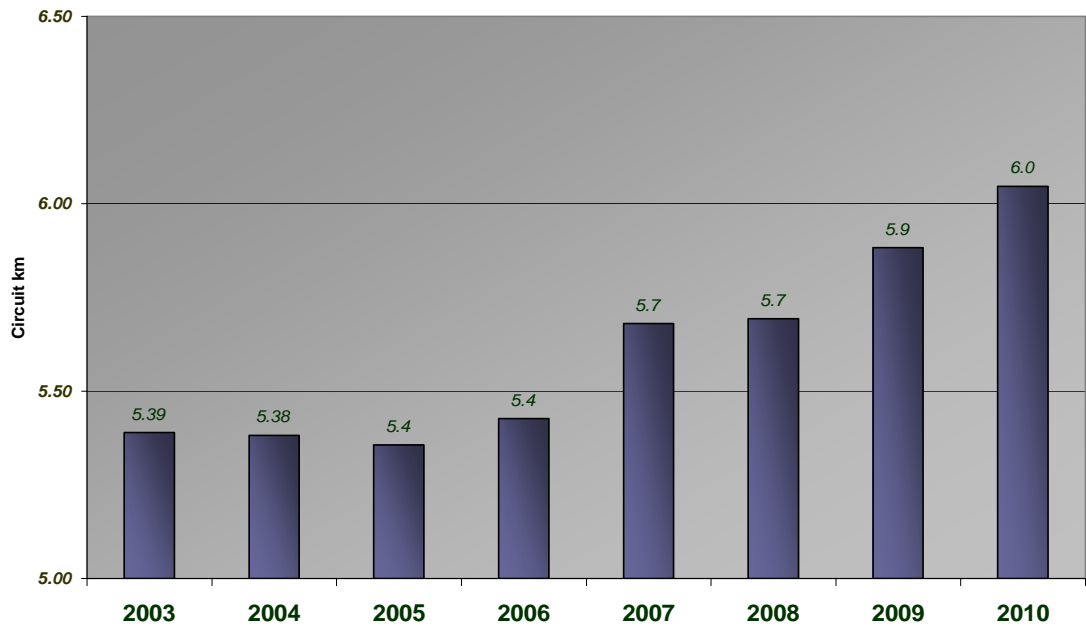
■ **Figure 9 Installed transformer capacity per employee**

TransCo Installed MVA per Employee



■ **Figure 10 Circuit km of line per employee**

TransCo Installed Circuit km per Employee





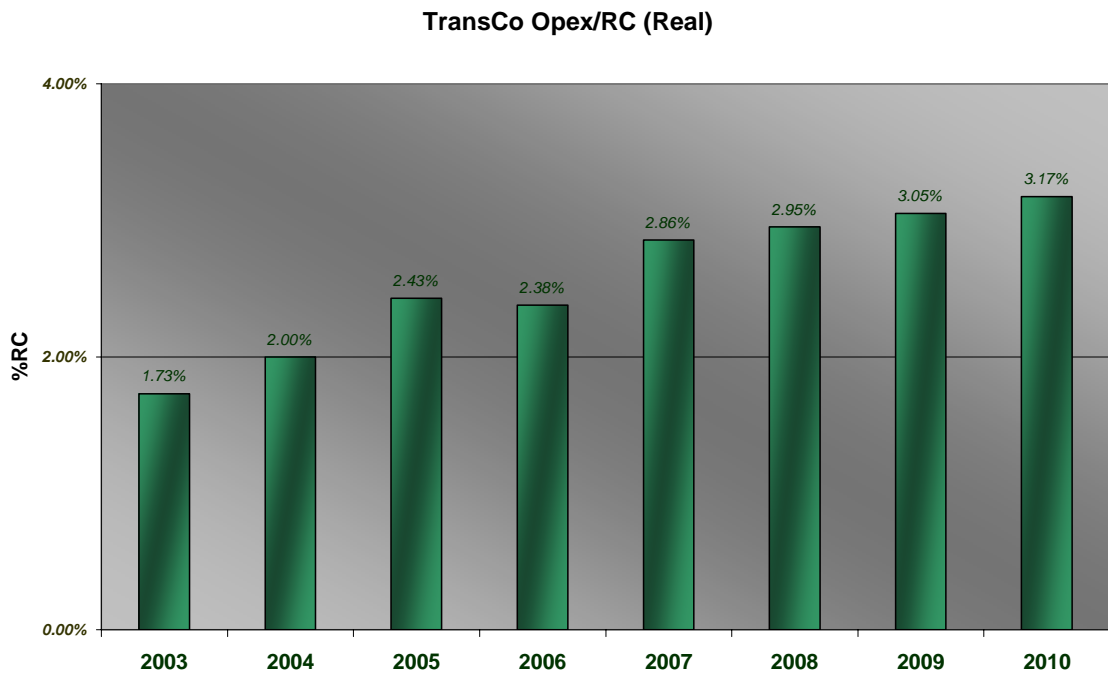
For each of these indicators, a rising trend represents increasing efficiency. Although staffing numbers are forecast to increase slightly over the forecast period, improvements in labour efficiency can be demonstrated in all the measures considered.

5.3.2 Economic Efficiency

The following indicators of economic efficiency have been used: Opex/Replacement Cost, Opex/MW demand, Opex/MVA capacity and Opex/circuit kilometre.

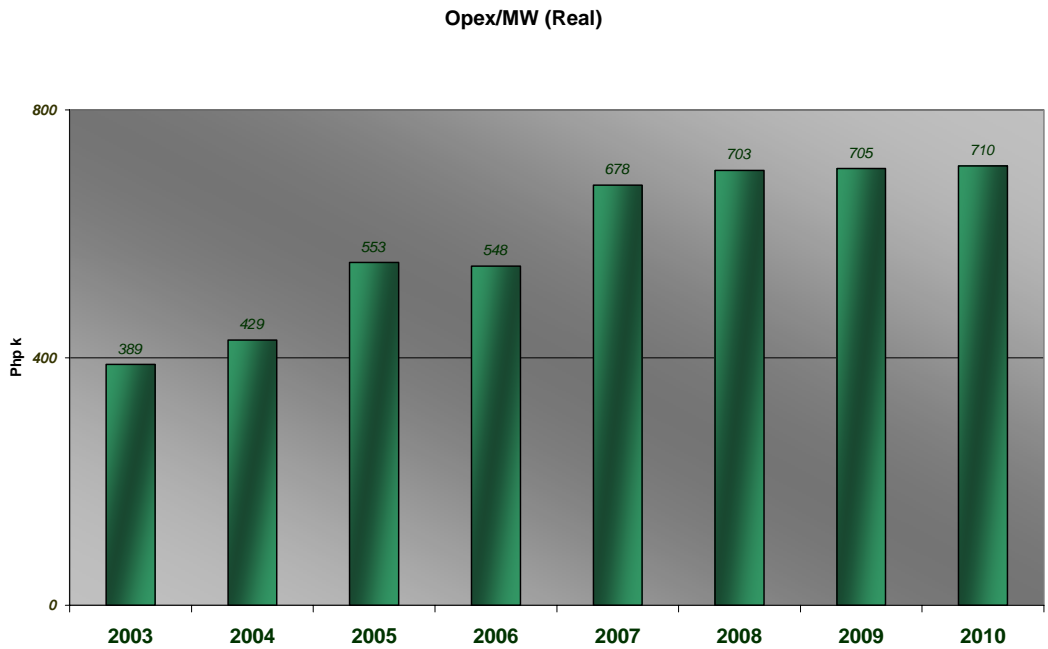
These indicators are plotted in the following graphs. For each of these measures, a falling trend represents increasing efficiency.

- **Figure 11 Opex per RC**

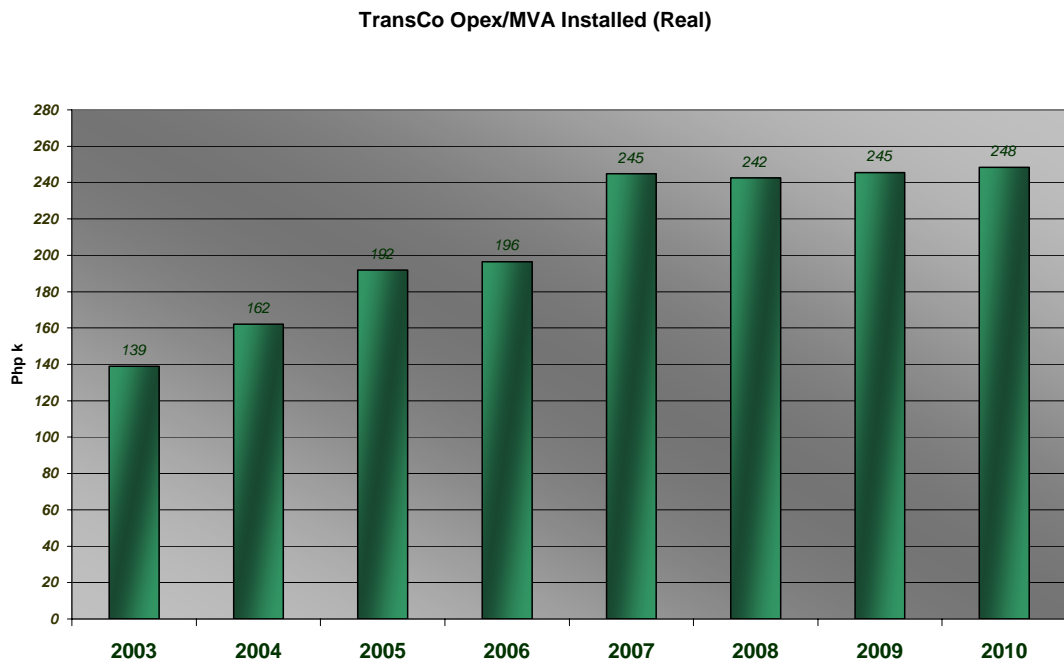




■ **Figure 32 Opex per MW**

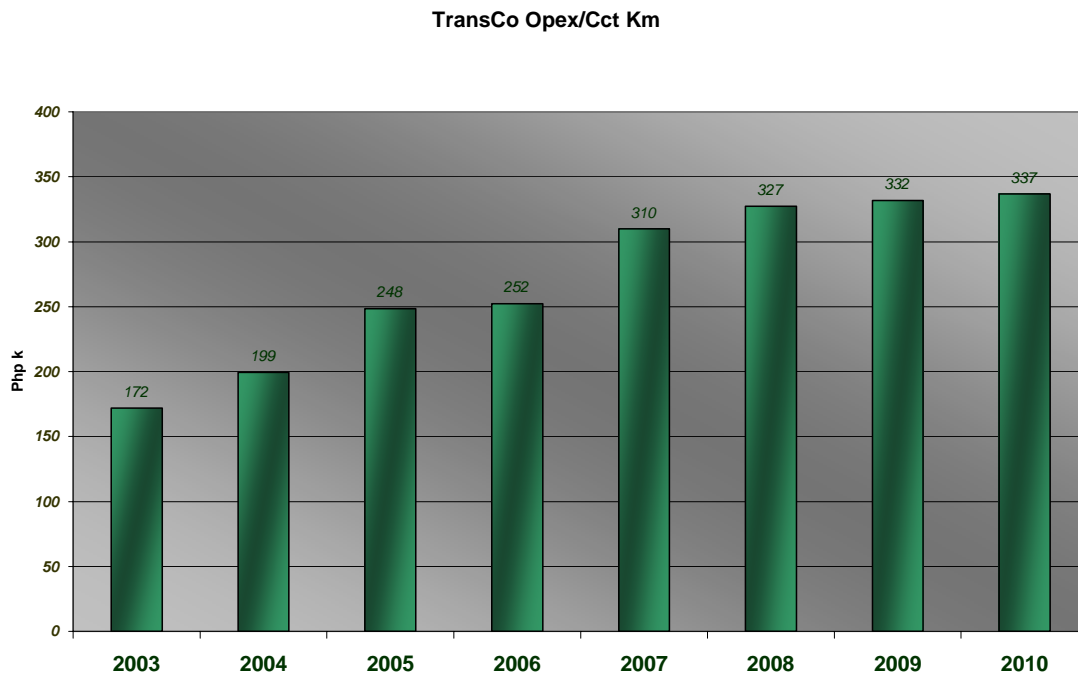


■ **Figure 13 Opex per MVA**





■ **Figure 14 Opex per Cct km**



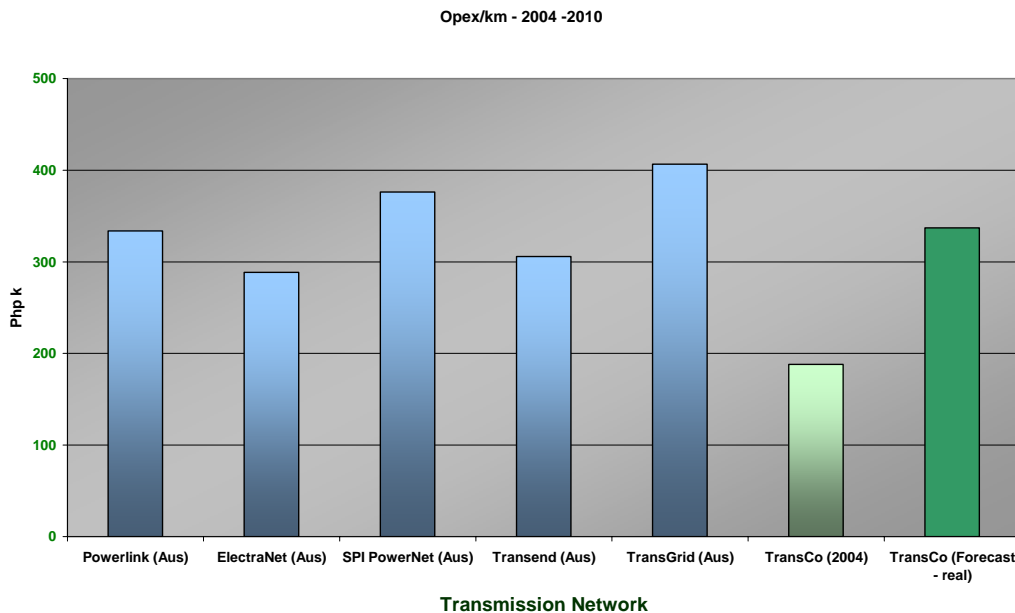
For each of these indicators, a reducing trend would represent increasing efficiency. It is clear that in all measures, there is an apparent loss of efficiency over the forecast period.

5.4 Impact of Opex Forecast on Benchmarked Performance

In this section, some of the benchmark charts from Section 5.2 are reproduced with the forecast indicators for TransCo in 2010 included to demonstrate the impact of the present forecast on comparative performance. With “CPI-x” style regulation it would be expected that most the transmission businesses benchmarked will increase their efficiency over this time. In these calculations, the forecast 2010 Opex used has been in 2005 Peso (real).

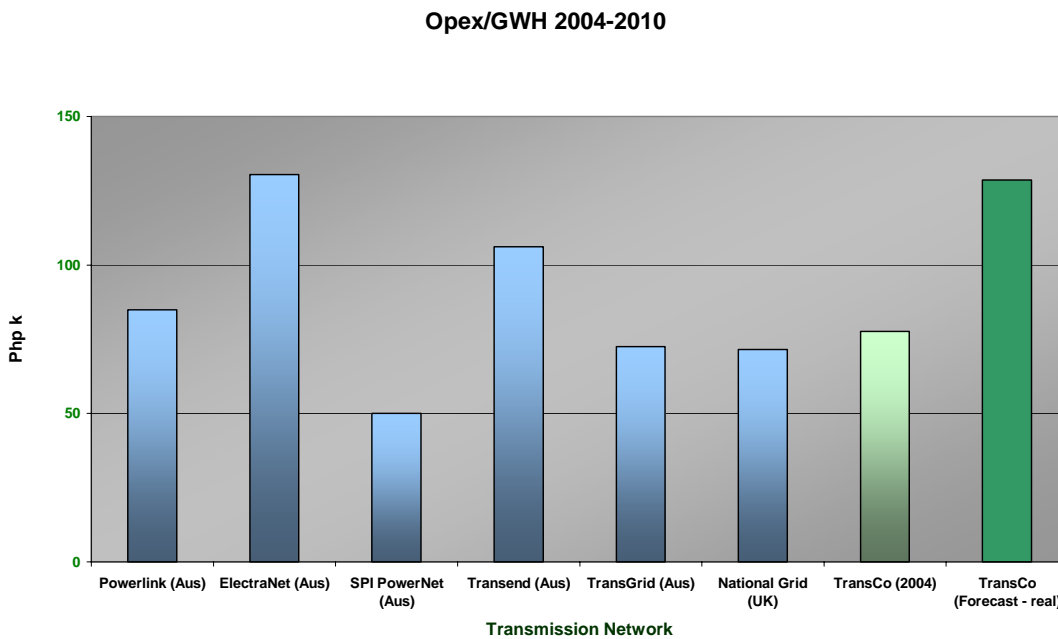


■ **Figure 15 Movement in Opex per Cct Km**



In this measure, TransCo will move from being the best performing participant to the third worst.

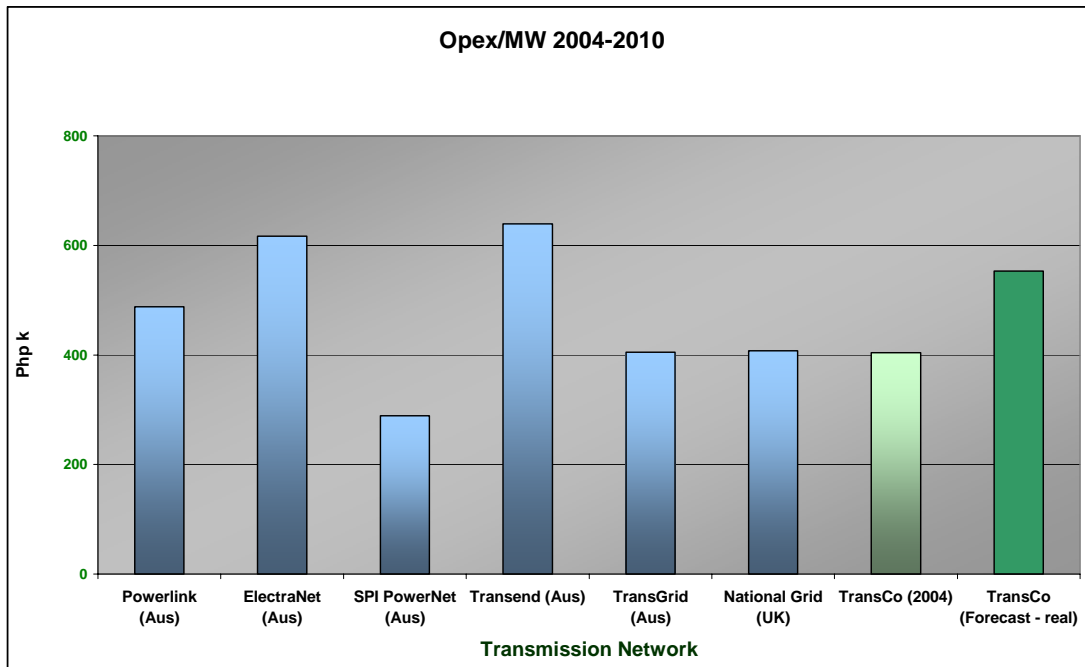
■ **Figure 16 Movement in Opex per GWh**



In this measure, TransCo moves from being an average performer to one of the worst performers in this group.



■ **Figure 17 Movement in Opex per MW peak**



In this measure, TransCo moves from being an average performer to being the third worst performer in this group.

5.5 SKM Commentary

Although the current opex forecast is able to demonstrate improvements in labour efficiencies, there will be a significant decline in the economic efficiency over the forecast period and a worsening of TransCo’s ranking in most benchmark measures.



6. Overheads

The level of overheads carried by a business is also a measure of the efficiency of a business' expenditure program.

Overheads typically cover costs associated with Corporate and Business Unit support costs. The extent of these costs will depend on the size of the organisation, the geographical coverage, organisational structure, ownership arrangement, business strategies etc.

The level of overheads and the allocation method used to recover these support costs vary significantly from business to business. While some organisations apply an overhead to labour only, others recover these costs by an overhead to total direct costs or by other methodologies such as user pays, floor space used etc.

Decisions regarding the capitalisation of overheads also vary significantly from business to business.

Because of this great variety in application, valid comparisons can only be made at a very high level. Comparisons here are limited to an analysis of overheads as a percentage of total opex and capex costs.

For TransCo, the capitalised overheads are clearly presented in the capital budget. In this analysis, the operational overheads are assumed to include non-network expenses plus payroll costs associated with Admin, HR, Finance Corporate & Regulatory Staff. To calculate total expenditure, the opex forecast has been added to the forecast capex of both TransCo and the future Concessionaire.

Total overheads as a percentage of total expenditure varies across the forecast period in a range from 12% to 26%. While there is a steady decline in the quantum of overhead capitalised, there is a steady increase in the operating overheads, predominantly reflecting the increasing payroll and head office costs.

From SKM's experience, a typical electricity distribution or transmission business has overheads that range from 22% to 30% of total expenditure.

It would appear that TransCo's overheads lie within this typical range.



7. Reliability Performance

Some initial comments were made concerning recent reliability performance in section 3.3 amongst comments on the 2004 Operating and Maintenance expenditure.

A more complete summary of the recent historical reliability performance is shown in the table below.

Table 5: TransCo's Historical Reliability Performance

Performance Indicators		Year			
		2001	2002	2003	2004
Unserved Energy (GWh)		54.06	42.84	39.95	27.47
Transmission	SAIFI	1.31	1.05	0.77	0.76
	SAIDI (mins)	177.67	342.27	115.05	94.94
Sub-transmission	SAIFI	5.12	5.86	4.98	2.87
	SAIDI (mins)	1014.04	1240.47	1238.53	474.31
Frequency Limit Compliance (%)		99.98101	99.86911	99.94365	99.96453
Voltage Limit Compliance (%)		70.74715	85.42783	90.44265	90.77524

Reliability targets have not yet been set by the ERC. This suggests that the methodology to be used to set targets for the next regulatory period will be based on the average performance over the last five years (as per Grid Code). TransCo officers have calculated the following targets using the methodology described in the section 10.4.2 of the Philippine Grid Code:

Table 6: Reliability Targets

Performance Indicators		Targets for Philippine System	
		Lower	Upper
Transmission	SAIFI	0.71	1.56
	SAIDI (mins)	85.17	279.51
Sub-transmission	SAIFI	3.63	5.87
	SAIDI (mins)	707.94	1362.96
Frequency Limit Compliance (%)	Luzon	99.90131	99.99656
	Visayas	97.48735	99.97597
	Mindanao	99.73636	99.94452
Voltage Limit Compliance (%)	Luzon	70.09699	92.02393
	Visayas	98.53432	100.0
	Mindanao	97.43117	99.41015

These targets represent a continuation of the present performance levels.



While few transmission businesses now report on the traditional loss of supply measures such as SAIDI and SAIFI, SKM's experience is that typical SAIDI figures for transmission networks are significantly less than 10 minutes per year. This compares with figures for TransCo's transmission network of 95 minutes or higher (see Table 5 above).

As stated earlier, it is SKM's opinion that the relatively poor performance of the TransCo transmission network is predominantly a function of the lack of N-1 security. This will be addressed over time as load density increases and capital works moves the network towards a full N-1 level.

Although the operating and maintenance expenditure has a smaller impact on reliability measures, it can still be significant. Opex may also impact on response times, with the potential to shorten restoration times, consequently improving SAIDI measures. However, as stated previously, SKM's view is that the level of maintenance being undertaken by TransCo is reasonable.

While there are some minor increases in operations staff forecast over the five year period, most increases in expenditure are related to higher pay scales and benefits. On the expense side, increases forecast in expenditure on system maintenance are limited while the asset base is forecast to grow at a rate of approximately 3.6% pa. While some efficiencies can be expected, it seems unlikely that the forecast expenditures will deliver any real improvements in network performance and the forecast appears designed to maintain the status quo (in keeping with the targets discussed above). Any reliability improvements will have to come from capital projects.



8. Capex/Opex Trade-off

The TransCo network is considered to be relatively young with a weighted average age of approximately 15 years. SKM has developed a replacement/refurbishment capital budget requirement from the age profile data gained in the recent valuation. This indicates that the replacement expenditure required over the next five years is approximately Php 1 billion pa for the transmission network and approximately Php 2.5 billion for the subtransmission network. If the replacement expenditure included in the capital forecast is less than the level suggested by the SKM model, this would indicate that the network will age over coming years.

It is reasonable to expect that the operating and maintenance requirements of a network will increase as the system ages. In previous projects, SKM has modelled the opex versus age relationship for various asset types. In these models, it has been assumed that the relationship between opex and age follows an exponential equation. The true relationship will depend on the environment, utilisation, mix of assets and many other variables.

It is difficult to translate these curves from one business to another. However, SKM has good knowledge of the mix of assets which make up the TransCo asset base. Despite reservations, a weighted mix of opex/age curves generated for other businesses has been applied to the known mix of TransCo assets. This analysis suggests that if a similar business with a similar set of assets and with a weighted average age of 15 years was operated in Australia, then the expected operating and maintenance expenditure would be approximately 1.25% of the replacement cost of the asset. This is below the current level of opex for TransCo (1.9%). The difference could well result from the onerous tropical conditions which reduce expected asset lives and the high rates of vegetation growth. The lack of N-1 capacity will also make access to assets for maintenance more difficult and expensive.

This same analysis suggests that, as the system ages further, additional opex equal to approximately 0.05% of RC will be required for each additional year of aging. This is an attempt to quantify the trade-off between capital expenditure and operating and maintenance expenditure. There is no apparent allowance in the opex forecast for additional resources to cope with any real increase in the asset age.



Appendix A Mercer HR Survey

MERCER

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April 13, 2005

Mr. Noli E. Pomperada
Manager, HRSD
National Transmission Corporation
Power Center, Quezon Avenue corner BIR Road
Diliman, Quezon City

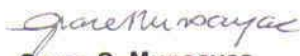
Dear Mr. Pomperada,

We are pleased to submit the **2004 Philippines Energy Total Remuneration Survey**. This survey includes the following reports:

- ◆ **Survey Overview**
- ◆ **Short-term Incentive Prevalence Report**
- ◆ **Benefits Prevalence Report**
- ◆ **Survey Methodology & Definition of Terms**
- ◆ **Regressed Market Data**
- ◆ **Benchmark Positions Report**

Should you need further assistance, you may contact us at tel. no. (632) 810-0704 loc.108.
Thank you very much.

Best regards,



Grace S. Munsayac
GIS Practice Leader
Mercer HR Consulting

2004

Philippines Energy Industry Survey

Overview

About the Survey

Mercer Human Resource Consulting is pleased to present the **2004 Philippines Energy Industry Survey**. As shown in the table below, we see **15 companies participating in the survey**.

2004 Philippines Semiconductor Survey Profile

Organizations Participating in Survey	15
Incumbents Represented	1,659

If You Have Questions

If you have questions regarding the survey or the report, please call Grace Munsayac at (632) 810 0704 or e-mail her at grace.munsayac@mercer.com.

Confidentiality

To ensure the confidentiality of all data, a minimum number of observations are required in order for statistics to be displayed. Three organizations must report at least three observations for a variable in order for the mean to be displayed. Four organizations and four observations are required for the display of the median. Five organizations reporting at least five observations are required to display 25th and 75th quartiles. Two hyphens are displayed when there are insufficient data for statistical display.

Survey Report types

This is a non-executive report (showing market data up to career level M5) and the report is divided into sections as described below.

Overview – Provides information on the following:

- List of participating organizations
- Participant Profile
- Economic Trends and Indicators
- Salary Movement Trends
- Staffing Trends
- Starting Salaries Trends

Survey Methodology and Definitions - Provides a description of the methodology used in analyzing the data collected and definitions of all variables and statistics included in the survey report. The valuation methodology for determining benefit values and the values for long-term incentives are also described.

Regression Analysis - Provides the regression analysis based on actual market data and Mercer's International Position Evaluation (IPE) classifications.

Actual Market Data Reports - Provides the statistical analysis of actual market data. The first section of the actual market data report shows the combined job families by career levels and the rest of the sections show the market data for the respective functions (Eg. Finance, Human Resources, etc)

List of Participating Organizations

1	.	Asea Brown Boveri Inc.
2	.	CBK Power Company Ltd.
3	.	CE Luzon Geothermal Power Company
4	.	East Asia Power Diesel Corporation
5	.	Forum Exploration Inc.
6	.	Intergen Management Services (Phils.) Inc. (Quezon Power)
7	.	Mirant Philippines Energy Corporation
8	.	Northern Mindanao Power Corporation (Alto Power Management Corp.)
9	.	Philippine Géothermal Inc.
10	.	Philippine National Oil Company – Energy Development Corporation
11	.	Philippine National Oil Company – Exploration Corporation
12	.	San Roque Power Corporation
13	.	STEAG State Power Inc.
14	.	Subic Power Corporation
15	.	Wartsila Philippines Inc.

Participants Profile

Industry Sector Breakdown

Survey participants were categorized by industry types as shown in the table below.

Industry	Org Count	Percent
Power / Energy	10	67%
Oil & Gas Exploration	2	13%
Services	1	7%
Mining	1	7%
Electrical Engineering Products & Services	1	7%
TOTAL	15	100%

Activity Analysis

Type of Activity	Org Count	Percent
Power / Energy Generation	11	73%
Services	2	13%
Sales & Services	1	7%
Sales, Services, & Assembly	1	7%
TOTAL	15	100%

Participants Profile

Organization Size

The following tables provide information about the size of the organizations participating in the survey based on their reported annual gross revenue/sales (in USD) and total employment.

Revenue/Sales in USD	Org Count	Percent
Less than US\$25 Million	6	40%
US\$25 Million - < US\$50 Million	2	13%
US\$50 Million - < US\$100 Million	4	27%
US\$250 Million - < US\$500 Million	2	13%
US\$500 Million - < US1 Billion	1	7%
TOTAL	15	100%

Total Employment	Org Count	Percent
Less than 50	4	27%
50 to < 99	3	20%
100 to < 249	4	27%
250 to < 499	2	13%
1,000 to < 2,999	2	13%
TOTAL	15	100%

Economic Developments and Trends

	2003 (Actual)	2004 (Estimate)	2005 (Forecast)
GDP			
GDP Growth (%)	4.5	4.9 – 5.8	4.5 -5.5
Inflation			
Inflation Rate (%)	3.1	3.8	4.0 – 5.0

GDP

The Country's GDP has remained in forecast at 4.9% to 5.8% same as the first quarter of the year, having last year's at 4.5%.

Though there are indicators of momentum for expansion and continuous growth due to the sustained growth in electronic products and capital growth.

The government expects imports to increase this year, noting that imports for semiconductors increased to 18.7 percent pulling up the total electronics products to 17 percent. Other electronics products grew such as medical and industrial instrumentation, consumer electronics, automotive electronics, Telecommunication and electronic data processing.

INFLATION

Inflation remains within the government target of 4.0-5.0 percent for 2005, notwithstanding the 3.8 percent increase in March citing National Statistics Office (NSO) data. Romulo Neri, NEDA Secretary, noted that headline inflation based on the new 2000-based series picked up to 4.2 percent in March from 4.0 percent in February, bringing the average inflation rate to 4.0 percent.

What caused inflation pressure was the increase in prices of food items such as rice, corn, milk, cooking oil, pork, beef, and selected vegetables. This is contrary to what happened last month when lower food prices for some items such as chicken eased inflation.

Prices in cooking oil increased due to the uptick in coconut prices, while the prices of beef rose due to the impact of the mad cow scare on imported

The increase in prices of gasoline, diesel, engine oil, medicines, selected construction materials and some items for household operations and personal effects also contributed to the pressure.

Labor Development and Trends (May)

	2003 (Actual)	2004 (Estimate)
Unemployment (%)	10.6	12.2

The January 2004 Labor Force Survey results recorded a labor force participation rate (LFPR) of 67.2 percent. The unemployment rate was estimated at 11.0 percent in January this year. Last year's unemployment rate was 10.6 percent.

The national employment rate was recorded at 89.0 percent in January this year. A year ago, it was estimated at 89.4 percent. Employed persons in agricultural sector reached 11.1 million, while those in the industry and services sectors were 5.0 and 15.3 million, respectively.

Underemployment rate was recorded at 17.5 percent in January this year.

Tax and Social Security Developments and Trends

The recent income tax reforms included a restructuring of income tax brackets to six bands, ranging from 5% to 32%. Adjustments in personal taxation exemption limits will result in allowances of PHP 20'000 for an individual (increased from PHP 9'000), PHP 25'000 for the head of the family, PHP 32'000 for each married individual, and PHP 8'000 per qualified dependant (not to exceed four).

The thirteenth month of pay is given every December of every year. This is equivalent to one month of the employee's salary and is given tax-free only if it does not exceed the ceiling of PHP 30'000. The excess of the PHP 30'000 ceiling is taxable.

Other relevant changes include a maximum PHP 2,400 per annum as personal income tax deduction for health insurance premiums.

Salary Movement Trends

The most common salary review dates are: January (27% of the organizations surveyed) and on the employee's anniversary (20% of the organizations surveyed). 2003 actual salary increase given last year was reported at 10.48%. Salary projection for 2004 and 2005 is 10.37% and 10.40%, respectively.

Base Salary Increases

	25 th Percentile	Median	75 th Percentile	Average
2003 Actual Increase				
Top Management	8.00	9.50	12.00	10.14
Management	5.00	10.00	12.00	8.92
Professional Non-Sales	7.25	11.45	12.00	9.99
Staff	8.00	10.45	11.75	9.39
2004 Estimate Increase				
Top Management	7.00	10.00	11.35	9.36
Management	6.75	9.50	12.00	9.25
Professional Non-Sales	7.50	10.05	12.25	9.87
Staff	8.00	10.30	13.00	12.10
2005 Forecast Increase				
Top Management	7.80	10.00	12.00	9.60
Management	8.00	10.00	12.00	9.58
Professional Non-Sales	8.00	10.00	12.00	9.58
Staff	6.00	10.00	12.00	9.20

Variable Bonus

Energy companies provide employees variable bonus based on employee performance. The table below shows Variable Bonus as a multiple of the employee's annual salary. There was no reported variable bonus freeze for 2003.

Variable Bonus as Percentage of the Annual Base Salary				
	25 th Percentile	Median	75 th Percentile	Average
2003 Actual Variable Bonus				
Top Management	9.27	15.38	26.43	25.81
Management	9.62	15.38	24.00	24.11
Professional Non-Sales	8.46	15.38	15.85	23.22
Staff	7.52	8.82	15.38	19.28
2004 Estimate Variable Bonus				
Top Management	12.47	15.38	18.68	24.79
Management	7.69	15.38	15.38	22.97
Professional Non-Sales	7.93	15.38	15.38	21.51
Staff	7.69	15.38	15.38	21.32
2005 Forecast Variable Bonus				
Top Management	10.85	15.38	21.98	26.14
Management	7.69	15.38	18.68	23.92
Professional Non-Sales	7.69	15.38	18.68	23.88
Staff	7.69	15.38	15.38	21.98

Average Actual Variable Bonus payout last year was 13.31% of the employee's annual salary. Maximum bonus was given to Top Management. For 2004 and 2005, average Estimate and Forecast Variable Bonus is 15.38% of the employee's annual salary

Variable Bonus

The following table shows variable bonus as a percentage of the employee's monthly salary.

Variable Bonus as Percentage of the Monthly Base Salary				
	25 th Percentile	Median	75 th Percentile	Average
2003 Actual Variable Bonus				
Top Management	120.51	199.94	343.59	335.53
Management	125.06	199.94	312.00	313.43
Professional Non-Sales	109.98	199.94	206.05	301.86
Staff	97.76	114.66	199.94	250.64
2004 Estimate Variable Bonus				
Top Management	162.11	199.94	242.84	322.27
Management	99.97	199.94	199.94	298.61
Professional Non-Sales	103.09	199.94	199.94	279.63
Staff	99.97	199.94	199.94	277.16
2005 Forecast Variable Bonus				
Top Management	141.05	199.94	285.74	339.82
Management	99.97	199.94	242.84	310.96
Professional Non-Sales	99.97	199.94	242.84	310.44
Staff	99.97	199.94	199.94	285.74

Average Actual Variable Bonus payout last year was 173.00% of the employee's monthly salary. Maximum bonus was given to Top Management. For both 2004 and 2005, average Estimate and Forecast Variable Bonus is 200.00% of the employee's monthly salary.

Staffing Trends

Hiring intention

Companies indicated the following changes to their staffing over the next 3 months.

Hiring intentions	*Org Count	*Percent
Recruiting / Adding Staff	9	60%
No Change	6	40%
Total	15	100%

Turnover and Headcount Growth

Turnover and headcount growth among the surveyed group are shown below:

Staff Turnover	Average (%)
% voluntary staff turnover in 2003	5.76%
% of staff retrenched in 2003	9.57%
Headcount Growth	Average (%)
% headcount growth in 2003	6.83%

Annual Base Pay – Fresh Graduates

	Average Annual Salary	Average Monthly Salary	Median Annual Salary	Median Monthly Salary
Degree (Engineering)	258,050	19,850	189,000	14,538
Degree (Non-Engineering, excluding Accounting)	188,537	14,503	149,000	11,462
Degree (Computer Science)	179,152	13,781	168,000	12,923
Degree (Accounting)	195,359	15,028	149,000	11,462

List of Participating Organizations

1	.	Asea Brown Boveri Inc.
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2004

PHILIPPINES Energy Industry Total Remuneration Survey

Survey Methodology and Definitions

The analysis of the compensation and benefits information collected is displayed for each of the survey positions where sufficient data was reported.

A description of each type of analysis provided for the positions is included below. Definitions of the compensation and benefits information and statistics displayed on the tables are provided on the following pages.

Report Types

Three main types of report tables are provided as described below.

The first report, **Regressed Market Report**, provides the regression curves for each of the compensation and benefits categories (that is, Comp1, Comp2, Comp3, Comp4, Comp5) based on the actual market data and Mercer's IPE classes.

The second report, **Regressed Function Report**, provides the regressed statistics for all families combined and for each job family separately. The regressed statistics were developed for each of the compensation and benefits categories (that is, Comp1, Comp2, Comp3, Comp4, and Comp5) based on survey data and Mercer's IPE classes.

The third report, the **Benchmark Position Report**, displays statistics, by position, based on the actual data reported for the position by all survey participants. Information on all elements of compensation and benefits are included.

Survey Item Definitions

Statistics

25th Percentile (25th %ile) - That data point that is higher than 25% of all other data in the sample when ranked from low to high. Also known as the first quartile (**Q1**).

Median - That data point that is higher than 50% of all other data in the sample when ranked from low to high. Also known as the 50th percentile.

75th Percentile (75th %ile) - That data point that is higher than 75% of all other data in the sample when ranked from low to high. Also known as the third quartile (**Q3**).

90th Percentile (90th %ile) - That data point that is higher than 90% of all other data in the sample when ranked from low to high.

Mean - The sum of all data reported divided by the number of observations in the sample. Also referred to as the **average**.

Market Regressed Line

The result of applying one of several mathematical models to fit a smooth curve through a series of graphed "X/Y" points (representing Position Class and a compensation figure respectively) such that the curve best represents the overall trend in those points. This term is used to replace the regressed market median in the regressed market table.

"Nth" Market Ratio

A smooth curve related to a Market Regressed Line but offset from it vertically at every "X" value (representing Position Class) by a proportion generally equal to the ratio of the corresponding actual median to the actual Nth percentile at each of those "X" values.

Receiving Item No. - The number of incumbents receiving for the compensation or benefit item. Each item, such as base salary or incentive amount, is analyzed individually using the data reported for that item only. If an organisation could not provide a piece of data for a position, this organisation's information would not be included in the calculations of the statistics. Therefore the number receiving the item may differ by item.

Receiving Item % - The percentage of the incumbents actually receiving the item based on the total number of incumbents in the position.

Compensation Items

No. of Months Paid - The number of times the monthly base salary is paid, including the fixed bonus.

Monthly Base Salary - The guaranteed monthly base salary, exclusive of any allowances.

Monthly Gross Salary from FESCO - The guaranteed monthly base salary that the incumbent received from FESCO instead of company. It's exclusive of any allowances and is specific to compensation package in China.

Guaranteed Bonus - The fixed amount of bonus given to the incumbent of this position.

Annual Base Salary (COMP1) - The formula to calculate this section: guaranteed monthly base salary multiplied by the number of months. This section includes annual base salary and annual fixed bonuses.

Transportation Allowance - The monthly fixed allowance at the time of the effective survey date multiplied by 12. This amount is given to subsidize transportation to and from work (does not include ad-hoc reimbursement).

Car Allowance - The monthly cash payment at the time of the effective survey date multiplied by 12. This amount is given in-lieu-of or for maintaining a vehicle.

Meal Allowance - The monthly fixed allowance at the time of the effective survey date multiplied by 12. This amount is given to subsidize meals taken by the employee (*does not* include meal allowance provided in the event of over-time work).

Housing Allowance - The monthly cash payment at the time of the effective survey date multiplied by 12. This amount is given in lieu of actual apartment / house or given to subsidize housing related expenses.

Phone Allowance - The monthly fixed allowance at the time of the effective survey date multiplied by 12. This amount is given to subsidize phone expenses incurred by the employee.

Job-based Allowances - Monthly value at the time of the effective survey date multiplied by 12. This amount is cash payments made which are directly tied to the job, including job

allowance, title allowance, burn-in allowance, clean room allowance, scope allowance, skill allowance, 8-hours shift allowance and 12-hours shift allowance.

Site Allowance (on-shore) - Monthly value at the time of the effective survey date multiplied by 12. This fixed allowance is given for working on a particular on-shore site or location or environment of hazardous nature.

Leave Travel Allowance - Monthly value at the time of the effective survey date multiplied by 12. This fixed allowance is provided by the company to the incumbent for the purpose of vacation and it is specific to the compensation package in India.

Medical-domiciliary - The maximum limit allowed for outpatient expenses/ clinical reimbursement annually for self and dependents. This does not include any premium paid by the company for hospitalisation insurance and it is specific to the compensation package in India.

Family Allowance - Monthly value at the time of the effective survey date multiplied by 12. This fixed allowance is provided by the company to the incumbent depending on the number of dependents. This allowance is specific to the compensation package in Japan.

Area Allowances - Monthly value at the time of the effective survey date multiplied by 12. This fixed allowance is given based upon area differences – such as cost-of-living, hardship or remoteness. It is specific to the compensation package in Japan.

Clothing Allowances - Monthly value at the time of the effective survey date multiplied by 12. This fixed allowance is given in lieu of a uniform or to subsidise uniform related expenses. It is specific to the compensation package in Vietnam.

Ex-gratia/Fixed bonus – The bonus is given by the company to the incumbent based on company performance.

Other Guaranteed Allowances - All other guaranteed allowances *not* listed above.

Annual Guaranteed Cash (COMP2) - COMP1 (Annual Base Salary) plus all the fixed allowances (ie. Transportation, Car, Meal, Housing, Job-Based Allowances and Other Guaranteed Allowances.)

Variable Bonus (Target) - Payments that will be made for the next 12 months, which is the targeted annual variable cash payments that are associated with individual, team and/or corporate performance, excluding Sales Bonus/ Incentives.

Sales Incentive (Target) - Payments that will be made for the next 12 months, which is the targeted annual cash payments that are associated with sales achievement and paid to sales and/ or marketing employees.

Profit Sharing (Target) - Payments that will be made for the next 12 months, which is the targeted annual cash payments that are associated with profit sharing scheme.

Annual Total Cash (COMP3 Target) - COMP2 (Annual Guaranteed Cash) plus targeted Variable Bonus and Profit Sharing and Sales Incentive.

Variable Bonus (Actual) - All payments made over the last 12 months, which are associated with individual, team and/or corporate performance.

Profit Sharing (Actual) - All payments made over the last 12 months, which are associated with profit sharing scheme.

Sales Incentive (Actual) - All payments made over the last 12 months, which are associated with sales achievements and paid to sales and/or marketing employees.

Annual Total Cash (Comp3 Actual) - The total annual cash paid out to the individuals in the position. COMP2 (Annual Guaranteed Cash) plus actual Variable Bonus and Profit Sharing and Sales Incentive.

Stock Grants - Cash values of all long term incentive plan in the form of company's stock grant to employee over the last 12 months.

Stock Option - Cash values of all long term incentive plan in the form of stock option grant to employee over the last 12 months. The Black Scholes method is used to value the Stock Option given to the incumbent.

Annual Total Cash plus LTI (Comp4) - The total of all cash items plus the value of the long-term incentives paid out to the individuals in the position.

Annual Net Total Cash - Comp 3 component minus income tax and employee's social contribution. This only applies to compensation in Vietnam.

PERQUISITES AND BENEFITS

Flexible Benefit – The value of the flexible benefit plan provided to the individual in this position.

Meal Subsidy – The annual cost of providing meals to the individual in this position.

Transportation Subsidy – The annual cost of providing transportation to the individual in this position.

Motor Vehicle – For leased motor vehicle, the valuation for this benefit would be to the amount that the company paid for leasing the motor vehicle. If it is a purchase, this survey will apply a standard motor vehicle valuation formula to calculate the amount. (please refer to the non-cash items valuation section for the actual formula)

Car / Housing / Personal / Renovation Loans – The value of the loan entitlement provided to the individuals in this position. (please refer to the non-cash items valuation section for the actual formula)

Medical Plan – The value of the medical plan provided to the individuals in the position. This includes the coverage for clinical, dental and hospitalization.

Accident/Life Insurance – The cost of providing the accident and life insurance coverages to the incumbent.

Club Subscription – The annual cost of subsidizing club membership for the individual in this position. (This excludes the joining fee)

Children Education – The annual cost of providing education for the employee's children.

Pension / Gratuities – The value of this benefit depends on the type of scheme. Different formula is used for valuation and the details of the formula can be found in non-cash items valuation section. This also includes the employer's contribution to the social security and statutory retirement plans.

Government-required Housing Fund – The annual contribution made by the employer to the housing fund as per the statutory requirement. This item is specific to the compensation package in China.

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Supplementary Housing Fund – The additional annual contribution made by the employer to the housing fund for the incumbent in this position. This item is specific to the compensation package in China.

Management Fee to FESCO – The management fees per employee that a Foreign Rep Office pays to FESCO for taking care of the benefits for its employees (excluding the benefit fees). This item is specific to the compensation package in China.

Agency Fee Paid by Company – The annual amount of agency fee paid by the company for the incumbent in this position. This item is specific to the compensation package in Vietnam.

Union Fee Paid by Company – The annual amount of union fee paid by the company for the incumbent in this position. This item is specific to the compensation package in Vietnam.

Annual Total Remuneration excl LTI - The total of all cash items plus the value of all benefits for the individuals in the position. This summation is without the value of the long-term incentives (eg. stock grant and stock option)

Annual Total Remuneration Comp5 - The total of all cash items plus the value of the long-term incentives plus the value of all benefits for the individuals in the position.

Benefits Valuation Methodology

This section details the methods used by Mercer to value the benefit plans and it is applied consistently to all submissions.

Long-Term Incentives

We use the Black-Scholes model to calculate the value of a publicly traded call option. The Black-Scholes model value for a given option is a function of the inputs:

- Fair Market Value (FMV) stock price of the stock on date of grant
- Exercise Price
- Option Term
- Risk-free Interest Rate (country-specific and is associated with the country where the employee receiving the stock option lives)
- Stock Volatility
- Dividend Yield

Formula:

$$\text{Call Option} = \text{FMV} * [N(d_1)] - \text{Exercise Price} * e^{-\text{Risk-free Interest Rate} * \text{Option Term}} * [N(d_2)]$$

Where

$$d_1 = \frac{\ln\left(\frac{\text{FMV}}{\text{Exercise Price}}\right) + \left[\text{Risk - free Interest Rate} + \frac{\text{Stock Volatility}^2}{2}\right] * \text{Option Term}}{(\text{Stock Volatility} * \text{Option Term})^{\frac{1}{2}}}$$

$$d_2 = d_1 - (\text{Stock Volatility} * \text{Option Term})^{\frac{1}{2}}$$

And

$N(d_1)$ and $N(d_2)$ represent areas under a standard normal distribution

For purposes of the Black-Scholes model, stock volatility is measured as the percentage change in the stock price using monthly closing stock prices for a

3-year period ending in the last complete calendar year. Mathematically, it is defined as the standard deviation of the rate of return on the stock and is based on the assumption that stock prices move randomly over time. The Black-Scholes model also assumes that an option is exercised at the end of the option term. The greater the volatility of the stock, the more valuable the option to the option holder.

Black-Scholes values are expressed as a multiple of the company's stock price. For example, an option with a Black-Scholes value of 35% is worth 0.35 shares of the underlying stock. If the stock were trading at 50 per share, the option is worth 17.5.

Total Stock Option value

$$= \text{Black Scholes Value} * \text{FMV} * \text{No. of Underlying Stock Options} * \text{Exchange Rate} * 0.01$$

(Exchange rate used : US\$1 = 56.26 Peso)

Motor Vehicle (Company Assigned Car)

In most of the countries where the calculation components for the motor vehicle are available, the following formula will apply in valuating this benefit. Where the components are not available, the survey will use a **straightline depreciation method to valuate this benefit**.

The total car benefit consists of two components, i.e. assigned car value and the present value of car related expenses. For this survey purpose, Mercer set assumptions on the car-related expenses paid by the company based on typical usage and particular country practice.

Other benefits such as driver, parking or limit of company coverage are not considered. The following illustration is in Singapore context and thus, the amount used will vary by the country.

Assumptions:

Yearly Discount Rate	= 6% (actuarial assumption)
Market Depreciation Factor	= 0.75
Annual Gasoline Consumption	= 2,500 liters per year
Maintenance Cost	= 4.5% of purchase price
Maintenance Cost Growth	= 20% per year
Insurance Premium Rate	= 3.00
Company contribution on gasoline, maintenance, tax and insurance	= 100%

Formula:

Assigned Car Value

Present Value of Total Depreciation Benefit during n years of car utilization =

$$\text{Purchase Price} - \frac{(\text{Purchase Price} * \text{Market Depreciation Factor}^{n+1})}{1 + \text{Yearly Discount Rate}^n}$$

Value of Company Assigned Car during m months of car utilization =

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$$\frac{\text{Present Value of Total Depreciation Benefit} * (1 + \text{Monthly Interest Rate})^n}{\frac{(1 + \text{Monthly Interest Rate})^m - 1}{\text{Monthly Interest Rate}}} * 12$$

Car Expenses

Gasoline

$$\text{Monthly Expense} = \frac{\text{Annual Gasoline Consumption} * \text{Gasoline Price}}{12}$$

Present Value of Total Gasoline Expenses during m months of car utilization =

$$\text{Monthly Expense} * \frac{(1 + \text{Monthly Discount Rate})^n - 1}{\text{Monthly Discount Rate} * (1 + \text{Monthly Discount Rate})^n}$$

Maintenance

Maintenance cost for a year is dependent on car depreciated value for particular year.

Car Depreciated Value after nth year =

$$\text{Purchase Price} * \text{Market Depreciation Factor}^{n+1}$$

Present Value of Annual Maintenance Cost in the nth year =

$$\text{Car Depr. Value after } n^{\text{th}} \text{ year} * \text{Maint. Cost} * \frac{(1 + \text{Maint. Cost Growth})^{n-1}}{(1 + \text{Yearly Discount Rate})^{n-1}} * (n - (n - 1))$$

Total Present Value of Maintenance Cost during n years of car utilization =

$$\sum_n \text{Present Value for Annual Maintenance Cost in the } n^{\text{th}} \text{ year}$$

Motor Vehicle Tax

Present Value of Motor Vehicle Tax in the 1st year =

Purchase Price * Tax Rate

Present Value of Motor Vehicle in the nth year =

$$\text{Car Depreciated Value after } (n - 1)^{\text{th}} \text{ year} * \frac{\text{Tax Rate}}{(1 + \text{Yearly Discount Rate})^{n-1}}$$

Total Present Value of Motor Vehicle Tax during n years of car utilization =

$$\sum_n \text{Present Value of Motor Vehicle in the } n^{\text{th}} \text{ year}$$

Car Insurance

Present Value of Insurance Premium in the 1st year =

(Purchase Price * Insurance Premium Rate)

Survey Methodology and Definitions

Present Value of Insurance Premium in the nth year =

$$\text{Car Depreciated Value after } (n - 1)^{\text{th}} \text{ year} * \frac{\text{Insurance Premium Rate}}{(1 + \text{Yearly Discount Rate})^{n-1}} * (n - (n - 1))$$

Total Present Value of Insurance Premium during n years of car utilisation

$$\sum_n \text{Present Value of Insurance Premium for } n^{\text{th}} \text{ year}$$

Total Car Expenses = Present Value of Total Gasoline Expenses
PLUS Total Present Value of Maintenance Cost
PLUS Total Present Value of Motor Vehicle Tax
PLUS Total Present Value of Insurance Premium

Therefore,

Total Car Benefit = Value of Company Assigned Car
PLUS Total Car Expenses

Car Loan, Housing Loan and Personal/Renovation Loans

This is simply taken as the net interest cost. Employee contributions, if any, as percentage of total cost are deducted from cost.

Assumptions:

Cost of Borrowing Rate for Car Loan = 14.00% per year
Cost of Borrowing Rate for Housing Loan = 12.00% per year
Cost of Borrowing Rate for Personal Loan = 15.00% per year

2004

PHILIPPINES Energy Industry Total Remuneration Survey

Survey Methodology and Definitions

Formula:

Loan Benefit = Maximum loan amount entitled
TIMES (Cost of Borrowing Rate – Employee Interest Rate)

Medical Plan

For this survey, the medical plan premium is derived using the following assumptions. Where the detail information is not available, this survey will reflect the actual premium figure provided.

Assumptions:

Number of family member= 4

Clinical Visit

Employee = 10 times per year
Dependents = 10 times per year
Average cost = 300 Peso per visit inclusive of medicine

Dental Visit

Employee = 10 times per year
Dependents = 10 times per year
Average cost = 300 Peso per visit inclusive of medicine

Insurance premium for hospitalisation based on 4-member family

<u>Range of Room & Board Rate</u> (Peso)	<u>Typical Annual Premium</u> (Peso)
Less than 500	25,740
501 – 800	27,300
801 – 1,600	31,188
More than 1,600	40,068

Formulas:

Clinical

Maximum Reimbursement Assumption =
Employee’s clinical visit x Average Cost x % of employee coverage
PLUS
Dependents’ clinical visit x Average Cost x % of dependents coverage

Clinical Benefit =
Minimum of (*Clinical Reimbursement Cap* or *Maximum Reimbursement assumption*)

Dental

Maximum Reimbursement Assumption =
Employee’s dental visit x Average cost x % of employee coverage
PLUS
Dependents’ dental visit x Average cost x % of dependents coverage

Dental Benefit =
Minimum of (*Dental Reimbursement Cap* and *Maximum Reimbursement assumption*)

Please note that if dental benefit is included as part of clinical (outpatient) benefit, the dental value is added to the clinical usage whenever the total amount does not exceed reimbursement limit.

Hospitalization

Hospitalisation Benefit = Annual health insurance premium corresponds to daily room and board rate as mentioned in the above assumptions.

Therefore,

Total Medical Plan Benefit = Clinical Benefit + Dental Benefit + Hospitalisation Benefit

LIFE / ACCIDENT INSURANCE

For this survey, the following assumptions will be used to calculate the life/accident insurance premium. Where the detail of coverage is not available, this survey would use the actual premium provided.

Coverage of insurance includes:

- Basic coverage in case of death
- Accidental death and dismemberment
- Personal accident coverage
- Business travel coverage

For each particular concept, this survey would apply a standard rate to calculate the premium based on the given coverage. These rates vary by country.

Coverage	Premium Rate
Basic Life	2.2 per 1,000 peso
Accidental Death	0.5 per 1,000 peso

PENSIONS

(A) Defined Contribution Pension Plan

Employer cost = Employer's contribution rate

The valuation assumptions are

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- Ignores the vesting on termination
- Assumed that the employee will remain with the employer until full vesting

(B) Defined Benefit Pension Plan

The defined benefits can be paid either in a lump sum amount or regular payments for life/fixed period of time or both.

(i) Defined Benefit Plan (lump sum)

Employer cost

$$= \max(\text{ER Cont, (Benefit Factor} \times (1.01)^{(-1 \times \text{Time to Retirement})}) - \text{Ee Cont})$$

ER Cont	= Required employer contribution to the plan
Ee Cont	= Required employee contribution to the plan
Benefit Factor	= benefit multiple at retirement
Time to Retirement	= Normal retirement age – current age

Valuation assumptions:

- Ignores termination benefit;
- Assumed that the employee will remain with the employer until normal retirement;
- Adopted projected credit valuation method;
- Assumed a long term 1% gap between discount rate and salary inflation;
- Assumes earnings used in calculating retirement benefit is equivalent to final earnings at retirement (ie. No final salary averaging).

(ii) Defined Benefit Plan (regular payment after retirement)

Employer cost

$$= \max(\text{ER Cont, (Benefit Factor} \times \text{Annuity Factor} \times (1.01)^{(-1 \times \text{Time to Retirement})}) - \text{Ee Cont})$$

ER Cont	= Required employer contribution to the plan
Ee Cont	= Required employee contribution to the plan

2004

PHILIPPINES Energy Industry Total Remuneration Survey

Survey Methodology and Definitions

Benefit Factor = benefit multiple at retirement
Time to Retirement = Normal retirement age – current age

Valuation assumptions:

- Ignores termination or early retirement benefit;
- Assumed that the employee will remain with the employer until normal retirement;
- Adopted projected credit valuation method;
- Assumed a long term 1% gap between discount rate and salary inflation;
- Assumed 3% discount rate, and US GAM1994 mortality table (50% unisex table);
- Assumed no increases in pension payments;
- Assumed earnings are at final salary

Mercer's International Position Evaluation System (IPE Version 3)

The TRS utilizes the International Position Evaluation (IPE) system Version 3 in support of job matching to allow full flexibility for analyses.

The IPE system is a proven approach to position evaluation and is used by thousands of companies around the world. Mercer has recently completed a review of the IPE system based on input and feedback from users and consultants worldwide. The continuous improvements made to the system address the changing environment and evolution of organization structures.

The new IPE Version 3 focuses on four business-related dimensions: impact and contribution to business unit results, communication, innovation and required knowledge. Each factor is divided into degrees, which have their individual weightings. The improvements to the system reflect the changes many companies are making to flatten their organizations and/or transition to a network based or team environment. The final result is an easy-to-use system, which facilitates not only position comparisons between companies, but also across companies and industries.

The system allows accurate comparisons between positions, as job titles alone can be misleading. For example, the title of "Finance Manager" in one company may describe a position that has rather operational responsibilities as compared to a Finance Manager in a second company with more strategic responsibilities. In other words, the scope and content of a Finance Manager position could be broad in some companies and limited in others.

By using the IPE method, we can further isolate similar positions and responsibilities. The information in the survey is presented to allow a rapid and precise measurement of salary levels.

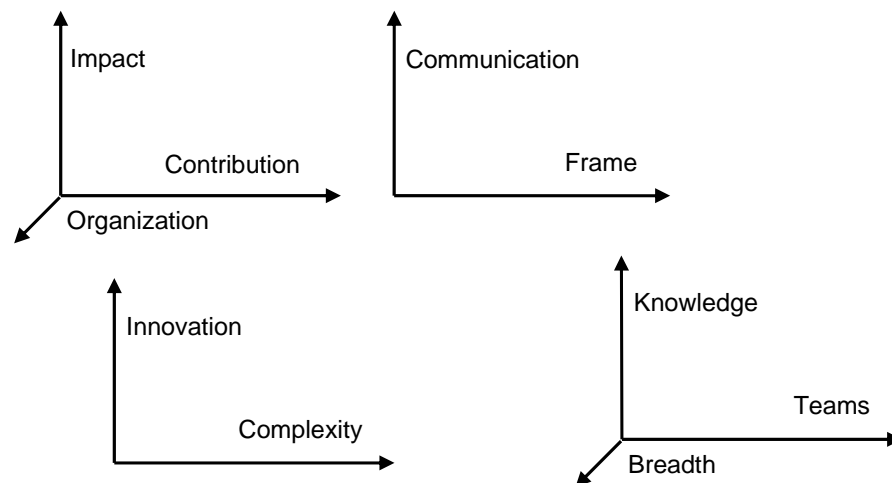
It is important to remember that, when conducting position evaluations, it is the "position" that is being evaluated and not the person holding that position. The qualifications and the performance of the present position holder may differ from what is actually required by the position.

Position evaluation is not just a tool for salary comparisons but also instrumental in recruitment, career planning, designing organization structures and, in addition, when dealing with expatriate compensation and planning.

IPE Version 3 Four Factors

The user should note that each position evaluation system has its own terminology and peculiarities. It is always easier to learn these details from a specialist so that the "how-to-use" questions are quickly understood. Equally important, the role of the Mercer survey specialist is to ensure proper representation of compensation available in each market, so that companies can accurately compare their compensation strategy across markets, regions and industries.

The Four Factors of International Position Evaluation (IPE) System





Appendix B Opex Forecast in ERC Format

TRANSCO

TOTAL OPERATING & MAINTENANCE EXPENDITURE FORECAST SUMMARY

(In Mn P)

Opex Category and Sub-Category	TOTAL OPERATING & MAINTENANCE EXPENDITURE (in Mn Peso, nominal)							
	Actual (Peso, nominal in peso of reporting yr)		Budget (peso nominal)	Forecast (Peso, nominal in peso of reporting yr)				
	2003	2004	2005	2006	2007	2008	2009	2010
Payroll								
Network Operations Supervision & Eng'g Staff	379	379	404	569	691	842	910	986
Network Operations Other Staff	419	419	473	656	767	946	1,020	1,109
Network Planning Supervision and Eng'g Staff	29	29	32	44	55	66	71	77
System Operations Supervision & Eng'g Staff	183	183	195	265	327	389	422	455
Admin, HR, Finance Corporate & Regulatory Staff	626	584	792	726	919	1,167	1,338	1,541
Easements owned by the Regulatory Entity								
Sub-total Payroll	1,636	1,594	1,895	2,260	2,759	3,410	3,762	4,169
Network Related								
Network Operations	287	398	454	664	680	702	731	758
Network Maintenance	694	962	1,087	1,332	1,248	1,292	1,347	1,399
Plant & Equipment Insurance	118	247	267	194	202	210	218	227
System Operations	79	174	187	196	224	237	251	265
WESM Compliance								
Sub-total Network Related	1,178	1,781	1,996	2,387	2,354	2,441	2,547	2,649
Non-Network Related								
Bad Debts	44	50	53	69	84	101	122	146
Internal & External Audit Functions		12	36	36	36	36	36	36
Regulatory liaison & compliance			76	30	10	31	90	50
Corporate & central office	52	158	315	425	380	372	328	383
IT licenses, operations & maintenance	19	8	10	11	11	12	12	13
Lease payments			9	9	10	10	10	11
Net foreign exchange (either loss or gain)			0	0	0	0	0	0
Property maintenance	65	77	2	2	2	2	2	2
Property insurance	20	23	42	54	55	56	56	57
Others			3	3	3	3	3	4
Sub-total Non-Network Related	200	328	546	639	591	623	660	701
Total Operating & Maintenance Expenditure	3,014	3,703	4,437	5,286	5,704	6,474	6,968	7,518
Exchange rate assumptions for Forecast Period (peso/US\$ at end yr)			56	56	56	56	56	56
Philippines Consumer Price Index change assumption (%pa over yr)			6.0%	5.0%	4.0%	4.0%	4.0%	4.0%
USA Consumer Price Index Change Assumption (% pa over yr)			2.4%	2.4%	2.4%	2.4%	2.4%	2.4%



TRANSCO

NOMINAL PESO OPERATING & MAINTENANCE EXPENDITURE FORECAST

Estimates for Peso Expenditure (In Mn P)

Opex Category and Sub-Category	PESO OPERATING & MAINTENANCE EXPENDITURE (in Mn Peso, nominal)							
	Actual (Peso, nominal in peso of reporting yr)		Budget (peso nominal)	Forecast (Peso, nominal in peso of reporting yr)				
	2003	2004	2005	2006	2007	2008	2009	2010
Payroll								
Network Operations Supervision & Eng'g Staff	379	379	404	569	691	842	910	986
Network Operations Other Staff	419	419	473	656	767	946	1,020	1,109
Network Planning Supervision and Eng'g Staff	29	29	32	44	55	66	71	77
System Operations Supervision & Eng'g Staff	183	183	195	265	327	389	422	455
Admin, HR, Finance Corporate & Regulatory Staff	626	584	792	726	919	1,167	1,338	1,541
Easements owned by the Regulatory Entity								
Sub-total Payroll	1,636	1,594	1,895	2,260	2,759	3,410	3,762	4,169
Network Related								
Network Operations	287	398	454	664	680	702	731	758
Network Maintenance	694	962	1,087	1,332	1,248	1,292	1,347	1,399
Plant & Equipment Insurance	118	247	11	8	10	10	18	27
System Operations	79	174	187	196	224	237	251	265
WESM Compliance								
Sub-total Network Related	1,178	1,781	1,739	2,201	2,162	2,241	2,347	2,449
Non-Network Related								
Bad Debts	44	50	53	69	84	101	122	146
Internal & External Audit Functions		12	36	36	36	36	36	36
Regulatory liaison & compliance			76	30	10	31	90	50
Corporate & central office	52	158	315	425	380	372	328	383
IT licenses, operations & maintenance	19	8	10	11	11	12	12	13
Lease payments			9	9	10	10	10	11
Net foreign exchange (either loss or gain)			0	0	0	0	0	0
Property maintenance	65	77	2	2	2	2	2	2
Property insurance	20	23	24	39	38	39	39	40
Others			3	3	3	3	3	4
Sub-total Non-Network Related	200	328	528	624	574	606	642	683
Total Operating & Maintenance Expenditure	3,014	3,703	4,163	5,085	5,495	6,257	6,751	7,301
Philippines Consumer Price Index change assumption (%pa over yr)			6.0%	5.0%	4.0%	4.0%	4.0%	4.0%



TRANSCO
REAL PESO OPERATING & MAINTENANCE EXPENDITURE FORECAST
Estimates for Peso Expenditure (In Mn P)

Opex Category and Sub-Category	PESO OPERATING & MAINTENANCE EXPENDITURE (in Mn Peso, real)						
	Budget (peso nominal)	Forecast (Peso, real as at December 31, 2005)					
		2005	2006	2007	2008	2009	2010
Payroll							
Network Operations Supervision & Eng'g Staff	404	542	633	741	771	803	
Network Operations Other Staff	473	625	703	833	864	903	
Network Plannig Supervision and En'g Staff	32	42	51	58	60	63	
System Operations Supervision & Eng'g Staff	195	252	300	343	357	371	
Admin, HR, Finance Corporate & Regulatory Staff	792	692	841	1,027	1,133	1,255	
Easements owned by the Regulatory Entity							
Sub-total Payroll	1,895	2,153	2,527	3,002	3,185	3,394	
Network Related							
Network Operations	454	632	622	618	619	617	
Network Maintenance	1,087	1,269	1,143	1,138	1,140	1,139	
Plant & Equipment Insurance	11	8	9	9	15	22	
System Operations	187	187	205	209	213	216	
WESM Compliance	0	0	0	0	0	0	
Sub-total Network Related	1,739	2,096	1,980	1,973	1,987	1,994	
Non-Network Related							
Bad Debts	53	66	77	89	103	118	
Internal & External Audit Functions	36	34	33	32	31	29	
Regulatory liaison & compliance	76	29	9	27	76	41	
Corporate & central office	315	405	348	328	277	312	
IT licenses, operations & maintenance	10	10	10	10	10	10	
Lease payments	9	9	9	9	9	9	
Net foreign exchange (either loss or gain)	0	0	0	0	0	0	
Property maintenance	2	2	2	2	2	2	
Property insurance	24	37	35	34	33	33	
Others	3	3	3	3	3	3	
Sub-total Non-Network Related	528	594	525	534	544	556	
Total Operating & Maintenance Expenditure	4,163	4,843	5,032	5,509	5,716	5,944	



TRANSCO
NOMINAL PESO OPERATING & MAINTENANCE EXPENDITURE FORECAST
Estimates for US\$ Expenditure (In Mn P)

Opex Category and Sub-Category	US\$ OPERATING & MAINTENANCE EXPENDITURE (in Mn Peso, nominal)							
	Actual (Peso, nominal in peso of reporting yr)		Budget (peso nominal)	Forecast (Peso, nominal in peso of reporting yr)				
	2003	2004	2005	2006	2007	2008	2009	2010
Payroll								
Network Operations Supervision & Eng'g Staff								
Network Operations Other Staff								
Network Plannig Supervision and En'g Staff								
System Operations Supervision & Eng'g Staff								
Admin, HR, Finance Corporate & Regulatory Staff								
Easements owned by the Regulatory Entity								
Sub-total Payroll								
Network Related								
Network Operations								
Network Maintenance								
Plant & Equipment Insurance			256	186	192	200	200	200
System Operations								
WESM Compliance								
Sub-total Network Related			256	186	192	200	200	200
Non-Network Related								
Bad Debts								
Internal & External Audit Functions								
Regulatory liaison & compliance								
Corporate & central office								
IT licenses, operations & maintenance								
Lease payments								
Net foreign exchange (either loss or gain)								
Property maintenance								
Property insurance			18	15	17	17	17	17
Others								
Sub-total Non-Network Related			18	15	17	17	17	17
Total Operating & Maintenance Expenditure			274	201	209	217	217	217
Exchange rate assumptions for Forecast Period (peso/US\$ at end yr)			56	56	56	56	56	56



TRANSCO

NOMINAL US\$ OPERATING & MAINTENANCE EXPENDITURE FORECAST

Estimates for US\$ Expenditure (In Mn \$)

Opex Category and Sub-Category	US\$ OPERATING & MAINTENANCE EXPENDITURE (in Mn US\$, nominal)							
	Actual (US\$, nominal in US\$ of reporting yr)		Budget (US\$ nominal)	Forecast (US\$, nominal in US\$ of reporting yr)				
	2003	2004	2005	2006	2007	2008	2009	2010
Payroll								
Network Operations Supervision & Eng'g Staff								
Network Operations Other Staff								
Network Planning Supervision and Eng'g Staff								
System Operations Supervision & Eng'g Staff								
Admin, HR, Finance Corporate & Regulatory Staff								
Easements owned by the Regulatory Entity								
Sub-total Payroll								
Network Related								
Network Operations								
Network Maintenance								
Plant & Equipment Insurance			4.58	3.32	3.43	3.57	3.57	3.57
System Operations								
WESM Compliance								
Sub-total Network Related			4.58	3.32	3.43	3.57	3.57	3.57
Non-Network Related								
Bad Debts								
Internal & External Audit Functions								
Regulatory liaison & compliance								
Corporate & central office								
IT licenses, operations & maintenance								
Lease payments								
Net foreign exchange (either loss or gain)								
Property maintenance								
Property insurance			0.32	0.27	0.30	0.31	0.31	0.31
Others								
Sub-total Non-Network Related			0.32	0.27	0.30	0.31	0.31	0.31
Total Operating & Maintenance Expenditure	0.00	0.00	4.90	3.59	3.73	3.88	3.88	3.88
USA Consumer Price Index Change Assumption (% pa over yr)			2.4%	2.4%	2.4%	2.4%	2.4%	2.4%



TRANSCO
REAL US\$ OPERATING & MAINTENANCE EXPENDITURE FORECAST
Estimates for US\$ Expenditure (In Mn \$)

Opex Category and Sub-Category	US\$ OPERATING & MAINTENANCE EXPENDITURE (in Mn US\$, real)							
			Budget (US\$ real)	Forecast (US\$, real in US\$ as at December 31, 2005)				
			2005	2006	2007	2008	2009	2010
Payroll								
Network Operations Supervision & Eng'g Staff								
Network Operations Other Staff								
Network Planning Supervision and Eng'g Staff								
System Operations Supervision & Eng'g Staff								
Admin, HR, Finance Corporate & Regulatory Staff								
Easements owned by the Regulatory Entity								
Sub-total Payroll								
Network Related								
Network Operations								
Network Maintenance								
Plant & Equipment Insurance			4.58	3.24	3.27	3.32	3.25	3.17
System Operations								
WESM Compliance								
Sub-total Network Related			4.58	3.24	3.27	3.32	3.25	3.17
Non-Network Related								
Bad Debts								
Internal & External Audit Functions								
Regulatory liaison & compliance								
Corporate & central office								
IT licenses, operations & maintenance								
Lease payments								
Net foreign exchange (either loss or gain)								
Property maintenance								
Property insurance			0.32	0.26	0.29	0.29	0.28	0.28
Others								
Sub-total Non-Network Related			0.32	0.26	0.29	0.29	0.28	0.28
Total Operating & Maintenance Expenditure			4.90	3.51	3.56	3.61	3.53	3.45