VODAFONE NEW ZEALAND LIMITED

SUBMISSION TO THE NEW ZEALAND COMMERCE COMMISSION

on

FURTHER DRAFT PRICING REVIEW DETERMINATION FOR CHORUS' UNBUNDLED COPPER LOCAL LOOP SERVICE

and

FURTHER DRAFT PRICING REVIEW DETERMINATION FOR CHORUS' UNBUNDLED BITSTREAM ACCESS SERVICE

Public Version

13 August 2015

Table of Contents

Executive Summary

i) The committed investment in next-generation and fibre networks, along with an intensely competitive mobile and retail broadband market means the future for New Zealanders to benefit from communications services is a bright one.

ii) Ensuring fair access to copper-based services remains as a dark cloud over this future. To continue to deliver great retail broadband services to Kiwi families and businesses, retail service providers like Vodafone are dependent on a wholesale access regime that delivers fair prices.

iii) The central requirement of this pricing review is to set prices that promote the long-term benefit of end-users. The mechanism for which the Commission must discover this price is, of course, TSLRIC. In simple terms, this means a starting point of compensating Chorus for the value of a brand new fibre and FWA network, despite it only facing the real world cost of delivering services on an aging and depreciated copper network with minimal ongoing investment built and paid for by New Zealanders generations ago.

iv) The further draft determinations incorporate significant modifications and improvements since the previous draft decisions issued in December 2014.

v) However, the fundamental issue remains - the Commission's revised draft TSLRIC prices are well above the true TSLRIC level based on New Zealand cost information. Our own analysis, and that of our external experts, simply does not support the proposed TSLRIC pricing. Our experts' reviews continue to conclude that the calculated point in fact is beyond an upper bound estimate as it is does not reflect efficient MEA costs. Further, the FPP prices remain above the median cost-based prices for the same services in the countries the Commission has chosen to compare ourselves against.

vi) That's a significant burden for Kiwis to bear. This is why Vodafone was so concerned to see that the Commission's TSLRIC prices for both UCLL and UBA remain above the true-TSLRIC price and cost-based international comparators.

vii) Simply put, we think this shows that New Zealand consumers are being asked to pay too much for access to Chorus' copper network. As this submission and our expert's reports set out in detail, this is a symptom of an approach to cost modelling – at both a parameter and systemic level – that over-estimates costs and ignores opportunities for genuine efficiency gains.

viii) This submission (and the expert reports that support it) address the issues arising from the Commission's revised draft decisions. Vodafone's principal point remains that the draft prices are too high.

Backdating

ix) The Commission is correct not to backdate FPP prices. Backdating in this case would harm the long-term interests of New Zealand telecommunications end-users. It would significantly harm competition, and introduce new distortions into a market that is already operating under uncertainty.

x) There is no statutory presumption that IPP prices are or were incorrect, and retail service providers have continued to compete on the basis of IPP prices. If it were the case that the parties had been able to predict with certainty a) that backdating would occur; and b) the 'to be

backdated' FPP outcome *and* c) the period over which backdating will apply, this would render the IPP redundant. Or more simply put: rather than benchmarking, the Commission could roll a dice to set the IPP price, as parties would ignore the prevailing prices and make all market decisions based on the outcome of the FPP. This simply does not apply to the current copper pricing review.

Non-recurring Charges

xi) The Commission is correct to make significant efficiency adjustments to Chorus' non-recurring charges. Chorus' actual charges do not reflect an efficient network operator's cost deploying a modern network with sufficient capacity as required under the Act.

xii) Chorus' aging copper network and systems mean that the total non-recurring costs simply do not match an efficient operator. While the proposed adjustments go some way towards efficient pricing, the top-down modelling approach is inevitably a compromise. If non-recurring charges are set above TSLRIC, then Chorus will face no incentive to improve efficiency, with the higher costs simply passed through to end-users.

xiii) Our consultants identify material corrections required to the benchmarking and cross check process undertaken. Efficiency must be considered across all seven benchmarked parameters (rather than limited to one as at present), and a balanced approach taken to cross-checking, rather than adopting an approach that only allows for upwards adjustment of Chorus non-recurring charges.

xiv) Clearly, there are opportunities for further efficiency adjustments in the non-recurring charges regime – and ensuring these are implemented will be essential to promoting the long-term interests of end-users, many of whom will be reliant on the copper network for some time into the future.

Fixed Wireless Access

xv) The Commission's conclusion on the FWA network footprint that an efficient modern operator would cover is entirely without basis. The Commission must follow its own statement, namely '*FWA should be used for lines where costs are particularly high and unbundling is unlikely'* - rather than applying an irrelevant distance criterion based on copper capacity degradation. Further serious concerns include that the implied assumption that FWA network do not traverse ESA boundaries ignores the laws of physics, and microwave backhaul – despite featuring both in New Zealand and overseas FWA networks – is also ignored. The Commission's approach is artificially raising costs.

xvi) Government policy and existing infrastructure must both be assumed to affect the Commission's hypothetical efficient operator, including UFB and RBI funding, and the deployment of a FWA network based on current RBI sites.

Modelling detail

xvii) Our expert consultants have also observed significant changes throughout the model, often without a comprehensive justification. Through a line-by-line assessment, significant opportunities are identified – both at a systemic level and with individual parameters – to ensure that the Commission's model accurately reflects an HEO MEA.

xviii) The modelling approach continues to result in draft TSLRIC prices that are well above the true TSLRIC level.

Recommendations

xix) With that in mind, and in light of the Commission's further draft determination, we urge the Commission to heed the following recommendations.

R 1. Recognise that:

i. the characteristics of regulatory situations in which backdating has been applied elsewhere do not apply in the context of the FPP.

ii. backdating in the context of the FPP will not enhance efficiency as the necessary conditions - 1) certainty on backdating, 2) predictability of final prices and 3) the ability to behave as if final prices already apply - are not met. The FPP process does not meet these conditions.

iii. backdating the FPP will create additional market distortions.

The Commission must retain its current majority view.

R 2. Develop an efficiency adjustment approach which applies efficiency adjustments to 100% of the relevant cost base. Include only countries which have similar labour productivity and labour costs to New Zealand in the Commission's international benchmark for efficiency adjustments.

R 3. Update the 'old' benchmark figures to reflect efficiency gains achieved in benchmark countries. Index the 'raw' benchmark figures with an annual productivity factor of 5% p.a. Exclude (a) transport times and (b) administrative times from the relevant activity processing time.

R 4. Withdraw the national cross-checking approach based on fibre connection costs totally. If the Commission retains the national cross-checking approach this must be applied symmetrically: it must apply equally in cases where costs would increase as in cases where prices would rise.

R 5. Apply a bulk discount scheme which is more cost reflective and not only be defined by a particular threshold. Apply bulk discounts to UBA-related service transaction charges.

R 6. Reduce the scope of POA based pricing to the absolute necessary minimum. The services 1.48 and 1.50 should not be priced according to POA.

R 7. Extend the scope of the NRC price determination to include the lead-in service and the 10 Gbps handover installation. 'Clean' the use of service codes in its mapping approach such that cost and work elements which do not belong to the regulated transaction services are excluded from the relevant cost base.

R 8. Do not accept the direct cost of Service Companies as given. Check the appropriateness of the cost allocation within the multi-product relationship between Chorus and the service companies. Recognise the incentive for Chorus to distort these allocations at the expense of transaction charges.

R 9. Revise Service Companies' overhead mark-up because it is generally too high and leads in some cases to a double-recovery of costs. Correct Chorus' overheads for efficiency and automation savings.

R 10. Predict reasonably foreseeable efficiency improvements in the provision of transaction services within the regulatory period, by implementing a productivity improvement factor as a price path of -3% to -5% p.a. from the calculated cost of the base year.

R 11. Implement an analysis consistent with the Commission's own statement: 'FWA should be used for lines where costs are particularly high and unbundling is unlikely' - rather than applying a distance criterion based on copper capacity degradation that is irrelevant to FTTH. Consider FWA for users in all Zone 3 and 4 areas where there is no current unbundling and future unbundling is unlikely.

R 12. Adopt actual, best-practice, FWA coverage and capacity information in place of the currently used throughput demand driver of copper capacity. As copper throughput capacity is meaningless in for a HEO's fibre and FWA network: fibre throughput does not degrade with distance.

R 13. Respect the laws of physics: radio signal is not limited by map boundaries. Instead, recognise that FWA sites provide coverage across ESA boundaries.

R 14. Ensure TERA's modelled footprint of FWA coverage accurately reflects the Commission's approach.

R 15. Include microwave radio as an option for modelling FWA backhaul for the HEO.

R 16. Reflect optimised deployment – and costs – across fibre and microwave backhaul.

R 17. Adopt Network Strategies' FWA model as a workable solution that can be applied to all non-unbundled areas, as this is based on actual terrain and propagation conditions in New Zealand and reflects the cost optimisation decision of a HEO deploying FWA in areas where it is feasible and economical.

R 18. Apply the same single MEA when determining FPP prices for both the UCLL and UBA services.

R 19. Reconsider demand assumptions to serve all customers that a profit maximising HEO would find viable to serve, including via FWA. Multi-dwelling units should be assumed to outnumber vacant lots.

R 20. Population growth projections must be built into an assumption of increasing demand.

R 21. Ensure appropriate network optimisation in the core network, MDF locations, and the access network through ensuring an appropriate "bottom up" approach to network design and taking into account opportunities for efficiency gains and sharing between services.

R 22. Enhance the transparency of the model, especially in relation to geo-spatial modelling.

R 23. Ensure that all aspects of the model, especially those which remain reliant on top-down modelling, properly take into account efficiency gains (and the potential for future efficiency improvements) that would be expected of an HEO

R 24. Review parameter values to ensure that appropriate HEO costs and deployment choices (as opposed to costs and deployment choices which are fundamentally out of step with international comparators and, in some cases, existing deployment approaches in New Zealand)

R 25. Review the model closely, taking into account WIK's detailed feedback, for modelling errors and double-counting (as identified in WIK's report).

R 26. Correct errors in the calculation for the percentage of aerial lead-ins, review the assumed percentage share of aerial deployment, reflect expected regulatory amendments creating faster and lower cost consenting processes for aerial deployment, gather data on pole lease costs and upgrades from all New Zealand LFCs, and review calculations for estimating the pole lease costs.

R 27. Include NZIER's average annual growth rates rather than TERA's compound annual growth rates, and use the 2% midpoint of the RBNZ's inflation target.

R 28. Recognise that a long-term price trend estimated for the whole heavy and civil engineering sector is likely to over-state the trend for trenching costs, especially in light of micro trenching techniques.

R 29. Increase the assumed rate of fibre optic cable price deflation, using 2003-2014 data, and ensure the revised price trends are implemented by TERA.

R 30. Recognise that the HEO benefits from UFB and RBI subsidies.

R 31. Ensure the modelling is consistent with its stated approach to TSO boundaries: resolve the error that remains in selection of buildings within the TSO by removing buildings outside the TSO from its assumed FWA coverage.

R 32. Ensure the stated methodology for calculating the asset beta is implemented, ensure consistency across the method for estimating notional leverage and the asset beta and adjust interest-rate estimates to reflect evidence that in only 50% of instances would two swaps be required in the New Zealand telecommunications sector.

R 33. Recognise that TERA's benchmarking methodology contains serious problems that undermine the validity of its conclusions.

A Introduction

A1.1 Vodafone welcomes the opportunity to comment on the Commission's Further Draft UBA and UCLL Determinations and accompanying reports released on 2 July 2015.

A2 Referencing FPP documents

A2.1 Specifically, we review and provide recommendations in respect of the:

(a) The Commission's Further Draft Pricing Review Determination for Chorus' Unbundled Copper Local Loop Service (**Further Draft UCLL Determination**); and

(b) The Commission's Further Draft Pricing Review Determination for Chorus' Unbundled Bitstream Access Service (**Further Draft UBA Determination**).

A2.2 We also refer to TERA's June 2015 modelling documentation.

A2.3 This submission should be read along with the expert reports prepared by WIK-Consult (**WIK August 2015 Submission**) and Network Strategies (**Network Strategies August 2015 Submission**) on the Further Draft Determinations and the **DotEcon Backdating Assessment**.

A2.4 We also refer to:

(a) The Commission's December 2014 Draft pricing review determination for Chorus' unbundled copper local loop service (**Draft UCLL Determination**);

(b) The Commission's December 2014 Draft pricing review determination for Chorus' unbundled bitstream access service (**Draft UBA Determination**);

(c) **TERA's December 2014 Model Reference Paper**, **December 2014 Model Specification** and **December 2014 Model Documentation;**[1]

(d) Beca's FPP Corridor Cost Analysis (**Beca December 2014 Report**);[2]

(e) Ingo Vogelsang's TSLRIC implementation report (**Vogelsang December 2014 Report**);[3] and

(f) Analysys Mason's models commissioned by Chorus and the **Chorus December 2014 UCLL TSLRIC user guide** and **Chorus December 2014 UBA TSLRIC user guide**.

A2.5 We also refer to previous expert submissions and cross submissions provided by:

(a) WIK-Consult (**WIK February 2015 Submission** and **WIK March 2015 Cross Submission**); and

[1] TERA *Model Reference Paper* (public version), November 2014, TERA *Model Specification* (public version), November 2014 and TERA *Model Documentation* (public version), November 2014.

[2] Beca *FPP Corridor Cost Analysis of Trenching and Ducting Rates in NZ*, November 2014.

[3] Ingo Vogelsang, *Current academic thinking about how best to implement TSLRIC n pricing telecommunication network services and the implications for pricing UCL in New Zealand*, 25 November 25 2014.

(b) Network Strategies (**Network Strategies February 2015 Submission** and **Network Strategies March 2015 Cross Submission**) and Network Strategies' modelling and report on fixed wireless access (**Network Strategies February FWA Report)**.

A2.6 We also refer to further submissions and cross submissions by other parties following the release of the Commission's December 2014 documents.

A3 Structure of this submission

A3.1 This submission is structured in three parts:

(a) Part 1 – Backdating

(b) Part 2 –TSLRIC modelling

(c) Part 3 – International benchmarking

A4 Critical assumptions regarding the 'HEO's world'

A4.1 The Commission's task is to determine TSLRICs of the UCLL and UBA services utilising an HEO MEA concept. A failure to consider potential efficiency gains and cost improvements ignores an essential ingredient in the very meaning of a hypothetical efficient operator. The Commission must assume that an HEO would not willingly bear inefficient costs. Instead, it would seek to achieve the most efficient (least cost) means of deploying a network and delivering services using that network. Any other assumption is inconsistent with the Commission's primary duty, expressed in the 'dominant provision' of s 18(1) of the Act, which is to promote competition in telecommunications markets for the long term benefit of end-users of telecommunications services.

A4.2 Real world information can inform the Commission's assessment of the constraints on an HEO and its likely decisions in light of those constraints. But the definition of the HEO and the MEA that it would deploy are ultimately abstractions from the real world. The current position of the incumbent can't simply be accepted as defining the HEO. This is because the incumbent's network and its costs are not necessarily efficient, and accepting that they are would be inconsistent with the TSLRIC requirement to determine efficient forward-looking costs.

A4.3 We agree with the Commission that the core functionality of the UCLL service is to allow access seekers to provide voice and broadband service to end-users.[4] The operative question to be addressed is, accordingly, what technology would a rational HEO seeking the most efficient/least costs use to deploy an MEA? We are pleased that the Commission has:

(a) accepted that an HEO would, if given the opportunity to share its infrastructure in order to reduce costs, utilise the existing infrastructure of non-telecommunications infrastructure providers in deploying an MEA;[5] and

(b) retained the inclusion of FWA technology as a component of the MEA for the UCLL service.

[4] Further Draft UCLL Determination, [1022]-[1032].

[5] Further Draft UBA Determination, [865].

A4.4 We are however concerned by the Commission's "slightly modified" approach to the inclusion of FWA in the MEA, which it explains as follows:

"*...we will be using the current RBI FWA coverage areas to derive costs for service provision to end-users who currently receive only low-speed data or voice-only service. We will then apply these costs to voice-only and low-speed data end-users nationally (as described in more detail below).*

We note in this regard that we are proposing to model the deployment of FWA by deriving a cost in the cost model and applying it to selected end-users rather than physically modelling the position of the FWA sites. As we describe in more detail below, we consider that this best balances a number of competing concerns and difficulties which arise in the context of modelling FWA."[6]

UFB and RBI apply to the Hypothetically Efficient Operator

A4.5 As noted above, real world information can inform the Commission's assessment of the constraints on an HEO and its likely decisions. But it is also necessary to extrapolate from real world information to identify the choices that an efficient HEO would make. The extent of the Commission's inclusion of FWA in the hypothetical infrastructure an HEO would deploy is unduly fettered by consideration of current Government policy in respect of UFB and RBI. This policy supports two key assumptions:

(a) that fibre will be rolled out as per existing UFB agreements; and

(b) that fibre will be rolled out to RBI cell sites as per existing RBI agreements.

A4.6 While these assumptions are useful, they cannot determine the extent of FWA deployment, not least because these considerations alone do not answer the key question that the Commission must address: what technology would a rational HEO seeking the most efficient/least costs use to deploy an MEA?

A4.7 Our view remains that an efficient operator would deploy FWA over an area that is considerably wider than the current RBI footprint. To the extent that Government policy in respect of UFB and RBI is a factor that is relevant to the Commission when determining the extent of FWA coverage within the MEA, the Commission must select from one of two logically sound approaches for the HEO's policy framework:

	Assumption on government policy affecting the HEO	**Logical implication for the HEO's MEA network**
Option 1: Ignoring UFB and RBI	The HEO is assumed to optimise its deployment of fibre and FWA based on an economic assessment of the properties and costs of the technologies, and the UFB and RBI funding schemes are assumed to not exist in the HEO's world.	A rational, profit-maximising and cost-minimising HEO would commercially deploy fibre to approximately 65% of the population.
Option 2: Assuming UFB and RBI exist for the HEO	The UFB and RBI schemes are assumed to exist for the HEO as they do currently for Chorus (and others) and so influence the deployment of fibre and FWA, and also contributions made to Chorus (and others) must be taken into account.	If fibre technology should be modelled beyond this point then it should consider providing an allowance in the model for subsidies for network extension beyond commercially viable areas (based on UFB / RBI subsidies in the real world).

[6] Further Draft UCLL Determination, [1111]-[1112]

A4.8 The Commission cannot simultaneously adopt both approaches. Vodafone recommends the Commission adopt the second approach and so assumes the existence of UFB and RBI policy, and that the HEO would benefit from the related subsidies.

Further relevant policy that applies to the HEO

A4.9 In the same way that health and safety legislation affects a HEO's operations and thus adhering to such policies represents a component of operating costs, the Commission must consider all relevant government policy affecting the HEO.

A4.10 The Commission must retain a forward-looking approach reflecting the evolving regulatory framework for consenting, and associated costs. The Ministry for the Environment has confirmed that advice on proposed amendments in National Environmental Standards for Telecommunication Facilities (NESTF) - supporting faster availability of new and better communications technologies - will be with the Minister in August and regulatory amendments to consenting can be expected to be implemented by 'late 2015-early 2016'. Thus we can reasonably expect consenting processes to be faster (and lower cost) during the regulatory period to which the FPP applies.

Other real world trends relevant to the HEO

A4.11 We have previously submitted that the Commission's demand incorrectly ignores population growth.

A4.12 By ignoring expected demographic changes, the Commission's constant demand assumption implies that all growth in telephony connections will be mobile-only, or fixed connections on networks other than the HEO's. Yet also on the supply side, the theoretical world of the HEO will also have more fibre availability than present reality, and so the Commission's assumption implies greater availability will have no effect on the decision to retain or acquire a fibre connection. These implications seem illogical.

A4.13 The Commission must also recognise developments in technology and widely expected trends in customer behaviour such as cloud computing, remote working, and consumption of streaming video on demand.

A4.14 Cloud computing is creating a revolution in information technology. Cloud-enabled services and applications are facilitating greater mobility and flexibility of solutions, and bring the resultant productivity improvements within reach of businesses of all sizes, large or small.

A4.15 Core requirements for effective remote working, whether that be working from home or working away from the normal office location, are the use of cloud services and Internet connectivity.

A4.16 Another expected significant influence on demand for fixed line services is the availability of streaming content via services such as Netflix, Lightbox, Neon and Quickflix. These services can be accessed by a wide range of devices including smartphones, and (usually) via fixed line connections on tablets, computers and smart TVs. Since the New Zealand launch of Netflix in March 2015, traffic has increased dramatically. After just two months, Netflix accounted for 15-20% of CallPlus' daily traffic. In the United States, Netflix comprises over one-third (36.5%) of downstream peak-time traffic on fixed broadband.

A4.17 These types of services have the potential to cause a shift in the preferred mode of content delivery: from dedicated broadcast spectrum, satellite or cable to streaming over the Internet. This could then translate into an upturn in fixed broadband service demand.

A4.18 It is still very early days for streaming services, and firm evidence of any sustained effect on the fixed line market is yet to come. By the time such evidence is available, final prices UCLL and UBA prices will have been set, based on a demand profile that is far from forward-looking.

Part 1: REGULATORY CERTAINTY

B Backdating

B1 Introduction

B1.1 The Commission is not required to backdate FPP prices set for the UCLL and UBA services. It has a discretionary power to do so. The existence of a power to backdate, and whether and how this power should be exercised, are related but separate questions. Backdating will not create efficiency benefits and will create additional market distortions. The Commission must retain its current majority view.

B1.2 Both IPP and FPP processes have the objective of setting prices that reflect the forward looking cost based pricing method. They differ in terms of the methodology by which this is done: benchmarking for IPP, TSLRIC for FPP.

B1.3 IPP prices are intended to be a "proxy" for the prices that would result from an FPP process.[7] Where an application has been made for review of an IPP price, s 42(2) of the Act provides that the IPP price continues to have effect and is enforceable pending an FPP determination. Any replacement of an IPP price by FPP price simply reflects a statutory scheme that provides for the relevant price to be set according to alternative methodology on application. The setting of an FPP price does not imply that the prior IPP price was incorrect or invalid in any sense.

B1.4 Nevertheless Vodafone accepts that, as the Act has been interpreted to date by the Courts, the Commission is authorised to backdate FPP prices in appropriate situations. This is established in the Court of Appeal's judgment in *Telecom v. Commerce Commission and another* where it held that "*...the Act itself allows the final determination to be enforced according to its tenor.*"[8] The Court of Appeal did not however require that an FPP price must in every context in the Act and in every instance be backdated so as to retrospectively apply to the period during which a valid IPP was in place. Nor is there any judicial presumption that backdating is consistent with the objectives of s 18 of the Act.

B1.5 Rather, the Court of Appeal simply held that the backdating of an FPP price is provided for by the Act and would not offend the ordinary presumption against retrospectivity. The Court of Appeal did express a view that, on the facts of the case considered, not backdating would result in inefficiencies (and backdating was therefore desirable). However, this observation was expressly confined to the case at hand: "*[i]n relation to the present matter, if a revised price were not to relate back that would in itself result in inefficiencies. That is because the revised price must be more efficient than the initial price.*"[9] This is entirely appropriate: if backdating is permissible, the efficiency properties of a backdating decision must in all instances depend on the assessment of the effects that arise directly and indirectly from the transfer involved, which cannot be postulated *ex ante* as a fixed rule.

[7] *Chorus v. Commerce Commission and others* [2014] NZHC 690, [28].

[8] [2006] NZCA 103, [37].

[9] [2006] NZCA 103, [35].

B1.6 The Commission has now confirmed the approach to considering whether backdating is appropriate that was set out in its Process and Issues Update Paper.[10] Specifically, it has confirmed that it will consider:

(a) s 18 of the Act, which provides "*the most important guidance*";

(b) whether backdating is "*demonstrably efficient*"; and

(c) whether backdating will "*demonstrably promote competition in a way that is likely to directly benefit end users*".[11]

B1.7 Vodafone agrees that this approach captures the assessment required by s 18. We also agree with the view that the implementation of this approach requires the Commission to acquire "*…the evidence described in [(b)] and [(c) above] in order to carry out the overall [s 18] assessment in [(a) above].*"[12]

B1.8 Based on the above criteria, the Commission has expressed a majority view in favour of not extending the regulatory period back to 1 December 2014, with Commissioner Duignan favouring backdating and a lump sum payment to Chorus by RSPs of the differential in FPP and IPP access charges. Both views are reasoned with reference to the long term benefit of end users, the Commission's primary duty pursuant to s 18(1) of the Act.

B2 Effects of backdating

B2.1 Backdating access prices implies that transactions between RSPs and Chorus that took place at the IPP price are, at a future point in time, retrospectively re-valued. If this is to occur, it must be clearly used to promote statutory objectives, i.e. it must maximise the promotion of competition for the long term benefit of end users.

B2.2 Backdating could in principle promote efficient outcomes if all parties:

(a) have certainty that backdating will occur;

(b) have certainty of the period over which backdating will apply;

(c) have certainty of the terms that will apply in market if backdating occurs; and

(d) can behave in the market as if 'new' prices to be backdated already applied during the periods within which these prices will be related back.

B2.3 However, these necessary cumulative conditions are not present in the current regulatory determination process. In contrast, these conditions might be met in situations where a regulatory setting is obviously 'wrong', such that subject firms could not reasonably (expect to) rely on the prices it set applying over the period to which they applied. In this case, it will be assumed that the setting will be reviewed and a 'more accurate' price applied.

[10] *Process and issues update paper for UCLL and UBA pricing review determinations* (19 December 2014), [15].

[11] Process and Issues Update Paper, [15]; Further Draft UCLL Determination, [854].

[12] Further Draft UCLL Determination, [856].

B2.4 In every case, however, the potential benefits of backdating must be assessed both against the necessary criteria for realising such benefits, and the potential costs of backdating.

B2.5 Without certainty that backdating will occur, a party will behave based on current market conditions, potentially conditioned by its expectation that backdating might or might not occur. Unless a party has perfect foresight, backdating will create a transfer of funds from 'losers' to 'winners' – who is who depends on the parties' relative positions and the outcome of the regulatory decision. Because backdating cannot change the past, it represents purely a transfer of wealth between parties that have transacted with each other on previously understood terms, different from the terms the regulator now says should have applied. This is not to deny the possibility of backdating in any circumstances – the Court of Appeal has found that backdating is permitted under the Act and that backdating does not offend the presumption against retrospectivity. But it is a consideration that is highly relevant to the efficiency properties of backdating and whether backdating can in the present case be expected to maximise competition for the long term benefit of end users.

B2.6 If backdating is expected but the final decision uncertain, prices over the backdating period remain unknown. Thus the potential for backdating creates uncertainties about future (and current) costs and revenue streams. Instead of being based on known price levels, decisions will be made on expectations on future prices, and so market participants are acting in markets without full information. Changing prices retrospectively will not make past inefficient market outcomes more efficient. Thus backdating creates uncertainty and additional risks, which could discourage investment. Certainty over revenue streams is more likely to be investment enhancing than uncertainty over future, and past and current regulatory settings.

B2.7 In fact, no party involved in this process can claim certainty as to what FPP prices would be set or whether backdating would occur. In particular, Chorus (and its predecessor, Telecom) appears not to have sought the conferral on the Commission of an explicit statutory mandate to backdate any FPP prices set for UCLL and/or UBA. Nor does it appear to have sought certainty via the development of *ex ante* guidelines to govern the exercise of any backdating discretion the Commission was found to have. The absence of an explicit statutory provision with guidelines giving certainty to its exercise are two factors telling against backdating in this instance.

B3 Backdating in practice

B3.1 The most commonly accepted application of backdating is a compensatory regime in which backdating of payments owed, prices or costs may be punishment for illegal activity and/or compensation for related losses. These scenarios do not apply in the present case: IPP prices were lawful throughout the period of their application and remain so unless and until replaced by FPP prices. Importantly, the FPP prices are not set with reference to the IPP prices being erroneous in fact or law, and nor is any error of those kinds implicit in the fact that FPP prices differ to the IPP prices set.

B3.2 The *ex ante* determination of regulated prices is typically not a regime that contains provision for backdating of prices in these scenarios and represents a very different situation. Such determinations involve prices being set for a future regulatory period with all subject firms entitled to rely on those prices applying for the duration of that regulatory period. A US State Supreme Court has labelled the retroactive application of public utility rate changes as a practice that "*would be odious to the generally established notions of justice, and would moreover, be*

utterly subversive of the policy and utility of any system of rate regulation; for no rate could be relied on as stable".[13] Applying this principle to the present case, subject firms should expect IPP prices to apply for the duration of the period for which these prices are lawful 'in market' prices.

B3.3 The vast majority of *ex ante* regulatory determinations are implemented without backdating. The power to backdate is generally conferred expressly by a statute or similar instrument, and criteria for its exercise set out in that instrument (or associated guidelines) clearly and in advance so as to enable subject firms to make better informed *ex ante* investment decisions.

B3.4 When backdating does occur this is usually in in general dispute resolution processes where the ability to apply backdating is used to discourage delaying tactics in regulatory proceedings. Dispute resolution proceedings typically concern action by a regulator to declare *ex post* the rights and obligations of subject firms under existing regulatory settings, or to fix the terms of transactions between subject firms pursuant to those settings, or to impose an obligation to transact pursuant to those settings. Effectively, they involve a regulator undertaking an 'arbitration' pursuant to statute to rule on parties' obligations under existing *ex ante* regulatory determinations.

B3.5 For example, Ofcom has an express power under s190(2)(d) of the (UK) Communications Act 2003 to backdate any prices set following the determination of a dispute. Determining the nature and extent of existing obligations, and applying sanction for their breach, via dispute resolution proceedings is fundamentally a different exercise from determining in advance the conditions under which subject firms must operate in a market.

Backdating in *ex ante* regulatory determinations

B3.6 Backdating within the context of an *ex ante* regulatory determination is exceptional. Where it has been applied in *ex ante* regulatory determination this has generally been in situations where a behavioural wrongdoing is being corrected, where a significantly detrimental 'regulatory error' has been made, where a regulator is discouraging delaying tactics in regulatory proceedings, or where a court deems a regulator has been unreasonably tardy.

B3.7 DotEcon have provided a useful survey of the rare circumstances in which backdating has been applied within the context of an *ex ante* regulatory determination, and identifies a rationale in each case that is not present in respect of the Commission's setting of FPP prices.[14] DotEcon's overview is not intended to provide a representative sample of backdating decisions that have been taken, and there is no suggestion that the examples discussed match the facts of the current case. Rather, the examples presented serve to illustrate how the considerations on the conditions in which backdating occurs, and the efficiency implications, apply in practice.

B3.8 The ACCC made an interim determination on access charges for wholesale ADSL services, with the objective of providing greater certainty over prices until a final determination could be reached, and decided not to backdate the final determination in spite of calls to do so. "*Specifically, the ACCC pointed out that its approach to backdating is different in the context of access determinations and dispute resolutions because the need to limit regulatory gaming is*

[13] Quoted in Stefan H Krieger, "The Ghost of Regulation Past: Current Applications of the Rule Against Retroactive Ratemaking in Public Utility Proceedings", *University of Illinois Law Review* 1991, no. 4 (1991).

[14] DotEcon, Backdating Assessment, section 2.

much reduced in cases where the authority controls the process."[15] The ACCC appears to follow a general practice of applying modifications of previous decisions *prospectively*. For example, a further draft decision on access prices for Telstra's copper network released in June 2015 and which *revises* an earlier decision from March this year that will see charges for seven access services fall by 9.6% from October 2015 onwards.

B3.9 The move in the EU approach to regulating fixed and mobile termination rates from benchmarking to LRIC-based rates in Europe did not involve backdating but instead applied a glidepath to achieve a gradual reduction.

B3.10 In the case of UK mobile termination rates (MTRs), the Court of Appeal ruled against retrospective adjustments to MTRs, and specifically noted that the principle of ex ante regulation as expressed in the European Framework and Access Directives imply that regulatory measures have to be forward-looking.[16]

B3.11 The Irish telecoms regulator ComReg rejected a request for retrospective funding for its universal service obligation, on the basis that a request for funding over the relevant time period has not previously been made, and so other operators would have made commercial decisions during that period with no reasonable assumption that backdating might be applied in the future.

B3.12 The Singapore Infocomm Development Agency (IDA) introduced a provision for backdating only in circumstances where elements of a telecoms tariff were in contravention of the Telecoms Competition Code (TCC). As DotEcon note, "*it would be clear to the parties involved that any tariff approved on an interim basis would be subject to backdating if it were non-compliant with the TCC.*"[17] It's noteworthy that DotEcon's research has not uncovered any instances where the IDC has made use of its powers to backdate.

B3.13 The Portuguese telecoms regulator ANACOM has the power to change the incumbent's reference offers, retrospectively. ANACOM has determined that penalties levied by the incumbent on access seekers should be lowered, and ordered a reimbursement by the incumbent to operators. ANACOM has only backdated penalty charges rather than access charges.

B3.14 The French Supreme Court ordered retrospective lowering of a retail price cap increase, following a challenge from small energy generators who complained the regulator's retail price cap was too tight and left them unable to compete with EDF. To the extent that the backdating applied higher charges, this was correcting a past distortion (incumbent prices having been too low) with a future distortion (where higher energy prices by incumbents provide more headroom for the new entrants). DotEcon explain: "[t]*he regulatory failure in this case is linked to the fact that retail price regulation has a direct impact on the ability for competitors to thrive in the market, and that setting regulated charges too low immediately frustrates the development of competition. The backdating decision is aimed at creating compensating distortions in the retail market rather than creating incentives for efficient behaviour.*"[18]

[15] DotEcon, Backdating Assessment, section 2.2.1.

[16] *Vodafone and others v. BT and others* [2010] EWCA Civ 391, [37]-[40]

[17] DotEcon, Backdating Assessment, section 2.2.1.

[18] DotEcon, Backdating Assessment, section 2.2.1.

B3.15 Two Spanish power companies were awarded compensation by the Supreme Court, which decreed the Ministry of Industry must backdate the payment of increased access charges to the operators, after the sector has suffered an accumulated deficit of €30 billion (in 2013).[19] A decision to freeze tariffs in the face of a substantial and growing deficit of this magnitude can be considered to be a serious regulatory failure.

B3.16 The Bulgarian electricity regulator set interim grid access fees for renewable energy suppliers at a level one hundred times the level of the final determination. Such a gross error could have a substantial effect and, with interim charges being different from final charges by orders of magnitude may justify correction through backdating, but it is equally obvious that this is an exceptional case of regulatory failure.

B3.17 A final example of backdating in the context of an *ex ante* price determination involved the Italian telecom regulator AGCOM's process for determining price controls has suffered lengthy delays, that appear to have been caused by AGCOM being slow to start the market reviews necessary to gather information required to update regulated charges, creating delays in approving Telecom Italia's reference interconnection offer. There have also been delays in agreeing costing methodologies with the European Commission. DotEcon explains:[20]

> *The European Commission, in its response to notifications of draft regulatory measures under the Article 7 procedure, has been commenting on these retroactive applications since at least 2012, emphasising the need to ensure that retroactive application of price changes did not impinge on legal certainty for operators which were providing services on the basis of previously imposed obligations. This comment was repeated in several responses to notifications.*
>
> *As notifications continued to involve retroactive price controls, the European Commission explicitly asked AGCOM to avoid setting new prices with retroactive effect as such retroactive price changes can have a negative impact on operators' incentives to invest in the deployment of NGA networks. With what one might consider to be a thinly veiled expression of exasperation, the European Commission ultimately stated that it "urges AGCOM to ensure that the procedures for the approval of cost oriented prices that are not subject to network caps be predictable for participating parties and as effective as possible, so as to avoid risks of delay and the need for corrections to the extent possible. In the event that that implementation of the measure will show that it is impossible to maintain a yearly timetable of price approvals that avoids retroactivity, AGCOM should consider whether a different pricing methodology would provide greater stability and predictability."*[21]

B3.18 These examples indicate a useful framework for assessing a situation's suitability for backdating:

(a) Firstly, there is a clear use of backdating as a means to discourage delaying tactics in a dispute resolution process and the compensation of victims (of unlawful behaviour or mistakes made by the regulator) as contrasted to the situation of a normal rate setting

[19] David Robinson, "Pulling the Plug on Renewable Power in Spain", Oxford Energy Comment, The Oxford Institute for Energy Studies (2013).

[20] DotEcon, Backdating Assessment, section 2

[21] Commission Decision concerning case IT/2015/1733; emphasis added. The issue of retroactivity and the detrimental impact that retroactive adjustment has on the market also figures prominently in the country overview in the latest Implementation Report (European Commission, "Implementation of the EU regulatory framework for electronic communication – 2015", Commission Staff Working Document (2015), in particular pp 171 – 172).

regulatory process. The use of backdating in standard regulatory determinations '*arguably conflicts with the ex ante nature of such regulation*'.[22]

(b) Secondly, backdating will cause detrimental effects unless the conditions under which it will be applied are known in advance with certainty.

(c) Third, the case for backdating is strongest where existing prices are manifestly wrong and all parties are able to both know that this the case and be able to accurately forecast the 'correct' prices that should apply.

(d) Lastly, the case for backdating is strongest where the benefits from improved decision making are large compared with the cost of uncertainty.

B3.19 DotEcon explain that these conditions are most likely to be met where prices are the matter of a dispute *and raised by one of the parties*, where one of the parties has superior information on what correct prices should be (ie underlying cost) *and is in a position to delay the process*. As in these cases a party with superior information is able to estimate the gains to be achieved by delaying a process.

B3.20 In contrast, in a process in which prevailing prices are explicitly set by interim determinations (which remain lawful and valid) and the final determination requires complex analysis, the outcome of which cannot reasonably be predicted by either party, there are substantial benefits from the certainty associated with such interim determinations. This holds even more so where the interim decision is not grossly out of line with the final determination. Assuming this holds, the best way to ensure efficient behaviour by all market participants, including in the market and in terms of engagement with the regulatory process, is for the regulator to commit to an 'answer' on which market participants can rely at the earliest opportunity.

B3.21 Exposing market participants to the uncertainty associated with the retroactive application of a future determination will significantly lessen the potential for efficient outcomes. Even if the interim decision is only approximately right, ensuring this price is predictable and holds regardless of the final decision is likely to lead to a better efficiency outcome if expecting parties to act on the basis of a best guess of what the final decision might ultimately be.[23]

B4 Backdating would cause substantial distortions in the New Zealand market

The current FPP process is different to the circumstances in which backdating has been applied elsewhere

B4.1 The Commission's process of determining regulated wholesale access prices for UCLL and UBA , namely IPP benchmarking and now FPP TSLRIC modelling, does not align with the described regulatory situations in which backdating has been implemented.

B4.2 None of the exceptional circumstances that have justified backdating in those *ex ante* regulatory determinations identified by DotEcon are present here:

[22] DotEcon, Backdating Assessment, section 2.

[23] DotEcon, Backdating Assessment, section 2

(a) The FPP process clearly does not involve resolution of a dispute, a scenario in which backdating would more commonly be expected.

(b) The process for determination of FPP prices is entirely within the control of the Commission.[24] The Commission has throughout controlled the administrative process that has been followed in determining FPP prices. All parties have cooperated with this process and met the deadlines set by the Commission. To the extent that parties' sincere engagement with the process has led the Commission to develop its thinking and extend the duration of the administrative process to account for this, this does not constitute any delay by parties that would of itself justify backdating.

(c) Throughout this process a lawful and valid price for UCLL and UBA services was present in market: there is no pricing lacuna that backdating is required to resolve.

There is accordingly no justification for backdating in the present case based on a survey of international practice relating to backdating. The characteristics of the scenarios in which overseas regulators have judged backdating to be appropriate do not exist in the present case.

There is no evidence that not backdating will lead to inefficiencies

B4.3 In addition, in the present case there is no evidence to suggest that the FPP price were not backdated this would result in inefficiencies. The situation is clearly different to that before the Court of Appeal when it decided: "*in relation to the present matter*" (emphasis added) that a failure to backdate would result in inefficiencies because the revised price must be more efficient than the initial price.[25] It is simply not correct, from an economic perspective, that failing to backdate a price would result in inefficiencies.

B4.4 As discussed above, if prices are backdated so as to retrospectively alter payments already made between parties, this does not 'dictate the price for supply': it does not change the conditions in the market and information available to market participants and acted on by them at the time transactions occurred.

B4.5 The actions of those market participants have already occurred based on prevailing prices - or an expectation of a revised price, which would be accurate only if market participants had perfect foresight. The retroactive application of a revised price cannot change decisions that have been made in the past. In efficiency terms, "*the only way in which the revised price could be said to be more efficient is in relation to decisions that are being made on the basis of this price, and these are forward-looking decisions.*"[26] So backdating a price will never in itself increase efficiency; and therefore by necessary implication, not backdating cannot be assumed to be inefficient *per se.*[27]

B4.6 As DotEcon explain:

> *…there is little, if any, justification for backdating where prevailing prices are not manifestly wrong, where parties cannot be expected to predict the correct price with reasonable accuracy, and where the process that leads to the determination of the correct price is not controlled by the parties to the transaction. In particular, there is little justification for using backdating to make up for regulatory*

[24] As pointed out by Commissioner's Gale and Welson (Further Draft UCLL Determination, paragraph 893).

[25] [2006] NZCA 103, [35].

[26] DotEcon, Backdating Assessment, section 3

[27] DotEcon, Backdating Assessment, section 3.

delays that are fully within the control of the regulatory body, and accepting that backdating is an acceptable way of meeting a missed deadline potentially distorts the trade-off between finding the right answer and finding a good answer quickly.[28]

The final outcome of the Commission's TSLRIC exercise is not predictable

B4.7 We do not agree that market participants are able to predict, with accuracy, the outcome of the Commission's final Determination on FPP prices.

B4.8 We agree with Commissioners Gale and Welson's view that "*TSLRIC modelling requires significant judgment, so results can vary dramatically",* and that it is not necessarily *"reasonable to expect all RSPs to perform this type of modelling*."[29] The TSLRIC calculation is complex, and it is obvious from the thousands of pages of Commission and TERA documents, complex calculations, stakeholder submissions and cross submissions: the calculations contains vast numbers of inputs and assumptions, variations in each of which can substantially alter the final calculated FPP prices.

B4.9 An information asymmetry persists. Whilst Chorus has provided much of the information on which TERA's cost model is based, the RSPs do not have access to this information and so cannot reasonably be expected to be able to predict the outcome of TERA's complex TSLRIC model nor the Commission's final determination.

B4.10 Moreover, even if the final FPP determination were predictable, we do not agree that RSPs are able to make current market decisions based on such an expectation. Expectations of the final FPP price are likely to vary accords RSPs, and so competitive markets would be expected to lead to downwards pressure on prices, to the lowest expectation of FPP prices held across RSPs.

There is no evidence that Chorus will not be able to cover actual costs in the absence of backdating

B4.11 Regulatory uncertainty as to whether there will be backdating and the extent (time-period and the quantum) of any backdating, would be likely affect RSPs' investment plans while Chorus' investment plans, as funded through the UFB, would remain largely unaffected. Chorus' future copper investment is limited by its contractual obligations, while its fibre investment is already committed.[30] In contrast, the potential financial impact of backdating on smaller RSPs may be particularly severe, leading to the possible failure of smaller companies.

Backdating will not promote competition for the benefit of end users

B4.12 The theoretical basis for the use of TSLRIC for pricing access to monopoly assets is that it will deliver efficient prices that will incentivise investment and innovation while ensuring that end-users obtain benefits from any efficiency gains over time.

B4.13 As discussed above, it is only the expectation of backdating that could potentially influence firms' decision-making and even then the four listed conditions must hold to achieve demonstrable

[28] DotEcon, Backdating Assessment, section 2.

[28] Network Strategies (2015), *Examining welfare effects of UCLL and UBA uplift*, May 2015. See Section 2.1.

[30] Network Strategies (2015), *Examining welfare effects of UCLL and UBA uplift*, May 2015. See Section 2.1.

efficiency gains or pro-competitive effects.[31] There is no general backdating regime that applies to the UCLL / UBA price review and, as noted in the Further UCLL and UBA Draft Determinations, this is a discretionary matter that will not bind future Commissioners. As such any decision to introduce backdating made in this proceeding cannot be regarded as providing certainty that the same will happen again in future.

IPP prices are valid and cannot be rendered redundant by backdating

B4.14 The present case, where IPP prices are expressly valid and apply unless and until replaced by FPP prices, where IPP prices are not shown to be wrong in fact or law by the standards according to which they were set, and where IPP prices are not manifestly wrong when they are compared in quantum with the prices that have been determined by the TSLRIC test for FPP prices, is not a situation in which backdating is justified. There is no statutory presumption that IPP prices are or were incorrect. They will simply be replaced by an FPP price that has been determined using an alternative methodology.

B4.15 If it were the case that the parties had certainty a) that backdating would occur; and b) could correctly predict the 'to be backdated' FPP outcome, this would render the IPP redundant. As explained by DotEcon:

> *Specifically, if the presumption is that parties would make better decision on the basis of their predictions of the outcome of an FPP process (even after taking account of the uncertainty associated with this) there would be little point in the Commission establishing an IPP price. It could simply announce that the FPP charges it will eventually determine will apply from the date at which a determination is sought without the need to set any interim price. Economically, the IPP/FPP framework makes sense under the assumption that there are benefits from establishing an IPP price that might later be revised following a determination under the FPP because the IPP price, even if only a proxy, provides more certainty and thus a better basis on which parties can make their decisions. This requires, however, that the IPP price can be relied on as a basis for parties decisions unless and until replaced by a forward looking FPP price.*[32]

B4.16 Or more simply put: rather than benchmarking, the Commission could roll a dice to set the IPP price, as parties would ignore the prevailing prices set by that process and make all market decisions based on the outcome of the FPP.

B4.17 This practical elimination of any role for IPP pricing is not consistent with the sequential IPP-then-FPP process that is explicit in the scheme of the Act. In particular, the presumption that an IPP price has no utility as a price setting mechanism is inconsistent with s42(2) of the Act which expressly recognises it as continuing to have effect and be enforceable pending the determination of any replacement FPP price.

[31] As above: backdating could in principle promote efficient outcomes if all parties: (a) have certainty that backdating will occur; have certainty of the period over which backdating will apply; have certainty of the terms that will apply in market if backdating occurs and (d) can behave in the market as if 'new' prices to be backdated already applied during the periods within which these prices will be related back.

[32] DotEcon, Backdating Assessment, section 3.

B5 The Commission's further draft determination majority view, not to backdate, is correct

B5.1 It follows that the Commission should retain its current majority view that backdating will cause distortions in the market, and should not be applied.

B5.2 Backdating will not improve efficiency outcomes and will instead serve only to introduce new distortions into a market that is currently operating under uncertainty. Backdating FPP prices in these circumstances would not be consistent with the requirements adopted by all Commissioners, including Commissioner Duignan, that evidence must show that backdating is "*demonstrably* efficient" and will "*demonstrably promote competition in a way that is likely to directly benefit end users*" in order to decide positively that backdating will promote competition for the long term benefit of end users, which is the overriding consideration.[33]

B5.3 Network Strategies presents the likely effect of increasing the retail price for copper broadband. The outcome is comparable to that identified in response to the Commission's consideration of an uplift in TSLRIC prices:[34] The impact of an increased retail price will be:

(a) a substantial loss in consumer welfare, unlikely to be offset by a gain in welfare due to potential faster fibre migration

(b) consumers will migrate to other alternatives, including mobile, fibre and cable

(c) the number of active copper lines will be reduced, so there will be fewer lines over which the backdated amount can be recovered; and

(d) as active copper lines decrease, RSPs will try to recover an increasing amount from each remaining copper customers, and so retail prices will continue to increase.

Recommendation 1	Recognise that the characteristics of regulatory situations in which backdating has been applied elsewhere do not apply in the context of the FPP; backdating in the context of the FPP will not enhance efficiency as the necessary conditions - 1) certainty on backdating, 2) predictability of final prices and 3) the ability to behave as if final prices already apply - are not met. The FPP process does not meet these conditions. Backdating the FPP will create additional market distortions. The Commission must retain its current majority view on backdating.

[33] Draft UCLL Determination (2 July 2015), [856].

[34] Network Strategies, August 2015 Submission, section 11.2.

Part 2: THE COMMISSION'S TSLRIC INPUTS AND MODELLING

C Non-recurring charges

C1 Introduction

C1.1 The Commission must identify how a hypothetically efficient operator will undertake tasks using forward-looking efficient techniques and costs. The Commission has chosen to apply a top-down efficiency adjustment to Chorus' actual charges to determine the non-recurring charges set out in the draft decision.

C1.2 Bottom-up modelling is the preferable approach to deciding TSLRIC non-recurring charges. WIK notes that "*all potential methodological alternatives are only able to achieve or approximate the same result indirectly and imperfectly*".[35] For practical reasons (lack of data availability), the Commission has adopted an alternative top-down approach with efficiency adjustments.

C1.3 Our analysis shows that the Commission's current top-down calculation, taking Chorus' service company actual charges and overhead costs as inputs, and then making efficiency adjustments, will not result in TSLRIC-based non-recurring charges. The draft prices continue to overstate the costs of a hypothetically efficient operator.

C1.4 The Commission has developed a bottom-up TSLRIC model for monthly recurring charges on the basis of a Hypothetically Efficient Operator who deploy a network to provide the regulated services using Modern Equivalent Assets. This has resulted in a mix of FTTP and FWA for UCLL, and FTTN for UBA – not Chorus' actual costs. While Chorus' actual service company costs may be an instructive starting point, and necessary for the top-down modelling exercise the Commission is undertaking, it is essential that appropriate efficiency adjustments are made reflecting what an HEO could achieve.

C1.5 Non-recurring charges remain significantly above international benchmarks. For example, WIK compared the four UCLL transaction services in New Zealand on a weighted average price based on transaction volumes. The weighted average New Zealand price amounts to €45.32 – significantly higher than the EU average of €37.[36] WIK note that "[t]*he price benchmark presented above indicates that the Commission are still rather high despite the fact that the Commission's calculations and proposals would generate major price reductions from their current level*"[37]

C1.6 The following section sets out the issues identified in the draft determination which do not meet that standard. We provide a recommendation to address these concerns.

C2 Are Chorus' actual charges the correct starting point?

C2.1 The Commission appears to accept as a default position that the structure of Chorus' non-recurring charges is efficient. Little consideration has given whether the costs would be incurred

[35] WIK, August 2015 Submission, section 3.

[36] WIK, August 2015 Submission, section 3.

[37] WIK, August 2015 Submission, section 3.

by a hypothetically efficient operator, and whether Chorus faces inefficiency due to the current network and historic systems – costs and impediments that would not be faced by an HEO.

C2.2 Chorus copper network and systems reflect aging cost infrastructure and records, when compared against an efficiency standard. This manifests itself in costs that a hypothetically efficient operator would not incur:

(a) Inaccurate network records result in multiple service orders and truck rolls, imposing time and cost on both Chorus and access seekers. The risks of inaccurate records can be removed by doing a truckroll, even if ultimately unnecessary. This leads to unnecessary higher costs – a challenge a hypothetically efficient operator wouldn't face.

(b) Managing limited capacity on the copper network, where Chorus does not have sufficient capacity for new customers, or has lines that are uneconomic to repair – challenges a hypothetically efficient operator wouldn't face.

C2.3 Today, an unacceptably high level of network re-arrangement occurs in Chorus' network to re-establish connections that have been disconnected to meet other demand, or to replace faulty pairs. These costs would be avoided by an HEO who had built a new network with sufficient capacity.

C2.4 Compensation for these network re-arrangements does not provide any incentive for Chorus to invest further in its systems and network to avoid these costs, which can simply be directly passed on to RSPs and end-users as connection charges.

Cabinet and Exchange Visits

C2.5 As an example, Vodafone, Spark and M2 have compared 300 UBA services that required an exchange connection in May 2015. Approximately 25% of these connections were released by the losing company earlier in the year.

C2.6 A trade-off exists between providing sufficient port capacity meaning no port needs to be broken down, and the cost to send a service company to the exchange. Chorus has less incentive to provide sufficient port capacity which it isn't compensated for, than having a higher incidence of installation truckrolls, where those costs can be passed on directly to the RSP. An HEO with new network would not face that dilemma because the hypothetical network is a modern asset with sufficient built capacity.

End-user Site Visits

C2.7 Vodafone, Spark and M2 also compared UBA site visit connections. 14% of the customer premises had previously been connected to Chorus' network early this year, with 20% having been connected within the last twelve months. Removing these intact lines is likely to have arisen from a shortage of capacity in the copper network – a challenge that would not be faced by an HEO – a modern network with sufficient capacity to service the customer base.

C2.8 Vodafone expects that similar results would occur with a wider sample. While Chorus may be operating rationally, these costs do not reflect an efficient modern network operator. No adjustment has been made in the Commission's top-down approach to address non-recurring charges inefficiently incurred.

C2.9 At the very least, this analysis demonstrates that any suggestion that Chorus' actual costs reflect an efficient network operator, are simply wrong.

C3 Recommended corrections to TERA efficiency adjustments

Efficiency analysis should occur across all cost elements

C3.1 The Commission has applied a limited efficiency adjustment to only one of seven elements of cost - time budgeted.

C3.2 The Commission ignores other efficiency adjustments on the basis that the components are specific to each country and can therefore not be subject to international benchmarking. No efficiency adjustment has been undertaken for the service company overhead costs or Chorus' own overhead costs. WIK identify that "significantly less that 50% of the service transaction costs have been checked for efficiency in the adjustment approach of the Commission".[38]

International Efficiency Benchmarking

C3.3 WIK has identified a number of corrections that must made to TERA's international benchmarking to ensure that it accurately captures and reflects efficient benchmarks.

(a) **Introduce a Productivity Factor over the regulated period:** European NRAs have regulated transaction charges such that significant efficiency gains have been realised over time, including material reductions in service delivery times. Chorus is investing in improved OSS/BSS that WIK expects will deliver greater speed and accuracy, and reduce unnecessary non-recurring charges. Accordingly, the efficiency factor should increase over time to reflect those changes. This is particularly important given Chorus non-recurring charges for the regulated period will be historic, and not take into account future expected efficiencies. WIK recommends that an annual productivity adjustment of 5% is made.

(b) **Revisit labour productivity comparators:** The level of labour-cost related input to service provision depends on the degree of process automation. The Commission should only include countries into its efficiency adjustment benchmark which have similar level of labour productivity and labour costs compared to New Zealand. WIK recommends that Spain and Romania are remove from the sample, and country "A" is also assessed against the same criteria.

(c) **Adopt consistent approach with benchmarks:** WIK identify that some international benchmarks include transport time in addition to effective required labour time, implying that the resulting process times are upwardly biased in the absence of any efficiency adjustment. Similarly, some benchmarks include administration time for a given activity, that may result in possible double counting when considered alongside Chorus and Service Companies' overhead cost components.

National Benchmarking

C3.4 The use of a cross check of calculated prices using national benchmarking. While the Commission identifies limited benchmarks, the use of LFC costs is instructive but are likely to

[38] WIK, August 2015 Submission, section 3.

overstate costs because the relevant non-recurring charges relate to fibre deployment and, as WIK identify, are significantly more complex than for the relevant copper services. If the Commission does apply this cross check, it must apply symmetrically.

C3.5 Where the calculated costs are lower than the corresponding national cross-check price, the higher price determines the final pricing outcome. TERA justify on the basis that their international benchmark approach had led to costs which were too low. However, for calculated costs than were higher than the corresponding national cross-check price, TERA used the higher price to determine the final pricing outcome without explanation.

C3.6 WIK conclude that "[t]he asymmetrical use of the national benchmark information – using information if it leads to higher prices and ignoring them if it leads to lower prices – is methodologically higher questionable".[39] "It is obvious that the use of the findings was less driven by the original idea to identify efficient costs but more by the idea to limit cost reductions."[40]

C3.7 It is also not clear from the national benchmarking analysis, why only one LFC has been considered as comparator. WIK also identify that fibre related non-recurring charges are likely to be at least twice the cost of copper based connection, meaning that LFC benchmarked costs are likely to be highly conservative, so the asymmetric approach taken by TERA is not only not justified, but also likely to be unreasonable.

C4 Service Company costs

C4.1 Chorus undertook a tender process to award its service companies' contracts that may reflect a competitive and therefore efficient market outcome for the contract as a whole. However, it cannot be assumed that it results in efficient individual prices for the following reasons identified by WIK:

(a) Incentives exist to allocate service companies costs such that competitive services and perhaps maintenance services get less burdened with costs than those services where costs can be shifted directly to users which demand those services;

(b) Line item costs have a high level of aggregation. The current non-recurring charge proposals match four service codes with 21 different NRC core charges. On average, more than five NRC core charges have been mapped with one service code.

(c) Service Companies' overheads are not adjusted, on the basis that no further analysis is required because of the competitive tendering process and therefore Chorus' contract rates should be taken. This is inconsistent with other areas of TERA's model where mark-ups have been correctly adjusted to correctly reflect efficiency standards.

(d) Chorus overheads for non-recurring charges are derived from its OPEX model. The efficiency of costs that Chorus faces to manage its service contracts is driven by the investment in IT automation and IT integration. TERA has not assessed the level of potential efficiency that has been experienced with IT automation and integration internationally. TERA has adopted a static approach that assumes constant overhead

[39] WIK, August 2015 Submission, section 3.

[40] WIK, August 2015 Submission, section 3.

costs for the whole regulatory period of 5 years. Chorus is currently investing in IT system improvements, including for example, the 'Chorus portal', with productivity improvements expected as a result. The Commission should therefore revisit the efficient Chorus overhead to apply for the regulatory period.

As WIK note "[i]t should be noted that extrapolating the incumbent's IT cost is dealing with its historic IT development path and all the high costs of changing an existing IT landscape. An HEO, however, is starting a greenfield and benefiting from a new and state of the art IT platform, without all old release change dependencies impacting an existing operator experiences."

Price Trends, Productivity Gains and Process Efficiency

C4.2 The Commission risks embedding historic inefficiency without any efficiency adjustment over the regulated period, and failing to set proper incentives for Chorus to continue to improve efficiency, and to let access seekers and end-users participate in these improvements. WIK recommends a productivity improvement factor for transaction services by setting a price path of -3% to -5% of the price level determined for the cost of its base year.

C4.3 Going forward, further opportunities to improve efficiency will be possible, so building in a price path for Chorus non-recurring charges over time will create the right incentives to become more efficient. As WIK notes, these incentives do not always sit with service companies, who are compensated for working with current inefficiencies that operate today.

Recommendation 2	Develop an efficiency adjustment approach which applies efficiency adjustments to 100% of the relevant cost base. Include only countries which have similar labour productivity and labour costs to New Zealand in the Commission's international benchmark for efficiency adjustments.
Recommendation 3	Update the 'old' benchmark figures to reflect efficiency gains achieved in benchmark countries. Index the 'raw' benchmark figures with an annual productivity factor of 5% p.a. Exclude (a) transport times and (b) administrative times from the relevant activity processing time.
Recommendation 4	Withdraw the national cross-checking approach based on fibre connection costs totally. If the Commission retains the national cross-checking approach this must be applied symmetrically: it must apply equally in cases where costs would increase as in cases where prices would rise.
Recommendation 5	Apply a bulk discount scheme which is more cost reflective and not only be defined by a particular threshold. Apply bulk discounts to UBA-related service transaction charges.
Recommendation 6	Reduce the scope of POA based pricing to the absolute necessary minimum. The services 1.48 and 1.50 should not be priced according to POA.

Recommendation 7	Extend the scope of the NRC price determination to include the lead-in service and the 10 Gbps handover installation. 'Clean' the use of service codes in its mapping approach such that cost and work elements which do not belong to the regulated transaction services are excluded from the relevant cost base.
Recommendation 8	Do not accept the direct cost of Service Companies as given. Check the appropriateness of the cost allocation within the multi-product relationship between Chorus and the service companies. Recognise the incentive for Chorus to distort these allocations at the expense of transaction charges.
Recommendation 9	Revise Service Companies' overhead mark-up because it is generally too high and leads in some cases to a double-recovery of costs. Correct Chorus' overheads for efficiency and automation savings.
Recommendation 10	Predict reasonably foreseeable efficiency improvements in the provision of transaction services within the regulatory period, by implementing a productivity improvement factor as a price path of -3% to -5% p.a. from the calculated cost of the base year.

D Fixed Wireless Access

D1 Introduction

D1.1 The Commission has adopted a revised approach to the inclusion of FWA in the HEO's MEA network. The hypothetical FWA footprint is determined with reference to ex ante current real-world copper connection capability, and with no reference to the HEO's definitive efficiency characteristic. The assumes that irrespective of an area's terrain and customer density, the HEO will simply follow a blanket rule of providing fibre access to customers within a certain distance from an exchange.

D1.2 The Commission's approach is entirely the 'wrong way into' this analytical exercise, and we strongly urge the Commission to reconsider. The Commission must recognise that current copper connections are irrelevant when considering the deployment a HEO would decide upon: in the HEO's world, current telecommunication connections do not exist and a network is being built for the first time. Thus the HEO will consider expected demand profiles (regardless of technology) and will make an economic optimisation assessment on the supply costs of deployment of fibre or FWA.

D1.3 Vodafone's view is that the Commission's assessment of a HEO network must take account of current government policy settings. The HEO will receive subsidies to incentivise fibre beyond the point that would otherwise be economic, and to deploy FWA in rural areas beyond what would otherwise be deemed economic. Thus all relevant subsidies need to be taken into account, not simply those from non-government third parties.

D1.4 The RBI scheme has contributed to a FWA deployment within RBI areas. Thus Vodafone's current RBI contract - to deploy FWA based on existing mobile sites and some new sites - represents the actual footprint of a FWA network that, given current policy settings and an existing mobile network, it is rational for a HEO to deploy to.

D1.5 Vodafone's current choice of technology is also informative: where RBI deeds require, fibre backhaul is deployed. In other areas, an economic assessment is made and for some sites, microwave backhaul is applied. The Commission's understanding that Vodafone has stated that we are replacing microwave with fibre was based on a simple but important misunderstanding. The verbal comment was made to Commission and TERA staff with reference to backhaul in urban areas. In contrast, Vodafone is actively deploying microwave backhaul to new rural sites (including sites not covered by the RBI, so for which the technology choice is purely an economic assessment). And for sites within the RBI, microwave backhaul links exist too.

D1.6 The Commission cannot set aside strong evidence of real world economic assessments of MEA backhaul technology, and replace with a blanket 'all-fibre backhaul' assumption that was based on Commission and TERA staff misunderstanding of a verbal comment. The evidence provided by Vodafone must be considered.

D2 A new approach to determining FWA footprint

D2.1 Vodafone supports the Commission's general inclusion of FWA within the MEA for UCLL. The TSLRICs that the Commission is determining for the UCLL and UBA services must reflect the cost incurred by an HEO deploying a network using MEA: where FWA is accepted as a valid component of the MEA, this is a required component of the HEO's cost optimisation exercise.

D2.2 The requirement for the Commission to consider the means by which an HEO would most efficiently deploy a network is plain from the definition of TSLRIC in the Act. As the Court of Appeal has observed that: "*[t]he TSLRIC model provides an estimate of the costs of an efficient access provider over a sufficient period of time (long run), on a forward looking basis (reflecting the notional costs to an operator if it built a new network)…*"[41] In effect, the proper application of TSLRIC requires the Commission to determine the costs of an efficient access provider.

D2.3 Given the scope of this function, the Commission cannot exclude FWA from the MEA where the evidence before it suggests that an HEO would deploy a network using this technology. Vodafone submits that there is strong and compelling evidence that the HEO would include FWA in its network, and the Draft UCLL Determination also adopts this view.

D2.4 We also consider that the relevant coverage area for FWA in the MEA should be the entire area in which it is more efficient for the HEO to deploy a network using FWA as opposed to a FTTH or another fixed line solution, with the HEO's costs influenced by current government policy settings and subsidies. We consider that a failure to do so would constitute a substantial error in the Commission's analysis.

D2.5 The Supreme Court's *Vodafone v. Telecom* judgment is relevant in this regard.[42] There, the Supreme Court established that the Commission erred in law by declining to include lowest cost technology (i.e. mobile technology) when undertaking a statutory function that required it to determine the unavoidable net incremental cost of an efficient service provider in providing a particular service. Two passages are particularly relevant given the approach to inclusion of FWA that the Commission has adopted in the Draft UCLL Determination:

[41] *Chorus v. Commerce Commission and others* [2014] NZCA 440
[42] [2011] NZSC 138

(a) *"The Commission was right to think that a service provider which is efficient must be one which avoids costs which are in practical terms capable of being avoided – that is, are capable of being efficiently avoided. But, examining the matter in a practical way, the service provider will not take a short-term view of what costs can be avoided if such avoidance will prejudice it in the longer term. It will, in other words, favour dynamic efficiency.*" [43]

Here, the court confirms that in examining the choices that an efficient service provider (i.e. an HEO) would make, the Commission must not confine its assessment simply to the existing deployment or capability of a candidate MEA technology. It must also account for the actual and foreseeable future deployment of that technology. Applied to the present case, this passage suggests that the Commission should not confine the inclusion of FWA in the MEA, either with reference to its current deployment or through excessively conservative assumptions regarding the extent of future deployment. As the Commission has noted in respect of other elements in the FPP process where it is exercising choice, it should exercise preference in favour of dynamic efficiencies.

(b) "*The Commission has committed a second error of law of the Edwards v Bairstow type in the determinations to which the appeals relate by declining to change its model to include mobile technology because of its belief that it would then need to allow compensation to Telecom for the effect of the change, namely the stranding of some legacy assets. The Commission declined to introduce the mobile technology because Telecom would not then receive the return on and of its legacy assets which it could expect to get under the Commission's model."*[44]

This passage confirms that an error of law will exist if the Commission limits the inclusion of technology within a model for reasons that do not have any sound factual or analytical basis. As noted above, the statutory function being performed requires the Commission to determine the costs of an efficient access provider: an HEO. This requires an economic assessment of the choices that an HEO would make. The relevant coverage area for any technology included in an MEA is determined solely by the assessment that a rational HEO would make as to whether it is more efficient to use that technology that any alternative. If the Commission departs from this principle it risks making a significant error in its analysis. In particular, relying on the current capacity properties of a copper network subverts overarching purpose of the TSLRIC function as directed by the Act: determining the costs of an efficient access provider. Basing assessment of the extent of FWA on current copper costs undermines what should be the key consideration in the Commission's analysis: what technology decisions would a rational HEO make so as to minimise costs of deploying an MEA real-world connection capabilities, e.g. copper, are entirely meaningless in the hypothetical modelling exercise that proper application of TSLRIC requires.

D2.6 The Commission's new approach to determining the HEO's deployment of FWA is to assume, *ex ante*, that a specific subset of customers of the HEO will connect via FWA. These customers are arbitrarily identified based on the existing capacity restrictions of current copper connections. This is not a valid way of assessing the extent of coverage that an efficiency maximising HEO

[43] [2011] NZSC 138, [66]

[44] [2011] NZSC 138, [75]

would achieve using FWA. A proper approach involves assessment of the actual capability of FWA to provide a suitable broadband service, and consideration of the comparison that a HEO would carry out to establish the relative costs of deployment options.

D3 The HEO's optimisation across fibre and FWA, taking into account RBI sites, has been provided

D3.1 The Commission has stated that previous '*submissions have not provided a workable solution that can be applied to the whole country*'.[45]

D3.2 We do not agree. Network Strategies' February 2015 FWA modelling is a best practice approach to assessing the economically efficient deployment of FWA (conditional on current government policy and so making use of cellsite masts currently used by the RBI). The FWA model provided is a workable solution that can be extended to non-unbundled ESAs across the whole country, *without* having to model the whole country. Sample areas across the four rural geotypes were selected. The geotypes were considered to ensure diverse rural terrains and propagation conditions were included. Modelling is based on actual Vodafone RF planning. The RF planning achieved 100% coverage of rural premises within the TSO (higher than our usual rural networks would aim to achieve). Thus Network Strategies' February 2015 FWA modelling results can clearly be used to achieve a - conservative - estimate of FWA costs across all rural areas in New Zealand to which a HEO would deploy FWA.

D3.3 It is curious that whilst the Commission has stated that '*submissions have not provided a workable solution that can be applied to the whole country'* the Commission also then includes Network Strategies' recommended method to extended their findings to all rural, non-unbundled, ESAs: *'Network Strategies recommended that the costs derived from the engineered sample areas should then be applied to end-users in zones 3 and 4 in ESAs that had not yet been unbundled*.' [46]

D3.4 The Commission has claimed that Network Strategies' modelling approach has not provided adequate reasons for the proposed FWA coverage areas. We disagree, Network Strategies' model does not consider all Zones 3 and 4 areas and *detailed reasons for choosing the proposed FWA areas within these zones were provided* in the February 2015 FWA Submission. Zones 1 and 2 were not considered for FWA as fibre is likely to be the most cost-efficient technology in dense urban areas. Network Strategies' February 2015 FWA Submission clearly specifies that Zones 3 and 4 ESAs, that currently have no unbundled lines, were chosen and gives clear reasoning.[47] We agree with Network Strategies' conclusion that the reasons given in the Commission's further draft determination, for not developing a comprehensive FWA model, are inadequate.

D3.5 The Commission reports that, according to TERA, a comprehensive FWA model will be complex or infeasible to apply while unbundle-ability is subjective and difficult to measure.[48] We agree with Network Strategies' advice:[49]

[45] Commerce Commission (2015), Further Draft UCLL Determination, paragraphs 1124-1125.

[46] Commerce Commission (2015), Further Draft UCLL Determination, [1121.6].

[47] Network Strategies February 2015 FWA Submission, section 3.2 and August 2015 Submission, section 2.4.

[48] Commerce Commission (2015 Further Draft UCLL Determination [1127-1128]

[49] Network Strategies, August 2015 Submission, section 2.4.

It is important that the Commission's model accurately reflects efficient costs even if the correct approach seems 'complex'. In fact, it is fairly standard practice in TSLRIC modelling to consider different geo-types which reflect the varying demographic, geographic and/or topographic features of a country. An examination of other access cost models reveals that geotypes and sample areas are used to estimate efficient costs which are then applied to the all areas:

The Swedish model[50] divides the total geographical area into 7546 zones and classifies them into six geotypes (which are chosen based on density of subscribers). A sample of 50 zones is selected in the model to estimate the costs.

The Australian model[51] also uses the geotype approach by classifying a total of 5070 areas into 16 geotypes. The geotypes are defined based on density and spread of subscribers and average road distance between locations/subscribers. A sample of 200 areas is modelled to find the costs.

The Commerce Commission's TSO wireless cap model for New Zealand selected 14 ESAs and classified them into four geotypes to represent the range of conditions encountered by network planners in New Zealand.

D3.6 The Commission cannot conclude that the standard practice of using a sample of representative geotypes to estimate costs for a whole area is too complex.

D3.7 Further, in proposing a method which assumes that the operator will deploy fibre or FWA based only on distance from the exchange, the Commission entirely neglects the implications of geotype on deployment cost. Network Strategies explain:[52]

Geotypes are generally classified to represent different regions, terrain and customer densities. These factors affect deployment costs and more importantly the decision of an operator to choose technologies (in this case fibre or FWA). Although the Commission's model accounts for differences in regions (urban and rural) and soil types to calculate the costs of civil engineering assets (including ducts and trenches), there is no analysis of the HEO's technology choice based on regions, terrain and customer density. The Commission assumes that the HEO will provide fibre to all customers within a certain distance from the exchange without considering the cost implications of doing so. In other words the Commission assumes that an HEO's decision for deploying fibre or FWA will be same for a fixed distance in a busy urban area (such as Auckland) and a remote rural area (such as Tapawera). We believe this is a totally unrealistic and inefficient assumption for an HEO. We have already proposed a reasonable and cost effective approach of modelling FWA in Chorus' Zones 3 and 4 (the rural zones) yet to be unbundled.

D3.8 Network Strategies' FWA model is not only workable but aligns with TSLRIC standard modelling practice by considering costs for the most efficient least cost modern replacement technology in different geotypes in New Zealand.

D4 Premises served by FWA is inconsistent with optimal network planning and economic efficiency

D4.1 The Commission's discussion on households covered by FWA is confused. Whilst the Commission states "*RBI sites were chosen as a proxy*" and "[o]*ur view is that FWA should be used for lines*

[50] Post- och telestyrelsen (2013), *Hybridmodell version 10.1,* 16 December 2013.

[51] Australian Competition and Consumer Commission (2010), *Analysys fixed network cost model – October 2010*, available at http://www.accc.gov.au/regulated-infrastructure/communications/fixed-line-services/fixed-line-wholesale-services-pricing-review-2009-2010/consultant-report.

[52] Network Strategies, August 2015 Submission, section 2.4.

where costs are particularly high and unbundling is unlikely – our judgement is that, on balance, the number of customers fed by RBI felt about right".[53] Yet the households covered by FWA in the Further Draft UCLL Determination are not the buildings that will be covered by Vodafone's RBI sites.

D4.2 Instead the households covered are determined via current copper capacity connections, with no relation to areas deemed suitable for FWA. The Commission classifies customers who are further than 5.3km from the closed node as 'low capacity users' and as such, these are deemed to be connected via FWA. The remainder are connected via fibre. This 5.3km distance limit for fibre is predicated on the capacity properties of a *copper* network. This criteria simply cannot logically apply to the construct of a FTTH and FWA MEA. A fibre service does not degrade with distance, and so the HEO's decision of the boundary between fibre and FWA cannot be based on providing a minimum capacity to households.

D4.3 The Commission's assumptions on capacity and demand results in its HEO connecting only 40,833 households via FWA. This downwards adjustment [ ]**CNZRI** buildings (within TSO boundaries) that the Commission's February 2015 HEO served via FWA are now assumed to be served by fibre. Furthermore, this low figure represents only 16% of the 250,000 households and businesses Vodafone will cover under our RBI agreement with the Crown.

D4.4 Notwithstanding our submission that copper capacity is irrelevant to the HEO, we note Network Strategies' identification of TERA's underestimation of low capacity users:[54]

> *The Government stated in 2011 that 252 000 rural households were unable to access broadband services[55]. If we compare this figure to TERA's FWA plus non-TSO end-users*]***CNZCI*** *lines have been either omitted from the FWA category or counted as full speed lines. Furthermore, we note that Chorus states on its website that as at 31 December 2015 it had, through the RBI initiative, 'brought new or upgraded broadband coverage within reach of 81 000 rural lines[56]. It is inappropriate to exclude these upgraded lines from the Commission's set of low capacity users, unless the Commission makes an explicit allowance in the model for the RBI subsidy that made the upgrade possible*

D4.5 Network Strategies have carried out valuable mapping of the Commission's FWA approach, which shows the HEO deploying in a manner that clearly diverges from sensible network planning and makes no economic sense:[57]

> *Both examples illustrate how the RBI sites in the model are only serving a reduced number of the users which are located more than 5.3.km away from the exchange. It can be seen that some fibre-served buildings are in the midst of FWA-served buildings – this cannot represent efficient deployment by the HEO.*

[

[53] Commerce Commission, Further Draft UCLL Determination, para 1132.

[54] Network Strategies, August 2015 Submission, section 2.2.

[55] Steven Joyce (2011), *Rural Broadband Initiative underway*, 20 April 2011, available at http://www.beehive.govt.nz/release/rural-broadband-initiative-underway.

[56] Chorus (2015), *Chorus Half Year Result, FY15*, 23 February 2015, page 14.

[57] Network Strategies, August 2015 Submission, section 2.3.2.

]**CNZRI**

D4.6 The Commission's approach is many steps too far removed from the observable evidence provided by an efficient operator making deployment decisions in rural areas under the framework of current government policy settings. We agree with Network Strategies:

> *The Commission should implement what it stated – namely 'FWA should be used for lines where costs are particularly high and unbundling is unlikely'[18] – rather than applying a distance criterion that is irrelevant to the technologies considered. Consequently we suggest that the Commission should consider FWA for users in Zones 3 and 4 areas where there is no current unbundling and future unbundling is unlikely.*

D4.7 We are also concerned by Network Strategies' finding that the resulting footprint of FWA coverage does not appear to accurately reflect the Commission's approach. Using information on the location of Chorus' cabinets at March 2015, Network Strategies find:

(a) buildings further than 5.3km from Chorus' cabinet or exchange that the Commission is assuming are served by fibre; and

(b) [ ]**CNZRI** buildings that the Commission states are served by FWA are in fact located within a radius of 5.3km from the closest cabinet. Similar results are obtained when assessing distance from Chorus' exchanges.

D4.8 Serving more distant buildings by fibre will have a substantial inflationary impact on the HEO's network costs.

D5 Capacity

D5.1 The new HEO's own customers' capacity demand is also based on distance from the exchange. The Commission assumes a demand distribution for throughput based on current real-world connection 'quality' over a copper pair. The Commission must change this approach: current real world connection capabilities - over copper - are entirely meaningless in a HEO world of a fibre and FWA MEA network, as fibre throughput does not degrade with distance.

D5.2 The Commission's assumed distribution of demand in turn determines the total throughput demand per FWA site. The Commission has revised its assumptions on the number of premises served per base station. Our February Submission noted:

> *LTE is a superior technology and its improved performance in fade margin, data rates, latency, packet loss, failure rates, spectral efficiencies and the scalable bandwidth allowing improved coverage and cell edge data rates are ignored by TERA. Further, that 700MHz spectrum band enables better coverage and slow fading margins are lower in rural than urban areas is also ignored.*

D5.3 The revision of throughput assumption of 66,000kbit/s capacity per FWA site, leading to an assumed 264 users per 3-sector site, is welcomed. However this improvement to a more realistic capacity assumption is undermined by the how FWA is implemented in the Commission's model, which results in a vastly underutilised assumed capacity.

D5.4 The Commission's model neglects to account for simple physics: a radio signal is not limited by map boundaries. Instead, an FWA site will provide coverage across ESA boundaries. The Commission's method of considering sites in each ESA separately will substantially over-engineer the network resulting in substantially higher deployment and operating costs.

D5.5 Network Strategies report that is it unclear how TERA's model calculates cost per Mbit/s and the resultant value. The model appears to take all base stations required per MDF (assuming maximum capacity) then multiplying by the number of RBI stations in the MDF. This will clearly result in a substantial over-estimate of cost as not all RBI stations will be required to serve the Commission's 40,833 FWA customers. Moreover, this implies the full capacity of 66 000kbit/s per base station will be significantly under-utilised by the Commission's HEO.

D5.6 We submitted in February that the Commission's coverage assumptions (based on Vodafone's 3G sites) were overly conservative considering the improved coverage available when using the 700MHz band. Whilst the Commission has accepted this argument, it nonetheless retains a

'conservative range' to mitigate 'topology and other factors'.[58] The Commission must revise its assessment to recognise that Vodafone's RBI network is already designed to account for topography and other factors.

D6 Microwave backhaul for rural areas and cannot be ignored

D6.1 The Commission continues to assume that optical fibre is the MEA choice for backhaul, and so continues to ignore microwave backhaul as a viable option. Key to this position is the Commission's statement that "*...the use of microwave backhaul is not forward-looking. Vodafone advised us that it is progressively replacing its microwave backhaul with optical fibre.*"[59]

D6.2 Vodafone have been unable to locate information to this effect within the full set of information on FWA provided to the Commission under s98, or voluntarily, during the IPP and FPP processes. Commission staff assisted by confirming to Vodafone that:[60]

(a) "*TERA and Commission staff recall the statement 'that Vodafone is progressively replacing its microwave backhaul with fibre' being made by Vodafone staff during cell site visits*" (so a *verbal* comment); and

(b) the Commission's view on microwave and fibre backhaul does not relate to information included in written material provided by Vodafone to the Commission during this FPP process.

We have questioned Vodafone staff present during the site visit by TERA and the Commission. The Vodafone engineers present have confirmed this statement was indeed made. However the statement was made with reference to **[.]VFNZCI**

Microwave backhaul is, and will continue to be, deployed by Vodafone in New Zealand

D6.3 **[**

[58] Commerce Commission, Further Draft UCLL Determination, para 1132.

[59] Commerce Commission, Further Draft UCLL Determination, para 1132.

[60] Robin Meaclem (Commerce Commission), by email to Tamara Linnhoff (Vodafone), 23 July 2015.

] VFNZ CI

(b) **Reliability** - Microwave links are affected by path degradation, however sophisticated designing and link duplications ensures high reliability. In contrast, fibre backhaul in rural areas may be damaged by animals (for example, rats) or local council contractors working in the area. It is also worth noting that it is to protect microwave links by adding more links, which is not the case for fibre lines due to the high cost of duplicating long fibre lines in rural areas.

[

D6.12

]VFNZCI

Microwave backhaul is deployed overseas

D6.13 Network Strategies provide evidence on the continuing viability of microwave backhaul for 4G/LTE globally:[61]

> *We note that microwave backhaul is a popular option for sites globally and is expected to remain so in the future to serve 4G/LTE technologies. Ericsson's 2014 report on microwave backhaul emphasises its importance and presence by stating: 'Today, microwave transmission dominates mobile backhaul, where it connects some 60 percent of all macro base stations. Even as the total number of connections grows, microwave's share of the market will remain fairly constant. By 2019, it will still account for around 50 percent of all base stations.*
>
> *There will also be geographical differences, with densely populated urban areas having higher fiber penetration than less populated suburban and rural areas, where microwave will prevail for both short-haul and long-haul links.'*

D6.14 Microwave radio must be considered as an option for modelling FWA backhaul for the HEO. Microwave backhaul can demonstrably provide sufficient capacity for rural demand and is significantly more cost efficient than fibre backhaul.

D7 Cost of an FWA network

D7.1 The cost of the FWA network component is arrived at by firstly determining the cost per Mbit/s of the FWA network, and then applying that cost per Mbit/s to the actual coverage. Vodafone's existing sites are assumed to exist in the HEO's network, and are assumed to be used at 'full' capacity of 22Mbit/s per cell. The total capital cost is the cost of base stations and backhaul to exchanges. This total is then divided by peak throughput of the FWA in RBI areas, to infer a cost per Mbit/s.

D7.2 The Commission has previously assumed that a FWA would face equivalent spectrum charges as paid by nationwide mobile operators at competitive spectrum auctions. We agree with the Commission's downwards revision the spectrum fee relevant for the operation of FWA in rural areas. The Commission's approach entirely sets aside the approach of an MEA selecting the most appropriate cost effective technologies to serve its customers.

D8 Issues with TERA's cost modelling for FWA

D8.1 Network Strategies previously raised a concern that the methodology used to determine demand delivered results which were inconsistent with the Commission's stated approach (which was to exclude capex of the network outside the TSO derived boundary from the full network TSLRIC cost). Network Strategies demonstrated that FWA end-users located outside the TSO boundary should be excluded from the dimensioning of the network.

D8.2 The Commission clearly confirms agreement to this approach: "*we agree that end-users outside the TSO area should not have been served by FWA*"[62]. And yet Network Strategies have found that this issue has not been addressed in the revised version of the model: almost 5000 premises that are outside the TSO boundaries are still considered to be served by FWA, and the associated

[61] Network Strategies August 2015 Submission, s 2.3.5.

[62] Commerce Commission (2015), Further draft pricing review determination for Chorus' unbundled copper local loop services, 2 July 2015, paragraph 1132.

infrastructure costs therefore feature.[63] Thus the Commission's own stated approach is not followed in the HEO's network modelling.

D9 The Commission must optimise the HEO's network across fibre and FWA

D9.1 The Commission's current approach to determining a HEO's FWA is inferior to the approach attempted in December 2014. However the Commission's December 2014 FWA footprint was itself incompatible with TSLRIC principles, as this was determined by exogenous considerations and not based on an efficiency approach.

D9.2 As noted in our February Submission, TERA's access model was not dimensioned to consider FTTH and FWA networks simultaneously. The Commission did not optimise the location, build specifications and coverage decisions of a HEO. Adopting Vodafone's rural mobile sites built under the Government's Rural Broadband Initiative (and the coverage provided by those sites) as the rational coverage for the modelled network simply does not fulfil the pure TSLRIC standard. No assessment is undertaken as to whether the number and location of these sites are the result of coverage or profit optimisation. Where FWA is accepted (quite appropriately) as a valid component of the MEA, this is a required component of the cost model.

D9.3 Vodafone recommend that the Commission should adopt the extensive modelling undertaken as it:

(a) accounts for complex terrain and propagation factors while providing a an efficient solution for a HEO.

(b) can be easily adopted by TERA – we and Network Strategies have already suggested a feasible approach to apply our model results to rural areas.

(c) is based on a reasonable assumption that no further unbundling is expected during the modelling period;

(d) adopts conservative coverage assumptions - ensuring 100% coverage to all buildings within the TSO;

(e) provides for adequate capacity for rural broadband; and

D9.4 A critical reason Vodafone and Network Strategies' submissions on FWA must be heeded is these submissions reflect **[**XX **]VFNZCI**. We also find it curious that whilst the Commission has, within its consideration of fibre networks, correctly applied efficiency improvements that a HEO would make compared to Chorus' fibre deployment, for rural areas the Commission is assuming a HEO would be less efficient than Vodafone currently is. Such an internal inconsistency in analysis raises is concerning.

D9.5 The Commission cannot ignore the detailed analysis undertaken and instead propose a method which simply assumes that the operator will deploy fibre or FWA based on one factor only – distance from the exchange. Rather, the Commission must take account of evidence we are providing on microwave backhaul usage, current upgrades of microwave with microwave, the

[63] For detailed mapped evidence of this problem see Network Strategies, August 2015 Submission, s 7.2.2.

capacity and attributes of MEA microwave backhaul, and the cost differential between fibre and microwave.

D9.6 We expect that TERA has the capability to undertake FWA modelling. If this is not the case, the Commission has access to Vodafone and Spark's RF planning tools, Network Strategies' expertise, or will be able to procure external technical capability from elsewhere. Given the material already provided to the Commission, correctly modelling FWA need not be a lengthy task and would be feasible within the current FPP timetable for final decisions in December 2015.

Recommendation 11	Implement an analysis consistent with the Commission's own statement: 'FWA should be used for lines where costs are particularly high and unbundling is unlikely' - rather than applying a distance criterion based on copper capacity degradation that is irrelevant to FTTH. Consider FWA for users in all Zone 3 and 4 areas where there is no current unbundling and future unbundling is unlikely.
Recommendation 12	Adopt actual, best-practice, FWA coverage and capacity information in place of the currently used throughput demand driver of copper capacity. As copper throughput capacity is meaningless in for a HEO's fibre and FWA network: fibre throughput does not degrade with distance.
Recommendation 13	Respect the laws of physics: radio signal is not limited by map boundaries. Instead, recognise that FWA sites provide coverage across ESA boundaries.
Recommendation 14	Ensure TERA's modelled footprint of FWA coverage accurately reflects the Commission's approach.
Recommendation 15	Include microwave radio as an option for modelling FWA backhaul for the HEO.
Recommendation 16	Reflect optimised deployment – and costs – across fibre and microwave backhaul.
Recommendation 17	Adopt Network Strategies' FWA model as a workable solution that can be applied to all non-unbundled areas, as this is based on actual terrain and propagation conditions in New Zealand and reflects the cost optimisation decision of a HEO deploying FWA in areas where it is feasible and economical.

E Modern Equivalent Asset

E1.1 An MEA is a modern equivalent asset that an efficient operator would build today to provide the service in question. Using an MEA concept is consistent with Commission's function of determining TSLRIC by determining forward-looking costs over the long run, thereby promoting efficient investment

E1.2 We have previously submitted that, having selected a FTTH and FWA hybrid network as the MEA in respect of the UCLL service, the Commission is bound as a matter of law to adopt this same MEA in respect of the UBA service: a single MEA must be used for determining UCLL and UBA prices.[64] This is because we consider it contrary to the Act, and an error of law, for the Commission to determine the UBA FPP price by using as the first component for the UBA FPP price a different

[64] Vodafone submission (20 February 2015), [C1].

price/model derived from Chorus' existing unbundled copper local loop network. The Commission nevertheless tends to maintain this approach.[65]

E1.3 The Commission previously said that "*we must presuppose that the MEA of those additional components [i.e. the "additional costs" component of providing the UBA service] would exist on Chorus' copper access network*."[66] This assumption was apparently central to the Commission's prior view that it was required to adopt Chorus' existing copper network as the MEA for the UCLL service. Vodafone submitted that there is no such requirement: the only reference to copper in the UBA FPP is to the Unbundled Copper Local Loop price; network doesn't come into it.

E1.4 The Commission has now altered this position, noting that "*[w]hile the MEA for UBA is dependent on the underlying access network that the hypothetical efficient operator supplies the UBA service over, we are no longer of the view that we are restricted to presupposing that the underlying access network is Chorus' copper network*."[67] It also considers that, although the Act imports the price for the UCLL service, it is not restricted to using the MEA (that was used to determine the price for this service) to determine the additional costs of the UBA service, i.e. that the methodology used to determine the UCLL price does not restrict the methodology used to determine the UBA price. The Commission has therefore judged that it has freedom in respect of the UBA MEA it selects, which is not constrained by the UCLL MEA it has used and that, having regard to s 18 and relativity considerations, it should select a UBA MEA that utilises a copper access network.

E1.5 Vodafone's position remains that the Act requires the Commission to use the same single MEA when determining FPP prices for both the UCLL and UBA services. In particular, we repeat the points it made in its 20 February 2015 submission on this issue. By way of summary, its position is that the "*price for Chorus's unbundled copper local loop network*" (in the FPP for Chorus's UBA in Schedule 1, Part 2, Subpart 1 of the Act) is a reference to the price that has been determined for the UCLL. "The UCLL" is defined separately in Subpart 1 and the way in which that service is to be priced is then prescribed. It is contrary to the statutory scheme to use one pricing method for "Chorus's UCLL" when that term is used in the UBA section in Subpart 1 and another when it is used in the UCLL section. That is not, Vodafone says, a possible interpretation of the provisions.

Recommendation 18	Apply the same single MEA when determining FPP prices for both the UCLL and UBA services.

F Demand

F1 Introduction

F1.1 The Commission's revised approach has extended the relevant demand to also include HFC networks, in order to model appropriate scale for the provision of the UCLL service. The Commission has assumed no change in demand by assuming new connections since 2001

[65] Ibid.

[66] 2014 Draft UBA Determination, [227]

[67] 2015 Further Draft UBA Determination, [745] and [757]

balance vacant unconnected lots. The Commission continues to assume that neither population growth nor consumers' ever increasing consumption of high definition video will cause an increase in fixed line connections.

F2 The HEO's footprint

F2.1 Vodafone agree with a wider footprint for the HEO. As stated in our February Submission (and repeated in our March Cross Submission on TSO boundary issues), we believe the Commission should consider all connections a HEO would find economic to serve, today and throughout the regulatory period:[68]

> *The use of the 2001 TSO network as a starting point seems overly simplistic. Given the rapid changes in technology, we believe it would be logical for the Commission to count all demand connections that a HEO would find economical to serve. This would include both new connections within the TSO boundary, and beyond: with the use of FWA in more remote areas, it is likely that the economically served footprint would in fact be considerably larger than the 'TSO-derived' footprint*

F2.2 The Commission seeks views on whether its CoreLogic dataset should be refined to factors influencing demand: vacant lots and multiple connections at a single address. Whilst the Commission assumes these factors balance, we share Network Strategies' view that multiple connections at single address points are more likely to outnumber vacant lots: "*Data from the 2013 census suggests that 17% of occupied dwellings are characterised as 'two or more flats/units/townhouses/apartments/houses joined together'*."[69] The Auckland figures provided by Network Strategies shows the number of multi dwelling sites as over four times higher than the combined number of vacant lots and greenfield land ready for subdivision. Thus we disagree that vacant lots are likely to offset multi-dwelling units in the CoreLogic database.

F3 Demand growth

F3.1 The Commission assumes a HEO with instantaneous full uptake and a fully-loaded network. We agree this is the correct hypothetical construct as a starting point. However the assumption of zero demand growth over a five year period remains incorrect. We have previously submitted that the Commission's demand incorrectly ignores population growth.

F3.2 By ignoring expected demographic changes, the Commission's constant demand assumption implies that all growth in telephony connections will be mobile-only, or fixed connections on networks other than the HEO's. Yet also on the supply side, the theoretical world of the HEO will also have more fibre availability than present reality, and so the Commission's assumption implies greater availability will have no effect on the decision to retain or acquire a fibre connection. These implications seem illogical.

F3.3 Network Strategies present compelling evidence supporting an assumption of increasing demand, as shown in Box 1.

[68] Vodafone, February 2015 Submission.

[69] Network Strategies, August 2015 Submission, section 4.1. Referring to Statistics New Zealand *NZ.Stat*, data extracted 5 August 2015.

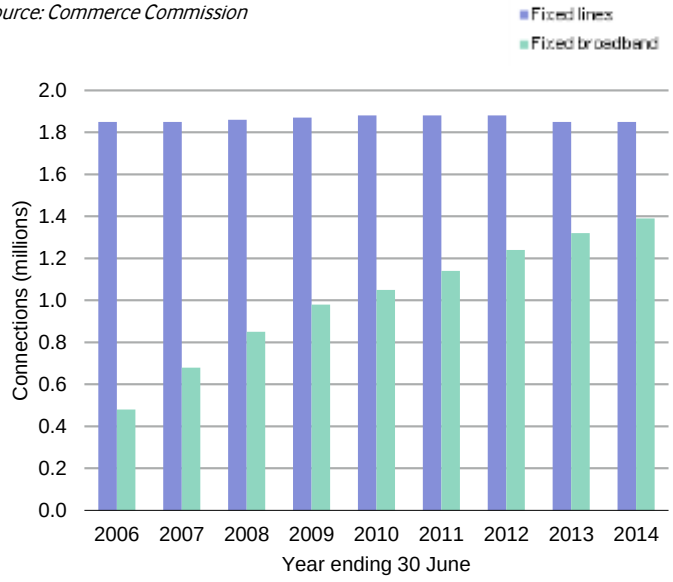
Box 1: Evidence supporting an assumption of increasing demand during the regulatory period

It is an undisputed fact that fixed lines have been relatively constant in New Zealand for a number of years, however with fixed broadband connections being three-quarters of all fixed lines it is clear that a key purpose for a fixed line is to deliver a broadband service.

Network Strategies believe that the market for fixed lines may be approaching a "tipping point" - a threshold which signifies a dramatic change in demand in response to a confluence of external factors. Such a point occurred with mobile data services, when the combination of devices (smartphones and tablets), sufficient bandwidth and desirable applications, all at affordable prices, generated an explosive growth in mobile broadband after many years of relatively modest take-up and usage.

Demand for fixed lines and fixed broadband connections, 2006 to 2014

Source: Commerce Commission



Cloud services

Cloud computing is creating a revolution in information technology. Cloud-enabled services and applications are facilitating greater mobility and flexibility of solutions, and bring the resultant productivity improvements within reach of businesses of all sizes, large or small.

Core requirements for effective remote working, whether that be working from home or working away from the normal office location, are the use of cloud services and Internet connectivity.

In mid-2014 the Government of the United Kingdom introduced legislation that enabled all employees with more than 26 weeks service to request flexible working hours or work from home. This legislation is expected to increase the number of home-based workers in the UK (those who spent at least half of their worktime at home), which comprised 13.9% of the workforce in the first quarter of 2014 (prior to the introduction of the legislation).

A 2012 survey by Statistics New Zealand found that one-third of employed New Zealanders undertook some work at home during the previous four weeks, with just 6% working more than 40 hours at home during that period.

Encouraging economic growth is a key aim for the Ministry of Business, Innovation and Employment and clearly there are opportunities for New Zealand businesses to improve productivity through flexible working practices. Compared to the UK, home-based working is still in its infancy, however if such productivity initiatives are to succeed, cloud computing and sufficient bandwidth will be essential.

Streaming content

Another potential gamechanger for fixed line services is the availability of streaming content via services such as Netflix, Lightbox, Neon and Quickflix.

These services can be accessed by a wide range of devices, including smartphones, tablets, computers and smart TVs. The paid services are priced significantly below Sky TV, and there are also free options from TVNZ and TV3.

Since the local launch of Netflix in March 2015, traffic has increased dramatically. After just two months, Netflix accounted for 15-20% of CallPlus' daily traffic. In the United States, Netflix comprises over one-third (36.5%) of downstream peak-time traffic on fixed broadband.

These types of services have the potential to cause a shift in the preferred mode of content delivery: from dedicated broadcast spectrum, satellite or cable to streaming over the Internet. This could then translate into an upturn in fixed broadband services.

It is still very early days for streaming services, and firm evidence of any sustained effect on the fixed line market is yet to come. By the time such evidence is available, final prices UCLL and UBA prices will have been set, based on a demand profile that is far from forward-looking.

Source: Network Strategies, August 2015 Submission, section 4.

F3.4 Whilst clearly we cannot be definitive about take up of new streaming video services and demand for cloud computing, the start of the trend is clear. Vodafone ourselves operate a 'work is a thing you do not a place you go' 'Better Ways of Working' policy under which employees are free to work remotely.

F3.5 We share Network Strategies' concern that not considering demand growth will risk an outcome that would be detrimental to New Zealand consumers and support their first recommended option: the Commission should adjust demand the forecasts to allow for growth. We do not support revisiting demand assumptions during the regulatory period as to do so introduces regulatory uncertainty.

F3.6 By ignoring demand growth the Commission is allowing an overestimation of the HEO's per line, and thus arrives at inflated wholesale prices.

Recommendation 19	Reconsider demand assumptions to serve all customers that a profit maximising HEO would find viable to serve, including via FWA. Multi-dwelling units should be assumed to outnumber vacant lots.
Recommendation 20	Population growth projections must be built into an assumption of increasing demand.

G Network optimisation

G1 Introduction

G1.1 WIK observe significant opportunities to optimise the network design for UCLL and UBA, and in particular noting that appropriate TSLRIC modelling would incorporate optimisation of the core network, MDF locations, as well as network nodes in the access network.[70] By scorching to MDF and FDS nodes, and using a simple shortest path per fibre calculation, the Commission's model misses significant opportunities for optimisation that would be expected in a best-practice TSLRIC model.

G1.2 WIK recommend optimising the network by endogenously deriving the number and location of cabinets. Without this, the modelled network does not reflect a hypothetically efficient one. The Commission's reasoning against optimisation of node location appears to relate predominantly to MDF nodes. While WIK observe that scorching MDF locations (i.e., scorched earth) is not uncommon in TSLRIC modelling, it is clear that optimised cabinet locations is common practice by regulators to deliver efficient network pricing. We strongly recommend that the Commission optimises the number and location of cabinets.

G1.3 Finally, these opportunities for cost savings also apply in respect of the core network. WIK observe that an HEO would deploy a national NGN network that would deliver considerable costs savings on that assumed in the Commission's model. It would better enable sharing of costs between (regulated and non-regulated) services, and would likely be more efficient in the number and location of FDS nodes.[71]

[70] WIK August 2015 Submission at sections 5.3 and 6.3.

[71] WIK August 2015 Submission, at sections 7.3.1.7 and 7.3.1.11,

G2 Geo-spatial modelling is intransparent

G2.1 WIK observe significant intransparency in the geo-spatial model, which make it difficult for interested parties to properly engage on whether the modelling represents an appropriately optimised or efficient deployment.[72] To the extent WIK can observe the approach taken in geo-spatial modelling, it appears that many parameter values selected (i.e., for private roads and motorways compared to public roads) are inherently arbitrary, and likely to over-state costs through inefficient network design.[73]

G2.2 However, to the extent that WIK can observe the approach adopted in the Commission's revised model, it is clear that there are numerous assumptions taken (apparently in favour of computational simplicity) which result in missed opportunities for optimisation that would be expected of an HEO deploying an optimised network. This translates to an over-estimation of network costs.

G3 Shortest path algorithm does not lead to optimal results

G3.1 To the extent WIK is able to assess the network path algorithm, its view is that it does not lead to optimal or efficient results. In particular, WIK observe that the increase in cable lengths through trench optimisation is unlikely to be accurate (because, as a general rule, less trenching should require less cabling).[74]

G4 Approach to network resiliency not optimised

G4.1 The Commission's revised model includes inflated costs for reinforcing large trenches with more than 5,000 lines connected.[75] While we support the underlying principle that the model needs to account for network resiliency measures in network planning (i.e., reducing certain single points of failure), it is highly likely that more efficient deployment techniques are available.

G4.2 For example, WIK recommend distributing feeder lines on both sides of the road to reduce the proportion of large feeder trenches which require expensive reinforcement.

G5 UBA Network Optimisation

G5.1 The Commission similar misses significant opportunities for network optimisation specific to the UBA network.[76]

G5.2 In particular, WIK observe that the wholesale bitstream access service is necessarily only one product alongside others delivered on the same platform. From an efficiency service, it is essential to take into account the synergies and cost-sharing with these services (otherwise the regulated service will simply cross-subsidise unregulated services).

G5.3 To account for this, WIK recommend:

[72] WIK August 2015 Submission, at section 7.2.13.

[73] WIK August 2015 Submission, at section 5.3.

[74] WIK August 2015 Submission, at section 7.3.1.2

[75] WIK August 2015 Submission, at section 7.2.13.

[76] WIK August 2015 Submission, at section 6.3.

(a) an all traffic node and topology optimisation to determine new FDS locations instead of treating them as scorched nodes; and

(b) ensuring appropriate network optimisation (and efficient network deployment) in the core network (which is missing in the Commission's model).

Recommendation 21	Ensure appropriate network optimisation in the core network, MDF locations, and the access network through ensuring an appropriate "bottom up" approach to network design and taking into account opportunities for efficiency gains and sharing between services.
Recommendation 22	Enhance the transparency of the model, especially in relation to geo-spatial modelling.

H Network deployment

H1 Introduction

H1.1 Vodafone, along with its expert consultants, have provided detailed advice on the key levers for network deployment costs that would face an HEO (and, as such, should be reflected in a high quality TSLRIC cost model).[77]

H1.2 While the Commission's revised draft determination reflects some of these opportunities to accurately model HEO deployment costs, there are significant opportunities which have been ignored. The consequence of this is to produce TSLRIC price which does not represent an HEO, risking over-recovery by the access seeker to the detriment of the long-term benefit of end-users.

H1.3 WIK have performed a sensitivity between the 2014 and 2015 models, and in doing so have observed significant changes in most values – many without significant explanation or detail in the revised draft decision or supporting documentation.[78] For example, WIK observe:

Selected parameter changes from the 2014 to the 2015 model	
Cost elements	**Relative increase - 2015/2014**
Sub rack exchange price	617%
CCT/FAT prices	up to 262.30%
Copper cable prices	up to 1,021%
Fibre cable prices	up to 746%
Joints prices	up to 12.08%
Duct prices	up to 62%
Non network costs	78.8%
Common cost share UCLL	116.8%
Common cost UCLL (absolute cost)	120%
CAPEX share UBA	44.1%

[77] WIK, February 2015 Submission, at section 3.4.

[78] WIK August 2015 Submission, at section 8.1.

H1.4

H1.5 The changes recommended by WIK relate to both specific parameters (like cost values) or more systemic issues (in many cases, efficiency adjustments are absent or only very minor). Together, these translate issues compound to much higher costs than seen in international comparator models – and ultimately an over-recovery by Chorus to the detriment of the end-users of telecommunications services in New Zealand.[79]

H2 Dimensioning inefficient

H2.1 By utilising modern network equipment, dimensioned efficiently (at the FDS and DSLAM level), WIK conclude that the UBA cost could be significantly reduced.[80]

H2.2 For example, the Commission's model assumes that, in the case where more than one FDS is required, location of these switches would have to be interconnected underneath one another to provide full routing flexibility within each FDS location.[81] WIK conclude that this is not the most efficient approaching, noting that an HEO could:

(a) choose a higher capacity switch in order to combine all ports in a single switch; or

(b) route the interswitch traffic through the next higher level switch.

H3 Cable related costs and volumes over-stated

H3.1 Over-estimations of cable costs translate to an over-recovery of approximately 8% in the monthly UCLL price and approximately 6.2% in the combined total monthly UBA price.[82] WIK identify a number of factors driving this, including:

(a) a major increase in unit prices (more than 100% overall), attributed to reliance on list prices from Chorus only which ignore opportunities like volume discounting that an HEO would be expected to achieve;

(b) installation costs which are significantly out of step (by a multiple of 100%) compared to international comparators); and

(c) apparent double-counting through the inclusion of service company overheads.

H3.2 In addition, the volume of cabling is over-stated by ignoring opportunities for cable aggregation and the use of larger cable sizes (either through a total lack of realised opportunities for aggregation, or through the use of smaller size cables than are readily available). For example, WIK identify opportunities for cable aggregation to reduce the costs of:

(a) MDU lead-ins;

(b) SLUBH and FWA cables;[83]

[79] See, for example, WIK August 2015 Submission, at section 9.

[80] WIK August 2015 Submission, at sections 6.4, 7.2.3 and 7.4.3.

[81] WIK August 2015 Submission at section 7.2.3.

[82] WIK August 2015 Submission, at section 7.2.11.

[83] WIK August 2015 Submission, at section 7.2.10.

(c) other core and access cables, because the largest cable selected in the model is 312-fibre (when cables of 592-fibre and higher are available).

H3.3 Importantly, we note that consequence of the over-statement of cable volumes is not limited to increase cable costs, but also is expected to drive significant (and highly inefficiency) additional costs for ducting and trenching.

H4 Active equipment related costs over-stated

H4.1 Over-estimations of equipment and installation costs translate to an over-recovery in monthly UBA charges of between 18.9% to 22.5% over the regulatory period.

H4.2 WIK observe that:

(a) there have been significant (and often unjustified) changes in equipment cost parameters which, overall, significantly exceed the prices WIK expect from their international experience;

(b) Chorus cost figures have been adopted without applying an appropriate sense check as to whether the costs are in line with international experience or, more importantly, reflective of costs expected to be faced by an HEO; and

(c) significant additional costs are included through the service company overhead fee and the Chorus project management fee, representing a likely double-counting of costs which are also included in the OPEX model.

H5 Ducting and sub-ducting requirements over-stated

H5.1 The treatment of encapsulating ducts in the model translates to over-sized ducting, driving up both ducting and trenching costs compared to an efficient deployment.[84]

H5.2 In addition, WIK have identified:

(a) a significant difference in the cost data as between equivalent Danish, Swedish and Italian cost models, suggesting the New Zealand data is significantly over-stated;

(b) an apparent error in the duct cost figures included in the TERA cost model;

(c) instances of double-counting for material costs in the BECA cost model.

H5.3 Finally, WIK note that the use of a hard-coded blended rate for sub-ducting size means the model lacks flexibility to reduce sub-ducting costs if, through trench optimisation, the blend of sub-duct requirements changes.

H6 Further missing efficiency adjustments

H6.1 WIK observe that a number of key costs, which are not modelled bottom-up and instead rely on Chorus' data or accounts, lack appropriate efficiency adjustment. These include:

[84] WIK August 2015 Submission, at sections 7.2.9 and 7.3.1.18.

(a) OPEX costs;

(b) Non-network costs; and

(c) Use of submarine and microwave links.

H6.2 Generally speaking, WIK observe that these costs significantly exceed international comparator benchmarks.

H7 Trench length and size over-stated, and modern techniques ignored

H7.1 In addition to the opportunities for reducing trench length through more efficient cabling and ducting deployment choices and through proper network optimisation, WIK observe that trench costs in the model are over-stated because:

(a) the longest route possible for trenches is assumed alongside and additional (and surplus) 5% margin for obstacles; and

(b) modern trenching techniques which are already in use in New Zealand, such as mini- and micro-trenching are ignored.

H8 Lead-in costs over-stated

H8.1 The model's approach to poles (number and height), street-crossings and MDU lead-ins result in far greater infrastructure costs that an HEO could expect to bear.

H8.2 In addition, capital contributions from users and developers for lead-ins and for reticulating subdivisions are not excluded from the cost base, meaning Chorus will double-recover.

Recommendation 23	Ensure that all aspects of the model, especially those which remain reliant on top-down modelling, properly take into account efficiency gains (and the potential for future efficiency improvements) that would be expected of an HEO
Recommendation 24	Review parameter values to ensure that appropriate HEO costs and deployment choices (as opposed to costs and deployment choices which are fundamentally out of step with international comparators and, in some cases, existing deployment approaches in New Zealand)
Recommendation 25	Review the model closely, taking into account WIK's detailed feedback, for modelling errors and double-counting (as identified in WIK's report).

I Sharing aerial infrastructure

I1.1 The Commission previously assumed a 'joint build' scenario, which doesn't fit with the framework of a HEO deploying its network alongside existing (other utilities') infrastructure. We support the Commission's revision of the HEO's aerial infrastructure scenario to 'build and lease', whereby the HEO leases access to an existing EDB's aerial network poles.

I1.2 We support the use of actual EDB data for estimating the percentage of aerial infrastructure in the HEO's network. However we note concerns raised by Network Strategies:[85]

(a) There is an error in overhead customers served by Aurora Energy;

(b) There is an unexplained decrease in the EDBs' percentage of aerial distribution cables. The assumed share is now below the previous 51% (that had also been verified: replicated using EDB data by Network Strategies);

(c) Assumed consenting costs are based solely on information provided by Chorus and are too high: The Commission must retain a forward-looking approach reflecting the evolving regulatory framework for consenting, and associated costs. The Ministry for the Environment has confirmed that advice on proposed amendments in National Environmental Standards for Telecommunication Facilities (NESTF) - supporting faster availability of new and better communications technologies - will be with the Minister in August and regulatory amendments to consenting can be expected to be implemented by 'late 2015-early 2016'. Thus we can reasonably expect consenting processes to be faster (and lower cost) during the regulatory period to which the FPP applies.

(d) Assumed costs of leasing access to an aerial network are too high: these are based mainly on Chorus' data, it is not clear how Chorus has obtained the data and the Commission's calculation of least cost is not transparent.

I1.3 The Commission must base it's assumptions on costs to share aerial infrastructure from a wider information set: at a minimum this would be information from all New Zealand LFCs.

Recommendation 26	Correct errors in the calculation for the percentage of aerial lead-ins, review the assumed percentage share of aerial deployment, reflect expected regulatory amendments creating faster and lower cost consenting processes for aerial deployment, gather data on pole lease costs and upgrades from all New Zealand LFCs, and review calculations for estimating the pole lease costs.

J Price trends

J1.1 The Commission has presented advice from NZIER on the price trends relevant to inputs into the FPP pricing process. Network Strategies have reviewed NZIER's methodology, their application of the heavy construction index for trenching; and price trends presented for fibre optic cable.

J1.2 We support Network Strategies' conclusions:

(a) NZIER's use of average annual growth rates is superior to TERA's use of compound annual growth rates;

(b) NZIER's recommendation that the Commission use the 2% midpoint of the Reserve Bank of New Zealand's (RBNZ's) inflation target (1-3%) is reasonable;

[85] Network Strategies, August 2015 Submission, s 5.1.

(c) Whilst basing the trenching price trend on Statistics New Zealand's Producers Price Index (PPI) for outputs of the heavy and civil engineering construction sector is preferable to the capital goods price indices used by Beca (which excludes operational and labour costs), the PPI is still an imperfect proxy. As the PPI is comprised of information inputs across the heavy and civil engineering construction sector which includes infrastructure projects other than telecommunications, including roads, dams, tunnels and electricity networks.[86]

J1.3 Network Strategies repeat previous submissions on cost reductions for telecommunications trenching costs:[87]

> *[A PPI] trend will take little account of recent technological developments in the telecommunications sector which seek to reduce construction costs. Such developments include hydrotrenching and microtrenching. In a 2008 analysis we found that while microtrenching can reduce costs significantly, it is not a ubiquitous solution for New Zealand conditions.[88] Nonetheless this suggests that a long-term price trend estimated for the heavy and civil engineering sector is likely to over-state the trend for trenching costs.*

J1.4 Network Strategies have reviewed NZIER's presentation of price trends for fibre optic cable.[89] Using the same approach, Network Strategies calculate a slightly faster downwards trend of -1.4% rather than -1.3% (annual growth rate) for 2006-2014. Despite NZIER claiming that data from 2003 was used, the assessment appears to start in 2006. We support Network Strategies' assessment that the 2003 to 2014 should be used, which results in an average annual growth rate for fibre optic cable prices of -3.0%.

J1.5 TERA have not implemented all of the Commission's updated price trends: the NZIER price trends for building, copper and fibre were not used by TERA. No explanation is provided. Network Strategies' view the likely net effect would be to reduce prices for a HEO's fibre and FWA network. However the effect on the copper model is uncertain as the net effect of copper price inflation and building and fibre cost deflation is unknown.

Recommendation 27	Include NZIER's average annual growth rates rather than TERA's compound annual growth rates, and use the 2% midpoint of the RBNZ's inflation target.
Recommendation 28	Recognise that a long-term price trend estimated for the whole heavy and civil engineering sector is likely to over-state the trend for trenching costs, especially in light of micro trenching techniques.
Recommendation 29	Increase the assumed rate of fibre optic cable price deflation, using 2003-2014 data, and ensure the revised price trends are implemented by TERA.

[86] Ministry of Business, Innovation and Employment (2013), *New Zealand Sectors Report 2013: Construction*, November 2013.

[87] Network Strategies, August 2015 Submission, section 6.3.

[88] Network Strategies (2008), *Micro-trenching: can it cut the cost of fibre to the home?*, December 2008. Available at http://www.strategies.nzl.com/wpapers/2008019.htm.

[89] Network Strategies, August 2015 Submission, section 6.4.

K Capital Contributions

K1 Introduction

K1.1 The Commission, in general, attempts to ensure that Chorus is not allowed double recovery of costs that in the real world, attract third party contributions.

K2 Different treatment of contributions for trenching and for aerial lead ins

K2.1 The Commission now excludes the cost of trenching for all lead-ins from the property boundary to the building within the TSO boundary, given customers usually pay for these. In contrast, the full cost of aerial network deployment is included. There is no convincing reason given for the differential treatment of these two types of third party capital contributions: the Commission has stated that a new aerial lead-in does not create an identifiable asset. We agree with WIK that: "[t]*his argument is misleading and incorrect because aerial lead-ins need assets like poles on the estate of the customers and/or on the rooftop of the building or at its wall. Also the Model Specification confirms that poles are part of the aerial lead-ins.*[90] *Furthermore, labour and design efforts are required which are capitalised in the model.*[91] "[92] The Commission must correct this inconsistency: all network deployment costs that are already covered by the connection charge (intentionally) must not be double counted as a cost to the HEO.

K3 UFB Funding

K3.1 The Commission must consider that the HEO benefits from UFB subsidies. Without the UFB policy and funding an efficiency maximising operator could not be assumed to deploy a fibre beyond 75% of the population.

K3.2 The Commission must consider the analysis reported by Network Strategies, which is that based on their cost modelling of FTTH and FWA, a rational, profit-maximising and cost-minimising HEO would commercially deploy fibre to approximately 65% of the population. If the Commission believes that fibre technology should be modelled beyond this point then it should consider providing an allowance in the model for subsidies for network extension beyond commercially viable areas (based on UFB / RBI subsidies in the real world).

K3.3 However, the Commission's states: "*based on our position that we are only going to deduct capital contributions to the extent that they influence the TSLRIC cost of the network, we do not consider UFB funding relevant, as Spark and Vodafone submitted we should.*"[93]

K3.4 We share Network Strategies' concern:[94]

> *The Commission is correct in stating that subsidies obtained by Chorus for the UFB network have not* ***directly*** *reduced the actual cost of supply of UCLL services.*

[90] See TERA, Model Specification June, p. 42.

[91] See TERA model, CI-ComCom - Inputs - v8.0.xlsx, sheet "Unit costs calculation", cells L10 to M21.

[92] WIK, August 2015 Submission, section 5.5.

[93] Commerce Commission, Further Draft UCLL Determination, para 1625.

[94] Network Strategies, August 2015 Submission, s 7.2.

However this misses the point of our previous discussions of the relevance of UFB subsidies to this proceeding[95]. The Commission is tasked with estimating the long-run costs of a hypothetical efficient operator deploying a modern replacement network today. Different technologies should be considered as possible MEAs, provided that they represent an efficient means of delivering the service to be costed at a similar level of quality. In this respect the Commission states:

> *Where the capability of Chorus's copper access network means that end-users can receive voice-only or low-speed data services, we consider that a replacement network that provides unbundleable, point-to-point service provides significantly more capability than required, and that this would not be an appropriate MEA. Accordingly, the unbundleability and point-to-point features of the MEA network are not required throughout the whole network and we have considered alternative technologies, such as FWA, for lines that we identify as low capability lines.[96]*

This implies that the Commission now believes that a fibre service is not the appropriate MEA where it delivers significantly more capability than the copper service is provisioning in the real world.

Our key point is that there is no economic case for unbundling in very rural and remote areas of New Zealand. In an empirical analysis we used GIS mapping to review the co-ordinates of both existing and planned unbundled exchanges, and found none in Zone 4 areas, one in Zone 3b and a small number in Zone 3a. It is notable that we also found in such areas many examples of end-users being served by FWA technology. We conclude that there is no commercial market for unbundling in these areas, and the most efficient forward-looking means of providing a broadband access service in such areas is via FWA technology.

In deciding on the appropriate criteria for the use of FWA in its model the Commission should rely on TSLRIC principles which require the use of the most cost-effective forward-looking technology available to provide a replacement service. In other words it should adopt a purely economic basis for defining the extent of the fibre footprint with alternative technologies supplying the remainder of customers within the TSO boundary. This is consistent with the HEO construct and with likely future technology deployment. In contrast, an assumption of future fibre deployment in these areas is completely unrealistic, unless subsidies are assumed. The veracity of this statement is illustrated by the need for Government intervention in order to achieve fibre deployment to 80% of the New Zealand population.

As we have previously noted, it is evident that in the absence of RBI subsidies Chorus itself would not have extended broadband services in rural areas. This RBI-funded network extension encompassed 72 000 rural lines as at the end of the 2014 financial year

K3.5 Nineteen percent of all lines in New Zealand are in Zone 4 which Chorus describes as a 'large and geographically challenging area' with 'very small towns, low density areas and remote locations'[97] And yet the Commission has assumed FWA is the appropriate MEA in its model for only 2% of lines.

K3.6 The Commission must select from one of two logically sound approaches for the HEO's policy framework, which leads to logical inferences on the HEO's MEA network:

---

[95] Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA, A review of key issues*, 20 February 2015. See Section 3.

[96] Commerce Commission, Further Draft UCLL Determination, para 1016.

[97] Chorus (2014), *Chorus Institutional Investor Briefing*, 7 October 2014.

	Assumption on government policy affecting the HEO	Logical implication for the HEO's MEA network
Option 1: Ignoring UFB and RBI	The HEO is assumed to optimise its deployment of fibre and FWA based on an economic assessment of the properties and costs of the technologies, and the UFB and RBI funding schemes are assumed to not exist in the HEO's world.	A rational, profit-maximising and cost-minimising HEO would commercially deploy fibre to approximately 65% of the population.
Option 2: Assuming UFB and RBI exist for the HEO	The UFB and RBI schemes are assumed to exist for the HEO as they do currently for Chorus (and others) and so influence the deployment of fibre and FWA, and also contributions made to Chorus (and others) must be taken into account.	If fibre technology should be modelled beyond this point then it should consider providing an allowance in the model for subsidies for network extension beyond commercially viable areas (based on UFB / RBI subsidies in the real world).

K3.7 Given all else is assumed constant for the HEO's world, we strongly urge the Commission to adopt the second approach: do not ignore UFB and RBI's impact on the HEO's network deployment and revenue streams. The second option is consistent with the Commission's assumption that RBI cell sites would be used for deployment of FWA. Accepting the existence of the RBI agreement is a necessary condition for assuming the existence of these RBI cell sites for FWA.

K3.8 If the Commission prefers not to assume the existence of the RBI cell sites its previous approach to FWA, and that in the Further Draft UCLL Determination, cannot hold.

K3.9 Vodafone strongly recommends that the Commission select the latter analytical framework: assume RBI exists. The FWA network design and cost modelling provided by Vodafone and Network Strategies in February also rests on the assumption that the RBI cell sites exist.

K3.10 Lastly, the Commission must ensure its model's results have not been indirectly affected by real world subsidies without any compensating allowance. It is inconsistent for the Commission to include lines upgraded via an RBI subsidy in its count of full-speed lines, without allowing for the subsidy in the model.

Recommendation 30 Recognise that the HEO benefits from UFB and RBI subsidies.

L TSO boundary issues

L1.1 We share Network Strategies' concern on the Commission's treatment of the infrastructure costs of serving customers outside the TSO boundary:[98]

> *While the Commission is not explicit about the changes made in the model to address the issue of the exclusion of infrastructure outside the TSO areas to serve customers within the TSO areas, the information provided by TERA is not sufficiently clear to fully understand the changes in the approach and to assess the impact on the results.*

L1.2 This lack of transparency means we are not able to meaningfully submit on this aspect of the Commission's analysis.

[98] Network Strategies, August 2015 Submission, s3.1

L1.3 Network Strategies has previously alerted the Commission that 'a considerable number of FWA-served buildings were actually outside the boundaries of the TSO areas.'[99]

L1.4 Despite changes that have been introduced by the Commission, the applied method that is used to select buildings within the TSO is in fact inconsistent with TERA and the Commission's stated approach. And so this error has not been resolved: Network Strategies find 4,842 properties that the Commission is assuming to be connected by FWA do in fact lie outside the stated network boundary.

Recommendation 31	Ensure the modelling is consistent with its stated approach to TSO boundaries: resolve the error that remains in selection of buildings within the TSO by removing buildings outside the TSO from its assumed FWA coverage.

M WACC

M1.1 The Commission's Further Draft Determinations reduce the mid-point of the WACC from 6.47% to 6.03%, as a result of changes in parameters feeding into the WACC.

M1.2 Network Strategies has carried out an assessment of the Commission's revised WACC calculation. We support Network Strategies' recommendations that the Commission:

(a) accurately implements its stated methodology for estimating the asset beta;

(b) re-estimates notional leverage to ensure consistency with its approach for estimating the asset beta; and

(c) adjusts its interest rate swap estimate to reflect evidence that in only 50% of instances would two swaps be required in the New Zealand telecommunications sector.

Recommendation 32	Ensure the stated methodology for calculating the asset beta is implemented, ensure consistency across the method for estimating notional leverage and the asset beta and adjust interest-rate estimates to reflect evidence that in only 50% of instances would two swaps be required in the New Zealand telecommunications sector.

P Further modelling concerns

Inclusion of design costs not justified

P1.1 The model includes design in the unit cost calculations for joints and poles. These costs are reflective of Chorus' indicated costs, and there is no evidence of a required efficiency adjustment.

P1.2 More importantly, it is unclear whether inclusion of these costs at all is justified. It is not clear that these costs have been included from OPEX costs (as a part of general network planning costs). As such, there is a real risk that Chorus is permitted to double-recover (on costs which are likely inefficient to start with).

[99] Network Strategies, August 2015 Submission, s3.1

Leased lines

P1.3 The model does not properly take account of leased lines, which in an efficient fibre network, should be expected to share and absorb costs in both in the access and core network. WIK observe that TERA rely on a cost-saving value from models conducted in other jurisdictions, but this information is not available to the FPP parties to interrogate.

P1.4 WIK observe that savings in markets with which they have experience as being between 10% to 20%, which is significantly higher than apparent in the Commission's model.

Q Uplift

Q1.1 The Commission has decided not to uplift the central TSLRIC estimate, nor the WACC. Vodafone supports this decision.

Q1.2 NWS has provided a critique of the Commission's uplift modelling – which applies only in the case that the Commission reconsiders its decision on uplift.

Part 3: COMPARISONS OF THE FPP PRICE AND IPP PRICE

R International Benchmarking

R1 Introduction

R1.1 Comparison of the prices of international benchmark services that are similar to UCLL and UBA services is of primary relevance in the IPP process that preceded the current regulatory proceedings. The determination the FPP prices for these services is, as the Act makes clear, a function of the Commission's estimation of the TSLRIC for each service. Benchmarking has no role in the statutory function being performed.

R1.2 However, benchmarking of similar services is instructive in that it exposes headline differences in the cost of providing similar services in New Zealand and other countries, and in this way operates as a practical sense check of the Commission's approach.

R1.3 TERA has carried out an international benchmarking assessment to cross check its FPP cost modelling results. The Commission has relied on this analysis to demonstrate that costs in New Zealand are relatively high, so justifying the high UCLL price. However TERA's benchmarking exercise is not robust, and so the Commission cannot rely on its conclusions.

R2 Benchmarking approach

Comparator models

R2.1 TERA's selection of comparators is not appropriate. TERA includes regulatory modelling information from Denmark (2015), France (2005), Ireland (2010) and Sweden (2009) in its benchmarking exercise. We note TERA has not made use of the more recent Swedish model that is publically available. Further, the French data is too old to be comparable, and we understand TERA has not had access to the Irish model and so has made assumptions on the relevant data.

Methodology and adjustments

R2.2 We share Network Strategies' concerns on the benchmarking method:[100]

(a) TERA's benchmarking is based on a cross check of copper modelling results. And yet the Commission's MEA is building a fibre and FWA network. Sweden's more recent network cost model is for a fibre MEA and so must be considered. If a comparison is to take place, then we agree with Network Strategies that New Zealand results can only be compared against Sweden, and potentially Denmark.

(b) TERA's approach to converting currencies to New Zealand dollars is inappropriate for benchmarking the UCLL service.

R2.3 TERA's adjustments to data from France, Ireland and Sweden includes:

(a) "updating" prices to 2015, as the comparator prices applied to an earlier time period;

[100] Network Strategies, August 2015 Submission, section 10.3.

(b) comparing against a price determined for a subset of lines (for France and Ireland) rather than national average cost

(c) extending the scope of costs and lines for New Zealand, and comparing against the costs of a copper network rather than a fibre and FWA network.

R2.4 These adjustments result in comparators that are not fit for purpose. The French data is drawn from 2002 and so, in an industry with rapid technical change and decreasing equipment costs, clearly cannot remain relevant thirteen years later. TERA makes errors in its calculations on Irish data, and provides no basis for its assumption that Irish costs would be 'distributed similarly to Denmark and/or New Zealand'. Further, no detail is provided on the adjustments made to the Swedish model based on 'asset price specific to Sweden'.

R3 TERA's benchmarking must be rejected

R3.1 We share Network Strategies' conclusions that:

(a) The French information should not be considered as relevant benchmark data.

(b) The Irish benchmark presented by TERA is both incorrect and irrelevant.

R3.2 We also note WIK's comments: "It is our opinion that the Commission has not undertaken an adequate examination of the reasons for the glaring differences between the numbers that come out of the benchmark sets and the relevant estimate from the TERA model for New Zealand."[101]

R3.3 We conclude that TERA's benchmarking exercise is not robust, and so the Commission cannot rely on its conclusions.

R4 We do not agree New Zealand is more sparsely populated than Sweden

R4.1 As per WIK's comments, we agree that the spatial dispersion of end-users might be a cause of higher costs per line for New Zealand than other more densely populated countries. However we do not agree that evidence has been provided to demonstrate that New Zealand is more sparsely populated than Sweden.

R4.2 Population density information from the World Bank indicates that for the period 2010-2014, Sweden has 24 people and New Zealand has 17 people per square kilometre.[102] However population density information at a national level cannot be viewed in isolation of information on how people are spread across different types of areas.

R4.3 Population distribution data from the World Bank indicates that at a national level, Sweden and New Zealand have an almost identical proportion of the population living in urban areas.[103] The OECD provide more detailed information on the degree of urbanisation. The most recent regional statistics (2012) include the proportion of a country's population that live in 'Predominantly

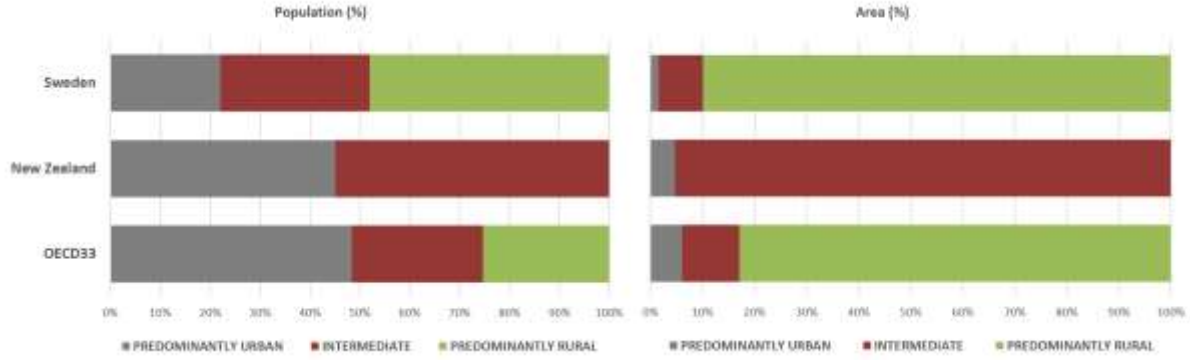
[101] WIK, August 2015 Submission, section 9.

[102] World Bank, Indicators, Population Density, at http://data.worldbank.org/indicator/EN.POP.DNST

[103] The 2010-2014 percentage of the population in urban areas is 86% for both Sweden and New Zealand. World Bank indicators: http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS/countries

Urban;', 'Intermediate', and 'Predominantly Rural' regions.[104] The distribution of a country's geographical area across the same categories is also reported. Figure 1 compares the distribution of population and area for the OECD 33-country average, New Zealand and Sweden.

Figure 1: Distribution of population and area by type of region, 2012.



Source: OECD.

R4.4 New Zealand and Sweden both have a lower 'Predominantly Urban' population share than the OECD average. However Figure 1 clearly shows that New Zealand's population is spread across the Predominantly Urban (45%) and Intermediate (55%) areas. This data also appears to show that New Zealand's rural areas are classified as Intermediate, and so must be considered more urbanised than areas that would be classified Predominately Rural.[105] In contrast, Sweden's Predominantly Rural population is 48%, with only 22% in Predominantly Urban areas. Furthermore, Sweden's geography is classified as 89% Predominantly Rural. These statistics show that in terms of population distribution and geographical area types, more people live in rural (so not 'Predominately Urban') areas in Sweden than in New Zealand.

R4.5 Maps of housing and population density across New Zealand and Sweden, as shown in Figure 2, do not provide definitive evidence that New Zealand is more sparsely populated than Sweden. Noting the differences in the colour shading scale across the maps, it appears that the southernmost third of Sweden is fairly densely populated, and New Zealand's most concentrated population density is in the upper third of the country, around Auckland.

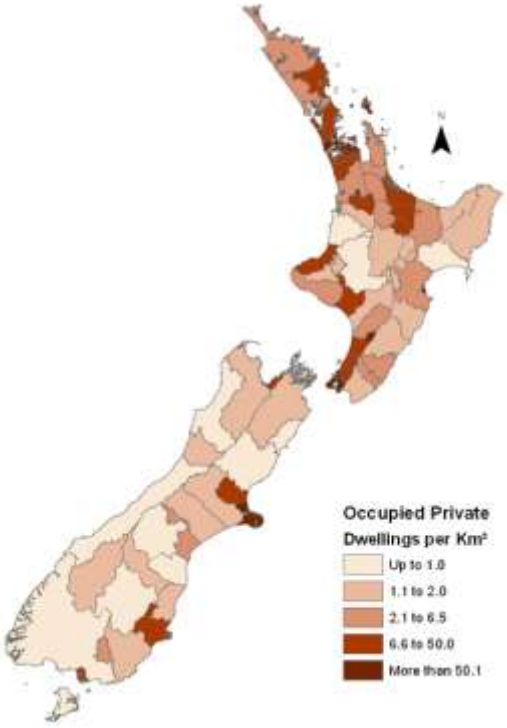
[104] OECD, Regions at a Glance 2013. Chapter 2, Figure 2.1 Distribution of population and area by type of region, 2012. Data at http://dx.doi.org/10.1787/888932913247

[105] We have not uncovered the precise definition of categories used by the OECD. We consider that perhaps the reason no areas in New Zealand are classified as Predominantly Rural may be due to smaller towns being spread throughout most of New Zealand. We have requested clarification from the OECD.

Figure 2: Comparing population densities: New Zealand and Sweden

NEW ZEALAND

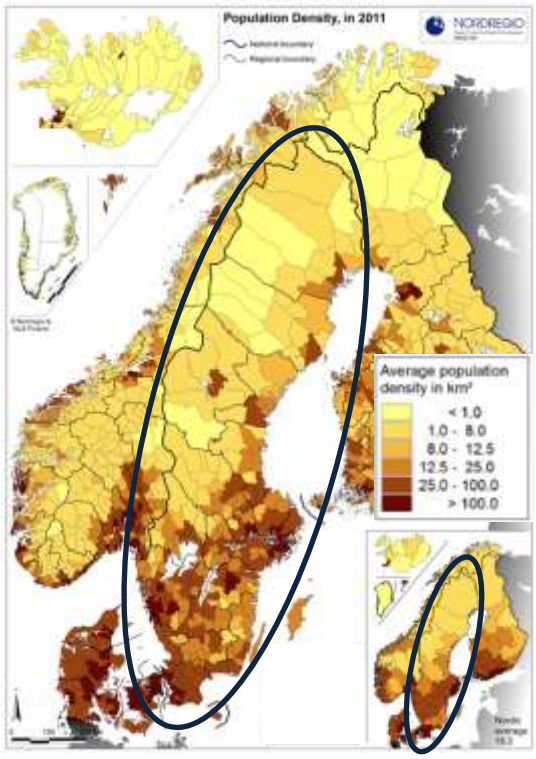
Housing density 2008



Source: Statistics New Zealand

SWEDEN

Population density 2011



Source: Nordregio

R4.6 Finally, we refer to TERA's suggestion that 'the length of road per active line' provides a better metric to assess population density relevant to telecommunications networks. Network Strategies' have found that Sweden's metric is 0.09km of road per active line and New Zealand's comparable metric is 0.07km of road per active line. This therefore suggests that the population distribution of Sweden is extremely similar.

R4.7 We do not agree with TERA's assertions that New Zealand's cost per line are higher than in Sweden due to New Zealand having a more sparsely distributed population.

R4.8 Furthermore, very real differences in climate conditions across the two countries do not appear to have been taken into consideration. Temperatures in Sweden during their long winters fall far lower than during New Zealand's shorter winter season. The harsh climate in Sweden means that the ground is frozen for longer periods of time, and cables require better protection against the elements. Such factors will result in higher deployment (and maintenance) costs in Sweden than in New Zealand for equivalent activities.

Technology modelled contributes to rural cost inflation

R4.9 Finally, TERA's finding that costs in New Zealand's rural areas are 'an order of magnitude higher than median costs'[106] is simply a further important red flag that cannot be ignored: the

[106] TERA Consultants (2014), *International comparison of TSLRIC UCLL and UBA costs and prices*, June 2015. Appendix 5.

Commission's decision over the HEO's fibre footprint cannot be sustained. The Commission must model FWA based on a HEO optimising cost across fibre and FWA.

Recommendation 33	Recognise that TERA's benchmarking methodology contains serious problems that undermine the validity of its conclusions.

Appendix 1 – Microwave backhaul information

[

]VFNZCI