

Final report for TelstraClear

Draft determination on the application
for pricing review for designated
interconnection services

Comments on the Telecom submission

PUBLIC VERSION



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Draft determination on the application for pricing review for designated interconnection services

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1 Introduction

In its submission¹ regarding the Commerce Commission's Draft Determination on the Application for Pricing Review for Designated Interconnection Services ('Draft Determination'), Telecom has provided a detailed assessment of the CostPro model and identifies a number of related issues for attention.

In this report, we comment on several of the issues raised by Telecom, namely:

- scale economies (section 2)
- whether the Commission model can be considered TSLRIC or TELRIC (section 3)
- structure sharing assumptions (section 4)
- mark-ups for operating costs (section 5)
- an examination of the various options for TSO exclusion (section 6)
- mark-ups for land and buildings (section 7)
- labour costs (section 8).

Finally, in section 9, we present our conclusions.

Please note that although commissioned by TelstraClear, the views contained in this report are entirely those of Network Strategies.

¹ Telecom (2005) *Submission in respect of the Commerce Commission's Draft Determination on the Application for Pricing Review for Designated Interconnection Services*, 26 May 2005.

2 Scale economies

Telecom claims that the PSTN network in a small country such as New Zealand is ‘particularly susceptible to scale economies’² and thus the interconnection costs would be higher than those in Europe and the United States (excluding the possible effects of higher equipment or labour costs, or efficiency differences). While we acknowledge that scale economies are certainly one factor which may influence costs, there are other factors which may offset this effect or have more influence on total network costs.

The relationship between size of a country and network costs is not as clear as Telecom implies. This may be demonstrated with data on interconnection rates from the European Commission from its regular review of regulation³. This shows that while the United Kingdom had the lowest rates for local exchange (Exhibit 2.1) and single tandem (Exhibit 2.2), the double tandem rate for the United Kingdom was relatively high amongst the EU15 countries (Exhibit 2.3). This data also shows that small countries, such as Denmark (which has the second lowest local exchange and single tandem rates, and the lowest double tandem rate) do not necessarily have high per minute costs.

² *Ibid*, paragraph 13.

³ European Commission (2004) *European electronic communications regulation and markets 2004*, 10th report, 2 December 2004.

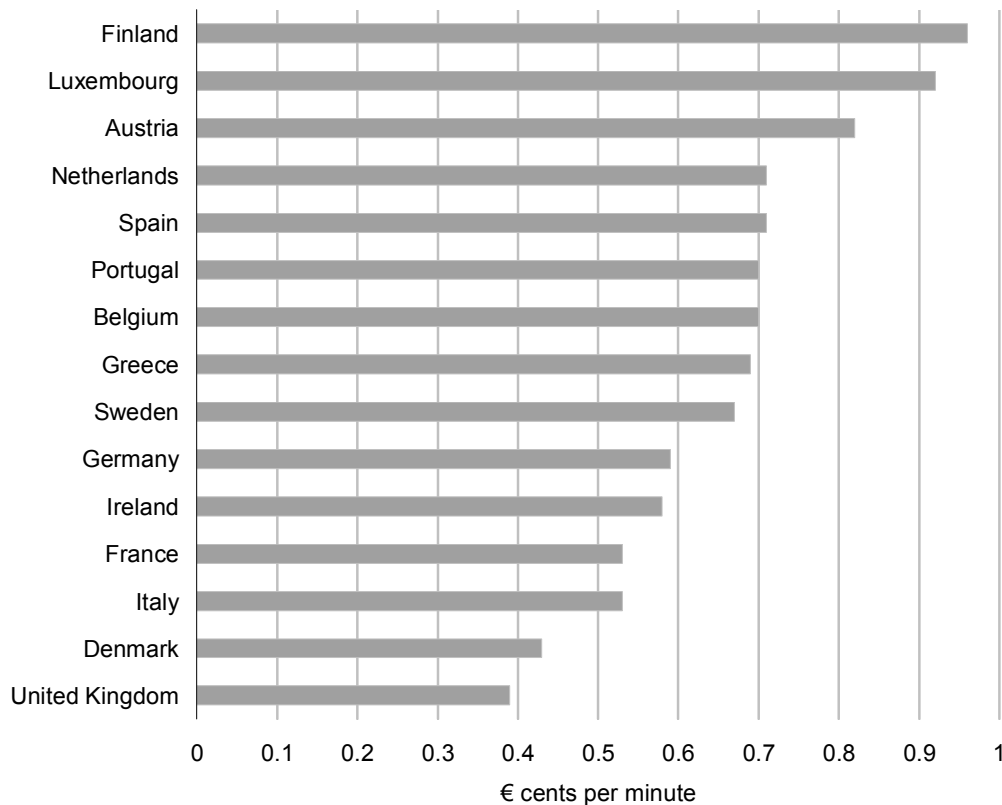


Exhibit 2.1: *Local exchange interconnection charges for call termination on the incumbent's fixed network (July 2004) [Source: European Commission]*

It is clear that the size of the market (and therefore the potential traffic volumes) is not the only factor which influences the network cost. We see that the single tandem rates in France and Germany (two of the largest countries in the EU) are higher than those in many countries with smaller population, such as Denmark, Sweden, the Netherlands, Luxembourg and Ireland (Exhibit 2.2).

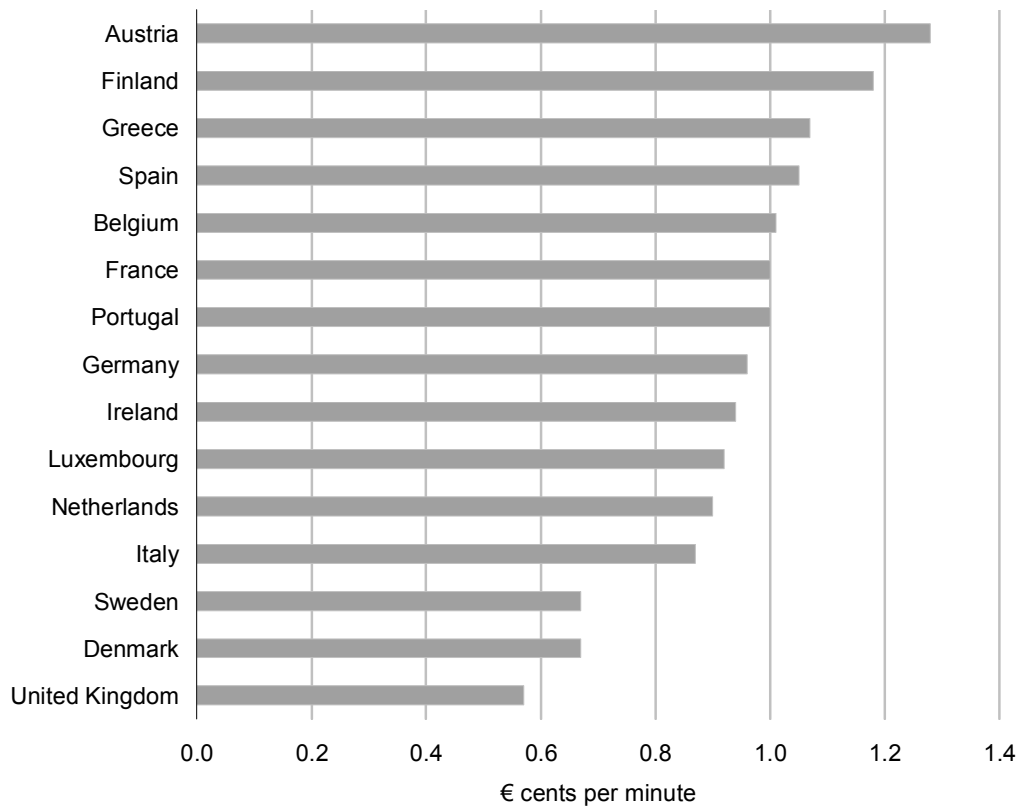


Exhibit 2.2: *Single tandem interconnection charges for call termination on the incumbent's fixed network (July 2004) [Source: European Commission]*

For the double tandem rates, the European Commission found that a number of countries with relatively low population – Denmark, Sweden, the Netherlands and Ireland – have lower per minute rates than the three largest countries in the EU, namely Germany, France and the United Kingdom (Exhibit 2.3).

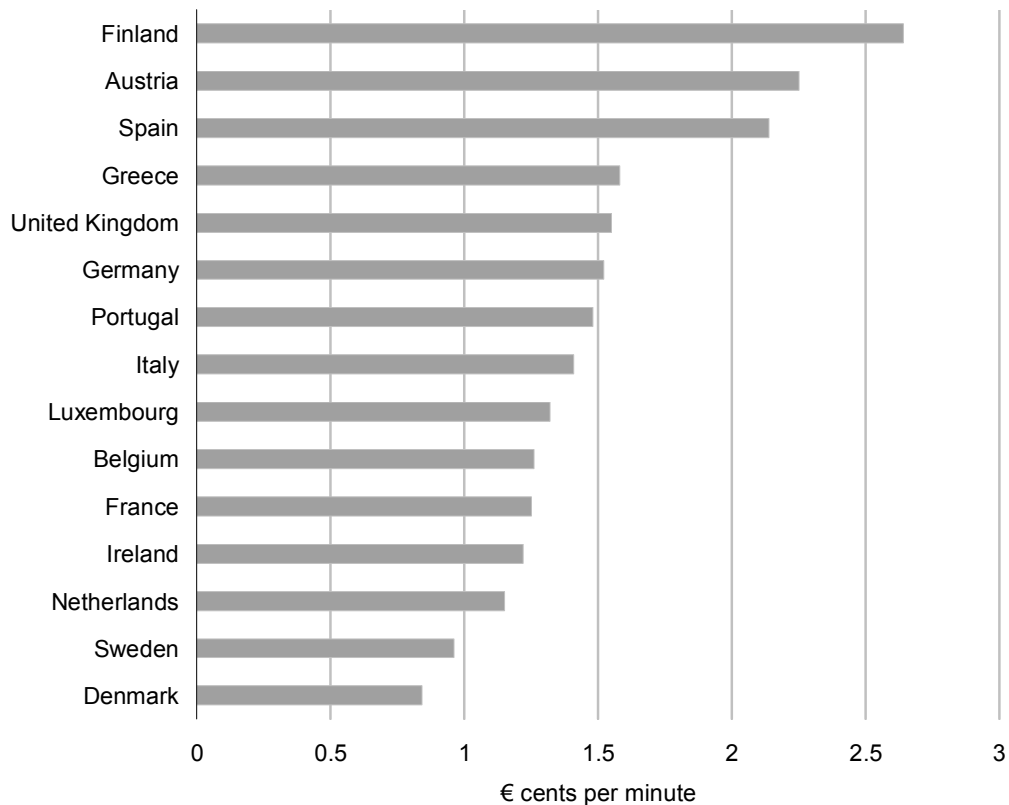


Exhibit 2.3: *Double tandem interconnection charges for call termination on the incumbent's fixed network (July 2004) [Source: European Commission]*

Network costs are driven, not only by traffic, but also by coverage requirements. In sparsely populated countries (such as New Zealand and Australia), the coverage-dependent costs would be more significant than in a country with higher population density (such as the United Kingdom). Thus we would expect to find that total network costs in low population density countries may be less sensitive to traffic volumes than in high density countries.

Equipment prices depend more on simply the volume shipped: they can also depend on the strategy of the vendor and the importance of the contract. For example, the vendor may view having a network in New Zealand as being strategically important, and so could price its equipment as a loss-leader without financially damaging its business.

3 TSLRIC or TELRIC?

On pages 17 and 18 of its submission Telecom states that the CostPro model is a TELRIC model and as such is deficient because:

- some incremental costs in the TSLRIC context are treated as common costs in the CostPro model
- some common costs, like network opex common costs, are excluded or not adequately recovered
- it does not include elements that are both partly incremental and partly common – for example the NEAX software file.

Telecom provides little information regarding its concept of a TSLRIC interconnection costing model. Network Strategies believes that TSLRIC and TELRIC (plus an appropriate share of common costs) approaches are the same provided that the latter includes all services using elements of the core network and appropriate common costs.

The FCC is of the opinion that TSLRIC is equivalent to the TELRIC of a network element⁴:

...prices for interconnection and unbundled elements ... should be set at forward-looking long-run economic cost. In practice, this will mean that prices are based on the TSLRIC of the network element, which we will call Total Element Long Run Incremental Cost (TELRIC), and will include a reasonable allocation of forward-looking joint and common costs. [p329].

⁴ FCC (1996). *In the Matter of: Implementation of the Local Competition; Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*. FCC Docket No. 96-325. 8 August 1996.

Network Strategies' view is that the CostPro model through summation of element costs, the inclusion of all services using the core network (through the data services sharing factor) and the inclusion of appropriate forward-looking common costs, satisfies the requirements of a TSLRIC interconnection costing model and therefore satisfies the requirements of the Act.

The NEAX software file has a switch-specific component and a interconnect traffic-specific component. If these costs have been omitted from the CostPro model Network Strategies recommends that they be included, with the cost of the former to be allocated to the switch and the cost of the latter to be allocated to retail/wholesale costs. This will result in a small increase in interconnection costs. It is not clear whether the costs that Telecom presents on page 63 of its submission are MEA costs – if not they should be adjusted accordingly.

In summary, Network Strategies' view is that:

- the CostPro model satisfies the requirements of a TSLRIC interconnection costing model
- if the CostPro model excludes the NEAX software file costs these should be included and, if necessary, should be adjusted to reflect the MEA technology requirement.

4 Structure sharing

Telecom believes that the following issues relating to structure sharing that have not been addressed by the Commission, namely that the CostPro model:

- does not optimise the data part of the core network, but assumes substantial sharing
- optimises a wired network, yet the Commission's optimised access model has significant parts that are wireless.

4.1 Network optimisation and sharing

In paragraph 80 of its submission, Telecom states:

...the data network is an unoptimised network, while the voice network has been optimised.

While the CostPro model does optimise the voice network inasmuch that the switches and transport links are dimensioned to the traffic these carry, the network is still scorched node, meaning it uses the same locations as Telecom's nodes, rather than being scorched earth, which would mean the number and locations of nodes are optimised.

Telecom then claims that:

There must be question marks as to whether a scorched voice network can share anything with a data network that has not been scorched.

This statement is meaningless because there is very little scorching (i.e. route optimisation) within the transport network. Since data is modelled as equivalent voice circuits on the voice network, any scorching on the voice transport network is also applied to the data transport network. For example, while voice transport routes may be slightly different in the model from reality because the model follows different roads, this must also apply to the data network. Thus sharing between the voice and data networks is indeed possible.

Paragraph 80 finishes:

Because the data network is not optimised it will be larger than it would have been had it been optimised. This means that it takes a larger share of the costs than it would have had it been optimised.

However, it appears that the model does in fact use the optimised number of E1s. The CostQuest specifications for the model specifies that the equivalent data E1s is determined by⁵:

...a count of transport data traffic that originates or terminates at each ESA location.

As traffic data is used to derive the number of E1s, rather than the actual deployed E1s, the number must already be optimised. Thus Telecom's claim that the data network is not optimised is incorrect.

4.2 Proportion shared with access

In paragraph 85, Telecom states that because of the high level of wireless and aerial access in the TSO model, the level of sharing between the access and core networks that could realistically be achieved is lower than assumed by the Commission:

...the Commission has decided in the TSO context that the forward looking access network would be mainly wireless – some 60% of the rural clusters are in fact wireless. In the

⁵ Commerce Commission (2005) *Draft Determination on the Application for Pricing Review for Designated Interconnection Services*, 11 April 2005. Appendix B (CostQuest final specifications, page 5).

remaining rural clusters 24% of the plant length is aerial. In other words a substantial majority of the rural clusters are likely to be served by a technology for which sharing is either not possible (wireless) or very unlikely (aerial).

While this may be true to a certain extent, the vast majority of radio clusters are in extreme areas – the least populous, the most rugged and remote (that is, the most expensive, by definition). Only a few of them are likely to be in areas where there is core network transport – generally along main highways between towns and cities where the terrain is rugged and population density is low. We would therefore expect that most clusters along core network transport routes are implemented with structure that can be shared.

With respect to aerial access, if an operator was deploying a green fields network with core and access simultaneously, it would design the network so that sharing was possible: the operator would either put both the core and access above ground or both underground. While it is unlikely the operator would put core network above ground, putting the core network and access network underground in the same trench would be cheaper than putting the access above ground and the core underground, which is possible in the models – this could be considered a worst case scenario.

In paragraph 86, Telecom states:

Almost all (99%) of the remaining rural plain is direct buried. While it is possible to direct bury access and core network cable in the same trench, this is not best practice.

While it may be ‘best practice’ to bury access and core network cables in different trenches because the risk of damaging one cable when accessing the other is reduced, it is in fact not efficient, nor is it, in many instances, practical or possible. It is unlikely an efficient operator would incur the extra expense for the small benefit gained. Additionally in many instances there would not be enough room on the road berm for more than one trench, necessitating both cables to share the same trench.

Additionally, it would be possible for the access and core transport to share fibre sheaths. While the model does not currently model sheath sharing, it does mean the current methodology can be considered worst case. We therefore believe that Telecom has been conservative in its estimates concerning the amount of sharing.

4.3 Summary

The level of sharing within the CostPro model is not overstated, as claimed by Telecom.

- Telecom believes that the number of data E1s has not been optimised. However, because the number is derived from the actual traffic, it is optimised to the same level as the voice network.
- Telecom believes that because of the high number of wireless clusters modelled in the TSO model, the level of sharing possible is lower than that assumed by the Commission. However this is not necessarily correct because most wireless clusters are in remote areas, and not on key routes between nodes.

5 Operating cost mark-ups

Telecom claims that CostQuest's opex cost mark-ups are inadequate on the basis that:

- the CostPro mark-ups are based on inappropriate source data
- little or no allowance has been made for network common operating costs.

We examine each of these issues in turn below.

5.1 The CostPro mark-ups are based on inappropriate source data

Telecom states that CostQuest's model should use the same direct network operating cost mark-ups as used by ACCC/NERA on the basis that the mark-ups are⁶:

...based on figures from a new entrant (Optus) in Australia, which has similar labour costs to New Zealand, and which have been thoroughly tested in the Australian regulatory context. [p33]

We note that mark-ups should only be based on labour costs for Telecom's New Zealand operations, not for the group as a whole (which are inflated by the Australian operations – see section 8.1 for further information).

While the ACCC/NERA mark-ups have been tested in the Australian regulatory context, Network Strategies believes that the mark-ups are inappropriate in the New Zealand

⁶ Telecom New Zealand Limited (2005). *Submission in respect of the Commerce Commission's Draft Determination on the Application for Pricing Review for Designated Interconnection Services*. 26 May 2005.

context due to the prevalence of higher labour rates in Australia (section 8) and unquantified inefficiencies⁷:

Cable & Wireless Optus submitted to the Commission that many of these O&M cost percentages, notably those for site and SDHs, are higher than would be the case for an efficient operator. [p46].

While Network Strategies agrees with Telecom that the source data is inappropriate we do not agree that the ACCC/NERA mark-ups are most appropriate. We believe that the most appropriate mark-ups are those in Telstra's forward looking PIE II model as they are based on efficient operation. These mark-ups are asset category-specific. The PIE II and CostPro mark-ups recover the same costs – air-conditioning, power and maintenance. Implementation of the PIE II mark-ups in the CostPro model has a negligible affect on the interconnection price – an increase of less than [] CCRI for period 1.

5.2 Allowance for network common operating costs

Telecom provides no examples of the unrecovered 'network common operating costs' they refer to nor do they suggest how the CostPro model recovers these costs. Network Strategies has previously stated⁸ that it believes that the CostPro model recovers sufficient common costs through the 5% common cost and 1.5% retail/wholesale mark-ups on direct network capital investment.

5.3 Summary

We agree with Telecom that the source opex mark-up data is inappropriate, however we believe that the most appropriate mark-ups are those in Telstra's forward looking PIE II model as they are based on efficient operation.

⁷ ACCC (2000). *A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services*. July 2000.

⁸ Network Strategies (2005). *Pricing review for designated interconnection services*. 24 May 2005.

However we disagree with Telecom's view that the CostPro model under-recovers common costs and in particular network common operating costs. The model recovers sufficient common costs through the 5% common cost and 1.5% retail/wholesale mark-ups on direct network capital investment.

6 TSO exclusion

The CostPro model excludes from forward-looking common costs, those costs incurred by the service provider in relation to TSO. Telecom does not agree with the approach taken by CostQuest. In its discussion on the TSO exclusion, Telecom compares five options for different exclusions. These options include the Commission's model and Telecom's own model.

Option A This is the CostPro model that the Commission used to calculate the interconnect price. It excludes TSO by subtracting the cost of the interconnect traffic generated by customers in CNVCs from the overall cost of interconnect traffic, because the CNVC interconnect traffic is paid for through the TSO.

Telecom has calculated this TSO contribution to be 0.11 cents per minute⁹.

Option B This is also the CostPro model used by the Commission, but Telecom have performed some post-processing to remove its own TSO contribution: it has decided that if it cannot recover its share of the TSO (72.84%) from liable parties via their TSO payments, it will recover it from them via interconnect payments.

It is unclear as to why Telecom wishes to recover its TSO payment obligation entirely through the interconnect service, and not any of

⁹ Telecom New Zealand Limited (2005). *Submission in respect of the Commerce Commission's Draft Determination on the Application for Pricing Review for Designated Interconnection Services*, 26 May 2005, Appendix 4.

the other services it offers (such as national calls, mobile calls, international calls and 0800 calls), as do the liable parties.

By only excluding the TSO contribution from liable parties, Telecom is clearly double-recovering its TSO contribution, and this is unacceptable.

Option C

Options A and B exclude TSO costs as calculated by the TSLRIC model. This TSO cost is not based on the value calculated for the TSO Determination – the TSLRIC model uses quite different assumptions. The most significant differences between the TSO determination and the TSLRIC model are the different value for WACC and the inclusion of common and retail costs, as well as costs being updated for the later time period.

Option C is the same as Option A except that the costs have been taken from the TSO model rather than the TSLRIC model. (It is not clear whether or not the TSO WACC has been used, nor whether or not the common and retail costs have been excluded.)

Option D

Option D is similar to Option C, but like Option B it only includes the portion of TSO paid by the liable parties (27.16%).

Option E

Option E is Telecom's model, and is Telecom's preferred approach. It is similar to Option D in that it subtracts the TSO version of the costs and only includes the liable parties' share of the TSO. However this option subtracts the *net* TSO cost, which is the cost of the providing the service less a share of the revenue Telecom receives from the non-viable customer, rather than the actual cost. This is because it is the net cost that is recovered through the TSO, and not the actual cost.

In its submission, TelstraClear states that the TSO deduction should result in an interconnect price that includes only the incremental costs of providing the interconnect service, plus a share of costs that are common to any other services except TSO services

(local calls and dial-up Internet). TelstraClear's position would result in an interconnect cost that would consist of:

- the direct costs of providing the interconnect service (that is, the costs directly attributable to interconnect)
- inter-LICA transport costs (which are common costs, but are not common to TSO services).

7 Land and building mark-ups

Telecom claims that the Commission's mark-up of [] CCRI (comprising [] CCRI building and [] CCRI land) on switching capital investment to recover land and building costs does not adequately recover costs as:

- the mark-up may not recover the costs associated with providing earthquake resistance [paragraph 34]
- this excludes costs associated with transmission equipment [paragraph 160].

We examine each of these issues in turn below.

7.1 The recovery of costs associated with providing earthquake resistance

Telecom claims that buildings in New Zealand have a greater fit-out cost due to the risk of earthquakes. Beca, an engineering consultancy recommended to Network Strategies by the New Zealand Society for Earthquake Engineering, has indicated that a typical assumption on the differential in total costs between a building with or without seismic detailing would be 5%¹⁰. Network Strategies recommends that if the buildings mark-up does not recover these costs it be increased appropriately.

¹⁰ Email from Rob Jury, Technical Director – Structural Engineering, Beca, 8 June 2005.

7.2 The recovery of costs associated with transmission equipment

The CostPro model inputs imply that land and building costs associated with transmission equipment are recovered through mark-ups of [] CCRI and [] CCRI respectively. We assume that these mark-ups are applied to transmission equipment capital investment, though this is not documented. Telecom however claims that these mark-ups are not implemented in the model. Network Strategies has investigated Telecom's claim by setting the transmission-related mark-ups to zero and comparing the results obtained with the default results. The two sets of results are identical, verifying Telecom's claim (or indicating that transmission costs are not incremental, though this is clearly not the case).

Network Strategies has compared the Commission's mark-ups with those obtained through analysis of the Danish and Swedish LRIC models¹¹, Telstra's PIE II model¹² and the fixed and mobile LRIC interconnection costing model developed by BIPE SA for the World Bank. The BIPE SA model¹³ was developed for African networks:

African networks are small in size and quite spread out. They rely on specific architectures and technologies to reconcile their small market size in volume to the scattered habitat. Transmission links are mostly over microwave technology, and the roll out of fiber-optic systems remains limited to urban centers. It is in this context that the World Bank contracted BIPE to develop a cost model that captures specificities prevailing in Africa and that could be easily replicable. [p6].

Network Strategies believes that although the BIPE SA model is not representative of the New Zealand situation it is a valuable source of publicly available information. As such we have included it in our comparison.

¹¹ Marsden Jacob Associates (2005). *Cross Submission on the TSLRIC Model for Designated Interconnection Services Commerce Commission Draft Determination 11 April 2005*. Draft 6 June 2005.

¹² Email from Andrew Briggs (Telstra), 7 June 2005.

¹³ Public-Private Infrastructure Advisory Facility (PPIAF) (2004). *A Model for Calculating Interconnection Costs in Telecommunications*. First printed in December 2003.

We have assumed that the CostPro mark-ups are on equipment capital only and not on capitalised installation costs. CostPro's land and buildings switching-related mark-up is very similar to that in the BIPE SA model (Exhibit 7.1). However the transmission-related mark-up in the BIPE SA model is much higher than that in CostPro. We believe that this is due to the high site costs associated with microwave transport. For comparison we have also presented the mark-ups obtained when capital investment includes capitalised installation costs. It can be seen that the inclusion of capitalised installation makes little difference to the mark-up. This is because the majority of costs are infrastructure related. The BIPE SA mark-ups are much higher than those adopted in the Danish and Swedish hybrid LRIC models and in Telstra's PIE II model.

<i>Model</i>	<i>Mark-up on capital investment associated with:</i>		
	<i>Switching</i>	<i>Transmission</i>	<i>Total core</i>
CostPro – no installation	[] CCRI	[] CCRI	n.a.
BIPE SA			
– no installation	25.8%	33.5%	8.3%
– with installation	25.7%	33.4%	8.5%
Danish model – no installation	16.3%	n.a.	n.a.
Swedish model – no installation	13.7%	n.a.	n.a.
Telstra PIE II – with installation	n.a.	n.a.	[] TCLRI
1 Core = Switching + transmission + infrastructure			

Exhibit 7.1: Land and buildings mark-ups [Source: BIPE SA, Marsden Jacob Associates, Network Strategies, Telstra]

Telecom recommends that the Commission adopt benchmark values which would result in a total mark-up on core network capital investment for buildings, fittings and land of [] TCNZRI. This figure is much higher than those presented above.

7.3 Summary

Network Strategies recommends that the Commission:

- investigates whether the buildings mark-up recovers costs associated with providing earthquake-resistance. If it does not the mark-up should be increased appropriately.
- ensure that the CostPro model correctly implements the transmission-related buildings and land mark-ups
- investigate publicly available models with the aim of determining representative forward-looking mark-ups.

8 Labour costs

Telecom disagrees with the Commission's and CostQuest's argument that operating costs in New Zealand should be lower than in countries with higher labour rates. Telecom raises three points to support its view:

- Telecom's labour costs are similar to the labour costs of incumbents in countries with higher labour rates
- recent research argues that differences in labour rates do not significantly drive differences in overall costs
- there is no evidence that overall costs nor opex mark-ups are lower in countries with lower labour rates.

8.1 Telecom's labour costs

Telecom stresses that its personnel costs per employee as reported by CostQuest in Appendix G-B of the Draft Determination are almost identical to Bell Canada, close to Telstra and not very far from France Telecom and KPN Telecom (Exhibit 8.1). Although Telecom's assertion is correct, its costs are still the lowest of the incumbents listed by CostQuest. General labour rates in these countries are higher than in New Zealand, so why are Telecom's personnel costs per employee apparently comparable? We believe this is due to two factors:

- a significant proportion of Telecom's labour costs are from its Australian operations
- Telecom has a high level of outsourcing.

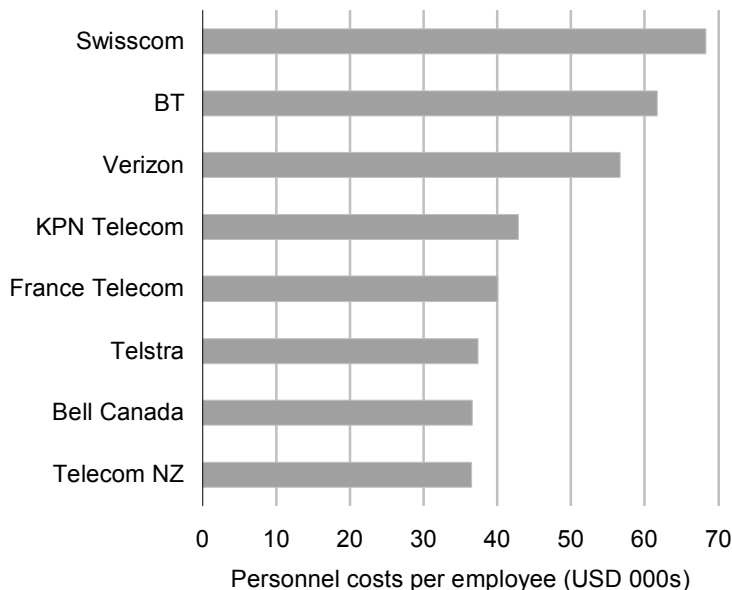


Exhibit 8.1:
Annual personnel costs per employee, 2001 (except Verizon – 1998) [Source: CostQuest, OECD, Network Strategies]

If Telecom’s labour costs were compared to a wider sample of incumbents a broader statement on labour costs could be made. Exhibit 8.1 may be expanded by including all of the 26 companies for which 2001 data was available from the OECD’s *Communications Outlook 2003*. Within this larger sample Telecoms’s labour costs are ranked 16 (Exhibit 8.2).

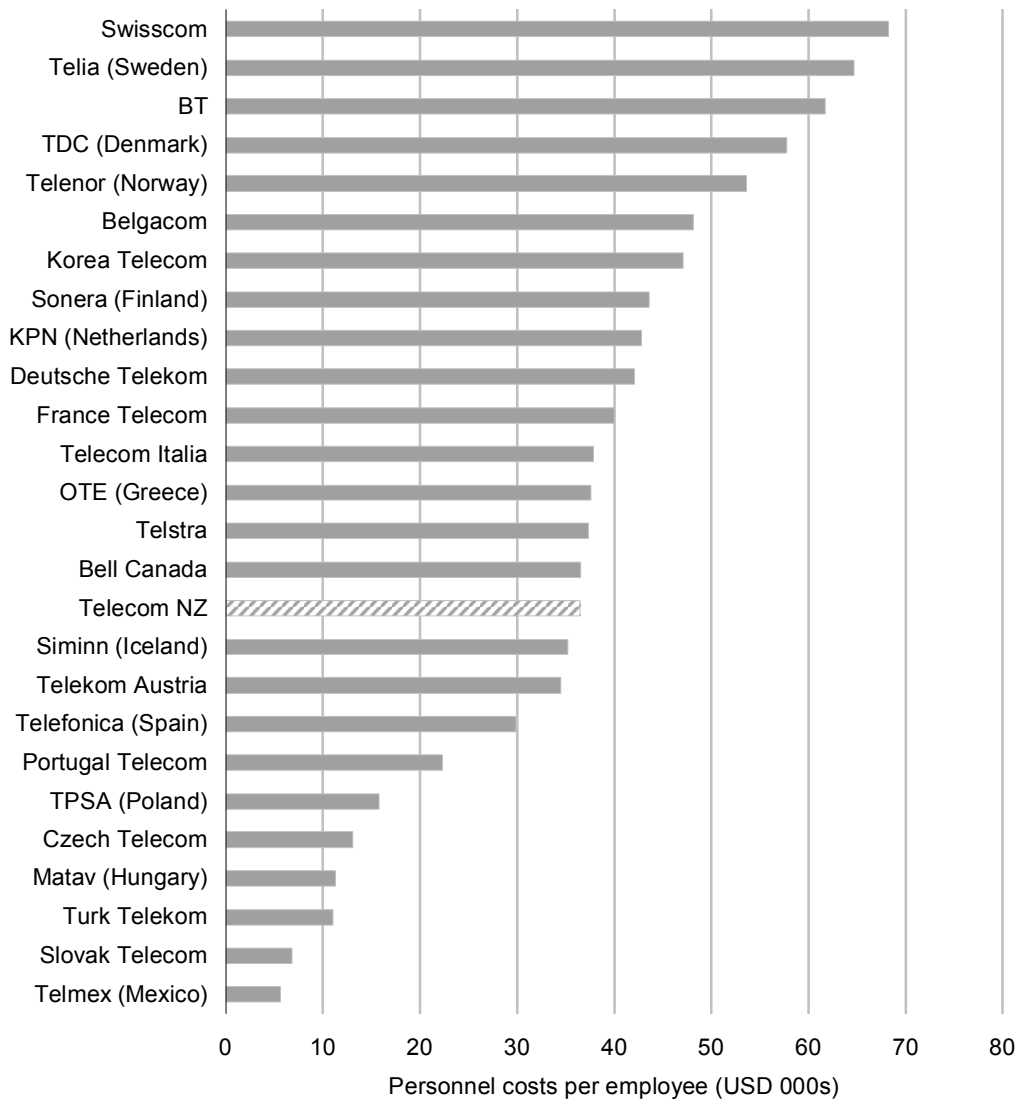


Exhibit 8.2: 2001 personnel costs per employee (using OECD average annual exchange rates) [Source: OECD, *Network Strategies*]

CostQuest sourced the personnel costs per employee from the OECD *Communications Outlook 2003*, which reports each company's consolidated results rather than the costs specific to the country in which it is incumbent. This means the Telecom New Zealand figure includes Telecom's Australian operations, which in 2001 accounted for 28% of Telecom's total personnel. Examination of data from Telecom's annual reports show that for the period 2001 to 2003 the personnel costs per employee of its New Zealand

operations were significantly lower than those of the Telecom Group (Exhibit 8.3). This therefore implies that the gap between Telecom and those operators it considers comparable (Bell Canada and Telstra) is somewhat wider than is implied by the OECD figures.

	2000	2001	2002	2003
<i>Personnel costs per employee (NZD)</i>				
Telecom Group	67 276	78 388	67 243	63 039
New Zealand operations	71 016	70 965	55 540	54 664
% difference	+5.6%	-9.5%	-17.4%	-13.3%
New Zealand labour costs (% of total)	84%	65%	66%	70%
New Zealand employees (% of total)	79%	72%	79%	81%

Exhibit 8.3: *Telecom personnel costs per employee, 2000–2003 [Source: Telecom annual reports, Network Strategies]*

Any examination of labour costs should also note that Telecom outsources many of its functions that are carried out in-house by other operators, including tasks undertaken by linesmen and technicians. Outsourcing enables Telecom to maintain a smaller workforce. If the employees retained tend to be the higher paid managerial staff this would lead to a higher labour cost per employee than that of an operator with low levels of outsourcing.

An indication of the level of outsourcing may be obtained from the number of access paths (fixed lines and mobile subscriptions) per employee. Operators with low staff levels or high efficiency would tend to have a high number of access paths per employee (although we also note that local characteristics, such as geography and population dispersion, will have a substantial influence on staffing levels). Note that Telia, an operator that outsources most of its technical expertise, has the highest number of access paths per employee. We find that Telecom has a relatively high number of access paths per employee (Exhibit 8.4), significantly higher than Telstra and France Telecom (operators which Telecom claims have comparable labour costs). Given that New Zealand is a relatively sparsely populated country, with difficult terrain, we would deduce that the high access paths per employee is likely to be due to substantial outsourcing of functions, and thus would influence Telecom's average labour costs.

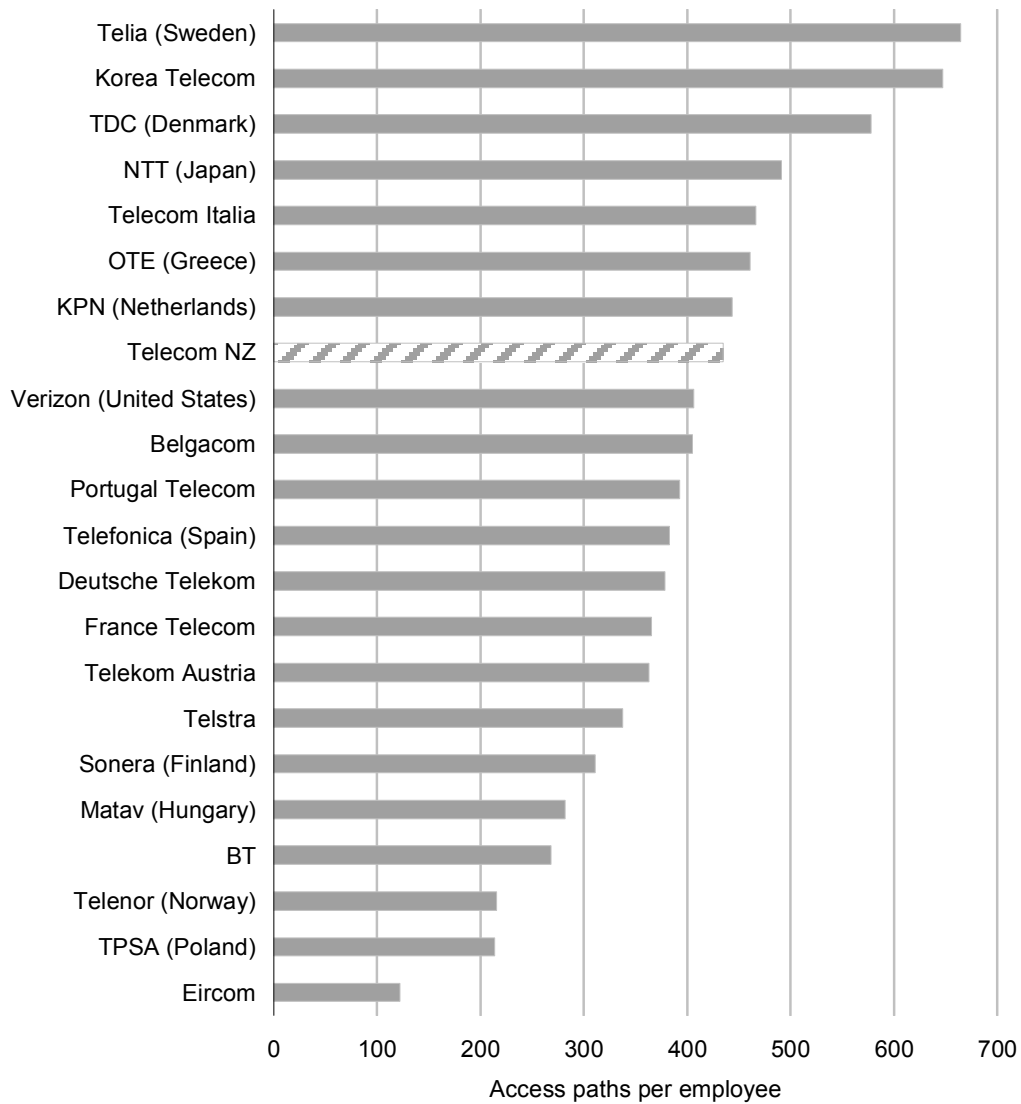


Exhibit 8.4: Access paths (both fixed and mobile) per employee [Source: OECD, Network Strategies]

To summarise, Telecom’s claim that its labour costs are comparable to incumbents such as Telstra and Bell Canada should be treated with caution:

- the labour costs per employee quoted for Telecom are inflated due to the inclusion of labour costs for Telecom’s Australian operations

- examination of labour costs per employee within OECD countries shows that those for Telecom are in the mid to low range of the incumbents
- Telecom's labour costs may be inflated in comparison with other operators by the high level of outsourcing, particularly of lower paid jobs.

8.2 The link between labour rates and operating costs

Telecom refers to two papers that discuss labour rates and differences in costs:

- a report by NERA on network efficiency for Ofcom¹⁴ in the United Kingdom
- a report by Cullen International and WIK on the accession countries for the European Commission¹⁵.

NERA study

The NERA report compares the cost efficiency of BT's network with those of LECs in the US. In order to make the comparison NERA tests whether or not staff costs per employee have an impact on total costs. While NERA claimed that staff costs were insignificant in explaining total costs, in fact the model included a dummy variable for those LECs located in the northeast of the US. NERA states that¹⁶:

Companies located in the North East of the US face different price levels, particularly for labour, to those in the rest of the US. Therefore a dummy was included to capture the impact of this difference on the total cost function.

¹⁴ NERA (2004). *BT efficiency: network study 2003*, report for Ofcom, May 2004.

¹⁵ Cullen International and Wissenschaftliches Institut für Kommunikationsdienste (WIK) (2001). *Universal service in the accession countries*. Annexes to main report. 30 June 2001. Report for the European Commission. Available at <http://www.cullen-international.com>. The accession countries are Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

¹⁶ NERA (2004). *BT efficiency: network study 2003*. May 2004. Report for Ofcom.

Hence NERA's claim that staff costs are insignificant in explaining total costs contradicts its own explanation of the model, as this factor is already included within the dummy variable. The dummy variable is statistically significant and it has the effect of increasing costs if the LEC is located in the northeast (ie has higher labour costs).

Telecom referred to the May 2004 of the NERA report – in a revised version¹⁷ of this analysis, published in March 2005, NERA used different data within its analysis and dropped the dummy variable from its model as it proved to be insignificant. Again, NERA concluded that average staff costs were insignificant in explaining total costs. If only the former, then variations in LEC labour rates may not have been tested for significance. We also note that total staff costs are likely to be correlated with the other variables within NERA's model (switched lines, leased lines, switched minutes, population density, sheath length in the network, the proportion of business lines to residential lines and time). Furthermore, as we shall see in the second study quoted by Telecom, low average staff costs do not necessarily translate to low operating costs – differing levels of efficiency and competition may offset any benefits that could be gained from lower labour costs.

Cullen International and WIK study

Cullen International and WIK explore the theory that operators in countries with lower wage rates will have lower overall costs. They argue that countries with lower wage rates also have lower productivity and that these factors are actually in proportion to each other. Furthermore, they then state that differences in labour productivity are smaller for labour intensive tasks than for capital intensive tasks, and as building access networks is relatively labour intensive, it may be cheaper to build in countries with lower wage rates. The authors deduce that this may then lead to lower network access costs in these countries. The authors also note that levels of efficiency tend to be worse in areas with little or no competition, counteracting the effect lower wage rates may have had on operating costs.

To summarise Cullen International and WIK's findings, a country with low wage rates, low productivity and little or no competition (and therefore no incentive for productivity improvements) will have network costs equally as high as a country with high wage rates,

¹⁷ NERA (2005) *The comparative efficiency of BT in 2003*, report for Ofcom, 11 March 2005.

high productivity and effective competition. Cullen International and WIK conclude that the EU accession countries at the lower end of the GDP per capita range (and hence the lower range of labour rates) may have access service costs no more than 10-20% lower than those in EU countries with efficient operators.

However, this situation is not replicated in New Zealand. While New Zealand's labour costs are relatively low compared to European Union countries, the telecommunications industry is very different to that in the accession countries which were still dominated by incumbent monopolies. Furthermore, a study by PwC Consulting found that Telecom was one of the most efficient companies within a sample of 50 operators (Telecom achieved a ranking of eight)¹⁸. This study calculated the degree of inefficiency between Telecom and the top decile of operators as only 1.5% (using the mean) and 3% (using the mode). This implies that the low labour costs and high efficiency within New Zealand should translate into lower network costs than in countries with lower levels of efficiency.

8.3 Evidence of lower operating costs in countries with lower labour rates

Network Strategies has collected the 2001 operating expenses (opex) for 15 of the companies included in the OECD *Communications Outlook 2003*. Opex was sourced from the companies' 2001 annual reports. For those companies with non-calendar year reporting periods we have applied the OECD's approach which uses the financial data for the period going beyond 31 December 2001 to represent 2001.

Exhibit 8.5 shows that a country's gross national income per capita¹⁹ has very little impact on the incumbent telecommunications operator's operating expenses per employee, although we note that there is strong evidence that observations fall within a well-defined cluster. Cullen International and WIK²⁰ use GDP per capita as a representation of a

¹⁸ PwC Consulting (2002). *TCNZ efficiency study based on Stochastic Frontier Analysis (SFA)*. September 2002. Submitted to the Commerce Commission during the 2001-2002 TSO Determination. Public version available at <http://www.comcom.govt.nz>.

¹⁹ World Bank (2001). *World Bank online development indicators database*. Available at <http://www.worldbank.org>.

²⁰ Cullen International and Wissenschaftliches Institut für Kommunikationsdienste (WIK) (2001). *Universal service in the accession countries*. Annexes to main report. 30 June 2001. Report for the European Commission. Available at <http://www.cullen-international.com>.

country's labour rates. Network Strategies has chosen gross national income (GNI) per capita over GDP per capita as GNI is a measure of the total income earned by the citizens of a country. Telecom is clearly at the extreme edge of the cluster – it has the highest operating costs per employee of the given sample even though the majority of the countries have higher GNI per capita. As discussed in section 8.1, the high level of outsourcing by Telecom results in a relatively low number of employees, which coupled with outsourcing costs, would lead to a higher than average level of opex per employee.

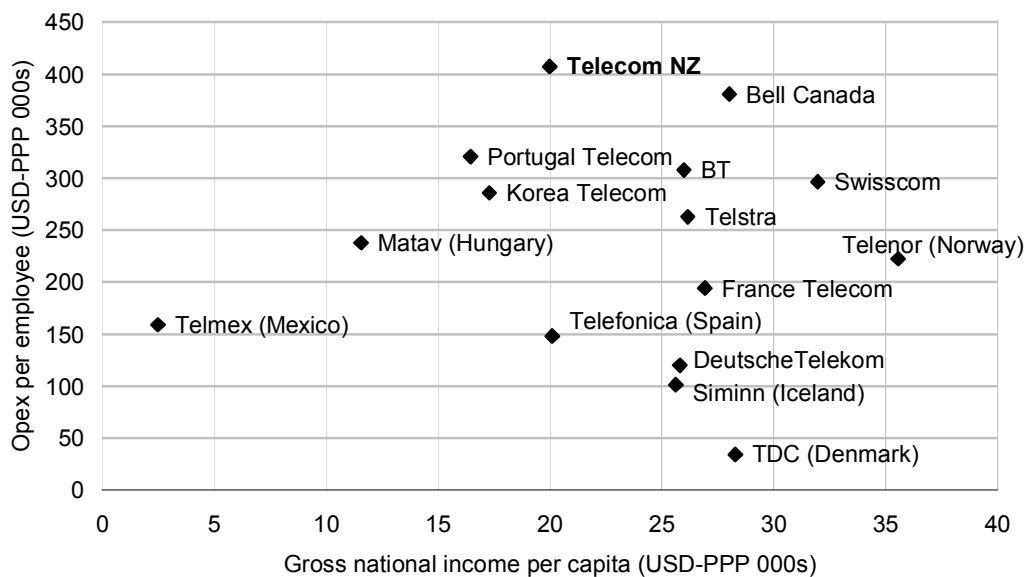


Exhibit 8.5: Comparing gross national income per capita with opex per employee [Source: OECD, World Bank, Network Strategies]

Telecom claims that there is no evidence to suggest that overall costs nor opex mark-ups are lower in countries with lower labour rates. Network Strategies has found no evidence of a relationship between GNI per capita and opex per employee but we note that other factors, such as the level of outsourcing and efficiency, may influence opex levels.

8.4 Summary

The three issues raised by Telecom in relation to labour costs are:

- Telecom’s labour costs are similar to the labour costs of incumbents in countries with higher labour rates
- recent research argues that differences in labour rates do not significantly drive differences in overall costs
- there is no evidence that overall costs nor opex mark-ups are lower in countries with lower labour rates.

Telecom’s third point is reasonable as Network Strategies has been unable to find evidence from country-level data of a strong relationship between operating costs and national average labour rates. However we note that our comparison has not adjusted the data for differing levels of competition, outsourcing and efficiency, which could mask the presence of a relationship between operating costs and national labour rates.

However, we disagree with Telecom’s first and second points. The labour costs for Telecom reported by the OECD are artificially inflated by the inclusion of higher labour costs from its Australian operations and the extensive level of outsourcing by Telecom. These inflated costs are still in the mid to low range of OECD countries.

The research cited by Telecom in support of its claim that differences in labour costs do not drive operating costs does not corroborate Telecom’s hypothesis. The NERA model cited by Telecom in which it was claimed that staff costs were insignificant actually incorporated a factor, proved to be highly significant, that allowed for differences in staff costs. The second cited study, from Cullen International and WIK, study found that incumbents in countries with lower labour rates will have relatively high overall costs if levels of efficiency and competition are also low – which is not the case in New Zealand.

In conclusion, we find that Telecom has not sufficiently disproved CostQuest’s assumption that operating costs in New Zealand should be lower than in countries with higher labour rates.

9 Conclusions

Below we summarise our responses to a number of key issues raised by Telecom in its submission concerning the Draft Determination, and provide some recommendations for further action.

Scale economies

Telecom claims that the interconnection costs would be higher than those in Europe and the United States as New Zealand cannot benefit from scale economies. Cost-based interconnection rates in European countries clearly show that the relationship between size of a country and network costs is not as clear as Telecom implies. For example, local exchange and single tandem rates in Denmark are comparable to those within the United Kingdom. Furthermore the rates in Germany and France – countries with large populations – are significantly higher than in a number of smaller countries.

TSLRIC vs TELRIC

It is our view is that:

- the CostPro model satisfies the requirements of a TSLRIC interconnection costing model and therefore satisfies the requirements of the Telecommunications Act
- if the CostPro model excludes the NEAX software file costs these should be included.

Structure sharing

The level of sharing within the CostPro model is not overstated, as is claimed by Telecom:

- because the number of data E1s is derived from the actual traffic, the number of data E1s is optimised to the same level as the voice network
- wireless clusters tend to be in remote areas, and not on key routes between nodes, and we would therefore expect that most clusters along core network transport routes are implemented with structure that can be shared
- an efficient operator would not bury access and core network cables in different trenches
- as the CostPro model does not currently model sheath sharing, the current methodology can be considered worst case.

Operating cost mark-ups

Network Strategies agrees with Telecom that the source data is inappropriate, however we do not agree that the ACCC/NERA mark-ups are most appropriate. We believe that the most appropriate mark-ups are those in Telstra's forward looking PIE II model as they are based on efficient operation.

TSO exclusion

In its submission, TelstraClear states that the TSO deduction should result in an interconnect price that includes only the incremental costs of providing the interconnect service, plus a share of costs that are common to any other services except TSO services (local calls and dial-up Internet). TelstraClear's position would result in an interconnect cost that would consist of:

- the direct costs of providing the interconnect service (that is, the costs directly attributable to interconnect)
- inter-LICA transport costs (which are common costs, but are not common to TSO services).

Land and building mark-ups

Network Strategies recommends that the Commission:

- investigates whether the buildings mark-up recovers costs associated with providing earthquake-resistance. If it does not the mark-up should be increased appropriately.
- ensure that the CostPro model correctly implements the transmission-related buildings and land mark-ups
- investigate publicly available models with the aim of determining representative forward-looking mark-ups.

Labour costs

Telecom disputes CostQuest's assumption that operating costs in New Zealand should be lower than in countries with higher labour rates. We have found that the labour costs for Telecom used by CostQuest are artificially inflated by the inclusion of higher labour costs from its Australian operations and the extensive level of outsourcing by Telecom.

Further investigation of the recent research cited by Telecom identified that the conclusion of the research was that incumbents in countries with lower labour rates will have relatively high overall costs if levels of efficiency and competition are also low – which is not the case in New Zealand. Low labour costs and high efficiency within New Zealand should translate into lower network costs than in countries with lower levels of efficiency.