TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services

Analysis of the critiques to the international comparator report

Commerce Commission

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Table of content

0 Context ____ *3*
1 Critiques regarding the use of the Swedish model ____ *4*
1.1 Summary of the critique ____ **4**
1.2 TERA response ____ **4**
2 Critiques regarding the use of the Irish model ____ *5*
2.1 Summary of the critique ____ **5**
2.2 TERA response ____ **5**
3 Critiques regarding the use of exchange rates ____ *7*
3.1 Summary of the critique ____ **7**
3.2 TERA response ____ **7**
4 Critiques regarding the metrics used ____ *9*
4.1 Summary of the critiques ____ **9**
4.2 TERA response ____ **9**
5 Other critiques ____ *12*
5.1 WACC ____ **12**
5.2 Common costs ____ **12**
5.3 Accounting of capital contributions in Sweden ____ **13**
6 Updated main results ____ *15*
6.1 Updated national results ____ **15**
6.2 Urban and non-urban results ____ **16**
7 Appendix ____ *17*

0 Context

On the 2nd of July 2015, the Commerce Commission published its further draft determination on UCLL and UBA TSLRIC models and prices.

Attached to this draft determination, the Commerce Commission published several expert reports. One of these reports is TERA's June 2015 report "TSLRIC price review determination for the Unbundled Copper Local Loop and Unbundled Bitstream Access services - International comparison of TSLRIC UCLL and UBA costs and prices" prepared for the Commerce Commission. This report (the *International comparator* report) analysed the cost differences between Sweden, Denmark, New Zealand, Ireland and France.

Following the publication of this document, several critiques were raised by the industry especially from Network Strategies, WIK and Spark. The objective of this report is to answer to the main critiques. They are treated successively and are also listed in annex.

Also, the figures presented in the *International comparators'* report are updated accordingly with the final TSLRIC model (following the second consultation) and because figures related to Irish TSLRIC model have been published by the Irish Commission for Communications Regulation (ComReg) after the drafting of the *International comparators'* report. They are presented in section 6.

1 Critiques regarding the use of the Swedish model

1.1 Summary of the critique

According to Network Strategies, the Swedish model used for the purpose of the report is out of date, since one updated model has been published since by the Swedish Post and Telecom Authority (PTS).

However, Network Strategies notes that the Swedish extrapolated prices are very close to the actual results of the most recent Swedish model (§10.3 of Network Strategies submission to the second consultation).

1.2 TERA response

The Swedish model used in the benchmark is the “final hybrid model v7-1” published by the PTS in 2009.

First of all, it provides results in line with the one used by the Swedish Regulation Authority to derive the current public regulated unit prices.

Second, it was preferred to work on copper scenarios for all the countries since most of the countries work on this basis. Yet the updated Swedish model referred by Network Strategies is a fibre + FWA model[1], which would not permit a comparison of copper inventories and costs.

It is not clear what it would provide in terms of benefits in the analysis.

[1] PTS, “Final hybrid model v10-1” published in 2013

2 Critiques regarding the use of the Irish model

2.1 Summary of the critique

In the *International comparators'* report, we indicated that the UCLL price (€12.41/line/month) in Ireland was based on the cost of lines connected to largest exchanges in the country. To compare it with other countries, we had to extrapolate this price to derive a national average cost.

According to Network Strategies (§10.3), the Irish national average cost cannot be inferred from the New Zealand and Denmark distributions of costs as the distribution of costs in Ireland is not known.

Extrapolating the national price from the "TSO" price – inside-LEA price (see below) would lack of robustness.

2.2 TERA response

2.2.1 Public information available on the Irish model

Since the drafting of the *international comparator* report in late June 2015, the Irish Commission for Communications Regulation ("ComReg") has published various draft documents regarding the TSLRIC UCLL copper model, notably:

- Eircom's Wholesale Access Services: *Further specification and amendment of price control obligations in Market 4 and Market 5 and further specification of price control obligation in Market 2*, ref: ComReg 15/67, published on July 3rd 2015
- TERA's report on the *determination of appropriate costing and pricing methodologies for the copper access network in Ireland* , ref: ComReg 15/67A, published on July 3rd 2015

In those documents, ComReg provides for:

- The draft regulated UCLL price which is calculated:
    - On the basis of the cost of lines connected to exchanges where infrastructure based competition is likely;
    - On the basis of the bottom-up LRIC approach for assets which are being replaced for NGA (mainly cables, joints but also trenches and poles which cannot be reused for NGA);
    - On the basis of top-down costs for civil engineering assets which are reusable for NGA (trenches and poles which can be reused for NGA).
- The bottom up LRIC price based on "Large Exchange Areas" footprint (where infrastructure based competition is expected and where build/buy signal are relevant). In this calculation, civil engineering assets which are reusable for NGA are also valued on a bottom-up LRIC basis ;

- The bottom up LRIC price based on a national footprint (all exchanges). In this calculation, civil engineering assets which are reusable for NGA are also valued on a bottom-up LRIC basis.

The latter price, to which minor adjustments need to be applied, can be compared to New Zealand and other benchmarked prices. In the *International comparators* report, as this price was not publicly available and was based on a 2010 estimate, it was inferred from the inside-LEA price and extrapolated to the national footprint thanks to cost distribution in New Zealand and Denmark. TERA knew this extrapolation was reasonable because it had developed the 2010 model but Network Strategies believe this estimate was not robust. The publication of new information enables to check whether this was a reasonable estimate.

Using the national price published by ComReg would lead to NZD 47 per month and per user, in line with the NZD 44-51 range provided in the International comparators report and stemming from an extrapolation analysis.

2.2.2 Adjustments to Ireland's price

The following adjustments were applied to the UCLL price in Ireland in the *International comparators* report:

- Add cost of repairing faults (+0.96€ per line)
- Remove cost of ETP (-0.94€ per line)
- Extrapolate 2010-2012 cost to 2017 with inflation
- Extrapolate cost to national costs

The two first changes mitigate each other.

The latter change was based on the distribution of access network costs among exchange areas in Denmark and in New Zealand (boundaries of the range provided).

The publicly available "*report on the determination of appropriate costing and pricing methodologies for the copper access network in Ireland*" provides further insights on the bottom up TSLRIC model:

- Prices for 2017
- National price for the bottom up model.

Hence, the third and fourth adjustments listed in the *International comparators* report are no longer needed to compare the Irish UCLL cost with the other selected countries.

Also, it confirms the robustness of the extrapolation methodology implemented in the *International comparators* report, as the actual Irish national 2017 price is at the centre of the range provided in the *International comparators* report.

3 Critiques regarding the use of exchange rates

3.1 Summary of the critique

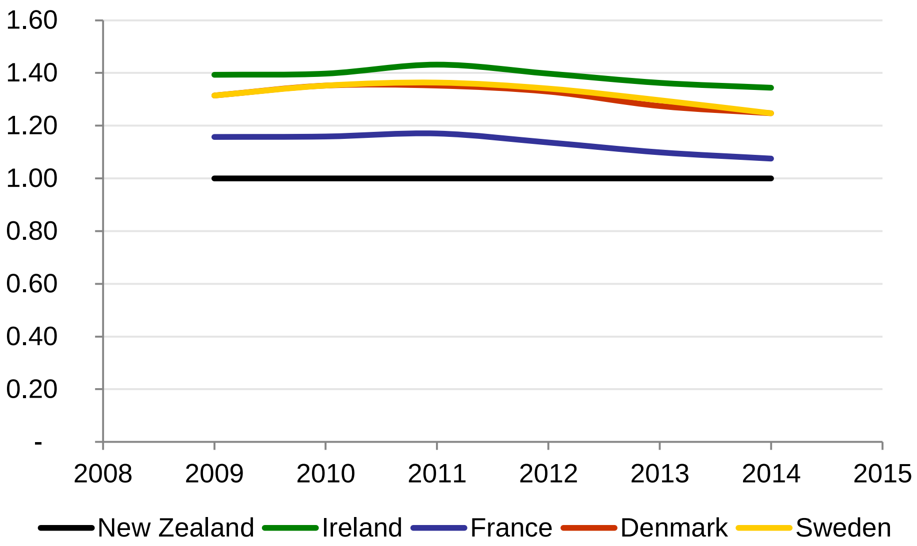
According to Network Strategies, Purchasing Power Parity exchange rates should be used rather than nominal exchange rates when comparing the prices of UCLL across different countries.

3.2 TERA response

3.2.1 Comparison of purchase power parities

The use of purchase power parities can provide relevant adjustments when comparing the costs incurred by the final purchaser.

Figure 1 – Relative PPP of the four benchmarked countries (NZ=100)



Source: OECD, analysis by TERA Consultants

It appears that not only New Zealand costs are higher than in the benchmarked countries, but, as purchase power is lower in New Zealand than in the benchmarked countries (in 2014, it was 26% lower as in Ireland, about 20% lower than in Denmark and Sweden, and 7% lower than in France), UCLL service appears costlier to purchase in the point of view of the final user.

PPP-adjusted results are provided in Table 2 **– Current UCLL price and national average cost of UCLL used in the remaining of the report to compare countries together**

TERA agrees that for some non-tradable components, such as labour, PPP is a more appropriate exchange rate than market exchange rates. For example in the 2012 IPP benchmarking the Commission used a blend of PPP and market exchange rates depending on whether goods and services are produced locally (PPP) or are traded internationally (market exchange rate).

For the comparison between Ireland, France, Sweden and Denmark we used market exchange rates for reasons of simplicity. If PPP rate was used, New Zealand costs would become even higher compared to using market rates. TERA notes that the use of market exchange rates does not change the result in terms of overall conclusions, which is that New Zealand prices were found to be higher than the comparator countries and this is due to key drivers such as average network length per line and trenching costs being higher in New Zealand.

3.2.2 Comparison of labour costs

Network Strategies states that labour costs should be lower in New Zealand than the sample countries, which may jeopardize the comparison with the selected countries.

The fact that New Zealand GDP per capita (consequently the labour costs) are lower than in the sampled countries do not prevent from comparing the costs of building the network.

It was stated in the International comparator report that the selection of countries was partly based on the fact the four sampled countries have a similar level of development to New Zealand, therefore similar levels of labour costs.

While GDP per capita in New Zealand is 18% lower than in the selected countries, the labour costs in the four benchmarked countries are in the same order of magnitude: it does not bias the relative cost of material and labour in the cost of building the network.

In addition, the costs of building the network are not inferred from the sole labour costs, but from the operator’s installation costs – that implicitly comprise of labour costs and productivity factors, both specific to the telecom network sector.

In any event, the best estimate of installation costs is the installation costs actually incurred by the national network operator, from which the unit costs used in the various models stem.

4 Critiques regarding the metrics used

4.1 Summary of the critiques

Network Strategies and WIK address several critiques and recommendations regarding the metrics deemed as drivers of UCLL costs.

Network Strategies suggests a broader use of the road network length (rather than access network length), distribution of loop length (distance from network node to end user), while WIK proposes the use of population dispersion.

In the next sections, TERA assesses the relevance of such metrics and compare those to the access network length per line.

4.2 TERA response

4.2.1 Possible use of road network length

TERA's *International comparators* report has considered in figure 5 the length of network infrastructure modelled by each NRA. This metric is more relevant metric than the total road network, as costs and regulated are derived from network infrastructure lengths.

For example, when two regions are connected through a motorway, access network is not rolled out there. This part of the road network is then not relevant for the costs of UCLL.

Thus, the total length of road network is less relevant than the length of road in inhabited areas, where the access network is deployed.

4.2.2 Possible use of loop length

It is important to note that average copper loop length does not help in understanding and comparing the cost of UCLL. Indeed, when buildings are concentrated but cabinets are sparsely located, average copper loop can be lengthy while its costs are recovered among a large number of lines.

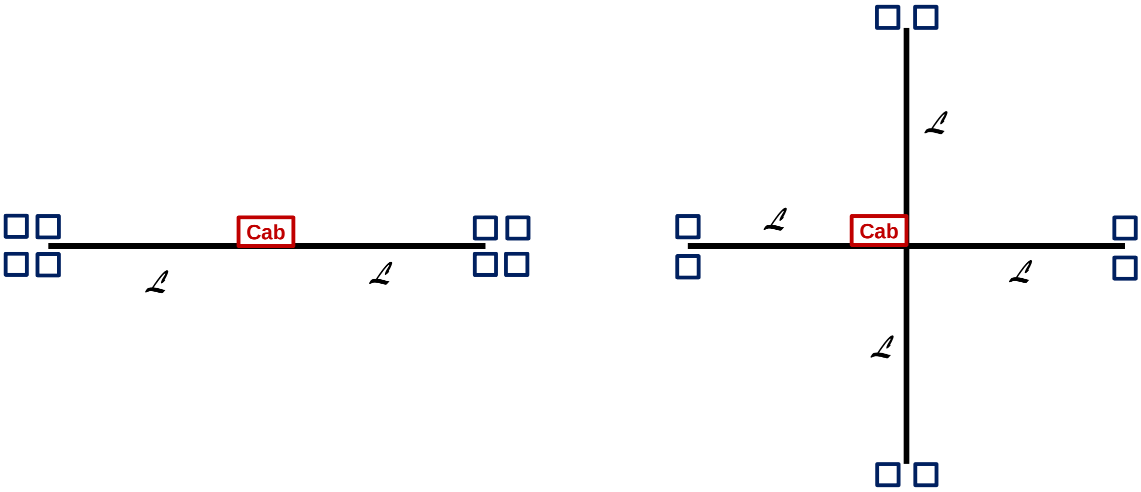
Average copper loop length does however reflect quality of service provided by DSL services.

Network length per active line, i.e. the total length of infrastructures divided by the number of active lines, is rather relevant to measure the average cost per line.

In the figure below, two networks are represented. Both have the same average copper loop length: L. However, the network on the right has a network length per line twice greater than the network on the left.

Indeed, the total network length in the left network is $2L$, recovered among 8 lines, i.e. $L/4$ per line, while the total network length in the right network is $4L$, recovered among 8 lines, i.e. $L/2$ per line.

Figure 2 – Average copper length and network length per line



Source: TERA Consultants.

4.2.3 Network length distribution

Network length distribution should not be confused with copper loop length distribution.

Copper loop length per line can easily be defined and its distribution computed in a straight forward manner.

However, network length per line can be defined in different ways:

- Incremental network length for each line;
- Allocated network length for each line.

In any case, average network length per line provides the best estimate of costs per lines as it stems from:

- Total costs (total network length);
- Total lines on which costs are recovered.

For instance, in figure 2, both networks have:

- The same total network length;
- The same total number of lines;
- Therefore the cost per line is similar.

But they have different network length distributions.

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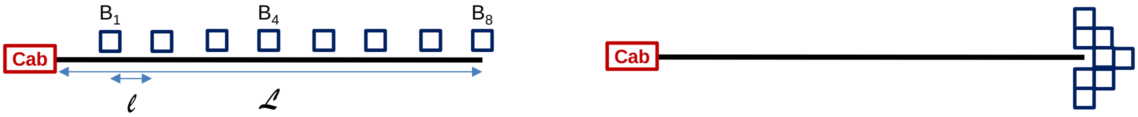
Figure 3 –Distribution of network length per line



Source: TERA Consultants.

In the right hand side, the network length is uniformly distributed among the buildings: all have the same network length per line, the average network length per line.

In the left hand side, the network length per line is heterogeneously distributed. It can however be defined in several ways:

- Network length for B_8 can be defined as $\frac{l}{8}+\frac{l}{7}+\cdots+\frac{l}{2}+l$, i.e. the share of each segment allocated to B_8;
- Or as l, the incremental length to connect B_8.

In any case, the distribution of network length per line is ambiguously defined and does not provide further insights on average costs per line, as compared to average network length per line.

4.2.4 Possible use of population dispersion

WIK suggests using population dispersion as an driver of network costs.

There can be multiple understandings of "population dispersion": population dispersion in space or population dispersion along the roads.

Population dispersion in space is population density. It has been demonstrated in the *International comparators'* report (see figure 4 of the report) that it does not capture well the costs of access network.

Regarding population dispersion along the road network, this amounts to computing the ratio of total road network length per line.

As stated above (section 4.1), total road network does not capture well the costs of access network as access infrastructures are not necessarily deployed along all roads.

What captures best the costs of infrastructures is the actual length of infrastructures: this is the chosen metric for the international comparator analysis.

We are not aware of any additional indicator, available for the countries identified in the benchmark, which would give a better overview of population dispersion in the specific context of this comparison of UCLL prices. For the example, the share of population living in urban and rural areas is not directly relevant. It could be also useful to understand how large cities in the different countries are dense. This exercise was conducted in the *International comparators'* report by comparing Dublin and Auckland for example.

5 Other critiques

5.1 WACC

5.1.1 Summary of the critique

Network Strategies recalls that the WACC used in the Swedish and Danish models are lower than in the New Zealand model and suggests harmonizing the WACC among the selected countries.

5.1.2 TERA response

TERA Consultants provided a comprehensive explanation of differences in depreciation factor stemming from differences in WACC in the *International comparators* report.

This analysis focused on the depreciation factor, which is based on the WACC, but also on the lifetime of assets and the price trend: depreciation factor is a key driver of the UCLL price, and a comparative analysis of it among the selected countries for that reason is provided in the *International comparators* report.

There is no requirement to compare, among the selected countries, the underlying factors of the depreciation factor (WACC, price trends, asset lives), as they are underlying factors.The relativities of the WACC between the four countries would be captured within the depreciation factor.

Indeed, the annuity – incurred each year by the HEO – is derived from the product of the investment and the depreciation factor.

For long term assets – such as infrastructures –, the depreciation factor is mainly driven by the WACC and the price trend. Indeed, since tilted annuities are used, annuities evolve along with asset prices.

Rather than harmonizing all the drivers of the UCLL price, each driver (network length, depreciation factor) has been analysed and compared among the models.

In the present case, depreciation factors for infrastructures have been compared among the selected countries in the *International comparators'* report. Therefore, harmonizing the WACC amongst the selected countries does not provide additional benefits for the comparison.

5.2 Common costs

5.2.1 Summary of the critique

According to Network Strategies, New Zealand and Denmark shall benefit from similar economies of scope since they have a similar population.

5.2.2 TERA response

In New Zealand, the access network wholesale provider (Chorus) has been separated from the retail provider (Spark). Hence, it is likely that the New Zealand UCLL provider benefits from less economies of scope on common costs than Denmark, where the wholesaler and retailer are still combined.

Also, it is important to note the boundary between what is accounted for in the corporate overheads and in the OPEX can vary from a country to another or from a company to another (e.g. in pay costs Sales and Marketing, Customer Services, Core platforms, Core network technicians). In the specific case of New Zealand, a number of costs identified as non-network costs would not be considered elsewhere as "non-network costs" in other models. After having removed costs that would not necessarily fall within the common costs category in some other countries (network IT costs for example), the ratio of non-network costs falls close to 10% which does not seem to be very different from what could be observed elsewhere.

In summary, it does not seem inconsistent that the share of common costs is greater in New Zealand compared to other countries (for example Denmark) because Chorus is a wholesale only entity. In addition to that, the issue seems simply an issue of cost categorising since some costs in New Zealand are considered as non-network costs while they would likely be considered as network opex in other countries.

5.3 Accounting of capital contributions in Sweden

5.3.1 Summary of the critique

WIK explains that putting TERA's metrics for New Zealand versus Sweden within the Swedish model shows that New Zealand costs should be much lower than NZD 38.

5.3.2 TERA response

TERA would like to note that the whole reasoning is based on a wrong assumption of a total investment of 40.5 billion SEK. As specified by WIK, this figure has been extracted from the consolidated Swedish model ***after*** removing some "expensed" costs (i.e. costs recovered by one-off fee that are not recovered by the line rental).

However, in Sweden most of the final-drop costs are considered as "expensed", where TERA in its benchmark specified that the benchmarked figures should consider the "same scope of costs (from exchanges to premises, excluding external termination point, but including final drop)".

For the purpose of the benchmark analysis, TERA has included the full costs of lead-in (except external termination point) in the New Zealand UCLL costs, while some lead-in infrastructures are excluded from the New Zealand regulated price, as well as in one other benchmarked country, such as Sweden.

TERA could not reproduce exactly the 40.5 billion SEK figure, however the sum (C_Cost_Category!M10:125 + V10:125) excluding the "expensed" costs at a level of 40.0 billion SEK seems to be a good proxy. The correct figure would be the sum including the "expensed" costs except NTP specific costs, that is to say 67.2 billion SEK, i.e. about 27 billion SEK missing costs – or 4.5-5 billion NZD.

Taking these additional costs into account (but excluding NTP costs) raises the total investment to 66.2 billion SEK – or 11-12 billion NZD.

When applying a cross-multiplication: 23.09 x 67.2 / 40.0 = 38.79 NZD. It results in a price comparable to NZD 38.13 given by the Commission's model in the July draft or to NZD 41.97 in the final model.

Some OPEX or common costs may not be proportional to CAPEX, therefore applying the cross-multiplication to CAPEX only would lead to 16.09 x 67.2 / 40.0 = 27.03 annual CAPEX. WIK accounted for 7.0 NZD of OPEX + common costs, which leads to 34.03 NZD.

The result of the adjustment of the Swedish cost model to New Zealand would therefore stand between 34.03 NZD and 38.79 NZD and would therefore be comparable to the result observed in New Zealand by the Commerce Commission. We note that Analysys Mason arrived the same conclusion in section 2.5 of their report for Chorus "UCLL and UBA FPP draft determination cross-submission" of September 2015.

In any case, TSLRIC models have been built in New Zealand as well as in Sweden to provide a robust assessment of the costs of building an access network and to prevent from inconsistencies that could arrive through a rough benchmarking analysis and through a lack of consideration of local factors. Thus, the costs stemming from TSLRIC models are compared – with harmonized scopes – but each of the TSLRIC models are developed on a stand-alone basis, without reference to each other. As a consequence, the exercise conducted by WIK can only be less precise than the development of TSLRIC models in New Zealand.

6 Updated main results

6.1 Updated national results

The *International comparators* report includes 3 tables which summarize the key results of the analysis (table 4, table 5 and table 6). These tables have been updated below (respectively table 1, 2 and 3) because:

- The New Zealand results have been updated accordingly with the most up-to-date models.
- WACC has been decreased.
- Unit costs (including joints, distribution points) have been updated.
- Some Ireland metrics have been added following the publication by ComReg of further documentation related to the bottom up LRIC model.

Table 1 – New draft UCLL price estimates

	Leveled price	2016	2017	2018	2019	2020
UCLL price	*30.63*	*29.75*	*30.22*	*30.70*	*31.19*	*31.68*

Source: Commerce Commission

Table 2 – Current UCLL price and national average cost of UCLL used in the remaining of the report to compare countries together

NZD/line/month	Current UCLL price	National average cost of UCLL	National average cost of UCLL (PPP-adjusted)
New Zealand	***30.63***	***41.97***	***41.97***
Ireland	*18.49*	*47.22*	*35.41*
Denmark	12.75	12.75	*10.46*
Sweden	16.09	17.26	*13.98*
France	14.93	23.82	*23.10*

Source: TERA Consultants

Table 3- Synthesis of key metrics driving UCLL costs

	New Zealand	Ireland[2]	France	Sweden	Denmark
Active lines (million)	***1.76***	*[ ]*	32.80	4.57	2.59
Cost per line (NZD/month)	***41.97***	*47.22*	23.82	17.26	12.75
% aerial	***46%***	*[ ]*	67%	[ ][3]	0%
Network length per line (m)	***66.5***	*[ ]*	41.2	51.2	55.0
Density (people/km²)	***15***	*60*	112	20	126
Depreciation factor for trenches	***4.2%***	*[ ]*	9.7%	7.0%	4.9%
Average trenching cost (investment – NZD/meter)	***91.3***	*[ ]*	88	52	34

Source: TERA Consultants

6.2 Urban and non-urban results

Urban and non-urban results (without adjustment) are detailed below.

They correspond to the regulated prices, i.e. based on a fibre + FWA network, with a scope narrowed to TSO areas and within-property lead in excluded from modelling.

Table 4 – Urban and non-urban regulated prices in New Zealand

	Leveled price	2016	2017	2018	2019	2020
National	*30.63*	*29.75*	*30.22*	*30.70*	*31.19*	*31.68*
Urban	*20.74*	*20.16*	*20.47*	*20.78*	*21.11*	*21.43*
Non-urban	*56.03*	*54.39*	*55.26*	*56.15*	*57.07*	*58.00*

Source: TERA Consultants

[2] Data not public.

[3] Data not available.

7 Appendix

The table below lists all the critiques to be addressed by TERA in this report.

	Submitter	Key points/position	Para reference
1	Network Strategies (NWS)	Tera use an old version of the Swedish model	p. 103
2	NWS	Ireland should be excluded because of a lack of public information	p. 97-98
3	NWS	Currency conversion by TERA should be rejected as it uses pure exchange rates	p. 99
4	NWS	Error in adjustment of Ireland's price	p. 100-101
5	NWS	Critique use of road network per active line then use this method to suggest Sweden is similar to NZ.	p. 104-105
6	NWS	Loop length data from the IPP suggests New Zealand should be cheaper	p. 105-106
7	NWS	Common costs higher in NZ but should be similar	p. 106-107
8	NWS	The Commission's WACC increases the costs significant in Denmark and Sweden	p. 107-108
9	Spark (Submission to July Further Draft)	"No information is provided in Attachment Q, or the TERA report to indicate how network length per line is distributed around TERA's measure of length. This is significant as the distribution of line lengths has an important impact on costs".	§ 421
10	WiK (Submission to July Further Draft)	TERA's review of WiK's treatment of capital costs in their Sweden/NZ analysis, including the value of the capital costs not included and the estimated price had they been included.	p. 123-125
13	WiK	WiK contends that the population dispersion between New Zealand and Sweden cannot be that different given levels of urbanisation are similar. WiK are also not convinced that network length per line is higher in New Zealand and queries whether it is a modelling error.	p. 128-129