



International Benchmarking of Mobile Termination Charge Rates

REPORT FOR VODAFONE AUSTRALIA

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1 Introduction

This report has been prepared by Frontier Economics for Vodafone Australia. This report provides a benchmark of the fixed-to-mobile termination rate (MTR) in Australia against MTRs of other countries. It also considers some cost estimates of the termination service in the context of these benchmarks.

There are three main parts in this report:

- 1) benchmarking of the Australian MTR against those of other countries using the latest data made available to us (from Cullen International), and under two different currency conversion methodologies;
- 2) examining the new MTR data from the Independent Regulators Group (IRG), and using these as a check on the data derived from Cullen International ('Cullen'), and to extract weights applied to combine peak/off-peak MTRs in each country;
- 3) reviewing the cost estimates of the mobile termination service relied upon by the ACCC in their Draft Decision on the *Mobile Terminating Access Service* (the Draft Decision),¹ and how these measure up against the actual MTRs charged around the world.

¹ Australian Competition and Consumer Commission, Mobile Services Review, *Mobile Terminating Access Service*, Draft Decision, March 2004.

2 Benchmarking of MTRs

This section describes the benchmarking of MTRs in other countries based on data compiled by Cullen International. It briefly documents the source data, specification and methodology employed in pooling and converting this data into a form that one may base comparisons with locally charged MTRs.

2.1 DATA SOURCE

Vodafone has provided Frontier (in April 2004) with the latest set of mobile termination rates from Cullen International. The data set details the MTRs charged by individual mobile network operators (MNOs) in each country within a group of 17 European countries both within and outside the eurozone. These are separated by peak and off-peak rates, and specific rate structures where applicable (eg call setup charge, minimum call duration and charge). The MTRs are denominated in their local currencies (euro or non-euro).

In this report, we have omitted Finland as there is considerable uncertainty regarding the appropriate rate to use. This was confirmed by the cross-check of the Cullen International data with the IRG data (explained in Section 3.2). Hence we have included 16 European countries in this benchmarking.

2.2 MOBILE TERMINATION RATE SPECIFICATION

The MTRs we have calculated are based on a per minute fixed-to-mobile termination charge that would apply to a three minute call. This is the same specification used by the European Commission for their surveys of MTRs in their ongoing reports on the implementation of the telecommunications regulatory package.

We calculated a per minute rate based on the termination charge that would apply to a three minute call because this allowed the incorporation of any call setup charges, and any differential rates which apply to a specified part of the call – e.g. minimum charge for first X seconds (indivisible), followed by a different rate.

Where different off peak rates were available for evenings and weekends, these were averaged into one off peak rate for that MNO. The mobile termination rates for a country were calculated as the average rates of each MNO in that country (peak and off peak separate).

The MTR for each country presented in our analysis are thus unweighted by MNOs, and is separated by peak and off peak rates.

Benchmarking of MTRs

2.3 FOREIGN CURRENCY CONVERSION

There are a number of alternative methods for conversion of prices of goods and services denominated in foreign currencies into local currency. These include:

- 1) PPP;²
- 2) nominal market rates;
- 3) 'equilibrium exchange rates'; or
- 4) average nominal market rates (e.g. 10 year averages).

We have converted the country MTRs into Australian dollar (AUD) cents using the two methods: PPP and 10 year historical average exchange rates.³ The use of PPP based exchange rates for the purposes of benchmarking is common and has previously been supported by the Productivity Commission.⁴ The 10 year average method is based on the approach adopted by the New Zealand Commerce Commission after consideration of many arguments for and against different methodologies.⁵ In short, both the PPP and 10 year averaging methods tend to reduce the effect of volatile market exchange rate movements on the benchmarked prices, and provide a better basis on which to do international comparisons.⁶

The ACCC in their Draft Decision (note 331, p 166) 'adjusted' the figures from MCI's submission – these were cost estimates from underlying studies – to 'account for current exchange rates'. As is discussed below in section 4, the ACCC has used simple nominal current market exchange rates of a much smaller time period (10 day average of the buy and sell rates from the first two weeks of March 2004) in their conversions used to verify the veracity of MCI's data.

² PPP rates are found by comparing the prices levels of a collection of consumption and investment goods. This approach gives equal weight to the ability of each currency to be exchanged for goods in their respective countries. The PPP rate only accounts for price differences at a highly aggregated level and there is no guarantee that this bundle gives an accurate reflection of the relative costs of providing telecommunications services.

³ The PPP rates for each country are that for the year 2003 (latest), sourced from the OECD, Main Economic Indicators, May 2004, 256.

⁴ See Productivity Commission, 'International Benchmarking of Australian Telecommunications Services' (March 1999).

⁵ The NZCC has, in other recent determinations, adopted an approach to currency conversion based on a 10-year average of nominal exchange rates including 9 years of historical data and 1 year of forecast data. Averaging the nominal exchange rate across a long time frame, in this way, removes the volatility associated with the nominal spot rate. For our purposes, a 10 year historical average was used. (See *Determination on the TelstraClear Application for Determination for Designated Access Services*, 5 November 2002.)

⁶ The 10 year average rates were sourced from Oanda.com. The period used is the same as that used in a previous study for Vodafone New Zealand – 10 years to 12 February 2004. This was to maintain consistency and comparability with previous benchmarking studies (especially considering that the MTRs presented in the new set of Cullen International have not changed); maintain the convenient timing of the transition of many of the euro countries in the middle of the period; and with the consideration that shifting the period forward a few months would have very small effects on the average rate over ten years.

Benchmarking of MTRs

2.4 THE INTERNATIONAL BENCHMARKS

The following charts show the peak and off-peak MTRs of the benchmark countries, converted into AUD using PPP and 10 year average exchange rates.

We have used the average Australian MTR of 21 AUD cents as presented by the ACCC in the Draft Decision (Table 5.3, p 58) to see how it ranks against MTRs currently being charged in other countries.

Table 1 summarises the ranking of Australia's MTR against the 17 other benchmarked countries denominated in AUD cents per minute under the two different exchange rate methodologies.

From this set of benchmarks, Australia's MTR at present does not appear to be particularly high relative to that of other countries.

MTR (Exchange Rates)	Australia's ranking (1 = lowest MTR; 17 = highest MTR)
Peak MTR (PPP)	#7
Peak MTR (10 Year Av)	#2
Off-Peak MTR (PPP)	#11
Off-Peak MTR (10 Year Av)	#8

Table 1: Rank position of Australia's MTR against benchmarked countries

Benchmarking of MTRs

Figure 1: Peak MTRs, AUD cents per minute (PPP)

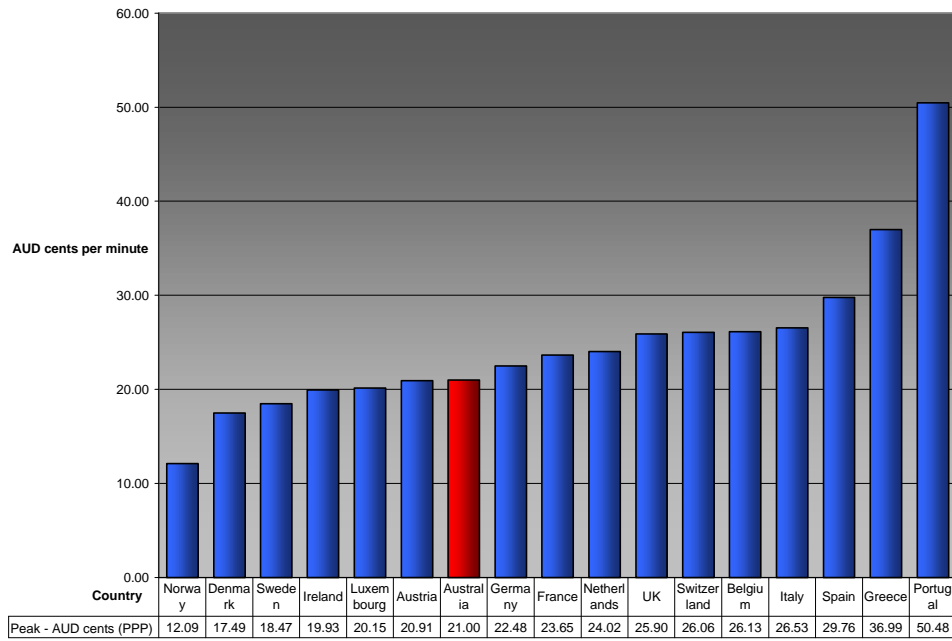
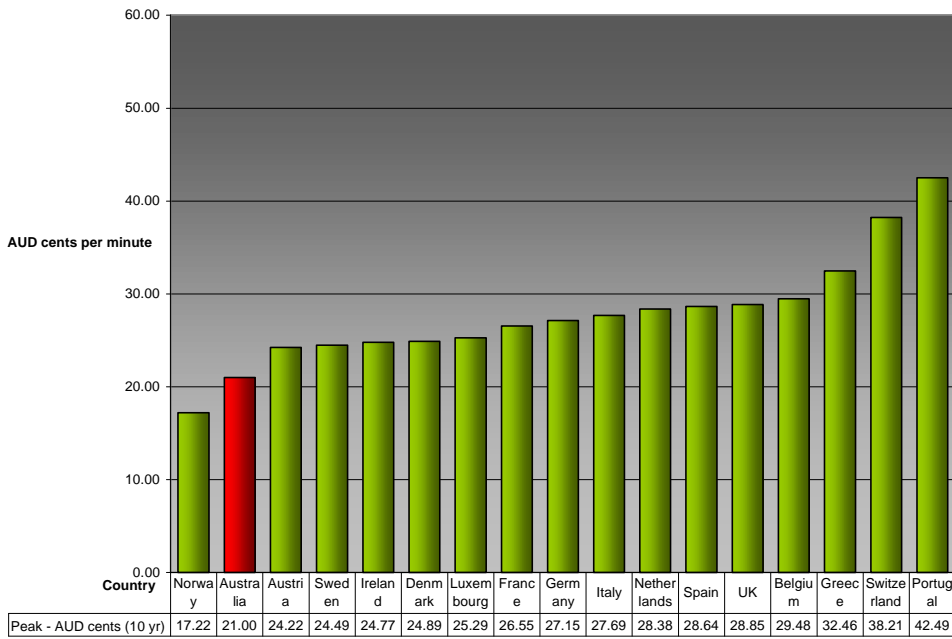


Figure 2: Peak MTRs, AUD cents per minute (10 Yr)



Benchmarking of MTRs

Figure 3: Off-peak MTRs, AUD cents per minute (PPP)

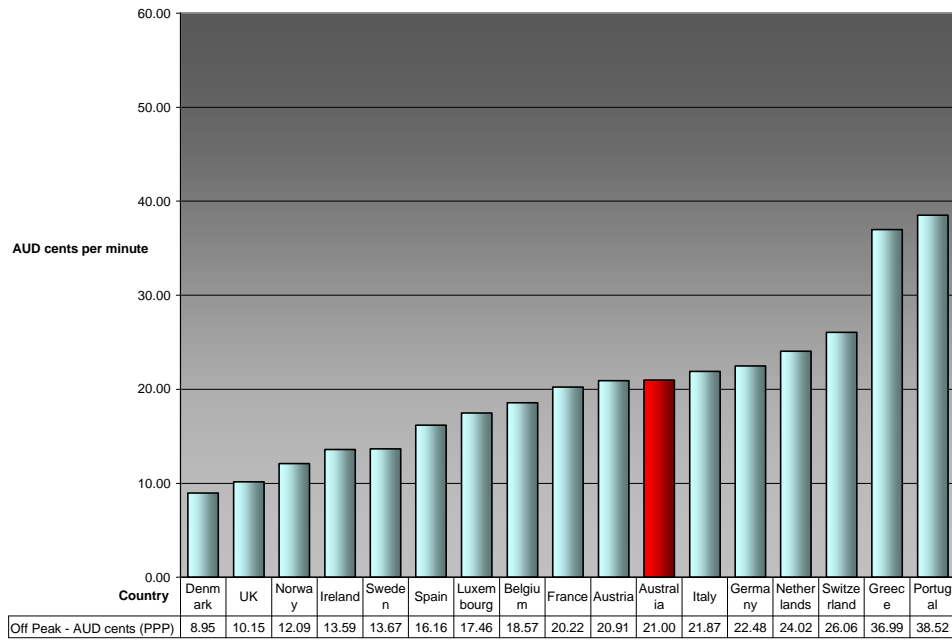
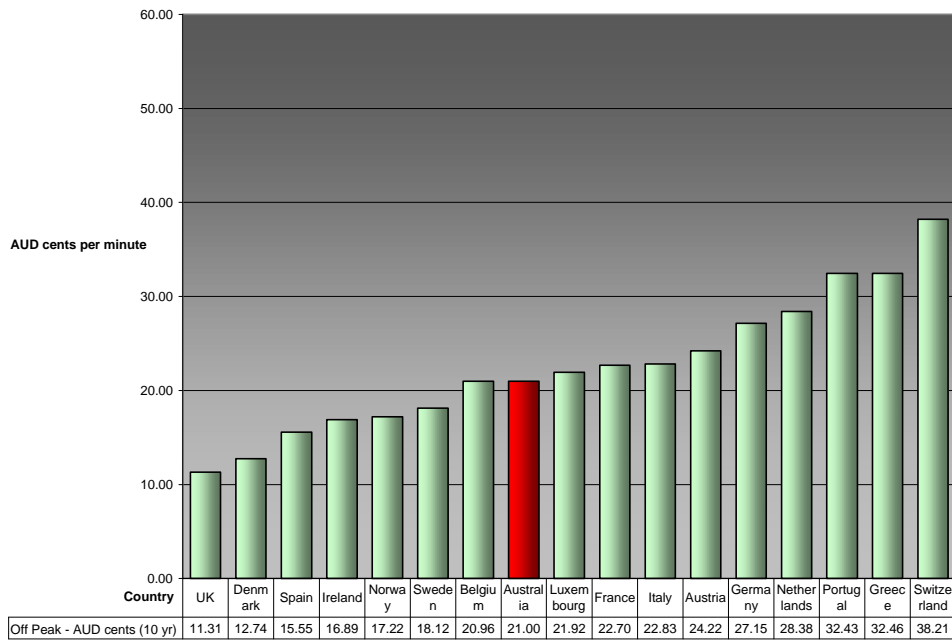


Figure 4: Off-peak MTRs, AUD cents per minute (10 Yr)



Benchmarking of MTRs

3 IRG Benchmark MTRs

We have been supplied with a set of MTRs compiled by the Independent Regulators Group (published 23 April 2004). We have used this to provide a check on the rates which we have calculated from the Cullen International data, and the methodology which we have adopted for this data. This section details the findings of these comparisons.

3.1 SPECIFICATION

The IRG's specification of the MTR as a per minute rate of a 3 minute fixed to mobile call is the same as that we have adopted. The MTR presented by the IRG are those applicable on the 31 January 2004 and are denominated in euro cents per minute.

We note the following differences in how the country MTRs presented by IRG differ from our calculations using the Cullen data:

- in averaging for the country averages, the IRG weighted rates from each MNO by their market shares (by the number of subscribers. IRG noted however, that the definition of this may vary between countries.)
- the IRG presents peak and off-peak rates for each country, and a 'total' rate which is a weighted average of the peak and off-peak rates. Where they had data, the weighting was by traffic volume ratios (voice calls and number of minutes); where they had no data, they assumed the ratios of 50 : 50 (peak : off-peak) or 50 : 25 : 25 (peak : off-peak : weekend);
- the IRG had rates for additional countries not covered by Cullen International: Cyprus, Lithuania, Czech Republic, Iceland; Slovak Republic; Poland; Latvia; Hungary; Slovenia; Malta; Estonia. For the purpose of verifying our Cullen International based data, we have restricted our focus on the countries previously covered (West and Central Europe).

It is unclear what exchange rates were used by the IRG to convert MTRs of non-eurozone countries into euros per min.

For off-peak rates we had adopted the same 'even' assumption as the IRG when dealing with off-peak weekday and weekend rates – i.e. averaged the price of off-peak and weekend rates on equal weights.

In our previous benchmarking work, we kept the peak and off-peak rates separate to maintain data integrity and comparability with other benchmarks such as that of the European Commission. In this report we have sought to identify what weights were used and when they were used by the IRG, see section 3.2.4 below.

IRG Benchmark MTRs

3.2 COMPARISON BETWEEN IRG AND CULLEN DERIVED MTRS

3.2.1 Currency conversion

For comparison purposes, we have converted the IRG data into AUD.

All MTRs in the IRG data were denominated in euro cents, including those of countries not in the eurozone. In order to use PPP conversion rates (which are expressed in local currencies) we had to convert those MTRs not in euros back into their local currencies. Since the basis for the exchange rate conversion used by the IRG is not given, we have assumed that nominal market rates were used.⁷ We used the average exchange rates for the month to the publication date (24 April 2004) for converting these non-eurozone MTRs. These were sourced from Oanda.com.

The local currency derived MTRs were then converted to AUD using the same PPP and 10 year average exchange rates that were calculated and applied to the Cullen International data.

3.2.2 Comparisons with Cullen data

There will necessarily be some differences between the Cullen and IRG country rates due to the different averaging methods used, and also to any discrepancies in the exchange rates chosen to convert them back into local currencies.

Nevertheless, most of the rates cited by IRG (with the exception of Finland) are only slightly lower than those we have calculated from the Cullen data. A smaller group of rates cited by IRG are slightly higher than those calculated from the Cullen data. These include: France (peak rates); Italy (peak and off-peak); Denmark (peak and off-peak); Sweden (off-peak). See Figure 5 below.

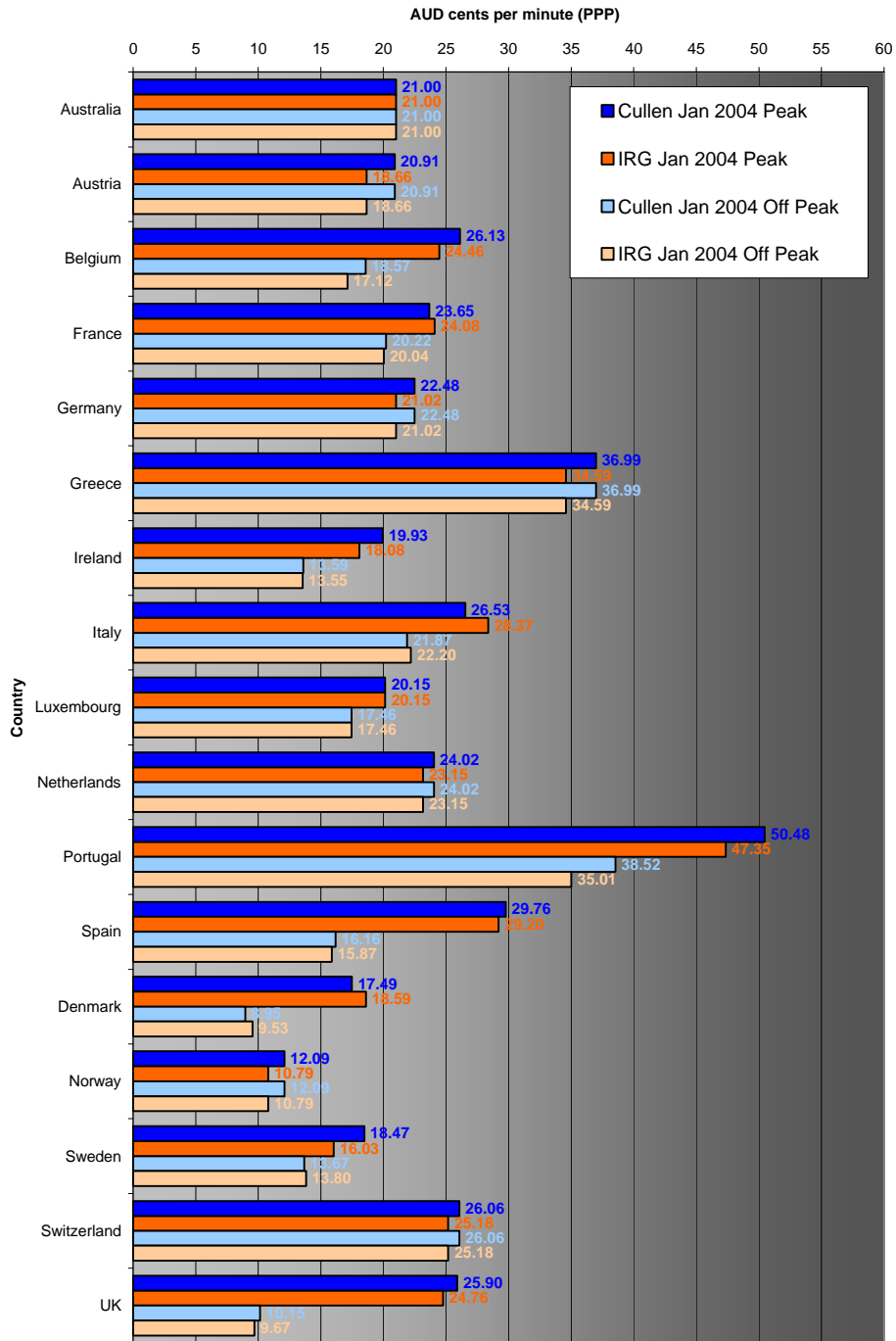
We have excluded Finland from the analysis because we found a large discrepancy between the Cullen and IRG data. The reason for this is most likely because Finland doesn't have 'wholesale' termination charges for F2M calls as such, but rather an unregulated 'retail' charge to the end consumer of a F2M call.⁸ Furthermore, we understand that the EC has been considering initiating infringement procedures against Finland. Due to these current uncertainties and for the sake of consistency, we have omitted Finland's rates from the benchmarking.

⁷ It is presumed that if another basis was used this would have been indicated by the IRG.

⁸ Cullen International (2004). The difference between the IRG and Cullen numbers for Finland suggested that a wholesale termination charge might have been estimated from the fixed-to-mobile retail call charge (which includes VAT) for each MNO.

IRG Benchmark MTRs

Figure 5: Comparison of IRG and Cullen based MTRs, AUD cents per minute (PPP)



IRG Benchmark MTRs

3.2.3 Comments

This process has shown that our calculations based on the Cullen International data is not unreasonable in comparison with the IRG data. On the whole, any differences in the results seem to be negligible, and can be quite confidently attributed to the factors mentioned above (e.g. MNO weights, exchange rates used by the IRG).⁹ There is certainly no evidence indicative of any systemic error that may be identified in the Cullen International based results.

This would appear to be the case even though IRG's methodology employs some weighting of MNO market shares, and peak/off-peak volumes in their country averages (we say 'some' because IRG noted that weighting was not applied uniformly across all countries due to the lack of necessary data for some of these).

This provides a certain degree of confidence that our MTR figures are at least soundly based on the best publicly available data.

3.2.4 Peak/off peak weights

We have used the information presented by the IRG, to calculate the weights that were applied (if any) to the peak and off-peak MTRs to come up with a 'total' or blended figure. Table 2 below shows the implied weights from the IRG data. Weighting was not applicable (marked 'n/a') in countries where there was no differentiation between peak and off-peak MTRs, or if the rates were the same. Evenly distributed weights (i.e. 50% peak; 50% off-peak) can be safely interpreted as those countries for which there were differential MTRs for peak and off-peak, but where traffic volume data was unavailable.

We applied these implied weights to the Cullen International derived benchmarked MTRs to give indicative 'blended' MTRs (see section 3.2.5 below.)

⁹ The exception is Finland, where it appears completely different methodologies have been used in assessing MTRs across the Cullen and IRG processes. We have therefore excluded Finland from the benchmarks presented here.

IRG Benchmark MTRs

Table 2: Weights implied from IRG peak an off-peak 'blended' MTRs

	Implied Weights (% of traffic volume – voice minutes)	
	Peak	Off-peak
Austria	n/a	n/a
Belgium	54%	46%
France	75%	25%
Germany	n/a	n/a
Greece	n/a	n/a
Ireland	50%	50%
Italy	52%	48%
Luxembourg	50%	50%
Netherlands	n/a	n/a
Portugal	75%	25%
Spain	57%	43%
Denmark	50%	50%
Norway	n/a	n/a
Sweden	67%	33%
Switzerland	n/a	n/a
UK	50%	50%

3.2.5 Applying Peak/Off-peak Weights to Cullen Data

The weights applied by the IRG to peak and off peak MTRs of each country were applied to our Cullen based data to 'blend' peak and off-peak MTRs for each country into a single weighted average MTR number. The blended MTRs were then converted to AUD cpm using the two exchange rate methodologies. See Figure 6 and Figure 7 below.

On the basis of these two benchmarks, Australia's MTR ranks as the 8th lowest under PPP exchange rates, and 5th lowest under 10 year average exchange rates out of the 17 countries covered.

IRG Benchmark MTRs

Figure 6: 'Blended' MTRs for each country, AUD cents per minute (PPP)

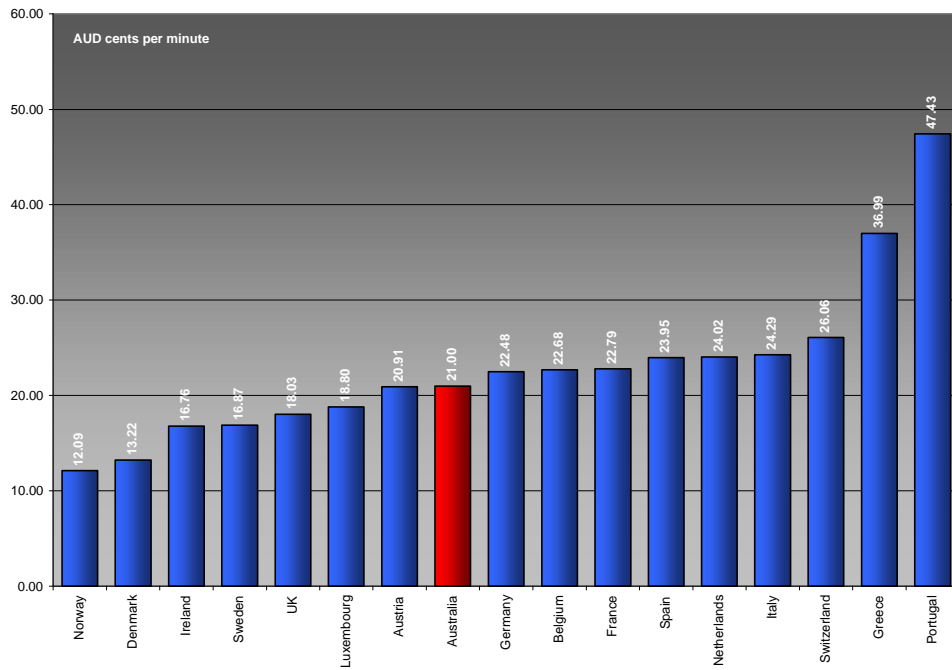
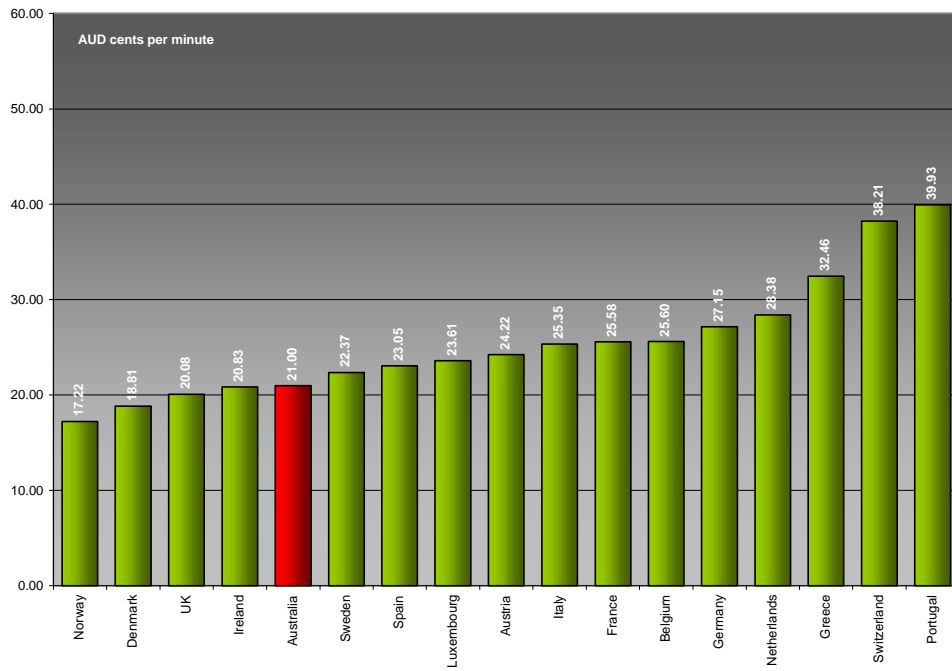


Figure 7: 'Blended' MTRs for each country, AUD cents per minute (10 Yr)



IRG Benchmark MTRs

4 Cost Estimates

The ACCC in their Draft Decision relied on a table of numbers from MCI representing various estimates of the underlying cost for the mobile termination service (Draft Decision, p 58 & 166.).

These included TELRIC and LRIC+EPMU¹⁰ numbers for the mobile termination service in three US states (New York, California, and Florida) and the UK, estimated from various models.

Given the concerns that Vodafone has about the relevance of using US-based cost estimates as comparators for the Australian market, the US Sprint cost estimates are not considered in this report.

4.1 OFTEL/ANALYSYS COST ESTIMATES IN THE DRAFT DECISION & THE MCI SUBMISSION

Reproduced below are the UK cost estimates as they appeared in MCI's submission to the ACCC (reproduced again by the ACCC in the Draft Decision, p58), and WorldCom submission (14 January 2002) to the Swedish regulator.

	MCI / ACCC AUD cpm	WorldCom EUR cpm
UK – Analysys LRIC + EPMU	11.92	6.73

Table 3: UK cost estimates reported by MCI and Worldcom

On inquiry, the ACCC said that it had verified MCI / WorldCom's numbers by referring to the Oftel 2001 source report for their 'UK – Analysys LRIC +EMPU' cost estimate.¹¹

According to correspondence from the ACCC:

Oftel estimated upper and lower bound costs for 900 and 1800 Mhz spectrum (excluding a network externality surcharge) for the 2005/06 financial year. These numbers were expressed in real terms, with 2000/01 as the base year.

For verification, the ACCC averaged these 4 numbers to arrive at a number of 4.275 pence per minute. This was then adjusted for inflation, and converted to a 2005/06 nominal cost estimate of 4.76 pence per minute. In turn, this was converted to Australian dollars using a 10 day average of the buy and sell rates from the first two weeks of March 2004 (1 pence = 2.429 Australian cents). This yielded a number of 11.56 Australian cents per minute.

¹⁰ TELRIC = Total Element Long-Run Incremental Cost, LRIC = Long Run Incremental Cost, EPMU = Equal Proportionate Mark Up (for common costs).

¹¹ Oftel, "Review of the charge control on calls to mobiles", 26 September 2001, p 37.

Cost Estimates

The four numbers referred to are lower and upper bound cost estimates for 900Mhz and 1800 Mhz networks respectively, and are referred to in the OfTel report as a 'Range across scenarios for cost of mobile termination – LRIC plus equal proportionate mark up for common costs'. There are different ranges of cost estimates because the common cost of network coverage differs between the two parts of the radio spectrum. More base stations are required to provide the same degree of coverage for 1800 MHz spectrum, therefore the common costs for 1800 Mhz networks are slightly higher proportion of total costs than a 900 MHz network.

We converted the ACCC's adjusted, GBP denominated cost estimate (4.76 ppm) into Australian dollars using our two conversion methods, see Table 4 below. These are lower than the number presented by MCI.

	PPP AUD cpm	10 Year Average AUD cpm
UK – Analysys LRIC + EPMU	10.22	11.39

Table 4: UK cost estimates, AUD cents per minute (PPP & 10 year)

4.1.1 Network Externality Mark-Up

While there is wide acceptance among both regulators and operators of the inclusion of network externality in MTRs – to reflect the benefits to other parties when one party becomes a mobile subscriber – the actual magnitude of this effect has been heavily debated. Significant efforts were spent in the UK debate in estimating the appropriate mark-up on LRIC (in addition to EMPU) to take into account network externalities.

OfTel (2001) explains in detail the justifications for including this element into the assessment of the target regulated termination rate (see Annex 4 of their report).¹² In conclusion, OfTel suggested that the appropriate network externality mark-up was 2 pence per minute. The UK Competition Commission (UKCC) used a different framework to estimate the mark-up and suggested that the appropriate number to be 0.45 pence per minute.

We have added the network externality mark-up concluded by OfTel and UKCC to the 'adjusted' LRIC+EMPU cost estimate suggested by ACCC. These were converted into AUD using our two methodologies, see Table 5 below.

¹² OfTel, "Review of the charge control on calls to mobiles", 26 September 2001, p 64–75.

Cost Estimates

	<i>NEMU</i> <i>GBP ppm</i>	PPP AUD cpm	10 Year Average AUD cpm
UK – Analysys LRIC + EPMU + NEMU (OfTel)	2	14.52	16.17
UK – Analysys LRIC + EPMU + NEMU (UKCC)	0.45	11.19	12.46

Table 5: UK cost estimates (LRIC + EPMU) + Network Externality Mark-ups

4.2 COST ESTIMATES AND MTRS

The charts below compares the cost estimates against the actual MTRs being charged in the benchmarked countries: Figure 8 and Figure 9 compare the 'blended' (peak and off-peak) MTRs derived from the Cullen International data, under the two currency conversion methodologies, with the various cost estimates of mobile termination.

The UK/Analysys numbers are presented with and without the network externality mark-ups. The cost estimates are shown with the two different mark-ups from OfTel and the UKCC (CC).

Cost Estimates

Figure 8: 'Blended' MTRs, AUD cents per minute (PPP) & cost estimates

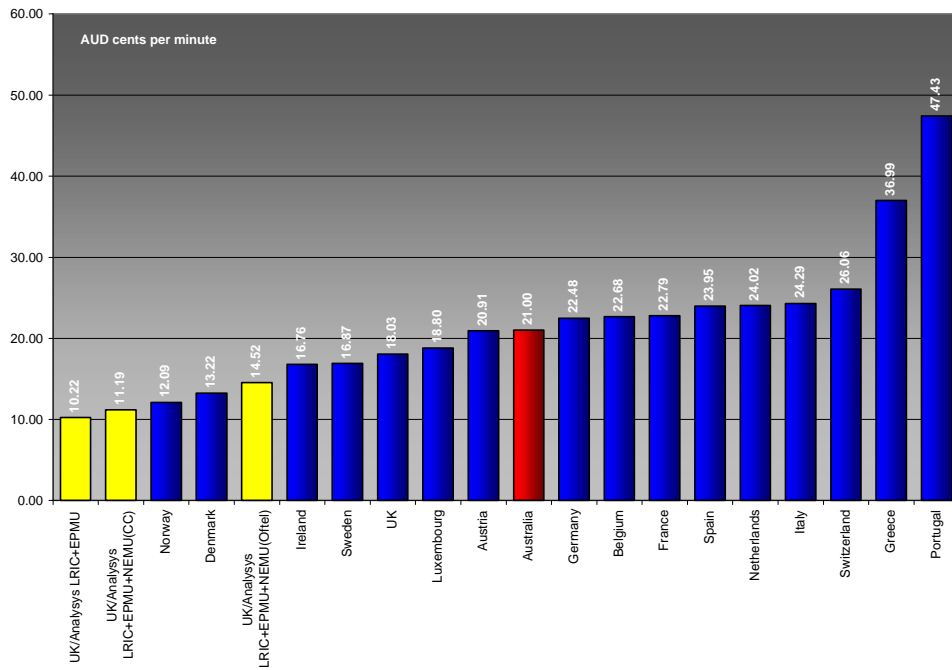
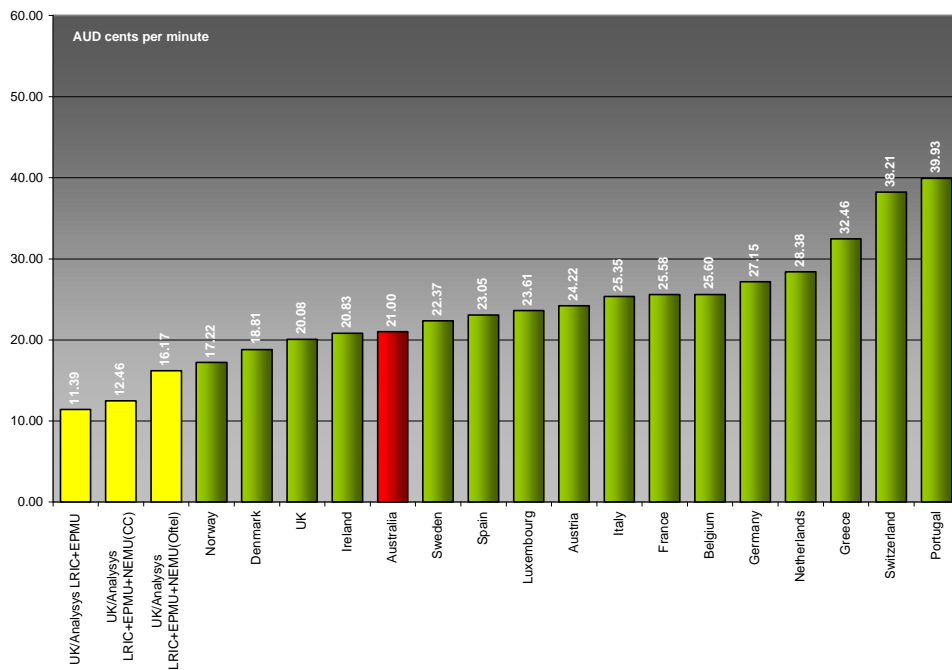


Figure 9: 'Blended' MTRs, AUD cents per minute (10 Yr) & cost estimates



Cost Estimates

4.3 GENERAL COMMENTS ON COMPARING MTRS ACROSS COUNTRIES

The MTRs presented in this report have generally been subjected to a regulatory process.

Differences or commonalities in the operating environments will affect the basis upon which the comparisons are made. We have not undertaken a detailed analysis of the country specific effects that may impact MTRs and their underlying costs. However, we can say that generally, the presence of the following factors in comparator countries would result in underlying costs, and possibly MTRs, being lower than those in Australia:

- higher populations, and higher subscriber densities;
- greater proportions of less expensive network architecture (e.g. 900 Mhz networks relative to 1800 Mhz networks);
- higher interconnect traffic levels; and
- higher penetration rates.

Cost Estimates

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