OPERATING & MAINTENANCE COSTS

This attachment outlines the explanation for the following:

- Operating and Maintenance costs for the current regulatory period. It details our allowed versus actual on the basis of past allocation and future allocation methods, together with proposed adjustments from assets moving from Distribution to Transmission.
- Operating and Maintenance forecasts for 2004-2009.

1. Operating & Maintenance Costs 1999/00 – 2003/04

At the time of the last Transmission determination, EnergyAustralia had a limited ability to provide an accurate estimate of the Transmission component of our Network Operating costs. As a result it was necessary to estimate these costs on the basis of a global allocation based on the proportion of the replacement cost of Transmission assets relative to total network assets. This global allocation resulted in the following operating costs for the Transmission business.

Table 1 - Transmission O&M costs based on current regulatory account methodology

	Actuals ($'Million Real - 2002/03)			
	2000	2001	2002	2003
Total O & M	246.2	264.8	328.0	296.8
Transmission ORC/ Network ORC (%)	10.1%	9.8%	9.9%	9.1%
Transmission O&M (Allocated)	23.6	25.9	30.2	27.1

This has been the basis upon which operating costs have been reported in the regulatory accounts.

During the current regulatory period considerable progress has been made in identifying and forecasting maintenance costs by asset category. This has been made possible through the introduction of a condition based maintenance regime based on reliability centred maintenance (RCM) and techniques such as Failure Modes Effects Criticality Analysis (FMECA).

This has enabled a far more accurate basis for identifying maintenance costs by asset class and allocating remaining share costs between distribution and transmission.

The following table provides a comparison between actual operating costs for the last regulatory period re-calculated on this more robust basis and determined operating costs. It should be noted that these costs have been based on the original asset bases and do not include the impact of recent changes in network configuration and investments which have significantly increased the proportion of the business that is defined for regulatory purposes as Transmission.

Table 2 - Comparison between Forecast & Actual O&M ($'s Real – 2002/03), Original Transmission Assets and Revised Costing & Allocation Method

	2000	2001	2002	2003	2004 (forecast)	Total
Actual O&M	19,820	20,425	19,711	19,303	18,591	**97,850**
Forecast & Determined O&M	18,279	16,699	16,593	16,440	16,552	**84,563**
Difference	1,541	3,726	3,118	2,863	2,038	**13,287**

As can be seen actual operating costs were 15.6% higher than forecast. Factors that impacted on operating costs during the current regulatory period have been identified and discussed in our submission and primarily include additional costs as a result of additional OH&S Regulations and increased insurance and superannuation costs.

The table below provides detailed operating costs on the basis of revised definition of the Transmission business which takes into account those assets which now meet the definition of Transmission for regulatory purposes. This information is provided to enable a comparison with forecast operating costs for the next regulatory period.

Table 3 - Operating & Maintenance Costs (Revised Costing & Allocation Method and Including Impact of New Transmission Assets)

Actuals ($' Real – 2002/03)					
	2000	**2001**	**2002**	**2003**	**2004** [2]
Transmission O&M	22,303	23,127	22,349	21,689	21,136
Distribution (IPART)	214,593	229,821	298,226	266,760	254,960
Street Lighting	9,255	9,223	7,449	8,392	8,748
Total Network (as per IPART Regulatory Accounts)	**246,150** [1]	**264,849**	**328,024**	**296,841**	**284,845**
Transmission O&M	22,303	23,127	22,349	21,689	21,136
Maintenance	14,528	13,987	10,276	10,868	11,293
Transmission Substations	9,727	8,981	5,274	5,260	5,440
Zone Substations	831	865	1,363	1,494	1,597
O/H Transmission Lines	1,341	915	939	1,023	1,089
U/G Transmission Lines	2,629	3,226	2,699	3,091	3,167
Other	7,775	9,140	12,073	10,821	9,843

Notes: (1) Excludes Abnormal Superannuation Adjustment of ($9.05M)
(2). Forecast cost.

As can be seen from Table 3 above, transmission operating and maintenance expenditure decreased by around 3% in real terms between 1999/00 – 2002/03.

Maintenance expenditure represents the largest share of transmission expenditure (around 55%). The decline in maintenance expenditure in 2000/01 – 2001/02 was a result of two factors. Firstly, the combined effect of limited technical resources and higher than expected growth in demand resulted in a need to defer non-essential maintenance. This deferral has resulted in a small backlog in planned maintenance which is planned to be overcome by June 2005. Secondly, EnergyAustralia has introduced a condition-based maintenance framework. This framework more effectively targets maintenance in terms of risk and condition and has seen an increase in the efficiency of the maintenance activity. This impact is concealed slightly by the fact that average age and volume of assets is increasing and therefore increasing the level of activity required to maintain the network.

2. Operating & Maintenance Forecasts (2004-2009)

Transmission O&M costs are projected to increase over the next regulatory period at an average rate of 5.7% in real terms. This increase is largely the result of the increase in maintenance costs which are forecast to increase, without any allowance for efficiency gains, by around 12% in real terms, even allowing for the impact of the impact of the proposed $87.5M in replacement capital expenditure.

This increase is largely the result of a forecast increase in corrective and breakdown maintenance particularly involving substations and underground cables. EnergyAustralia believes that it will be possible to mitigate against this projected increase in maintenance costs through efficiencies as a result of a number of planned asset management initiatives which will mean that maintenance costs will increase by around 7% in real terms over the next regulatory period. Since it is not possible at this stage to allocate these savings to a particular asset category, these efficiencies have been included in the other cost category.

EnergyAustralia also advises that maintenance cost forecasts vary slightly from those contained within our submission as a result of an error that was identified in the operating cost allocation model. This error did not impact total operating cost forecasts but did alter the reported direct maintenance cost estimates.

Indirect operating costs comprise the following;

- Insurance, rates & taxes
- Communications & control
- Shared IT (Asset Management Information Systems)
- Administration

A more detailed discussion of these costs is also contained within our submission.

It should be noted that forecast costs do not include the impact of abnormal superannuation costs.

Table 4 - Operating & Maintenance Costs 2004/05-2008/09 ($'2003/04)

	Forecasts				
	2005	2006	2007	2008	2009
Transmission	24,370	25,751	26,559	27,143	27,729
Distribution (IPART)	279,977	287,487	288,107	287,644	285,929
Street Lighting	10,157	11,017	11,877	12,967	13,597
Total Network (as per IPART Submission)	314,503	324,254	326,543	327,754	327,254
Transmission Expenditure	24,370	25,752	26,559	27,143	27,729
Maintenance	13,282	14,511	15,742	16,893	18,201
Transmission Substations	6,331	6,877	7,423	8,116	8,514
Zone Substations	1,875	2,046	2,217	2,025	2,558
O/H Transmission Lines	1,262	1,367	1,473	1,606	1,684
U/G Transmission Lines	3,814	4,221	4,629	5,146	5,445
Communications & Control	4,151	4,109	4,064	4,024	3,986
Other	6,937	7,131	6,753	6,226	5,542

3. Maintenance Cost Forecasts (2004-2009)

There is an explicit relationship between capital investment and maintenance expenditures. With the assistance of SKM, this relationship has been modelled over the lives of major asset categories. The key parameters of the model are the average and the initial expected operating and maintenance expenditure by each major asset category, and industry benchmark maintenance costs over the life of an asset, which are defined relative to the replacement value of that asset category.

SKM modelled the following classes of transmission assets:

1. Sub-transmission substation circuit breakers
2. Zone substation circuit breakers
3. Sub-transmission substation transformers and tap changers
4. Zone substation transformers and tap changers
5. Sub-transmission and zone substation protection and control

For each of these categories an average O&M spend as a percentage of the Replacement Cost of the assets was calculated as well as an initial expected O&M cost. The expenditure in each category is due to planned, corrective, and emergency (breakdown) maintenance. The initial expected O&M expenditure was taken to be planned maintenance cost only and as breakdown maintenance is not affected by refurbishment investments, was excluded from all calculations.

This modelling is commercially sensitive information but EnergyAustralia would be happy to provide ACCC staff and their consultants a detailed presentation of the methodology and data used to develop maintenance cost forecasts.

Major projects and programs of capital expenditure have been evaluated with regard to the expected Operating Expenditure/Savings. For the programs an average asset age was assumed and used in the model as the age at which assets within that class would be replaced. For major projects, an average age was determined based on specific age information available for the projects.

4. Maintenance cost estimates (2004-2009)

Average unit costs of key maintenance activities for the last three years were used to forecast the cost of maintenance activities by major asset category. The actual expenditure between 1999/00 and 2001/02 and the weighted average age of the assets in this year were used to locate EnergyAustralia's current position on benchmark maintenance curves and to project the impact of age on future maintenance expenditure requirements.

Despite our proposed replacement program, the network is still expected to age nearly two years over the next regulatory period. The net addition of new assets is an additional secondary driver of maintenance expenditure.

In addition to the impact of age on maintenance costs, the transition from time-based to condition-based maintenance has highlighted the need for an ongoing increased level of planned maintenance expenditure. The benefits of this approach to maintenance include:

- increased focus on the overall life-cycle costs of assets and the costs of maintaining an asset over its life; and
- a significant and sustained reduction in the level of reactive, breakdown maintenance in the longer term.

Initially, however, the introduction of the new maintenance regime is not expected to result in an immediate reduction in the levels of breakdown and reactive maintenance.

This major review of the overall maintenance framework has been undertaken during the 1999 Determination. It has resulted in the establishment of a revised, condition-based maintenance framework and strategy. This revised methodology has been developed with the assistance of best practice firms within transport and military sectors familiar with the use of techniques such as FMECA (Failure Modes Effects Critically Analysis) and Reliability Centred Maintenance (RCM). These techniques undertake a detailed assessment of the inherent failure characteristics of every asset type and require the determination of an appropriate maintenance and or replacement program for each asset. This process trades off the costs of maintenance activities against the risks and consequences of failure. This work has taken nearly two years to develop and EnergyAustralia in the process of implementing this framework.

The key transmission asset categories are discussed below.

Transmission Substations

Transmission substations represent a significant share of the Transmission asset base with a replacement cost of $220M. [1]

Maintenance costs for transmission substations are forecast to increase from $6.3 million to $8.5 million over the next regulatory period. This increase is in line with the forecast increase of 2.3 years in the average age of these assets.

The increase in maintenance costs in this asset class is the result of an expected increase in corrective maintenance of existing assets combined with a small contribution from new assets. Over the next regulatory period, $52.9 million of new capital expenditure is planned in this asset category and $28.8M in replacement.

Zone Substations

This category of transmission assets comprises a similar value of assets as Transmission substations at $209M.[2] Maintenance costs for these assets are forecast to increase from $1.9Mto $2.6M over the next regulatory period.

[1] As at June 30, 2004

[2] June 30, 2004 Replacement Value

The increase in maintenance costs for this asset class is the result of as an expected increase in corrective maintenance associated with existing assets combined with a small contribution from new assets. Over the next regulatory period, $2.4M of new capital expenditure is planned in this asset category with $13.8M in replacement.

Underground Transmission

Underground transmission assets represent the most valuable asset category with a replacement value of $506M.Maintenance costs for underground transmission during the next regulatory period is forecast to increase from $3.8m to $5.4m. This increase is driven by an expected increase in corrective maintenance combined with a small contribution from new assets.

The increase in maintenance expenditure is largely the result of a forecast increase in corrective and breakdown maintenance costs in line with the increase in the average age of these assets. The average age of this category of assets is expected to increase from 40 years at the start of the next regulatory period to 42.6 years by 2009. As discussed in the Asset Management section of the submission, where feasible, assets in this category requiring replacement will be replaced with a projected replacement capital expenditure of $36.1M.

Capital expenditure on new underground transmission assets is projected at $14.3m over the next regulatory period.

Overhead Transmission

EnergyAustralia's overhead transmission assets are valued at $89M.Maintenance costs during the next regulatory period are forecast to remain relatively stable at $1.3m to $1.7m over the next regulatory period. This increase is driven largely by an expected increase in corrective maintenance of these assets with a small contribution from the projected $12.5M in new overhead assets. This increase is in line with the increase of 4 years in the average age of these assets, which is forecast to increase from 37.5 years at the start of the next regulatory period to 41.5 years.

Replacement capital expenditure for this class of assets is projected to be $2m over the next regulatory period.