

Review of Submissions by Operators and Reports by Consultants relating to the NZ Commerce Commission's MTAS Investigation

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1 Introduction

This study was carried out by WIK-Consult on behalf of the New Zealand Commerce Commission (the Commission) during the period from 22 May to 9 June 2009. It consists of reviews and critical evaluations of submissions by Telecom, Vodafone and NZ Communications in response to the Commission's "Comments on undertakings received in relation to the MTAS Investigation" of 25 March 2009, as well as of the reports prepared by Covec for Vodafone and NERA for Telecom. The review focuses on issues raised in the submissions and reports as they relate to cost modelling based on the standard of forward-looking long-run incremental cost (FL-LRIC) and the use of benchmarks from other jurisdictions that are derived on the basis of this standard. Procedural issues, that make up a large part of the five documents, are not addressed.

The report is organised as follows: Section 2 contains a discussion of the concept of FL-LRIC consisting of some general comments followed by observations regarding the use of the concept by the Commission. Section 3 takes up, in this order, the report by Covec and the submission by Vodafone which as regards costing issues primarily uses the arguments of the Covec report. These two documents are the most extensive in their comments on costing issues. The review in Section 3 also covers Covec's comments on WIK-Consult's report for the Commission of 22 December 2008 entitled "Cost Driver Sensitivity Analysis with Mobile Cost Models". Section 4 reviews, in this order, the report by NERA and the submission by Telecom. Section 5 addresses comments regarding costing issues brought forward by NZ Communications.

2 The concept of FL-LRIC and its uses

2.1 General observations

The concept of forward-looking long-run incremental cost (FL-LRIC) has become the standard for cost determination in telecommunications regulatory practice around the world. This standard envisages costs that an efficient provider incurs when producing and offering to the market at present and in the future a given portfolio of communications services. The terms "forward-looking" and "long-run" together mean that it is the question of costs that in the long run are *all* variable, variable in the sense that depending on developments they may arise or not, respectively, are decided upon through the enterprise's management as a function of the development of business prospects at the given points in time now and in the future. This means that there are effectively no or only very few costs that are fixed and could not be increased or lowered as time passes and conditions change. The term "incremental" in turn implies

that it is the question of costs of a particular service or bundle of services that arise in addition to the costs of other services that are provided by the same provider.

The efficiency requirement is justified with reference to the operations of a competitive market. In such a market a provider can only set prices as high as the costs of efficient provision since prices above this standard would be competed away by other providers. Efficiency in turn implies that the relevant network must be based on best industry practice as that is the technology that a new entrant into the market would use. Thus the standard requires not necessarily to determine the cost of a currently existing operator but rather that of the new entrant ready to bring to market services using the best available technology, which will be the cost of existing operators only if these are in fact disciplined accordingly.

The forward-looking aspect of the standard implies the absence of cross-subsidisation over time which in turn requires the use of economic depreciation of assets. If a piece of equipment is installed to provide services over a number of years, economic depreciation in a particular year corresponds to the loss in value of that asset during that year. The loss of value of an asset during any time period is the value of the services (services in terms of the added value it produces) that it will not be providing any more due to the passage of time. Given that the asset's value is determined by output prices that will be equal to costs due to the effect of competition (or due to regulation that implements prices as if there were competition) that depreciation thus corresponds to the share of the services produced in that year relative to total services produced by the asset over all the years of its useful life, evaluated such that its present value corresponds to the purchase price of the asset. In particular this means that if there is growth and a piece of equipment will at the beginning provide lower volume of services than in the future, economic depreciation will call for lower amounts of depreciation at the beginning and rising amounts in the future.

Regulatory authorities often use bottom-up cost modelling to implement the FL-LRIC cost standard. In fact, bottom-cost modelling is well suited to implement the standard as all the aspects of the standard can flexibly be implemented with it. The prerequisite is that the relevant model (implemented through computer software) is in a position to design an optimised network and determine costs of the elements of that network that will also reflect the expected future market developments. On the other hand, the model's parameterisation should be flexible enough so that particularities of the given jurisdiction, aspects of uncertainty and risk, and justified claims of the regulated operators can also be taken into consideration.

If we now turn to the practice of FL-LRIC implementation by regulatory authorities we note that the above principles are not generally strictly adhered to. The following is a list with examples of deviations both as regards results and the very process of the corresponding modelling exercises :

- (1) On the assumption that there is competition on the retail level, costs of operators' current volumes are determined. It is generally neglected that this competition is of an oligopolistic nature with prices that tend to be still substantially above cost so that volumes are lower than they would be if there were vigorous competition typical for a market with many providers, which in turn implies higher cost..
- (2) Costs of individual existing operators are used.
- (3) Costs are determined that are not those derived for a network according to the most efficient technology.
- (4) Costs are used that were derived from the so-called top-down costing approach which is based on the cost accounting records of existing operators. This approach is usually not as flexible as bottom-up cost modelling although it is also capable of generating credible results. Since, however, these data are largely under the control of the operators and given the latter's interest, there is always the risk that inefficiencies and other factors that tend to inflate costs are not identified and compensated for.
- (5) There is too intensive an interaction between regulatory authority and the operators in the process of cost determination with the risk of allowing operators too large an influence on the result.

There may be good reasons on the part of a regulatory authority for some of these or other deviations from strictly applying the FL-LRIC standard. For example, using the individualised cost of an operator (2nd bullet) may be justified due to credible differences in the business case between operators or due to restrictions on the endowment with certain resources (frequencies) that the operators have no influence on. Also it may not be advisable to base cost on the most efficient available technology (3rd bullet) when there is still too large a risk regarding the success of this new technology. Nevertheless there is strong evidence that regulatory authorities have often to too large an extent allowed that these factors influence cost determination with an effect of an upward bias.

At least in one corner of the world there has been a vigorous reaction to this state of affairs. It is in the form of the European Commission's most recent recommendation on the regulatory treatment of termination rates in the EU.¹ It starts by noting the divergence between price control measures prevailing across EU Member States and the significant variety in the chosen costing tools and the different practices in implementing those tools, having the effect of widening the spread between wholesale termination rates applied across the Union. Further it states that "the absolute level for mobile termination rates remains high in a number of Member States compared to those applied in a number of countries outside of the European Union, and also

¹ See Commission of the European Communities, "Commission Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU".

compared to fixed termination rates generally, thus continuing to translate into high, albeit decreasing, prices for end-consumers".² As a consequence it proceeds to recommend a costing procedure based on an interpretation of LRIC that has been called "pure" LRIC. One crucial aspect of the approach is that it considers termination as the service that the operator has taken into its portfolio as the very last service so that it would be justified to assign to it only those costs that would not be incurred were termination not provided. The effect is that the cost so determined would benefit most from all the economies of scale and scope that have been reaped due to the relevant network's overall size while the costs of all other services, in particular on-net calls, would have to include all the cost components that arise due to indivisibles and overhead activities. The recommendation also advises that for the determination of such costs the use of bottom-up costing methodology would be the most suitable.

WIK has its problems with the costing approach proposed in the recommendation. There is no reason to assume that termination is the last service an operator provides for in its network; after all, operators have been realising the greatest profit from it. The approach effectively declares termination to be a service that somehow causes costs differently than other services which, however, on grounds of logic cannot be. One of the consequences would, for example, be that a call from Auckland to Wellington carried by a carrier on-net would "cost" more than the same call that was handed over from the originating network to another network for termination, which would be using very much identical facilities. The LRIC concept allows to define the increment for which costs are to be determined at any level. Besides a particular service, the increment in question may be a bundle of services, the output of the whole network, or even all the activities of a company. What is decided on by choosing a particular level at which the incremental costs are to be determined is the level of detail with which information regarding cost causation can be used in assigning costs to the increment. Having chosen an increment at the level of a particular service – thereby determining incremental costs at that level due to the use of particular facilities and items of equipment – does not obviate the necessity of also assigning to it additional costs arising at other levels of the organisation in which this service as part of the total activities of the organisation had also a share of causing. LRIC is a long-run concept in which all costs are in the long-run variable, including the costs of overheads, and variations in those costs are due to the overall activities of the company of which the service in question is a part. From this follows that the service of termination should be assigned its share of this cost as any other.

WIK does not fault the EC for the objective but feels that for this purpose the principles of proper costing methodology should not be compromised. A possible rationale for the EC's specific approach may be that it sees operators not competing vigorously at the

² Ditto, recital 3.

retail level, being able to charge high termination rates and as a consequence high rates for calls into competing networks while prices for on-net calls are kept relatively low. Since on this observation on-net calls are priced "as if" they had lower costs than calls to be terminated, the EC's approach would amount to a strategy to force the charges for termination to a comparable level for the purpose of which it is argued that costs are "as if" they were according to the "pure" LRIC level. WIK nevertheless would rather prefer that the EC's objective be achieved by a more strict application of the LRIC costing principles, approximating as best as possible the conditions under vigorous competition, basing costs on corresponding volumes and avoiding the slippages described earlier.

In another parallel development, there has been a decision on termination rates by the Austrian regulatory authority Telekom-Control-Kommission (TCK) dating from April of this year that will bring about substantial decreases in the level of termination rates in this country. TCK did not determine the costs on the basis of a bottom up model but apparently used company accounting records to establish the costs of termination for each of the four mobile operators. Then, referring to the "law of one price" according to which there must be one price for the same service, it picked the lowest cost, i.e. that of the 3G operator Hutchison, which is 2.71 € cent per minute for 2009 and of 2.01 € cent per minute for 2010. TCK announced that the latter rate will be implemented by the end of 2010 which will mean a decrease of more than 50 % relative to the current rate of 4.5 € cent per minute

We feel that the most important aspect of the decision of TCK is the use of the cost of the 3G operator Hutchison. This shows that the 3G technology is fully functional and represents current best industry practice. One should expect existing mobile operators to switch to fully functional 3G technology soon. Since this is the most efficient technology, and given that any new operator to enter the market will employ it and thereby define the competitive standard for all other operators, the cost of this technology should underlie the costs of termination. Arguments of incumbent operators that the "realities" of the market are such that the costs of operating two networks, one still 2G and another one emerging as 3G, should be blended together, in effect biasing costs upwards, are not valid. As mentioned, the competitive standard will be set by new operators building new 3G networks competing in end-user markets with incumbent operators with prices supported by that technology, and incumbent operators will have no choice to compete with comparable prices. Customers of these operators at the retail level will not be impressed by the argument that they still need to pay higher prices because of the operators' need to run two networks. The charges for the wholesale service should accordingly also be based on the cost of most efficient provision. Doing otherwise would be tantamount to conceding to incumbent operators the status of a monopolist that is allowed to load off onto users the cost of its inefficiencies and sunk costs.

3G technology offers greater scope of services and lower costs of existing services. That is why all operators are switching to it and all new operators are building networks based on this technology. Effectively, 2G technology should by now be considered obsolete and regulated prices should be according to costs of 3G technology, as has actually been ruled by the regulatory authority of Austria based on its findings of actual costs. However, as long as a pure 3G operator has not appeared on the scene, as long as the incumbent operators may claim that their 3G operations are still not fully operational and there are uncertainties regarding their costs, the most that these operators should be able to claim would be to have for the time being their costs and rates of termination based on efficient provision of services by 2G technology.

2.2 Use of the FL-LRIC standard by the NZ Commerce Commission

In its current investigation on the mobile termination access service (MTAS) the NZ Commerce Commission (Commission) has used the results of bottom-up cost model exercises based on the LRIC standard, that were carried out in other jurisdictions, as benchmarks for its preliminary assessment of the level of the cost of terminating calls in New Zealand mobile networks. It thereby adhered to the statement in its Mobile Termination Issues Paper of August 2008 that:

The Commission considers that the basis for calculating costs for access bottleneck services should be forward-looking long-run incremental costs (FL-LRIC). Such a methodology promotes efficient production and consumption, and minimises potential competitive distortions. In a competitive environment, operators would compete on the basis of current or forward-looking costs based on efficient technologies available in the timeframe considered.

Actually, the results of bottom-up cost modelling exercises from nine countries were used for which the cost levels in vary between 0.0526 NZ\$ and 0.1290 NZ\$ per minute. The Commission used the median value of 0.0694 NZ\$, pertaining to Sweden, as the basis for its own benchmark of 0.07 NZ\$.

Given its decision to use benchmarks, the Commission's approach is generally consistent with its objective. In the light of the discussion in the preceding subsection, we nevertheless venture to offer a few observations that caution against the relevance of the benchmark thus derived. At least a substantial number of the results on which it is based suffer from the deficiencies noted in our discussion above. All correspond to volumes of services that were realised in oligopolistically structured markets with retail prices still relatively high and therefore these volumes being still low relative to what they would be in an effectively competitive market. As we have discussed, this translates into lower economies of scale and therefore higher costs. In the case of at least four countries, i.e. the UK, the Netherlands, Norway and Denmark, the modelling

exercises were carried out in close cooperation with the regulated operators implying the tendency of an upward bias in the calculated costs. The Norwegian regulatory authority used a hybrid model for which the parameterisation was at least in part based on information from the operators, and in fact individual cost levels were determined. In the UK case the costs of 2G and 3G technologies were blended. While it must be recognised that some of the operators' interventions may have merit and in such cases should be taken into account, the overall bias of this interaction tends to be upwards and never downwards.³ Given thus the tendency toward upward biases, the Commission may have been well advised not to use the median value from the range of cost figures surveyed but, say, an average value from the three lowest figures. This would correspond to the approach recommended by the European Commission about ten years ago when giving advice on which interconnection charges (not costs) to use as benchmarks when determining such charges.⁴ This was at a time when cost modelling was not yet as prevalent as at present and benchmarking was more than today a common practice on the part of regulatory authorities.

We conclude this section with a comment on the Commission's benchmark for SMSs. For the termination of SMSs, the Commission set its benchmark at 0.01 NZ\$ per message. This figure appears to be very high. In our previous report to the Commission⁵ we had pointed out that according to the standard conversion rule the capacity of one minute of voice calling is sufficient to carry 432 messages. Even after factoring in the cost of the service centres needed to handle SMSs, the WIK cost models referred to in this report determined costs for an SMS that ranged between 0.00025 € and 0.00063 € per message which correspond at most to 1/8 of the figure set by the Commission.⁶

³ Assuming that regulatory authorities are committed to objectivity and have no agenda of actually setting prices below costs, assuming thus that their cost modelling is done in this objective way, errors and mistakes in the modelling discovered later on should also occasionally go in the downward direction. But they actually always never do.

⁴ See Annex II "'Best Practice' Interconnection Charges and their Derivation" in Commission of the European Communities, "Commission Recommendation of 8 January 1998 on interconnection in a liberalised telecommunications market (Part 1 – Interconnection pricing)". The annex starts with the statement: "The approach taken is to use the interconnect charges in the three lowest cost Member States (for which data was available at 1 September 1997) as the starting point for a set of 'best current practice' figures at which to aim in the short term.

⁵ WIK-Consult, "Cost Driver Sensitivity Analysis with Mobile Cost Models", Report to the New Zealand Commerce Commission, 22 December 2008.

⁶ The objective of these costs models was to carry out cost driver sensitivity analyses and not determine actual cost levels, as discussed in section 3.1 of this report, and the cost models were to some extent homogenized to increase comparability. The estimated costs for an SMS from these models should therefore be treated as indicative rather than being a determination of actual costs.

3 Review of the report by Covec and the submission by Vodafone

3.1 The report by Covec

The first part of this review consists of an evaluation of Covec's comments that relate to WIK-Consult's earlier report for the Commission of 22 December 2008 entitled "Cost Driver Sensitivity Analysis with Mobile Cost Models". For this it starts with some preliminary observations and then takes up three topics for which Covec refers to the WIK report. Following this two further topics are also covered.

Preliminary observations regarding the earlier WIK-Consult report

The earlier report by WIK-Consult was not intended to provide estimates of the cost levels for the termination in particular mobile networks but rather be an exercise, as the title indicates, in cost driver sensitivity analyses using several cost models that are specified in a way that such analyses could meaningfully be carried out. Three models constructed by WIK-Consult and the Analysys model as applied to the UK were used for this analysis. The three WIK-Consult models were differentiated according to the types of countries to which the models apply, where the types were designated as "SD: small densely populated", "MD: medium sized densely populated" and "LS: large sparsely populated". This differentiation served the purpose of giving an impression of the fact that – quite contrary to what Covec make of them – the differences in the costs of networks in such diverse territories might after all not vary that dramatically. The difference between the costs of the networks in the two most different country types, i.e. the small densely populated and the large scarcely populated country, was shown to be only 0.67 €cent per minute or less than 20 %. The report did not emphasize this since, as indicated above, the objective was to carry out cost driver sensitivity analyses and not determine actual cost levels. Also it should be noted that the three types of WIK-Consult models were to some extent homogenized to increase comparability. For example, all three model networks were endowed with 900 MHz spectrum only, while at least for several cases of actual applications dual band operations were modelled, with overlay cells using 1800 MHz frequencies, for which costs would be lower due to the savings of cell site development and towers. Further, for purely technical reasons, the cost per cell site plus BTS equipment was set at a similar value of 190,000 to 200,000 Euros in each of the WIK-Consult models which in terms of current prices is much too high. That cost levels were thus raised above realistic levels, is by the way illustrated by the fact that the LS type model, for a 35 % market share, shows a substantially higher cost per minute than was determined in the modelling exercise carried out by WIK-Consult for the Australian regulator ACCC for a carrier of 31 % market share in which this type of model was used.

Given the purpose of the earlier WIK-Consult study, and in particular given the above observations, it is obvious that the cost levels for termination that served as points of reference for the results of the sensitivity calculations, could not serve as benchmarks for the cost levels for networks in New Zealand. This is most certainly the case for the figures from the three WIK-Consult models which were used in the arguments presented by Covec. These arguments are nevertheless taken up in the following and scrutinized as to what their validity might have been.

In its efforts to show that the costs of termination in mobile networks in New Zealand are higher than the benchmarks developed by the Commission, Covec uses and refers to WIK-Consult results and analysis relating to three different issues. These are:

- The discussion in their Section 2.1.2 that the Commission neglected comparability concerns when developing its benchmark.
- The discussion in Section 2.2 that, given the cost/volume elasticities that resulted from the sensitivity analyses, and given the levels of traffic in New Zealand and the countries that were part of the sensitivity analyses, the costs in New Zealand networks should be considered much higher than the Commission's benchmark.
- The point made in its Section 2.3.1 that WIK-Consult is wrong in arguing that the costs of outgoing 2G and emerging 3G networks should not be blended for the purpose of constituting a basis for prices of termination.

In the following each of these points will be examined and evaluated regarding its validity.

Comparability issue

Each of the country types that differentiate the three models used in the sensitivity analyses is illustrated with reference to three countries that would not be unlike those types, i.e.:

- SD (small densely populated): Austria, Switzerland, Slovakia;
- MD (medium sized densely populated): Germany, France, UK;
- LS (large sparsely populated): Canada, Australia, Brazil.

Covec claims that none of these countries are like New Zealand. It continues, however, to compare the MD countries with New Zealand pointing out that as regards area New Zealand is similar to the UK but smaller than the other two and has a smaller population density than any of these three countries. The implication is that due to the higher population density in these countries the mobile network costs should be lower than in New Zealand. Covec then converts the base case cost figures from the WIK-Consult sensitivity analysis from € cent into NZ\$ cent to find that the resulting figure lies above

the Commission's benchmark. The intended implication is clearly to show that the Commission's benchmark is too low in comparison to the cost levels from the WIK-Consult exercise. This comparison, however, neglects completely that, as pointed out above, the base case cost levels used in the sensitivity analysis could not be used for this purpose given that for this analysis their levels had artificially been inflated.

Covec in this context also points out that WIK-Consult's results depend crucially on local conditions, where its focus is on differences in area, population density and per capita GDP. This statement is *per se* unobjectionable but with its focus on the three mentioned aspects it is jumping far too short. As is evident from the discussion in Section 2.1, it excludes other much more important characteristics, for example the degree of competition in the given mobile markets and, as far as the results of costing exercises and regulatory price setting are concerned, the effects of the lobbying efforts on the part of operators with the aim of influencing regulatory authorities in the direction higher termination rates.

Based on WIK-Consult's own cost modelling experience, the cost arrived at in the Australian costing exercise of 5,8 AU\$ cent per minute may be the closest to what could be expected from a similar exercise for New Zealand, where this would nevertheless probably still be on the high side. New Zealand is smaller than Australia and has a higher population density which, in terms of Covec's own criteria (reversing the statement in cipher 39 of its report), would tend to cause New Zealand to have lower mobile costs. More importantly, while the degree of urbanisation in New Zealand and the degree of penetration are quite similar to those in Australia, the share of cells that are coverage instead of traffic driven is most likely to be smaller than in Australia as one expects the non-urbanised population there to be dispersed over a much larger area. This again implies lower cost. Having said this, it holds in addition that, as discussed in Section 2.1, if the degree of competition due to the oligopolistic structure in the mobile services market gave way to the sort of vigorous competition typical of a market with many providers, in which lower prices at the retail level fuel increased use and cause greater volumes of traffic, cost would drop below what would be determined by these costing exercises.

The effect of economies of scale

The sensitivity analyses included the determination of the effects on costs of varying volumes provided by the networks in question. Covec uses the resulting elasticities in an attempt to calculate the cost for a minute of mobile termination for the case of New Zealand. It uses the three sensitivity exercises reported by WIK-Consult that involved the effect on costs of substantial changes in volumes (reported in Tables 1, 2 and 5). It must be pointed out that in two cases (examples from Table 2: effect on cost of quantity changes in the MD models between 2005 and 2007; and from Table 5: effect on cost of

volume changes in the Analysys model for the UK) Covec's calculations are not transparent so that comments are restricted to the remaining example from Table 1. In any case, the criticism formulated below would apply as much to the examples not commented on.

Covec's argument based on the results from Table 1 of the WIK-Consult report is apparently as follows:

- The mobile termination cost in the LS country involving 11.5 billion minutes is calculated to be 8.18 NZ\$ cpm.
- This cost reacts with an elasticity of -0.71 to changes in volume.
- The volume in the SD country of 4.2 billion is approximately representative of the volume in New Zealand; New Zealand is however, otherwise similar to the LS country.
- Using the cost shown in Table 1 of the WIK-Consult report for the LS country as reference point, assuming that its volume decreases to 4.2 billion, which means a decrease of 63.4 %, further determining the percentage change in cost by multiplying this volume percentage change with the elasticity of -0.71, Covec arrives at an increase of the cost calculated in the base case for the LS country equal to 45 %, i.e. an increase from 8.18 NZ\$ cpm to 11.87 NZ\$ cpm (see Table 6 in its report).

Only a little reflection will show that the above argument is completely fallacious. It involves, as it were, a comparison between apples and oranges. Two similar countries, the one large and the other small, the one with volumes of traffic, say, three times as large as the other, could have very similar costs per minute, provided only that their distribution of population (both residential and working people during the busy hour) and consequently the relative shares of cells driven by traffic, on the one hand, and driven by coverage, on the other hand, are similar.

Now, the WIK-Consult sensitivity analyses derived cost/volumes elasticities that must be seen as results in the context of networks in their respective countries with given shares of cells that are either coverage or volume driven. If demand for the services of these networks changes substantially, say demand decreases by more than 20 %, and the network is accordingly reconfigured, the number of coverage driven cells increases and the number of traffic driven cells decreases which has the effect of increasing cost. As already made plain by the preceding paragraph, one would observe nothing like this when first looking at the large country and then at the small country when these are similarly structured, which, as argued in the preceding subsection, may well be the case for New Zealand and the LS type country in the WIK-Consult report.

The cost of 2G vs. the cost of 3G technology

Covec takes issues with WIK-Consult's statement that for the purpose of determining the cost of termination there should be no blending of the costs 2G and 3G technology. Covec claims that by taking this approach the WIK model ignores the reality faced by existing mobile operators, which is that they previously invested in a 2G network and are now transitioning to a 3G network. It would be unrealistic to assume that an operator only operates a 2G network, or that transition to 3G could be done instantly or without cost.

We have dealt with this issue already in Section 2.1. We argued there that 3G technology offers greater scope of services and lower costs of existing services and that for this reason all operators are switching to it and all new operators are building networks based on this technology. According to the competitive standard, 2G technology should by now be considered obsolete and regulated prices should be based on the costs of 3G technology. However, as long as a 3G operator has not appeared on the scene, as long as the incumbent operators may claim that their 3G operations are still not fully operational and there are uncertainties regarding their costs, the most that these operators should be able to claim would be to have for the time being their costs and rates of termination based on efficient provision of services by 2G technology.

Regulated rates as benchmarks

Section 2.3.2 of the Covec report presents a compilation of prices (instead of costs per minute) for eleven countries. The list includes price data for the nine countries covered by the Commission and adds two more countries on the grounds that the Commission had (a) included the one (Austria) in a previous exercise and (b) initially considered to include the other (Spain) but was prevented from doing so because of confidentiality concerns, a reason which would not hold for the actual termination rate. The median value turns out to be substantially higher than the Commission's benchmark and, of course, the 75th percentile value is still higher.

Besides pointing out once more, that many of these regulated rates are biased upwards as a result of the effects discussed earlier in this report, it is worthwhile noting the result if the EC's recommendation of ten years ago (referred to in Section 2.2) is applied, i.e. take from the list the average of the lowest three values as benchmark. The value is below the Commission's benchmark. Furthermore, that value would drop again significantly if the price data from the recent Austrian decision and from Cyprus were included.

The effect of urbanisation and population per cell site on the rate of termination

Section 3 of the Covec report presents an econometric analysis essentially examining the relationship between the rate of termination and, as explanatory variables, the population density per cell site (either for all sites or only for urban sites) and the degree of urbanisation. The impact of the two explanatory variables is postulated to be negative. The data used come from the mobile networks that Vodafone operates in 16 countries. The econometric results show that the two explanatory variables have a statistically significant negative impact on the value of the termination rate. In other words, the greater the number of people covered by a cell and the greater the degree of urbanisation, the lower will be termination rate. Other explanatory variables, such as total population, urban land area, real GDP per capita or the use of cost models show no significant impact.

Using the coefficients from the econometric analysis together with the values of the relevant explanatory variables (not revealed due to confidentiality concerns), Covec calculates for New Zealand expected termination rates of 17.96 cpm and 18.35 cpm depending on whether "total population per cell site" and "urbanisation" are used as explanatory variables or only "urban population per cell site".

The negative relationship found by Covec is *per se* not surprising. Methodological questions, however, relate to the assumed linearity of the relationship and the resulting values of the coefficients. If concavity of the relationship between the termination rate and, in particular, the population per cell site were imposed, which appears to be the more plausible relationship than linearity, different coefficient values would probably be estimated. More importantly, instead of the variable "urban population per cell site" another more relevant variable should be used, like "urban presence per cell site during the busy hour" which would result from a blending of residential people in urban areas (not at work during the busy hour) and working people in urban areas (having moved into them during the busy hour of the work day). Again this would have substantially influenced the econometric results. Most generally, however, the results suffer from the fact that the overall level of the termination rates from the Vodafone sample appears to be high (relative to the actual cost levels that have most recently been determined) which would be due to the upward biases discussed in Section 2.1. This upward bias should hold for most of the 16 country values but especially for those in the left tail of the data set (i.e. in the plot of the termination rate against population per cell site, see Figure 5 in the Covec report). Correction for this upward bias would necessarily have the most dramatic – downward - effect on the econometric results, especially on the estimated termination rates for New Zealand.⁷

⁷ The termination rates in the Vodafone sample apparently derive from the data that the ERG regularly publishes, where those used are the ones valid as per July 2008. Most tellingly, some of the rates that in

3.2 The submission by Vodafone

On page 33 of its submission Vodafone lists seven concerns with the evidence that the Commission has used for forming its preliminary views on the cost of mobile termination. Below these concerns are reviewed and evaluated insofar as they touch on costing and pricing issues.

Benchmarks do not provide evidence of the cost of termination in New Zealand

The assumptions underlying the Commission's exercise is that there is a typical value for the cost of termination in a mobile network and that observations of cost levels resulting from relevant costing exercises would encompass this typical value. If there is the risk that the observations contain a relatively large share of extreme values, it is then good practice to use the median as an estimate of the typical value. As was shown in Section 2.1 of this report, there appears to be a risk of extreme values especially toward the high end of the benchmark values. So the use of the median appears to correspond to well founded statistical practice.

There is wide variation in cost estimates and that for New Zealand could lie anywhere in the given range

This is a question of probability. If, as just pointed out, there is a risk of extreme values due to upward biases, these extreme values should be discounted. Otherwise, on the grounds of results from probability theory, one is to select a central value that best describes the data. The median is under the given circumstances the best such central value.

It is claimed in the submission that the relevant cost could be anywhere within the range. This of course means that it could be as well near the lowest as near the highest value. Given the noted biases, however, there is a larger probability that the correct value is actually near the lower end.⁸

the Vodafone sample are among the highest had by January 2009 been decreased quite substantially, for example, Poland (-48%), Portugal (-34%), Hungary (-26%), and Greece (-22%). Needless to point out that this underlines the argument in the text.

⁸ To continue this train of thought: while the Commission may not know precisely what the cost of termination of Vodafone is, it may well know what Vodafone's price for on-net calls is. Given that on-net calls use twice as much in terms of network resources as the termination of calls does, the latter's cost should be no more than half of that price.

As shown in the report prepared by WIK-Consult, New Zealand has characteristics dissimilar to those in countries from which the benchmarks are derived

In Section 3.2 it is shown that at least one country from the benchmark countries, i.e. Australia, can well be compared to New Zealand, in the sense that a number of New Zealand's characteristics would even tend toward lower costs than there. The benchmark that the Commission determined lies above the cost from the costing exercise carried out by WIK-Consult for the ACCC. On the evidence just referred to, the benchmark for New Zealand should actually lie below that for Australia.

Regulatory authorities set regulated prices higher than costs based on the LRIC standard

There is at least one very recent counter example, i.e. the Austrian regulatory authority that decided on a termination rate that corresponds exactly to the cost of efficient provision determined for it by a group of external advisers. The rate, to be enforced by the end of 2010, corresponds in New Zealand currency to about 4 cpm. Another counter example appears to be Cyprus where the regulatory authority has set a mobile termination rate for the incumbent operator of 2.06 € cent per minute and has justified it with reference to a top-down cost determination. It may be that the regulator in setting this price went beyond this cost, maybe by a substantial margin – but this cost would indeed be very low.

In addition there appear to be a number of proceedings under way in Europe that will lead to termination rates according to the EC's recommendation on this subject (see the discussion of this recommendation in Section 2.1). These proceedings are likely to lead to determinations of termination rates that will be much lower than current ones and can be expected to be close to the costs arrived at on the basis of cost models. In the past there has been a hesitancy on the part of regulatory authorities to regulate termination down to the level of an effectively competitive market for reasons similar to those that were touched upon in Section 2.1.

The WIK model fails to take account of the transition costs mobile operators face in moving from 2G to 3G networks

As discussed in Section 3, the cost estimates involved in the sensitivity analyses carried out by WIK-Consult were not meant to provide a basis for the Commission's benchmark and were in fact not used for this purpose. The concern voiced by Vodafone is insofar beside the point. Otherwise we refer to our position on this issue presented in Section 2.1 and again in Section 3.3.

The Commission fails to benchmark against regulated prices and fails to consider comparability criteria

The first concern (not benchmarking prices) is a procedural issue and will therefore not be commented upon here. The second concern (failure to consider comparability criteria) will be addressed under the next heading.

There is a need for the Commission to apply a consistent approach to the treatment of the benchmarks from different countries

Vodafone invokes the risk of regulatory error, which in the current context would mean that the regulator may set termination rates below the underlying cost of providing mobile termination in New Zealand. In contrast, what the discussion of Section 2.1 has shown is the fact that mobile operators have in the past been treated very leniently by regulators. First, they benefited because termination rates were not regulated at all allowing them to reap monopoly profits from this bottleneck service. Then they continued to benefit when these rates became regulated but were set at levels that by the insights available today were much too high. The reaction on the part of regulators is now setting in, for which the recent measures taken by the EC and the Austrian regulatory authority are probably only the beginning.

Against this background pale the effects on a benchmark that could be ascribed to any estimation error due to different samples or possibly disregarding comparability issues. Vodafone refers to the compilation of prices for eleven countries that was carried out for it by Covec (reviewed already in Section 3.1). The list includes price data for the nine countries covered by the Commission but includes in addition Austria and Spain. If one were to consider the price data in this compilation, true enough, the median value turns out to be substantially higher than the Commission's benchmark. Applying, however, the EC's recommendation of ten years ago (referred to in Section 2.2) to use the average of the lowest three values from such a list of benchmarks, one would obtain a value that is below the Commission's benchmark. Furthermore, that value would drop again significantly if the price data from the recent Austrian decision and from Cyprus were included.

4 Review of the report by NERA and the submission by Telecom.

4.1 The report by NERA

There are three issues on costing that are addressed in NERA's report and that are addressed in this subsection. They concern the use of TSLRIC models, the benchmarks

used by the Commission and the question of what statistical measure to take when evaluating a set of benchmarks

TSLRIC models

The argument is that the degree of efficiency factored into the computer-designed network models cannot be achieved by existing real-world networks and that therefore such models would always underestimate the costs that could be achieved by actual mobile network operators. This argument overlooks several aspects. Experience shows that the differences between modelled and actual network structures are not that dramatically large to support NERA's argument.⁹ Further, the cost models usually factor into the network design ample spare capacity and in the costing module make assumptions regarding opex and common costs that tend to be on the conservative side. In any case, as described in Section 2.1, application of the competitive standard requires not that the cost of current operators be determined but the cost of a operator newly entering the market that applies the newest technology and would thereby discipline existing operators. As regards static vs. dynamic aspects, none of the models are based on a true competitive standard at the retail level, i.e. a market structure with no oligopolistic interaction and vigorous price competition with ensuing much lower prices and correspondingly higher volumes which in turn would increase economies of scale and therefore make for lower costs.¹⁰

The Commission's benchmarks

NERA also compiled a list of actual prices for mobile termination to show that the relevant values should be much higher than the benchmark by the Commission. The list includes the countries covered by the Commission's sample but also Spain, as does Covec's similar list, but not Austria. After correcting for alleged errors in the figures of two countries and separating into lower bound and upper bound values, NERA presents median values of these prices that are on average about 50 % higher than the Commission's benchmark.

The observations made in relation to the list prepared by Covec also apply here. For reasons discussed in Section 2.1, there is a massive upward bias in the shown termination rates. If one were at all to use actual rates as reference, in order to

⁹ When WIK-Consult modelled the network of an actual operator, the number of base stations hardly diverged from that in the actual network. As is well known, the cost of the access network, consisting of the cells with its base stations, make up the by far largest share of the total cost of a mobile network.

¹⁰ The interdependence between prices and volumes is demonstrated by the example of India. In this country the volume that is carried per year by a base station is on average near 5 million minutes, while the corresponding volume in other countries is less than half as much. These high volumes are made possible by prices at the retail level below 1 € cent and termination rates below 0.5 € cent.

compensate for this bias, it would be appropriate to use an average of the lowest three values, as proposed by the EC recommendation relating to the determination of fixed network interconnection rates (discussed in Section 2.1). The resulting values are also in this case below that of the Commission's benchmark. Again, if the price data from the recent Austrian decision and from Cyprus were included, the resulting value would still be significantly be lower.

Median vs. 75th percentile

NERA proposes that the 75th percentile values of the benchmarked termination rates be taken to avoid that prices are too low. While admitting that setting prices too high would harm allocative efficiency, setting prices too low would harm dynamic efficiency by deterring investment where this harm would have to be considered as the worse outcome. Therefore the risk that by regulatory error prices are set too low must enter the regulatory authority's consideration more heavily than the converse risk. Against this must be held the argument that the risk of harming competition by too high prices for termination and thereby preventing dynamic efficiency is to be considered at least as important if not more so. In any case, as pointed out already repeatedly, there has in the past been an upward bias in regulated termination rates that must not be perpetuated by using these rates when current decisions on rates are to be based on benchmarks. It was to exactly avoid such an effect that the European Commission proposed the use of the lowest three values of its list of fixed network interconnection charges in its recommendations of ten years ago.

4.2 The submission by Telecom

A large share of Telecom's comments relate to procedural aspects that this report does not address. For the rest, the comments that concern the Commission's benchmarking exercise essentially follow the arguments from the NERA report. There is some added emphasis as regards a few issues which are commented on below.

As regards the differences between the costs of 3G and 2G technologies, Telecom raises the claim that incremental cost of 3G may well be higher than that of 2G. This runs counter to accepted expert opinion on the matter. It also runs counter to the results from the cost determination for the Austrian 3G operator Hutchison (see the discussions in Sections 2.1 and 3.2) that showed lower cost of termination, i.e. 2.71 € cent per minute for 2009 and of 2.01 € cent per minute for 2010, than any in the benchmarks listed by NERA in its compilation.

Telecom expresses the concern that Commission's approach in formulating a preliminary view of acceptable MTRs will give rise to a significantly higher risk of regulatory error in the course of the undertaking process. The error implied is that of

rates higher than actual costs. The view expressed here is that the risk may also work in the opposite direction in promoting expectations that the final outcome will be termination rates at that level while costs that accord with the relevant competitive standard may be substantially lower.

5 Review of the submission by NZ Communications

NZ Communications expresses a strong preference for a bill-and-keep (BAK) approach which would set the rate for termination effectively equal to zero. BAK is a pricing policy which, however, grew out of the discussions on how to set cost-based prices properly. Like other proponents of BAK, NZ Communications seems to prefer it due to its short-run effects on competition. It is natural for a new entrant to prefer it as a newcomer will at the beginning of its operations have customers making a large share of their calls to subscribers of other networks while the prospect of having comparable calls flowing in will be uncertain. On balance, with BAK it could expect to benefit financially in the short-run as the net cost of absorbing incoming calls would be relatively small (given that capacity needs to be there anyhow before any substantial market share could be realised) while with a positive termination rate there would be a relatively heavy financial outflow on account of termination charges against an uncertain possibly relatively small inflow on account of incoming calls.

The impact of BAK in long-run competitive equilibrium, in contrast, has not been on the forefront of the discussion. If operators count on having in the long-run balanced exchange of traffic volumes, and if in other respects the operators are similar, the effect on the rest of their business may be negligible. Of course, on the surface it may appear that, since a large share of their costs for off-net calls is zero, they would therefore have an incentive to set their prices lower than dictated by efficiency considerations. However, if they did that they would have to consider that the other operators would respond in kind so that volumes on incoming calls would increase and correspondingly their own network costs of termination. Effectively, instead of the cost of termination payable to the other operators they would have to consider their own costs of termination as the relevant cost factor to set against the prices for outgoing calls. So we may indeed come to the conclusion that BAK has the advantage of saving transaction costs without affecting negatively other relationships. The outcome would be different if operators are not symmetric, also not in the long-run, in particular in respect of its volumes of traffic to be terminated. There would be operators with a smaller retail revenue from its own off-net calls and heavier network costs due to the inflow of calls to be terminated. Chances are that these operators would undertake measures to redress the imbalance. If these measures conflict with their initial business case it is an open question whether these measures would be in the interest of end-users and to the advantage of the economy as a whole. The validity of the BAK proposal would thus

appear to turn on empirical questions, i.e. whether operators have more or less symmetrical relationships and, if they have not, whether their reaction will be to the detriment of efficiency and overall welfare.

As regards concrete questions regarding the cost of termination, NZ Communications submits only a very limited number of comments. These are largely consistent with the arguments developed by WIK-Consult in this report. With reference to a document of the European Regulators Group, the comments suggest, for example, a benchmarking approach as best practice that is based on the weighted average of the 5 lowest MTRs in a given compilation of rates or costs from other jurisdictions. This is consistent with the recommendation of the EC referred to already several times (see in particular Section 2.1). It is noteworthy that although all three submissions from operators and the two reports from consultants date from May 2009, the one from NZ Telecommunications is the only one that mentions the decision by the Austrian regulatory authority from April 2009. It claims, however, that the rate was set at 1.87 € cent per minute instead of 2.01 € cent effective by the end of 2010. Also some other rates referred to supposedly set by European regulators do not seem to coincide precisely with the actual values. That a WIK model would determine costs of mobile termination in New Zealand of no more than NZ\$ 0.06 is not commented on here.